

CONTRIBUTED PAPERS

SEVENTH CONFERENCE OF  
**COMMONWEALTH**  
**STATISTICIANS**

November 16-28, 1970

VOLUME I  
ITEMS 2-5 OF AGENDA

CENTRAL STATISTICAL  
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Four documents relate to the work of the Conference :

1. Report of Conference :—A technical report of the proceedings highlighting the various issues discussed at the Conference. Report is printed for circulation to delegates/observers, the national statistical Offices of the Commonwealth Countries and the general public.

2. Contributed Papers :—Submitted in writing to the Conference by various countries :

A. Papers contributed on Items 2 to 5 of the agenda (Volume I).

B. Papers contributed on Items 6 to 9 of the agenda and papers contributed on items of the agenda which were not discussed in the Conference (Volume II).

C. Papers Contributed on Items 10 to 14 of the agenda and papers contributed on items which were not discussed in the Conference (Volume III):

Circulation of these papers is limited to delegates and official observers who attended the Conference, the statistical Offices of all Commonwealth Countries and at their initiative and discretion to the Statistical Associations in their respective Countries.

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SEVENTH CONFERENCE  
OF  
COMMONWEALTH STATISTICIANS  
NEW DELHI, NOVEMBER 16-28, 1970  
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Review of Statistical Activities Since the Sixth Conference -

The 1970 Population Census of the Commonwealth Caribbean.

1. Census Day in the Commonwealth Caribbean was 7th April, 1970. The census enumeration in the region has therefore been completed, and the job of data processing is in its early stages.
2. The 1970 Population Census has marked a considerable step forward for the Commonwealth Caribbean, in that this is the first population census which has been carried out entirely on the initiative of and as the responsibility of the governments of the region. From 1841 - 1844, when population censuses were first carried out in the countries of the region, to 1931, when the last census before World War II was undertaken, censuses of population, in what was then known as the British West Indies, were carried out in response to directives or advice from the United Kingdom. Thus the Censuses of 1844 were undertaken in response to a circular letter from the Secretary of State for the Colonies ordering that a census be taken in all colonies on 3 June 1844. Similarly, the following census in 1851 followed a proposal by the Registrar General of England to the Secretary of State that the colonies should take a census on the same date as proposed for England in 1851.
3. The Census of Jamaica of 1943 and the Censuses of the other British West Indian colonies of 1946 were, like their predecessors, undertaken in response to recommendations emanating from the United Kingdom, and the United Kingdom Government in fact bore most of the cost of these censuses. The 1946 census, however, was important in that it was the first time that a census of the region was carried out with central planning, the use of uniform schedules and instructions and the central tabulation of the results. This approach was repeated in 1960, though on that occasion it was found convenient to have the data processed at two centres - one at the Bureau of Statistics of Jamaica and one at the Central Statistical Office of Trinidad. For this reason, there were some minor differences in approach between Jamaica, which used a mark-sensing schedule for individuals, the remainder of the Western Caribbean region which used a household schedule but had its data processed in Jamaica, and the Eastern Caribbean whose data was processed in Trinidad. The Eastern Caribbean for this Census was Trinidad and Tobago, Guyana, Barbados and the Windward Islands - Dominica, Grenada, St. Lucia and St. Vincent. The Western Region, in addition to Jamaica, included British Honduras (Belize), the Leeward Islands - Antigua, Montserrat, St. Kitts/Nevis/Anguilla, and the British Virgin Islands - as well as the then dependencies of Jamaica - the Cayman Islands and the Turks and Caicos Islands.
4. But, as before, the initiative for the carrying out of the 1960 Census came from the United Kingdom which took the first step by allotting, through the Colonial Development and Welfare Organization, a sum towards assisting with the cost of the regional census, and in fact bore the total cost of the central operations of census planning and the data processing and printing of the results. In addition, the United Kingdom Government met the cost of the enumeration for many of the smaller, grant-aided colonies. When the West Indies Federation was set up, the Federal Government took over responsibility for the financing of the census, the funds to be provided by the

United Kingdom Government, but with the demise of the Federation in 1962, financial responsibility for the central operations returned to the United Kingdom Government.

5. While the most important new step in the Censuses of 1946 was the central organization, in 1960 most significant was the much greater part played by West Indians, from the Federal Government and the Governments of the larger countries which had their own central statistical organizations, in planning and directing the census operations. Indeed in Jamaica and in the Eastern Caribbean region, census responsibility was entirely in the hands of West Indian demographers and statisticians while only in the Western Region excluding Jamaica was there assistance in the planning and direction of the census from outside the region.

6. The census of 1970 in turn differs significantly from the earlier censuses in that on this occasion there was no initiative from outside the region for the carrying out of the Census. The four largest countries (in terms of population) - Jamaica, Trinidad and Tobago, Guyana and Barbados - are all independent and were, therefore, no longer liable to direction from or entitled to assistance from the United Kingdom Government. The remaining states of the region, while not fully independent are responsible for their own internal affairs, and they too received no direction or assistance from the United Kingdom Government with respect to the 1970 Census.

7. Nevertheless, the 1970 Census is again being carried out as a regional operation, and, unlike the census of 1960, only one central office for planning and data processing has been set up. This central organization came about as a result of a recommendation of the First Conference of Commonwealth Caribbean Government Statisticians held in Trinidad in 1966 (these conferences have been held annually since, the Fourth being held in Jamaica in 1969), that a Census Co-ordinating Committee should be set up, including the Census Officer of each country of the Commonwealth Caribbean, under the Chairmanship of the Professor of Demography of the University of the West Indies who had been Census Adviser to the Eastern Region in 1960.

8. The Governments of the region agreed to the setting up of the Census Co-ordinating Committee with a view to achieving the maximum collaboration and co-ordination in connection with the census. At a preliminary meeting held in 1967 the Committee proposed that an agreed annual sum should be contributed by the various Governments to the University for the use of the Co-ordinating Committee in the task of planning the census. This was agreed to, and the Committee was also given authority to seek to obtain financial and other assistance from other sources in connection with the carrying out of the census. Ford Foundation has made a two-year Grant to the Co-ordinating Committee in this connection.

9. The plans for the census enumeration were carried out at the Census unit at the University of the West Indies with active assistance from the Department of Statistics of Jamaica and the Central Statistical Office of Trinidad and Tobago. The statistical Departments of Guyana and Barbados have also assisted particularly in the testing of the various operations. The Co-ordinating Committee has met on a number of occasions to review the plans while sub-committees, consisting mainly of staff from the statistical departments of the four larger countries have been engaged in the detailed planning of the questionnaire and the field instructions.

10. For the pre-enumeration period, each Census Officer has been considered specifically responsible for organizing the proper sub-division of his country into enumeration districts and the preparation of adequate boundary descriptions and E.D. maps. However, a panel of experienced census staff, again mainly from the four larger countries, visited the various countries to assist and advise the Census Officers in these functions. This was particularly necessary in the smaller islands in which the Census Officer was, in many cases, a new-comer to census or large-scale survey work. In order to permit a comparability of the data at the E.D. level (summary data for E.D.'s was published by most of the countries for the first time in 1960) efforts were made to keep the E.D. boundaries the same as in 1960, with the sub-division of a 1960 E.D. into two or more E.D.'s for 1970 where the population had become too large for coverage by a single enumerator.

11. The Co-ordinating Committee decided, at one of its early meetings, that an electronic computer would be necessary for the processing of the data, and that the census schedule or questionnaire should be of a kind that could be read directly to computer tape, so avoiding the long delay of manual punching of cards as was done in most cases in 1960. Through the assistance of the Dominion Bureau of Statistics, an I.B.M. 360/30 computer was given to the Co-ordinating Committee for the data processing of the census, with the understanding that afterward it would be used in statistical work for the region. The Census questionnaires were therefore designed for use with an I.B.M. 1232 Optical Reader. Of the 44 questions on the form, all but four are entirely pre-coded. The questions which have to be coded are: industry, occupation, vocational training and religion. In the case of this last, the ten most important religions have been pre-coded for each country and coding would need to be done if the religion is not one of these ten, in which case the enumerator is required to write-in the name of the religion.

12. Up to the time of writing, the Committee has not looked in great detail at the tabulations that are to be obtained from the census or the tables that would be published. It has, however, been accepted that the tabulation scheme used in the two regions in 1960 should be a starting point, and the computer programmers have been engaged in programming all the tabulations which were common to the two regions in 1960. Within a few weeks after Census Day (7th April), it is planned to hold another Co-ordinating Committee meeting, probably with some sub-committee meetings, to look in detail at the tabulations which were not common to the two regions in 1960, to decide which, if either should be repeated, as well as to agree on additional tabulations that should be attempted because of the additional information that has been obtained (on vocational training and internal migration, for example), and because of the greater interest in and demand for census data from the Governments and researchers in the region.

13. Although a computer has been obtained, as stated above, the Committee must now approach the Governments for funds for the data processing and printing of the results. The contributions made by the Governments, so far, have been intended primarily for the planning of the enumeration and assisting the various countries in the preparation for and the carrying out of their enumeration. Each Government was, of course, also responsible for all expenses connected with its own enumeration. The Committee has been looking at the possibility of obtaining printing equipment as a gift so that the Governments of the region would be called upon only for the payment of data processing and printing staff and the non-capital supplies

required.

14. While the Census is referred to as the Population Census of 1970, a section of about ten questions on housing have been included. Housing questions were also included in the 1960 Census of Jamaica, but not in the basic Censuses of the other territories.

15. Despite the Co-ordinating Committee, the use of an almost uniform questionnaire and the decision to have a single data processing centre for the region, there are some differences between the approach of the various countries. The main difference is between Jamaica and the rest. Firstly, the Jamaican census is a *de jure* one, while the census for the other countries is *de facto*. This difference is historical, and it was agreed not to insist on uniformity in this respect. Also, again a historical difference, the enumeration in Jamaica begins on the day after Census Day, and all information is collected with respect to Census day; enumeration takes about a month; on the other hand, the enumeration in the rest of the region was done before Census Day, with a return visit on the Evening of Census Day to ensure that there were no changes in the composition of the households enumerated, and to make any adjustments that might be necessary (e.g. by adding births, deleting deaths or persons not spending Census night at the house concerned and so on).

16. Jamaica also has a definition of a household different from that used by the remainder of the region; while the other countries have continued to use the general definition of a household as a group of persons living together and sharing at least one common meal, the Jamaican definition is based on the dwelling unit, i.e. the accommodation unit with independent entrance, and a household is taken as the persons living in a dwelling unit.

17. The only other substantive difference is that in British Honduras (Belize) there is a question on Language spoken, while this is not important and has not been asked in the other countries.

18. Despite the very large measure of uniformity it is very likely that there would be slight differences in interpretation of instructions and in approach in a number of instances. This would mean that the data of the various countries of the region may still not be entirely comparable despite the genuine attempts at uniformity. It is unlikely that this would be of considerable importance, however; such differences are known to occur even within a country. In any case, despite the decision to undertake the census as a regional exercise, the census remains for each country, an expensive but extremely important source of information on a large variety of topics, and for them comparability of the data is of minor importance as compared with obtaining data of direct use in its own planning and policy-making.

19. For some reason or reasons that have not been disclosed, the Government of Antigua, after attending the early meetings of the Co-ordinating Committee, did not participate in the regional census. A census was carried out, however, on 7th April, the main difference in the questionnaire being that information on fertility was not sought. Antigua is making its own arrangements for data processing and printing.

REVIEW OF STATISTICAL ACTIVITIES SINCE THE SIXTH CONFERENCE,  
INCLUDING POPULATION AND AGRICULTURE CENSUS PLANS

INTRODUCTION

Integration of Economic Censuses and Surveys

A number of references are made in this report to the project for integration of economic censuses and surveys, which affected a number of areas of the Bureau's work. The report therefore begins with an account of this project.

For the year ended June 1969 censuses of mining, manufacturing, electricity and gas production and distribution, retail trade and selected services, and wholesale trade were conducted for the first time on an integrated basis.

The manufacturing and mining censuses for 1968-69 were part of the series of regular annual censuses conducted for these industries, but the mining census was being held for the year ended June instead of the calendar year as in the past. Electricity and gas production had previously been included in the manufacturing census; for the year 1968-69 they were treated as a separate census and the scope of the returns was extended to cover distribution as well as production. The retail census had been held every four or five years, the previous retail census being for the year 1961-62. Wholesale trade had not been the subject of a census before, although there had been an exploratory partial wholesale census for the year 1963-64. In future, censuses of retail and wholesale trade will be held about every five years, the other censuses annually as in the past.

The integration of these censuses meant that for the first time they were being collected on the basis of a common framework of reporting units and data concepts and in accordance with a standard industrial classification. As a result, the statistics for the industries covered by the censuses are provided with no overlapping or gaps in coverage, and in such a way that aggregates for certain important economic data such as value added, employment, salaries and wages, fixed capital expenditure and stocks can be obtained on a consistent basis for all sectors of the economy covered by the censuses.

It is intended to use these censuses as benchmarks for regular sample surveys of capital expenditure, stocks, retail sales etc., which will themselves be integrated with each other and will use the data concepts common to the censuses. In the past it has not been possible to use census data for this purpose.

To meet the purposes of integration, as they have been described it was therefore necessary to take four major steps, which will ultimately affect most if not all of the economic censuses and surveys conducted by the Bureau:



- (i) Standardisation of census units: defining business units at standard levels, corresponding to the strata in the business structure for which various types of economic statistics are required and can be collected; devising standard rules for identifying such business units. (See para 156)
- (ii) Establishment of an Integrated Register of business units: identification of the standard units for all businesses to be covered by economic censuses and surveys, and recording them in a register to be used in the running of the censuses and surveys. (See para 157)
- (iii) Standardisation of the industrial classification: adoption of a common system of classification suitable for all censuses and surveys, to which all the standard business units to be covered would be classified without gaps or duplication. (See para 153)
- (iv) Standardisation of data concepts: defining in common terms the basic items of data for which statistics are required across all industries covered by economic censuses and surveys, to permit comparison and aggregation. (See para 150)

#### I. POPULATION AND VITAL

##### Population Estimates

Estimates of total population for the States and Territories have been advanced from the 1966 Census population totals, largely from statistics of natural increase, recorded net gain from overseas migration, and from the estimated net gains and losses resulting from interstate migration.

2. Estimates of net interstate migration are now based on administrative records (electoral rolls and child endowment records). Such estimates are being monitored and supplemented by results from an annual interstate migration survey based on a nationwide sample of dwellings. Survey results provide independent estimates of the size and structure (age structure, masculinity, proportion of aliens) of interstate migration. For the Australian Capital Territory, estimates are based on average dwelling occupancy rates and statistics of new dwelling construction.

##### Population Projections

3. The Bureau has continued to make population projections for Commonwealth Departments and other authorities, as well as for State offices of the Bureau which request projections. These projections have related variously to Australia or a particular State or Canberra. In addition, the 'Interim Projections of the Population of Australia (1968 to 2001)' were prepared for general distribution and were published in April 1969 in abridged form.

### Overseas Arrivals and Departures

4. The transfer to the computer of the processing of statistics of overseas arrivals and departures in October 1966 has allowed additional and more complex tabulations to be prepared.
5. Detailed statistics are now available which classify overseas travellers by sex, marital status, age, occupation, nationality, country of birth, country of residence, country of embarkation/disembarkation, mode of transport, length of stay and purpose of travel. Most of these statistics are further classified by the State of residence (in Australia) or the State of embarkation/disembarkation.
6. Also in October 1966 in the statistical processing of passenger cards, card-marking and subsequent mark-sensing were substituted for the previous card-punching, and quality control measures were introduced to ensure an adequate standard of card-marking and to provide records of the performance of individual card markers.
7. Tabulations have been introduced showing passenger movement by sea into and out of Australian ports. Separate statistics of persons participating in short pleasure cruises starting and finishing in Australia have also been introduced.
8. Investigation into revisions to the overseas passenger card is now taking place. It is hoped that the revised card will be easier to complete and will also provide additional details relating to the purpose of the traveller's journeys. Redesign of passenger cards is being explored with a view to obtaining more information regarding the countries visited by Australians travelling abroad and the part of Australia in which visitors spend most of their time.

### Age Distribution

9. An adjusted age distribution for the 1966 Census population has been published. The adjustment was based on an investigation into age reporting biases encountered at the Census. Following this, an integrated set of estimates by single years of age for individual States and Territories was published for each year from 1961. Estimates for dates commencing 30 June 1967 include Aborigines, thus enabling the calculation of single-age specific rates relating to the total population. Investigations are to be carried out into possible sources of data on the age structure of interstate migration (electoral transfer records and child endowment records).
10. Tables of single-age specific fertility rates for the years 1921 to 1965 have been published with tables showing cumulative fertility rates of annual cohorts for the years 1908 to 1965. It is proposed to re-publish these tables incorporating revised rates in accordance with the adjusted 1961 to 1966 age distributions and rates updated to include experience to 1968.

Vital and Health Statistics

11. The Eighth Revision of the International Classification of Diseases was used for the first time in the presentation of mortality and morbidity statistics for 1968. To provide continuity with previous years, cause of death statistics for 1967 were recoded according to the Eighth Revision.
12. A booklet for the guidance of medical practitioners in completing death certificates has been prepared and distributed to all registered medical practitioners in Australia.
13. A series of training courses on cause of death coding was held for staff of the Central and State Offices of the Bureau. Additional courses to maintain the level of trained personnel are being considered.
14. In all States except Victoria and the Territories, the death registration laws have been changed to allow uniform reporting of perinatal deaths. Data will be collected in respect of live-born infants dying within twenty-eight days of birth and stillbirths occurring after the twentieth week of gestation.
15. From 1967 to 1969, new collections of hospital in-patient morbidity statistics were introduced in all States except Victoria and the Territories. In Victoria the existing collection continued unchanged. Coverage of institutions is not complete but is being extended as resources permit. The collections are based on recommendations made by the National Health and Medical Research Council.
16. Work is continuing towards the development of uniform procedures for collecting mental health statistics. A uniform set of tables for publication in all States and a glossary and index of names of mental disorders were prepared by the National Health and Medical Research Council in 1966 and 1967. Further developmental work is being undertaken by a sub-committee of this council.
17. A survey of chronic illnesses, injuries and impairments was undertaken by the Bureau in May 1968 in all States except Victoria, as a supplement to the Bureau's quarterly labour force survey. A similar survey was not conducted in Victoria as another special survey was being carried out in conjunction with the labour force survey at that time.

## II. MANPOWER

Wage and Salary Earners in Civilian Employment

18. This series is currently based on benchmark data derived from the population census of June 1966.
19. Between population censuses the employment data are obtained from three main sources, namely, current pay-roll tax returns; current returns from government bodies; and some other current returns of employment (e.g. for hospitals). The balance, i.e. unrecorded private employment, is

estimated. At June 1966 recorded employment obtained from the foregoing sources accounted for about 85 per cent of the total number of employees in the industries covered, as determined by the census.

20. Particulars of employment obtained from other collections, such as the annual manufacturing census and the censuses and surveys of retail establishments, are used to check and revise estimates. The quarterly labour force survey (see paragraphs 26-29 below) also provides a means whereby movements in the estimates can be checked at regular intervals.

21. At the 1966 Census a new definition of the labour force was adopted. This revised definition is similar to that used in the labour force survey and conforms closely to the recommendations of the Eighth International Conference of Labour Statisticians, so that a person's status is determined by his actual activity during the previous week. It is believed that at earlier censuses many persons - particularly married women - classified themselves according to their main or usual activity or status (e.g. home duties) and overlooked the part-time or casual employment that they had at the time of the census. As the scope of the monthly employment series is similar to and subject to the same limitations as that of the population census benchmarks on which it is based, the totals shown by earlier series do not necessarily represent, at any point of time, the total numbers of employed wage and salary earners, because of the exclusion of many part-time workers. For this reason the estimates now published for the period from June 1966 are not comparable with those for earlier periods.

22. The benchmark figures are derived from particulars recorded for individuals on population census schedules, while the estimated monthly changes are derived mainly from reports supplied by employers, relating to enterprises or establishments. Because the two sources differ in some cases in the reporting of industry, the industry dissection of the census totals was adjusted to conform as closely as possible to an establishment reporting basis. The industry classification used is that of the population census of June 1966.

23. Employees in agriculture and in private domestic service are not included in the estimates, because of the inadequacy of current data.

24. Pay-roll tax returns are lodged at present by all employers paying more than \$A400 per week in wages (other than certain Commonwealth Government bodies, religious and benevolent institutions, public hospitals and other similar organisations that are specifically exempted).

25. The series is published in the monthly bulletin 'Employment and Unemployment'. Detailed estimates for each month from June 1966 to June 1969, classified by State, industry and sex have been published in a bulletin entitled 'Employed Wage and Salary Earners, June 1966 to June 1969'. Detailed estimates for the earlier series were published in two bulletins entitled 'Wage and Salary Earners in Employment', covering the periods June 1954 to June 1961 and June 1961 to June 1965.

Quarterly Population Surveys

26. In November 1960, following extensive preliminary testing, the Bureau commenced quarterly population surveys in the six State metropolitan areas. In February 1964, regular quarterly population surveys were extended to cover the whole of Australia. The surveys are based on a sample of about 38,000 households which are selected by area sampling methods and the information is obtained at selected households by specially trained interviewers. The sample is a multi-purpose medium suitable for obtaining national labour force statistics and other information amenable to collection by personal interview methods. The emphasis in the population survey is on the collection of data on demographic and labour force characteristics, the principal survey component being referred to as the labour force survey. Supplementary inquiries are carried out from time to time in conjunction with the labour force survey.

27. The surveys have been used by the Bureau to obtain comprehensive labour force estimates at quarterly intervals during intercensal periods. The labour force classification used in the surveys follows closely the recommendations of the Eighth International Conference of Labour Statisticians and differs only in minor detail from that adopted for the labour force surveys in the United States. As already mentioned in paragraph 21, the concepts and definitions used in this classification were also adopted for the Population Census of 30 June 1966. The quarterly estimates obtained from the surveys are used to supplement the existing monthly employment series which covers civilian wage and salary earners (except those engaged in agriculture and private domestic service).

28. The surveys are conducted in February, May, August and November each year (to coincide with the mid-point of calendar quarters) and cover all persons 15 years of age and over, except members of the permanent armed forces, national servicemen enlisted in the Regular Army Supplement and certain diplomatic personnel customarily excluded from census and estimated populations.

29. Principal Australian estimates from the labour force survey are published in the quarterly bulletin 'The Labour Force'. Additional and more detailed estimates have been published in a comprehensive bulletin 'The Labour Force, 1964-1968', and it is planned to issue an annual bulletin containing similar estimates, commencing with the year 1969.

30. Supplementary surveys carried out since May 1968 have covered the following subjects:

- Chronic illnesses, injuries and impairments (May 1968)
- Non-school study courses (August 1968)
- Work experience (February 1969)
- Interstate migration (May 1969)
- Child care (May 1969)
- Personal income (November 1969)
- Full-time education (February 1970)
- Migration and journey to work or school (May 1970)

Results of these surveys are published separately in mimeographed bulletins.

### III. INDEX NUMBERS OF PRODUCTION (No Report)

#### IV. AGRICULTURE

##### Agricultural and Pastoral Expenditure Survey

31. An annual sample survey has been developed to collect data on capital and operating costs for rural holdings in Australia on a financial-year basis. The framework for the survey consists of all holdings included in the Agricultural Census. Holdings are stratified according to farm type and the sample is selected systematically with probability proportional to the holding's value of production. The survey consists of mail and field phases. In the mail phase, each holding selected is sent a questionnaire. In the field phase, a proportion of mail respondents and non-respondents is field enumerated. Cluster sampling is used to minimise costs. This second phase aims at checking on the quality of the mail-enumerated data, and at improving expenditure estimates by using the more reliable field-enumerated data as a calibration factor in the estimation procedure. The survey is still in the developmental stage and results have not yet been published. The sampling methodology used is described further in paras 161-166.

##### Post-enumeration Survey

32. Work has commenced on the establishment of a regular post-enumeration survey to be held subsequent to the annual Agricultural Census. The main aim of the survey, which is based on a sample of farmers' holdings to be field enumerated, will be to provide benchmark data on the accuracy of the results obtained by the annual mail Census. The results to be obtained from the post-enumeration survey could be used at a later stage to adjust Census data, to check on the suitability of the concepts and definitions used in the Census form and to ascertain the reasons for misreported Census data. It is hoped that the first post-enumeration survey will be after the 1970-71 Agricultural Census.

##### Wheat Surveys

33. A sample survey of wheat growers was established in New South Wales (the largest producing State) in 1965. The survey is now conducted on a regular annual basis by means of a mail questionnaire to obtain data on acres sown to wheat and forecasts of acres to be harvested. The success of the acreage survey led to the establishment, in 1967, of a similar sample survey to obtain data on acres harvested and production of wheat. As these surveys provided extremely accurate results, a similar survey was instituted in Western Australia (the second largest producing State) in 1969 and they will be extended to all mainland States.

##### ADP Developments

34. For the fifth year information collected in the annual Agricultural Census is being processed by computer. The Agricultural Census computer system consists of three main phases: form addressing and collection control, editing and amending the individual census returns, and aggregating the edited returns to the geographic levels required for publication purposes. Investigations

being made into both the editing and the aggregation phases are expected to result in major revisions. The revision of the latter phase, undertaken prior to the 1969-70 Census, consisting primarily of technical improvements, should result in less computer time being required, thus allowing the more timely publication of Census results. It is expected that the reappraisal of the editing system will result in the replacement of the existing limited system with an increased number of more detailed checks, comprehensive automatic computer adjustment of reported figures, and a simplified amendment system.

35. Prior to the adoption of a mail collection, the police acted as collecting and distributing agents for the Census schedules. Computer form addressing and collection control facilities were first introduced in 1966-67, and cover broadly the addressing of Census schedules from a Central Register located in each State, marking off returns received and indicating those for which follow-up action has been temporarily or permanently postponed, addressing reminders at pre-determined dates, and producing final lists of non-respondents for police follow-up action.

36. A generalised program to incorporate all these ADP developments has been used in several sample surveys of agriculture.

#### Farm Size and Type

37. A classification of rural holdings by size and type of activity is currently being undertaken in respect of data obtained from the 250,000 rural holdings included in the 1968-69 Agricultural Census. This will be the second classification of this nature undertaken entirely by computer. The method involves the classification of holdings to one of a number of farm types, such as sheep, fruit, milk cattle. The typing is based on the principal activity of each holding, measured by the gross cash receipts at the farm. In future years the computer will facilitate more regular publication of this type of classification.

### V. FISHING

#### Development of Uniform Statistics

38. Work has continued on developing uniform Australian fishing statistics. These efforts have been co-ordinated with the Commonwealth and State Fisheries Authorities through the Commonwealth-State Fisheries Conference and in particular through the Statistics Committee of that Conference.

#### Catch and Effort

39. The monthly catch and effort collection involves a complete Census of all commercial fishermen and is designed to show, for the major species of fish caught, quantities landed, fishing methods employed (beach seining, long lining, pot fishing, etc.), locality of catch (a 1° grid system is used) and the effort involved (number of hooks used, total hours of fishing time, number of pot lifts, etc.).

40. Computer processing of data was introduced in 1969. Tabulations for each month are forwarded to Federal and State fisheries authorities, and to the Commonwealth Scientific and Industrial Research Organisation for fisheries research purposes.

41. In a collection of this nature, there are numerous problems in obtaining accurate data and in ensuring prompt replies. These difficulties have been given special attention and, in addition to the distribution of appropriate publicity to commercial fishermen to increase their awareness of the importance of reliable statistics, an annual school has been organised for selected local State Fisheries Inspectors, at which some elementary training in the collection techniques and uses of statistics is given.

#### Boat Registrations

42. The legal requirement for annual registration of commercial fishing boats has provided a means of obtaining statistical information on the fishing fleet. Age, gross tonnage, length, make and horsepower of main engine, incidence of fish detection equipment and other fishing gear are among the details obtained from the annual boat registration application forms. The data have generally been processed by computers located in State Offices of the Bureau. As a result of a recent recommendation by the Australian Fisheries Council that full details should be collected only at five-year intervals, some variation may develop in the amount and detail of annual information in each State on fishing boats.

### VI. MANUFACTURING, MINING AND QUARRYING

#### Annual Factory Census

43. The annual factory census is part of the system of Integrated Economic Censuses conducted for the first time in 1969. Statistics of manufacturing are therefore now collected on a basis consistent with those of the mining and distribution industries.

#### Monthly Commodity Production Statistics

44. There has been a steady expansion of the monthly production series; a major development being the introduction of a new series for women's, maids' and girls' outerwear.

#### Monthly Factory Activity

45. Monthly returns covering the principal items of output (and, in some cases, input) have been collected since July 1962 from about 700 large factory establishments. These returns provide additional information to that obtained from the normal monthly coverage of factory production.



Quarterly Collections of New Tractors, Agricultural Machinery and Construction Machinery

46. Commencing in the September quarter 1967, the quarterly collection of receipt, sales and stocks of new tractors and agricultural machinery was expanded to include sales of new construction machinery and attachments.

Mining and Quarrying Census

47. The Annual Mining and Quarrying Census, like the Annual Factory Census, is part of the system of Integrated Economic Censuses. This has resulted in the adoption of the financial year as the period to which the statistics relate, instead of the calendar year period of the previous Mining Censuses.

Mineral Exploration

48. Statistics of mineral exploration (excluding petroleum exploration) on producing and exploration leases were collected and published for the calendar years 1965 to 1968. For 1968, the scope of the collection was broadened to cover general exploration survey work and other exploration activity not connected with particular leases. Information is now being collected on expenditure on drilling and other exploration methods, salaries and wages paid, the cost of materials, etc. used in exploration, expenditure on fixed tangible assets, payments to contractors, payments to and receipts from partners in joint ventures, expenditure under options to purchase, employment, footage drilled, and anticipated exploration expenditure for the following year. Collection on a financial year basis commenced with the year 1968-69. Petroleum exploration statistics are collected and published by the Bureau of Mineral Resources.

Monthly Minerals and Mineral Products Bulletin

49. A monthly bulletin 'Minerals and Mineral Products' was first published in March 1966. The coverage of this bulletin has since been extended and it now contains monthly statistics of : production of major minerals, primary smelter and refinery products and some basic manufactured products of mineral origin; exports and imports of minerals and mineral products; prices and price index data; Commonwealth Government payments to the mineral and manufacturing industries for products of mineral origin and changes in stocks of gold bullion held in Australia.

VII. CONSTRUCTION

Statistics of the Value of Work Yet to be Done on Buildings Under Construction

50. Since 1969, quarterly statistics of the value of work yet to be done on buildings under construction have been published in the 'Quarterly Bulletin of Building Statistics'. The compilation of these series has been carried out for past quarters to 1958, and are available by ownership from 1960 and by ownership and type of building (i.e. factories, offices, shops etc.) from 1961.

Building Contractors Collection Forms

51. A redesigned form has recently been introduced for the collection of data from building contractors. This form collects data, not previously compiled, on material of outer walls and structural frame (or load bearing walls) as well as data on roof and floor area in squares (100 square feet) for houses and other new buildings.

Computer Processing of Building Operations Statistics

52. Computer processing of building operations statistics has been progressively introduced in all States and Australian figures are now prepared by computer. Such processing has enabled a wider range of statistical data to be made available.

Computer Processing of Approvals

53. The 1970-71 statistics of building approvals will be processed by computer. Approvals processing will at the same time be linked to the processing of building operations statistics, maintaining statistical coverage and enabling statistics of works approved but not yet commenced to be compiled.

Building and Construction Census

54. The building and construction industry will be included in the second Integrated Economic Censuses in 1974-75. Before this sector can be incorporated into these censuses, however, it will be necessary to conduct at least a limited pilot census to evaluate the forms, etc., to be used. These pilot tests will be conducted in 1971-72.

Quarterly Construction Statistics

55. It is planned to start an annual collection in 1970-71 to enable statistics of the level of activity of civil engineering and construction work to be compiled. After an approvals collection is established, it is planned to develop construction operations series (i.e. of projects commenced, completed, work done, etc.) similar to those currently prepared for building operations. The first collection to measure these activities is scheduled for 1971-72.

VIII. ENERGY (No Report)

IX. CONSUMPTION (No Report)

## X. TRANSPORT AND COMMUNICATIONS

Survey of Motor Vehicle Usage

56. A Survey of Motor Vehicle Usage, based on a sample of vehicles listed on the State and Territory registers, was conducted in 1963; the results were published in 1965. The sample used for this survey was stratified by type of vehicle, viz. motor cars and station wagons; utilities and panel vans; and five categories for trucks grouped according to size. The survey questionnaire asked informants to recall, for the previous twelve months, the total miles travelled, with dissections according to broad area and purpose of travel, fuel consumption, average load and kind of business operation (rural industry, manufacturing, etc.).

57. The Bureau intends to conduct a series of surveys designed to give a wider range of reliable statistics of motor vehicle usage for 1971-72. The preliminary survey is planned for July 1971 in respect of the year 1970-71 with despatch of forms to a sample of about 50,000 vehicle owners on the register in June 1971. It will be of the recall-type similar to the 1963 Survey. The second survey based on a sub-sample of approximately 5,000 vehicles will be a field enumeration using log books to collect more accurate information on a weekly basis for 1971-72. The main 1971-72 survey will, in general, be a repetition of the 1970-71 survey but the information obtained will be adjusted on the basis of the field enumeration data. Results of the 1971-72 survey should be available in published form in 1973.

Census of Motor Vehicles

58. In order to draw a sample for the vehicle usage survey, it will be necessary to obtain a listing of all vehicles on the register in each State and Territory in June 1971 and it is intended that this will be subsequently processed to provide motor vehicle census statistics.

Interstate Road Freight Statistics

59. The Bureau is currently introducing a monthly collection of the tonnages of freight carried interstate by road between the capital cities and major industrial centres (e.g. Newcastle, Wollongong-Port Kembla, Geelong). The initial coverage will include about 100 principal road transport firms. Tonnage figures will be collected on an origin and destination basis and investigations are currently proceeding to reveal if it will be possible to dissect total tonnages into general goods, bulk goods, liquids and gases, and refrigerated and other temperature-controlled freight.

Road Traffic Accident Statistics

60. The Bureau, with the appropriate State authorities, is reviewing the basis and scope of statistics obtained from police accident report forms

with the aim of publishing a comprehensive range of objective data relevant to accident situations.

61. With an increased need for road traffic accident statistics, the Bureau began issuing in January 1970 a monthly publication, 'Road Accident Fatalities', showing State and Territory totals.

#### Shipping Statistics

62. Statistics of international and coastal shipping, compiled from returns submitted by shipping companies to Customs Houses at each port in Australia, have been published since July 1966. Returns are submitted for each movement of a vessel, arrivals and departures being treated separately.

63. Cargo is reported in terms of tons weight or tons measurement depending on the charging basis (1 ton measure = 40 cubic feet). The figures on the two bases are not aggregated in monthly published statistics, to avoid spurious comparisons.

64. Annual tables are published on the number and net tonnage of shipping movements, and freight rates for a selected list of export commodities are published quarterly.

65. Although no details are published of coastal cargo classified by origin or destination of shipping movements, totals for interstate cargo shipped and statistics for total overseas cargo loaded and discharged are published monthly.

66. Commodity statistics of shipping cargoes are being developed as a separate collection based on Customs export entries. Initially, outward shipping cargo statistics expressed in gross weight and value and classified by commodity, will be compiled from a redesigned export entry form, which is an integral part of a new aligned system of export documentation introduced on 1 April 1970.

67. Shipping cargo statistics derived from Customs entries will have the virtue of being expressed in terms of both gross weight and value for each commodity classification. Shipping statistics will be classified by the countries between which goods are consigned as well as by the ports of origin and destination. The former will show the movement of goods beyond overseas ports of loading and discharge, a valuable extension of statistical information on shipping transportation based on port-to-port data. These statistics will be available on month and year-to-date bases within two months after the close of the period to which they relate.

68. It is also proposed to explore the practicability of establishing inward shipping cargo statistics based on import entries.

## XI. INTERNAL TRADE

Census of Wholesale Establishments 1968-69

69. The first full-scale census of wholesale trade in Australia was taken for the year ended 30 June 1969 as part of the Integrated Economic Censuses.

70. An exploratory census of wholesale trade had been held for the year ended 30 June 1964. The main purpose of this exploratory census was to obtain preliminary information on the structure and trading practices in Australia to assist in planning the 1969 census.

71. Broadly speaking the census covered all non-retail distributive trade businesses; that is, all businesses which re-sold goods predominantly to retailers or other wholesalers or to institutional, professional or other business users, regardless of the price or quantities involved in the transactions. This method of defining wholesaling is in close agreement with the United Nations Statistical Office recommendations on distributive trade statistics.

72. The range of data collected includes: kind of business and type of operation of establishment, details of sales and other income, details of purchases and other expenses, stocks, capital expenditure, persons working, salaries and wages, and details of commodity items sold (for sales on own account only).

73. The data collected will allow some derived statistics to be compiled, e.g. gross margins and value added. Each establishment will be classified to one of the ASIC wholesale industries in accordance with predominant activity (determined, where possible, from details of commodity sales).

Census of Retail Establishments 1968-69

74. A census of retail establishments was taken for the year ended 30 June 1969. This was the sixth census to be taken in Australia since the collection of retail trade statistics commenced in 1948. Like the wholesale census, the retail census was conducted as part of the Integrated Economic Censuses.

75. The retail census covered the re-sale of new or used goods to final consumers for personal or household consumption. It also covered the activities of cinemas, licensed hotels, motels and clubs, restaurants, laundries and dry cleaners, shoe repairers and hairdressers.

Sample-census For Year Ended 30 June 1967

76. The purpose of this sample-census was to obtain the information

needed for updating the 1961-62 census data on which the monthly and quarterly surveys of retail establishments are based. The need to update the 1961-62 data arose when it became necessary to extend the life of the existing monthly and quarterly surveys, following the decision to defer a full retail census from 1967 to 1969 so that it could be taken as part of the Integrated Economic Censuses. If the sample-census had not been conducted, the number of establishments in the monthly and quarterly survey would have had to be increased significantly each year to keep the size of the standard errors of these sample surveys within acceptable limits.

#### Publication of Standard Errors of Estimates of the Value of Retail Sales

77. The estimates of the monthly and quarterly values of retail sales published by the Bureau are derived from the returns received from a sample of retail establishments. To provide users with a measure of the accuracy of both the level of the estimates of the value of retail sales for each month and quarter, and of the accuracy of the estimates of the movement in the value of retail sales from month to month and from quarter to quarter, details of the standard errors for these are now published by the Bureau.

78. The standard errors published for the monthly estimates relate to the total value of retail sales for Australia and were first published for the month of July 1968. For the quarterly estimates, the standard errors published relate to the total value of retail sales for Australia and to individual commodity groups within that total. These were first published for the June quarter 1968.

#### Seasonally Adjusted Estimated Value of Retail Sales

79. Seasonally adjusted monthly estimates of the total value of retail sales for Australia were first published in May 1967 and are available for each month from April 1961. Seasonally adjusted quarterly estimates of the total value of retail sales and of individual commodity groups within that total were also first published in May 1967, but are available back to the March quarter of 1958.

80. In seasonally adjusting these series account has been taken of both normal seasonal factors and trading-day effects arising from the varying numbers of Sundays, Mondays, Tuesdays, etc. in each month or quarter. No adjustment has been made for the effects of movements in the date of Easter.

### XII. EXTERNAL TRADE AND BALANCE OF PAYMENTS

#### External Trade

81. In July, 1965 an Australian Customs Tariff based on the Brussels Nomenclature was introduced and at the same time the Australian Import

Commodity Classification (A.I.C.C.) based on the Standard International Trade Classification (Revised) (S.I.T.C.(R)) was also established. This was followed in July, 1966 by the Australian Export Commodity Classification (A.E.C.C.) also based on S.I.T.C.(R). The A.I.C.C. is completely compatible with S.I.T.C.(R) at the five digit level, and A.E.C.C. is substantially compatible with S.I.T.C.(R) at the five digit level and completely compatible at the three digit level. The new classifications are more detailed than those previously in use. At the time of the introduction of A.I.C.C. the definition of merchandise used in external trade statistics was revised in accordance with the recommendations of the United Nations Statistical Commission.

82. The processing of statistics of imports and exports was converted from mechanical tabulation to ADP at the same time as the new classifications were introduced. The processing system was completely revised and advantage taken of the introduction of ADP to incorporate more extensive editing of source documents. The system has provided a very extensive range of tabulated material, some of which is published monthly, quarterly and annually, while the very detailed tabulated information is available on request.

#### Balance of Payments

83. Since 1966, developments in this field have, in general, been directed to continuously reviewing the adequacy and reliability of the estimates. As a result, while no new large-scale collections or surveys have been introduced, the coverage and reliability of the estimates and their presentation have been improved.

84. Balance of payments statistics are published in two ways by the Bureau: in the form of a quarterly summary, available within one month of the end of each quarter; and in the form of a more substantial half-yearly bulletin, containing not only global totals but also regional estimates, tables showing useful related data in more detailed form, and explanatory notes on concepts and content. The content of both of these publications has been extended since the last Conference. Quarterly estimates of private overseas investment in Australian companies, derived from the quarterly surveys of overseas investment, have been published for the first time, while in the half-yearly bulletins there has been a significant improvement in the amount of information published in respect of current invisible and capital transactions with selected countries.

85. Another noteworthy development has been the gradual increase in resources allocated to the tasks of producing unpublished monthly estimates and short-term forecasts of the balance of payments. To meet a growing demand for more information, it has been necessary not only to undertake the production of more detailed monthly estimates and forecasts but also to begin the systematic development of more advanced forecasting techniques.

86. An additional development during the years since 1966 has been the increased involvement of the Bureau in questions of concepts and principles basic to the balance of payments as a systematic and cohesive set of accounts. In this connection, Bureau officers have attended conferences of balance of payments experts convened by the International Monetary Fund in 1967, 1968 and 1970.

87. Throughout the period under review the Bureau afforded assistance to the Commonwealth Department of External Territories in the compilation and publication of estimates of the balance of payments of the Territory of Papua and New Guinea.

88. The Bureau's Balance of Payments Section conducts a number of regular samples and surveys with the object of collecting data for use, directly or indirectly, in the compilation of balance of payments estimates and forecasts. Developments and improvements in respect of these activities since 1966 are noted in the following paragraphs.

89. Data obtained from the quarterly Sample of Import Values are used to adjust recorded imports, which are calculated on a "value for duty" basis, to an f.o.b. transaction value basis required for balance of payments purposes. This sample also provides additional information used in calculating freight payable on imports. The input data, customs entries or warrants, were previously tabulated and processed manually by officers of the Department of Customs and Excise. Recently this work has been taken over by the Bureau and the data are now coded by Bureau officers and processed by ADP facilities.

90. Work continued on the development of the Survey of Overseas Shipping and Airline Operations. This survey is designed to provide data relating to transportation in the balance of payments current account and covers such items as port expenditure in Australia by overseas shipping operators, charter receipts and payments, freight earnings, and fares.

91. The coverage of this survey is still incomplete but is gradually being extended. A new survey covering vessels operated under charter agreements has already been established to provide details relating to the ship chartering operations of Australian importers and exporters and Australian and overseas shipping operators. In addition, developmental work at present being carried out will enable data, collected for the prime purpose of providing cargo statistics, to be used to improve the coverage of the shipping operations survey. These data will facilitate the identification of the operators of all vessels arriving at and departing from Australia.

92. The Survey of Import Orders is a monthly collection which has been in operation since 1965. It was designed to facilitate the short-term forecasting of imports. Information is also requested each quarter in



respect of amounts owing on imports. This type of information is designed to provide some measure of short-term credit for imports and also attempts to identify part of the balancing item in the balance of payments account.

93. A number of problems have been encountered in this survey, and these are still under investigation. For example, the survey has not yet been in operation long enough for a satisfactory lag relationship between orders and actual imports to be established. Coverage, which is limited to known importers with imports of over \$A200,000 per annum, is also unsatisfactory, accounting for only 60 to 65 per cent of total recorded imports. In addition, the present survey does not adequately take account of cancelled orders or goods imported on consignment without an order being placed.

94. Further work on import indebtedness statistics already collected will be necessary before they can be used to full advantage. A major problem here appears to be the elimination of overlaps between import indebtedness data and other items in the balance of payments account.

#### Overseas Investment

95. Since 1966 there have been considerable changes in the sources and categories of overseas investment into Australia. There has also been a considerable increase in the overall level of this investment and a steady rise in the level of Australian investment overseas, new channels for investment flows are being opened up and new forms of investment introduced. All these developments have required constant attention to the adequacy of present methods of collecting overseas investment statistics and consideration of possible alternative methods.

96. Together with the constant review of existing arrangements for collecting overseas investment statistics, a separate preliminary study has been made of the work necessary to provide detailed statistics on Australia's international investment position. The development of such statistics is a long-term project which will require more detailed investigation before it can be implemented.

97. Since the September quarter 1968, quarterly estimates of the inflow of private direct investment (other than undistributed income), portfolio investment and institutional loans, have been released in the quarterly publication 'Balance of Payments, Quarterly Summary'. These estimates are derived from the results of the Quarterly Survey of Overseas Investment.

98. The first results of a series of studies of overseas participation in Australian industry were released in February 1968. These statistics related to the Australian mining industry and covered the

calendar years 1963 to 1965. Subsequent bulletins have been released covering the years 1966 and 1967. Statistics on overseas participation in the Australian manufacturing industry for the years 1962-63 and 1966-67 were released in May 1969 and February 1970 and it is proposed to issue such publications regularly in future. Consideration is also being given to the extension of these types of studies into other sectors of the Australian economy. In all of these studies the approach adopted has been to examine the operations (as expressed in terms of production, wages and salaries, employment etc.) of establishments of Australian companies with direct overseas investment and compare their operations with those of establishments of other Australian companies. In these studies the distinction has been made between overseas ownership and overseas control. In the compilation of statistics on overseas ownership, the data relating to an establishment of an Australian company in which there is direct overseas investment are apportioned to overseas and Australian ownership according to the proportion of ordinary shares (or voting stock) held by the direct overseas investors. The data of all other establishments is allocated wholly to Australian ownership. In the statistics on overseas control, however, the data relating to an establishment of an Australian company in which there is direct overseas investment is allocated wholly to the category of overseas control. The data of all other establishments is allocated wholly to Australian control.

99. During 1968 and 1969 the Bureau provided the Government Statistician in the Territory of Papua and New Guinea with assistance in the collection of statistics of the flows of overseas investment to and from the Territory. The first Survey was conducted for the year 1967-68 and the results published in October 1969.

### XIII. WAGES AND PRICES

#### Consumer Price Index

100. The Consumer Price Index consists of a series of short term linked indexes with links being made at regular intervals to reflect the changing patterns of household expenditure. The fifth link in the series took effect from the December quarter 1968. This link took account of the continuing increase in importance of the motor car compared with public transport and added a number of items to the index, the main ones being services by dentists and doctors, hospital and health insurance funds, rentals of privately owned flats (unfurnished), and poultry. At the same time the reference base of the index was changed from 1952-53 = 100 to 1966-67 = 100.

#### Wholesale Price Indexes

101. A price index of Materials Used in Building other than House Building was published in 1969. It is the first of a new series of sector

type wholesale price indexes at present being developed. Other indexes prepared for release this year relate to materials used in house building, and material inputs to manufacturing.

#### Export Price Index

102. Work on a revised Export Price Index is currently being carried out, and it is expected that this will be ready for publication before the end of 1970. The weights and items in the revised index will give a more up-to-date representation of Australia's current export trade, particularly the changing importance of such items as minerals and manufactures.

#### Exports and Imports of Merchandise at Constant Prices

103. New quarterly series of exports and imports of merchandise at average 1966-67 prices were published in November 1968. They succeeded similar series at average 1959-60 prices. The new series were developed within the framework of the A.E.C.C. (Australian Export Commodity Classification) and A.I.C.C. (Australian Import Commodity Classification), and incorporate a number of improvements such as revaluation in greater detail and the use of automatic data processing.

#### Wage Rates and Earnings and Hours of Work

104. Statistics in this area include the wage rates indexes, rates of pay and standard hours of work for specified occupations, and the series of average weekly earnings per employed male unit.

105. To obtain detailed information on average weekly earnings and hours of work paid in respect of various specified categories of employees, annual sample surveys have been conducted since 1960. These have related to the last pay-period in October each year. From the October 1966 survey onwards, details have been obtained of the dissection of earnings and hours paid into their components of ordinary time and overtime. Developments contemplated for these surveys are the inclusion of government and semi-government employees and more frequent collection of data.

106. In October 1965, a special sample survey obtained details, in respect of adult males, which supplied a frequency distribution of the number of adult males in specified total weekly earnings groups and a dissection of total earnings by four components (overtime, ordinary time earnings at award, etc. rates and ordinary time earnings in excess of award, etc. rates (a) due to payments by measured result and (b) due to other forms of payment). Although the types of statistics obtained from this survey are increasingly in demand, it is not possible to undertake the surveys frequently because of the work load both on the respondents and the Bureau. It is not planned to repeat such surveys more than once every five years.

107. In May 1968 a survey obtained statistics of the number of male and female employees whose wages, salaries and conditions of work normally changed in accordance with variations in an award, determination, etc. of Commonwealth or State industrial tribunals. The survey was similar to ones previously conducted in 1954 and 1963. It is intended to make similar surveys in future at approximately five-yearly intervals.

#### Household Expenditure Surveys

108. Although the Bureau has not yet made any full scale surveys of household income and expenditure, a study was begun in July 1969 of the feasibility of conducting such a survey. This study is now being completed and will report on costs, order of accuracy (both sample and response), alternative methods of collection, data needs that would be met, and demands on resources if such a survey were undertaken.

109. So far, one pilot test of approximately 140 households and another of 300-400 households have been held. These tests are based on the methods used in the United Kingdom Family Expenditure Survey and preliminary results of the first test are encouraging.

### XIV. NATIONAL ACCOUNTING

#### Gross Product by Industry at Current and Constant Prices

110. During the planning of the Integrated Economic Censuses the national accounts branch of the Bureau undertook studies intended to facilitate the incorporation into the national accounts of statistics from this source. The principal expansion in the national income and expenditure accounts, arising from the availability of integrated establishment/enterprise data, is expected to be the more detailed dissection of product estimates by industry. The need was therefore felt to develop such estimates using establishment data from the existing censuses as fully as possible in order to prepare estimates at current and constant prices for the years prior to 1968-69 and generally to explore some of the problems of reconciling integrated census data with the main existing sources. The existing estimates of product by industry, presented in the Australian national accounts have only very limited industry dissection because estimates of operating surplus are largely based on taxation data for enterprises; furthermore these estimates relate to current prices only.

111. Accordingly, estimates of gross product by industry at constant prices for 1959-60 to 1965-66 were prepared last year and a new, more detailed historical series at both current and constant prices was published as a supplement to the 'Australian National Accounts, National Income and Expenditure 1953-54 to 1966-67'. This will be updated to 1967-68 using later information from existing census collections and with some further development of sources and methods, especially following completion

of the 1962-63 input-output tables. From then on, it is intended to rebase the series and to make the product estimates more independent of the income estimates instead of working, as has been done up to now, substantially within the framework of current-price estimates set from the income side. They can, of course, never be completely independent because any continuing or serious divergence necessarily triggers off further investigation and some compromise. Ultimately the income estimates would be seen as enterprise-based and production estimates as, in principle, establishment-based. Exact correspondence by industry is therefore not to be expected, and in total it would be reasonable to accept a moderate statistical discrepancy.

112. The development work underlying the publication 'Estimates of Gross Product by Industry at Current and Constant Prices 1959-60 to 1965-66', involved discussion of the development of basic data collections in several subject-matter areas needed for this and other derived series, such as sector price indexes and indexes of industrial production. The publication includes a discussion of some of the conceptual and operational aspects of the problems of estimating and interpreting industry gross product measures.

113. The gross product project has also been most useful in helping to specify the integrated census tabulations required for national accounts estimates, and work is still proceeding on methods by which the manufacturing census data might be linked before and after integration. A system is being developed which will form the basis of any future attempt to reconcile production census and income tax data.

Quarterly Estimates of National Income and Expenditure - Seasonal Adjustment and Production of Bulletins by Computer

114. Since the September 1967 issue of the quarterly bulletin, the national production account and various components of fixed capital expenditure and consumption expenditure have been seasonally adjusted. The general methods used for making the adjustments are described in 'Seasonally Adjusted Indicators 1969'. The ways in which these methods were adapted to the adjustment of national accounts and certain special methods adopted are described in the supplement to the March 1969 issue of 'Quarterly Estimates of National Income and Expenditure'.

115. Current activity is focused on experimenting with the production of the bulletin from multilith plates prepared from computer print-out. This will be one application of a time series file containing national accounts "statistical building blocks". The file will be used with seasonal adjustment and report generator programs for assembling the tables in the bulletin including automatic changes to totals and balancing items consequential on revised series. It will provide data for the preparation of national income forecasts using the econometric model referred to in paragraph 117. At a further stage of development, it is expected that the

file will contain basic data so that it can be used in the process of estimating some of the individual national accounting items now being prepared manually, e.g. using quarterly figures to interpolate when an annual estimate is revised or to extrapolate for recent quarters.

#### Forecasting and Development of Econometric Models

116. Since 1963 the Bureau has participated, with the Department of the Treasury and the Reserve Bank of Australia, in the National Income Forecasting Committee. This committee prepares forecasts of major national accounts aggregates for the remaining quarters of the financial year and for the four quarters of the following year. The forecasts are not published. The purpose is to assist the Treasury and Reserve Bank in assessing likely trends for policy purposes.

117. During the last two years a start has been made on the construction of a small-scale macro-econometric model for use in the forecasting work. Given forecasts of exogenous variables prepared by specialist areas within the participating organisations, the model generates forecasts of personal disposable income (non-farm), durable and non-durable personal consumption expenditure, investment in non-farm stocks, aggregate demand (non-farm), gross national product (non-farm) and imports of goods and services.

118. Developments of the model in progress include, inter alia: amplified treatment of factor share relationships, tax liabilities and imports of goods and services, inclusion of endogenous relationships for private gross fixed capital expenditure and for labour and money market variables. In the near future it is expected that expenditure functions will be expressed in constant price terms and wage - and price - determination relationships included.

119. It is expected that experience in econometric applications will aid the preparation of current estimates by identifying data gaps, and more directly by use of these techniques - for example in preparing estimates of complex derived series (such as GNP) when only a limited number of data inputs are available.

#### Input-Output

120. Work has proceeded on the preparation of the input-output tables for the year 1962-63 and it is hoped to publish them this year. Although the input-output project has been accorded a low work priority and its progress has been slow, it has proved to be of value in that it helped to identify the gaps in the existing statistical collections and provided assistance to various projects undertaken by other sections of the Bureau, such as the design of the Australian Standard Industrial Classification, the integration of economic censuses (including re-design of the census forms

and extension of the range of information sought) and the estimates of gross product by industry by the production method.

121. Preliminary planning has started on tables for 1968-69. Apart from consultation in the planning of the content of the censuses, work to date has been confined to evolving an industry classification based on ASIC and as closely comparable as possible with that used for 1962-63, and to specifying the form of tabulations required to facilitate later work.

### Taxation Statistics

122. A wide range of economic data is extracted each year from income tax returns made by persons, partnerships and companies and tabulated by the Bureau for use by the Taxation Branch, by the Bureau itself (e.g. for National Accounts estimates) and for general statistical purposes. Since the change to computer processing in 1964, the range of information extracted has been greatly expanded and in the past two years the time lag in compiling the statistics has been reduced by almost four months (i.e. from approximately 23 months to 19 months after the close of the income year). For individuals and partnerships, a basic core of information relating to income, concessional deductions for dependants, medical expenses, business expenses, purchases and disposals of depreciable assets, depreciation allowed, stocks, etc., is extracted each year and classified according to the size of income, sex and occupation of the taxpayer. Information on other items, mainly specific types of income (e.g. interest, dividends,) and concessional deductions, is extracted every two or three years on a rotating basis so that reasonably recent aggregates are always available. For companies, statistics are extracted every year on incomes, dividends, expenses, capital expenditure, stocks, etc.

123. The statistics for individual taxpayers with income from salaries and wages, and with less than \$A300 of income from other sources, have for some years been compiled by sample methods. From the 1970-71 assessment year (1969-70 income year), the statistics for taxpayers with more than \$A300 of income other than salaries and wages in the three larger States will also be compiled by sample methods. During this assessment year a system will also be introduced for selecting the samples by computer at the time the assessments are issued and transmitting to the Bureau some of the information required for statistical purposes on computer tapes.

## XV. FINANCE (PUBLIC AND PRIVATE)

### Public Authorities Finance Statistics

124. The work of developing improved statistics of the transactions of public authorities has continued and preparations are being made for discussions with State Treasuries and other authorities on the amount of

detail to be published. These discussions are necessary because a considerable amount of information has been provided which must remain confidential unless the authorities agree otherwise. Pending the outcome of these discussions a bulletin has been published based mainly on published information and containing much less detail than is proposed for the final bulletin.

125. During the past two years work has proceeded on the development of an ADP system for compiling these statistics. The system provides for individual transactions of each authority to be recorded in a computer file in the form of time series with up to 15 annual observations. The output system provides for the printing of selected lists of transactions, summaries in various forms, statistical tables and the generation of time series in a more summarised form for entry into the Bureau's time series file system. By use of a report generator these time series can be retrieved and printed out as statistical tables suitable for publication.

#### Building Societies

126. Annual statistics of the operations of permanent and terminating building societies in Australia have been published regularly over a long period. However, in recent years the permanent building societies have grown rapidly, and it has become necessary to have more timely statistics of their operations than the annual statistics which become available about 18 months after the end of the year to which they refer.

127. In mid-1969 a collection was instituted in which monthly information on their operations is obtained direct from permanent building societies. Publication of the figures commenced in December 1969.

128. Separate information is being published each month for each State of Australia in respect of the loans, share capital and borrowings of the permanent building societies.

129. Loan figures are published in terms of total value for loans approved, loans advanced, loans cancelled, loans approved but not advanced at the end of the month, loan payments received, and principal owing at the end of the month. In addition, the number and value of loans approved for dwelling units are published with separate information being provided for houses and for other dwelling units, with a further dissection into new and previously occupied dwellings.

130. Share capital figures are published for share capital received, withdrawn, and paid up share capital at the end of the month.

131. The amount received, withdrawn, and the amount owing at the end of the month are published for unsecured borrowings by the permanent building



societies. For secured borrowings the amount owing at the end of the month is published dissected by source of funds (government, banks, insurance companies or other).

#### Savings Banks

132. Since July 1962 the value of loans by savings banks for housing, outstanding at the end of each month, has been published with separate totals being shown for loans to individuals and loans to building societies. Concurrently with the development of the monthly collection of information on the operations of permanent building societies, arrangements were made to obtain additional details of the loans for housing made by savings banks.

133. Since July 1969 the savings banks have provided monthly information on the number and value of approvals of housing loans to individuals with separate figures being provided for new and for previously occupied dwellings. Information is also provided on the value of approvals to individuals for additions and alterations, and on the number and value of all housing loan approvals to individuals cancelled during the month. Also the value of loans approved but not advanced at the end of each quarter is supplied by the savings banks.

134. Aggregates compiled from this additional information for each State and for Australia have been published since December 1969.

#### Finance Companies

135. Annual balance sheets and profit and loss data have been collected from finance companies each year since 1963-64. A series of statistics derived from these annual returns should be published for the first time late in 1970. These figures will supplement monthly statistics already being published for finance companies showing amounts financed, collections and other liquidations and outstanding balances.

#### Quarterly Surveys of Stocks and Capital Expenditure

136. Work has commenced on planning for the introduction, probably in 1972, of quarterly sample surveys of stocks and capital expenditure based on the Integrated Economic Censuses. These surveys will replace quarterly sample surveys of stocks and capital expenditure currently being conducted in Australia that use lists of payroll taxpayers as a framework and employment figures as benchmarks.

### XVI. SOCIAL STATISTICS

#### Offences Reported to the Police

137. A series of statistics commenced in 1964 derived from police

records in all States and Territories, based as far as possible on uniform definitions and counting procedures is now compiled half-yearly and published annually. The series provides data on offences reported and cleared and persons involved (in broad age groups) for the offence categories homicide, serious assault, robbery, rape, breaking and entering, theft and illegal use of motor vehicles, fraud, forgery, and false pretences. It is proposed to expand the collection to include other offences, including larceny. A higher degree of comparability than before has been achieved between States, but there remain differences which reflect differences of administrative practice rather than of crime incidence.

#### Prison Statistics

138. In 1969, following meetings of prison administrators and Ministers responsible for prisons, a working party was established to recommend the development of comprehensive and uniform prison statistics in all States.

#### Court Statistics

139. In New South Wales, a new system has been developed for the statistical reporting of criminal cases heard before the courts, and for the compilation of extensive statistics on convicted offenders. The first statistics on the new basis became available for 1968.

#### Classification of Offences

140. Work is proceeding on an analysis of the classifications of offences used in the States, with a view to the development of a standard classification suitable for uniform national crime statistics.

### XVII. EDUCATION

#### Universities and Other Institutions of Higher Education

141. From 1968, some changes were made in the statistical information gathered from universities. More details are obtained about the subject field of higher degree studies and bachelor degrees conferred. Information is now collected about the type of student accommodation during term and the location of students' homes. The introduction of Commonwealth grants for colleges of advanced education and the rapid expansion of these colleges highlighted an urgent need for statistics on higher education outside universities. An annual collection from colleges of advanced education was begun in 1967, covering course enrolments, staff, libraries, and ages and other characteristics of students. Statistics are available for 1968 onwards. Student statistics, including details of the courses taken, have been collected and compiled from 1967 for teachers colleges and educational institutions of the Defence Forces.

Overseas Students

142. Attempts are being made to develop and reconcile statistics on overseas students in Australia. Information held by the Department of Immigration about overseas students studying in Australia under the Private Overseas Students Programme is analysed and detailed tables have been produced from 1967 onwards. An existing annual collection of information about overseas students at institutions of higher education has been expanded. Arrangements are being made to analyse administrative information available for sponsored overseas students and to co-ordinate the information derived from these separate series.

Sample Survey of Persons Enrolled in Post-school Study Courses

143. A survey was conducted in August 1968 of a one per cent sample of Australian households to obtain estimates of persons enrolled for courses of post-school study or training. Estimates have been prepared giving information about the age, marital status and occupation characteristics of course takers, as well as details of types of institutions attended, the level and length of courses and the number of persons starting courses in 1968.

Education Expenditure

144. Reviews have commenced of the classification of expenditure by public authorities on education, with a view to reconciliation of education expenditure figures required for administrative and planning purposes within the framework of the system of national accounts. A paper giving education expenditure shown in the national accounts and a partial reconciliation with Commonwealth and State Government education expenditures is prepared annually and is the basis for replies to requests for expression of education expenditure as a proportion of Gross National Product.

## XVIII. OTHER

Commodity Classification

145. The work load involved in planning for the 1968-69 Integrated Economic Censuses necessitated deferment of most aspects of developmental work in the field of commodity classification since 1966. There has, however, been continuous review, modification and up-dating of the Australian Import Commodity Classification (AICC) and the Australian Export Commodity Classification (AECC), both of which are detailed extensions of the Standard International Trade Classification (SITC).

146. Work is currently under way on the development of an industrial origin commodity classification which relates commodity output items to classes of the Australian Standard Industrial Classification (ASIC). The industrial origin commodity classification will initially cover only

commodities primary to the mining and manufacturing divisions of the ASIC and will be used for publishing the commodity data collected in the 1968-69 Integrated Economic Censuses. Subsequently it will probably be extended to cover the primary activities of all the relevant parts of the ASIC. A detailed key between items of data (as collected on the 1968-69 census forms) and ASIC classes was constructed during 1968 and 1969 for use in industry coding in the 1968-69 economic censuses and provides the basis for work on the development of the industrial origin commodity classification.

147. Depending on availability of resources it may be possible to resume work on development of an Australian Standard Commodity Classification (ASCC) for use in tabulating and publishing production data and overseas trade data on a consistent basis. This work was commenced in 1962 but had to be suspended in 1964. It is also hoped to introduce a revised Economic Categories Classification for Australian overseas trade data. Currently development of such a classification is awaiting further progress on the U.N. project of developing the Classification by Broad Economic Categories (BEC).

148. During the period since 1966, Australia has continued to participate in commodity classification work in the international sphere, particularly in the development of the BEC and in the revision of the SITC.

#### Australian Standard Industrial Classification

149. As part of continuing work on the development of the Australian Standard Industrial Classification (ASIC) which was started during 1965, an extensive series of field enquiries were conducted during 1966 and 1967. The field enquiries were designed to obtain information about the availability of statistical data for individual activities carried out at locations which were known to be engaged in two or more different kinds of economic activity. Information obtained in these enquiries was used in resolving the related problems of formulating working definitions of the establishment unit and of delineating the boundaries of industries of the ASIC.

150. Using data obtained from the field enquiries and other information a Draft Australian Standard Industrial Classification was prepared in September 1968 and circulated for comment to interested businesses, Government authorities, etc. On the basis of comments on the Draft ASIC, and further work done on estimating likely homogeneity ratios, a Preliminary Edition of the ASIC was printed in 1969 for use in the 1968-69 Integrated Economic Censuses.

151. Data obtained in the economic censuses, and information derived from investigations currently being carried out for industries which are outside the scope of those censuses, will be used as the basis for revising the Preliminary Edition of ASIC to produce a final version. Tables showing the specialisation and coverage ratios for individual industries covered by the 1968-69 Integrated Economic Censuses will be produced; when these

become available it is intended to commence the work of analysing the industry classes in the ASIC with a view to improving overall homogeneity ratios.

152. A major task during 1969 was the preparation of computer and supporting clerical procedural instructions for use in industry coding of the establishment and enterprise returns collected in the 1968-69 economic censuses. The system devised enables something like 80 per cent of the returns to be automatically coded by the computer using data reported on census forms. The remaining returns require some clerical action before they can be industry coded - mainly because the data reported on census forms are insufficiently detailed for automatic computer coding.

153. The ASIC will eventually be used in classifying all industry statistics collected, compiled or published by the Bureau. The classification covers all economic activities and at its most detailed level has approximately 400 classes. The individual classes are required to satisfy certain standards of homogeneity measured in terms of coverage and specialisation ratios and certain standards of size.

154. In developing the ASIC careful attention has been given to achieving the maximum degree of convertibility to the International Standard Industrial Classification of All Economic Activities (ISIC).

#### Integration of Economic Censuses and Surveys

155. The Bureau has completed its first set of Integrated Economic Censuses, covering mining, manufacturing, electricity and gas production, wholesale trade, retail trade and certain services for the year ended June 1969. These censuses were conducted a year later than had been originally intended, owing to the amount of planning and developmental work associated with the project. Because of these factors, it was also decided to restrict the scope of the censuses by omitting the proposed census of building and construction and the proposed collection of benchmark data from sectors outside the scope of the censuses.

156. For two years prior to the introduction of these censuses, an extensive programme of enquiries was carried out into the structure and record-keeping practices of a large number of businesses throughout

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Australia. These enquiries included testing of draft census forms and consultations on accounting practices and terminology with accountants' institutes and industrial associations. Information obtained in these enquiries was used to develop standard definitions of both business units and kinds of data to be collected.

157. For the 1968-1969 economic censuses, use was made, for the first time, of the Bureau's computerised central directory of businesses, the Integrated Register. The work which commenced in 1965 on constructing the Integrated Register system continued until it became operational in mid-1969. While the initial emphasis in constructing the Register was to accommodate the needs of the economic censuses, work is now proceeding to ensure that it can provide the additional facilities which will be required for implementing a system of integrated economic surveys. Currently the Register is being updated five times a year.

158. For the 1968-69 economic censuses, the information stored in the Register formed the basis for producing address labels, etc. for census forms. Extensive use was made of automated form and envelope labelling facilities, and of automated enveloping equipment. In addition, computerised collection control and processing systems were used more extensively in these censuses than in previous similar collections.

159. Design and investigation work has now commenced in preparation for the first integrated economic surveys in 1972, covering retail trade, capital expenditure and stocks, and based on the Integrated Economic Censuses as benchmarks.

#### XIX. STATISTICAL METHODOLOGY - CENSUSES AND SAMPLE SURVEYS

##### The General Surveys Program

160. As a result of the introduction of the Integrated Economic Censuses, the Bureau is redesigning several major surveys (including retail trade, capital expenditure and stocks) from the census data. A computerised system which will carry out all functions necessary in the design and operation of a sample survey is being developed; programming has begun on several sections.

161. It is intended that the General Surveys Program will handle any single-stage survey which has equal or variable probabilities of selection, and which uses any of unbiased, ratio, regression, and difference estimation. The General Surveys Program will have the following functions: the design of

the survey (including the selection of the estimation procedure, stratification of the universe, and allocation of sample numbers); selection of the sample; despatch and control of collection of returns; editing of returns; calculation of estimates and variances; and finally, the preparation of results for publication.

162. While it is to be developed primarily for handling sample surveys based on the Integrated Register, the General Surveys Program is in no way restricted and it is anticipated that on completion it will be put to extensive general use, either in its entirety, or in part.

#### Post-census Evaluation Studies 1971

163. Several evaluation studies are being devised for the 30 June 1971 Census of Population and Housing.

- (a) Persons Coverage and Details Check. After the 1966 Census a one-half per cent sample of persons was drawn from each State of Australia, using the Population Survey Sample framework. It is expected that the 1971 operation will be of similar size and design. The check will provide estimates of the proportion of persons erroneously included or omitted from the Census and information on the accuracy of personal and employment details provided.
- (b) Dwelling Coverage Check. It is expected that this study will take the same format as the 1966 Census Dwelling Coverage Check. In 1966, a one per cent area sample of dwellings was drawn using the Population Survey framework. Population Survey interviewers were used to prepare independent lists of dwellings in sample areas and these lists were compared with Census Record Books; this check provided estimates on the proportion of omitted and wrongly included dwellings in the Census and an estimate of the number of persons omitted from the Census as a result of omissions of dwellings.

#### Preliminary Processing of Population Census 1971

164. It is planned to give priority to the processing of a sample of Census schedules from the 1971 Census, so that preliminary tabulations can be made using this sample. It is expected that a multi-stage sample of dwellings will be used. If so, it will be possible to employ ratio estimates using the 1966 Census figures as benchmarks.

#### Annual Agriculture Expenditure Survey

165. An annual sample survey has been developed to estimate both capital and current expenditure of all rural holdings in Australia for the

financial year ending on June 30. (See para. 31.) The framework for the survey consists of all holdings included in the annual Agricultural Census.

166. A two-phase sampling procedure is used in the survey. Data are collected in the first phase by means of a mail questionnaire and in the second phase by means of field interview. The second phase, is in fact, a sub-sample of both respondents and non-respondents to the first phase. It is hoped by using the more reliable field data as, a basis for calibration, to reduce the biases in the first phase due to misreporting and also to form separate estimates for the non-response sector of the mail sample.

167. All holdings are stratified according to their State and farm type. Some of the smaller farm types were combined. For instance, all orchards, industrial crops, vegetables and poultry were contained in a single intensive stratum.

168. The first-phase sample is selected systematically with probability proportional to estimated value of production. Value of production is estimated from livestock and crop data obtained for each holding in the Annual Agricultural Census. The second phase is a simple random sub-sample of the first phase. Two independent samples are selected for respondents and non-respondents. In those strata where the mail sample is widespread, two-stage sampling is employed in the second phase in order to reduce travelling costs. In these strata the same first-stage sampling units are used for both the respondent sample and non-respondent sample.

169. At present, a first-phase sample of about 3500 is selected and the second-phase commences when response is 70-75 per cent. Twelve per cent of first-phase respondents and twenty-five per cent of first-phase non-respondents are selected in the second phase. Response is high in the second phase; most of the non-response is due to non-contact.

170. All estimation is done by computer. At present, all editing is done manually, although it is hoped to use computer editing in the future. As the survey is still in the developmental stage, no results have yet been published.

#### Experimental Design in Pilot Tests

171. Some use has been made of experimental design by the Bureau in connection with pilot testing of survey plans. Increasing use is now being made of the technique to make numerous tests simultaneously. This technique was applied in a current series of pilot tests for the feasibility study of a household expenditure survey, as well as in some other developments mentioned in this review.

#### Response Bias in Motor Vehicle Usage Surveys

172. The survey of motor vehicle usage conducted by the Bureau in



1963 used a mail questionnaire requiring respondents to recall miles travelled over the previous twelve months period. A special study is currently being undertaken for one region (Canberra) to measure response bias. By observing mileage reading at successive re-registrations, a comparison can be made of actual miles travelled and recalled estimates by individual vehicle owners. Preliminary results have suggested that there are substantial differences between the actual miles and recalled estimates for individual vehicles, but overall the discrepancy is quite small.

#### XIX(a) CENSUS OF POPULATION AND HOUSING

173. The Government has recently approved the taking of a Population and Housing Census in June 1971. Some of the more important developments associated with this Census are outlined below.

##### Consultation with Users

174. In order to obtain information about the needs of users of census data two courses of action were followed. Firstly, an investigation was conducted into the written requests received from all sources since 1963 and later a special letter of inquiry was sent to all persons on the 1966 Census publication mailing list. Current users of census data were asked to specify the intended use of the data they had requested. Secondly, after a feasibility study, two Census Users' Advisory Committees were established. One Committee represents the views of commercial and business organisations as well as academic bodies, while the other represents the views of planning bodies (both governmental and semi-governmental).

175. Briefly the function of the Committees is to advise the Commonwealth Statistician on the content of the census, the topics to be included in the schedule, the definitions and classifications to be used, the tabulations required and the overall aims and content of the census publication programme.

176. Inaugural meetings of these two Committees were held in 1968 and the members were asked, after consultation with interested parties, to submit topics to be considered for inclusion in the 1971 Census Schedule. As guidelines, they were given a number of criteria which it was thought should be at least partly satisfied by each census question. The most important of these was that the question should be widely accepted as being of economic and/or social significance for the community.

177. Suggestions for new census questions were also sought from Commonwealth and State government departments. A great number of suggestions were received from the Advisory Committees and government departments and these were considered by the Bureau. Some suggestions were inappropriate for a census because they required too much space and others were too intrusive or too difficult to answer. Priorities were allocated

to the remainder and a final selection made for inclusion in a test schedule.

#### Schedule Design

178. After consideration of several possibilities, it was decided that the best way of adequately collecting a large amount of extra census data was to use a booklet schedule. This type of schedule provides sufficient space to include not only a large number of additional census questions but also to use design techniques, such as tick boxes and directional arrows which it was confidently expected would make the schedule relatively easy to complete. However, it was appreciated that such a schedule had some disadvantages, the most important being extra processing problems and the adverse initial reaction it was likely to arouse in a number of householders.

#### Census Pre-test

179. A pre-test was held in Sydney in July 1969 and approximately 4,000 dwellings were included.

180. The main aims of the pre-test were, firstly, to test in simulated census conditions the effectiveness of a newly developed booklet schedule that was different in design and content from previous censuses and, secondly, to identify any problem areas in the schedule such as badly worded questions, inadequate instructions, etc. and to investigate and record householders' attitudes to the census, schedule design and particular questions. Following the Sydney Pre-test the Government approved the addition of a number of new items to the next census form.

#### Field Procedures

181. Although the basic field organisation and procedures for the 1971 Census will be the same as in 1966, a number of changes have been proposed to overcome recognised deficiencies in the 1966 system. For example, in order to ensure that the best possible field staff are obtained, a number of recruitment standards have been proposed and as much uniformity as possible will be introduced into recruitment procedures. In addition, a better system of training field staff is being explored. This system involves the preparation of a training manuscript which will be delivered verbatim by the trainer. This system, if successful, has several advantages; for example, special equipment such as projectors, etc. is not required, training is standardised and special training officers or Bureau advisors are not required.

182. These systems received extensive testing in the second Census Pre-test held in Melbourne in April 1970. A booklet schedule was retained though amended in the light of the first pre-test results and the Government's decision to exclude a number of new questions.

Processing

183. In considering processing methods for the Census it became apparent that, in the time available, it would not be possible to provide for direct reading of information on the schedules to the computer. The need for a transcription stage was accepted and available optical character and mark reading equipment are currently being examined on that basis.

184. Methods of editing and tabulation will be basically similar to those used in the 1966 Census but some increase of computer processing is likely in such areas as allocation of not-stated codes and the direct preparation of publications. Particular emphasis will be placed on the need for more timely production of results. It is thought that too much effort has been spent in the past in removing the small proportion of inconsistencies remaining in the data after editing.

## XX. SEASONAL ADJUSTMENT

185. In August 1966, the Bureau decided to adopt as the basis of its method of seasonal adjustment the X-11 Variant of the Census Method II Seasonal Adjustment Program developed by the United States Bureau of the Census. This particular method, while basically similar to others considered earlier by the Bureau, was found to be preferable on two main grounds: its operation and its suitability to Australian requirements. The programs offered a wide range of options to allow for the particular characteristics of individual series and this was important in the Australian context where a number of series are derived from relatively few sources and need therefore to be handled with as much individuality as possible. In addition the X-11 programs provide a number of statistical measures for determining the most appropriate selection of options for individual series.

186. In July 1967, the first issue of 'Seasonally Adjusted Indicators' was published, presenting in graphic and tabular form both original and seasonally adjusted data for 48 series in the categories of production, overseas trade, employment, internal trade, building and finance. 'Seasonally Adjusted Indicators' has been published annually since 1967 and has been expanded to include series on national accounts as well as a wider range of series in the categories mentioned above.

187. Between issues of 'Seasonally Adjusted Indicators', as current original figures become available, the corresponding seasonally adjusted figures are calculated by subject-matter statisticians, using the forward adjustment factors provided by the program, and published with the original data in appropriate subject-matter bulletins. Selections are also included in the 'Digest of Current Economic Statistics' and the 'Monthly Review of Business Statistics'.

188. It is planned to add progressively to the range of published seasonally adjusted statistics to cover a wider area of subject matter and to provide more detail by way of industry and other dissections. At the same time, it is planned to continue current research into methods of seasonal adjustment, with investigations into ways of improving adjustments at present attainable with the X-11 programs, research into alternative methods of adjustment and development of more efficient computer facilities for time series data storage and retrieval.

#### XXI. APPLICATIONS OF ELECTRONIC DATA PROCESSING

##### Equipment Installed

189. The equipment now installed in the Commonwealth Bureau of Census and Statistics is as follows:

(i)	Australian Capital Territory (Canberra)	Control Data 3600 and two Control Data 3300's
(ii)	New South Wales	Control Data 3200, 3330 and 160A
(iii)	Victoria	As for New South Wales
(iv)	Queensland	Control Data 3200 and 160A
	South Australia	Control Data 3200
	Western Australia	As for South Australia
	Tasmania	As for South Australia (shared with Tasmanian State Government).

190. The major components of the systems installed are summarised in the table on the following page.

Installation	Computer (Control Data)	COMPONENTS								
		Core Storage Size	Mass Storage Million Characters	No. of Channels	MT	CR	CP	PT R/P	Line Printers	Plotter
A.C.T.	3600	32K	-	4	}28	1	-	-	-	-
	3300	65K	36	6		1	}1	}1	}5	-
	3300	32K	12	6		1				-
N.S.W.	3300	32K	24	8	9	4	}1	}2	}2	-
	3200	32K	-	4	8	}2				
	160A	8K	-	2	(a)					
VIC.	3300	32K	24	8	9	}2	}1	}2	}2	-
	3200	32K	-	4	8					
	160A	8K	-	2	(a)					
QLD.	3200	16K	-	4	}10	1	1	1	1	-
	160A	8K	-	2		1	1	1	1	
S.A.	3200	16K	-	4	7	1	1	1	1	-
W.A.	3200	16K	-	4	7	1	1	1	1	-
Tas.	3200	16K	-	4	7	1	1	1	1	-

(a) Shares 4 magnetic tapes with 3300

191. The components enumerated in the above table represent a considerable expansion of the facilities given in the previous report. The increase in the power of the equipment was effected in 1967 following the implementation of a number of new systems. The equipment installed acts, in each State, as a data processing service bureau for some other Commonwealth Authorities. The Bureau is responsible for operation of the computers and maintenance of software; it also provides a systems advisory service for the other authorities which carry out their own applications programming. The rapidity with which applications were rendered operational both for the Bureau and other users led to the expansion.

192. The systems provide extensive software facilities which include assembly languages and assemblers, FORTRAN and COBOL and their respective compilers, file management facilities, including LISA and a large library of standard packages such as SORT routines, Table Generators, Report Generators, conversion routines and mathematical and statistical routines. The Canberra installation includes a 3300 with multiprogramming facilities which is operated under the MASTER operating system. Further expansion of the Canberra installation is planned.

#### General Comments on Operation and Administration

193. The subsidiary installation in each State is operated by the particular State Office which also has its own programming group. Co-ordination of the work undertaken by all computers in the complex is maintained through Central Office and includes allocation of priorities, establishment of operating and utilisation reporting procedures, and supervision of scheduling. Acquisition of consumable stores is also arranged by Central Office.

194. The establishment of a set of priorities embracing known developments has enabled co-operative programming effort to be applied to some systems which require processing in each State and at the Commonwealth level as well. Similarly, the collaboration existing with respect to the scheduling enables decentralisation of processing to be effected as required.

195. The compatibility of peripheral equipment between installations allows the transfer of machine readable media. This flexibility has been used for both the transfer of data and programs.

196. The use of a multi-computer network has also emphasised the need for establishing and adhering to standards for ADP work. A considerable amount of effort has been devoted to devising and documenting suitable standards which are sufficiently flexible to be adaptable to changing requirements, but which effectively improve the efficacy with which computer technology is employed to the advantage of the Bureau.

197. The applications processed range from small one-time projects to

large, complex, regular monthly statistical series, requiring many hours of computer processing each month and major periodic projects such as the population census. The general philosophy adopted for processing statistical work has been that the data preparation and transcribing of data from punched cards and paper tape to magnetic tape is de-centralised to the points where the data are prepared. Magnetic tapes are then despatched to Canberra, where the majority of processing work is undertaken. In some cases, magnetic tapes are sent back to State Offices for production of hard copy.

198. Approximately 150 statistical applications are being processed on the computers in the network. Some of the major ones are listed below:

Population census

Imports and clearances

Exports

Shipping statistics

Integrated Economic Censuses (factories, mining, wholesale, retail)

Personal income tax

Company income tax

Other taxation

Employment

Capital expenditure

Stocks

Public authority finance

Building approvals and operations

Vital statistics

Hospital morbidity

Mental health

Overseas migration

Seasonal adjustment of time series

Econometric models and forecasting

Methodological and mathematical research

Motor vehicle registration

199. While most of the programming and developmental work is carried out in Canberra, where the largest programming team is located, many smaller projects have been developed in all State Offices, which also have programming facilities. Several large projects including the Agricultural and Pastoral Census, Integrated Economic Censuses, and Building Statistics have been developed as co-ordinated applications by State Office and Central Office programmers. Substantial savings have been made by developing these as co-ordinated projects rather than as six separate projects. This method of development will continue to be used extensively.

#### Generalised Programs

200. Several powerful generalised programs have been developed or are under development. These programs are designed to eliminate repetitive programming of similar functions for different applications. The most important completed to date is a generalised table generator (or array generator) which was first used for tabulation of the 1966 population census data and is now extensively used on other applications, it has also been used by overseas statistical offices. A companion system to the table generator is a generalised report generator designed to operate on table generator output. This system, which is nearly complete, enables reports to be generated in tabular form with alphabetic heading and stub descriptions and fully edited for reproduction and publication.

201. A generalised time series storage and retrieval system and associated report generator has been developed and is in use on a number of applications including quarterly national accounts. Similar in many ways to CANSIM, this system enables clerical staff with only brief training in the command language to create, update and retrieve time series files on mass storage, apply seasonal adjustment programs and other analyses to them, and generate reports in tabular format with alphabetic descriptions.

202. The Bureau plans to develop more generalised programs and is to participate in this type of work at the United Nations Computing Research Centre in Bratislava. The systems it plans to develop include those to perform the following functions:

Sample Design

File Manipulation

Sample Selection and Rotation

Sample Estimation and Variance Calculation



Studies are also being undertaken on the use of a standard data description language and the practicability of devising a generalised editing program.

#### Software Development

203. Several specialised software systems have been developed, including FORDAPP written for the Control Data 3300 computers. This, is a complete system for commercial data processing, it is based on FORTRAN, and is designed largely to overcome the inefficiencies of the FORTRAN input/output system. A FORTRAN input/output control system called FORMON has also been developed for the Control Data 3600 computer. This system provides automatic restart capacity and a protected file structure to reduce the effect of parity errors on long runs using magnetic tape files. Other software facilities have been developed for the use of disks and displays.

#### Programming Languages

204. To date, most applications have been programmed in COMPASS, a Control Data assembly language, FORTRAN or FORDAPP. In future it is hoped to program most applications in a standard high level language such as A.N.S.I. FORTRAN or A.N.S.I. COBOL for the purpose of achieving a greater degree of machine independence for applications programs. Training courses in COBOL are being given to applications programmers and use of COBOL is being encouraged to a greater degree than in previous years.

#### Use of Mass Storage

205. Although small scale mass storage is already available at several installations, most of the applications implemented to date have been designed for batch processing and employ magnetic tape for file storage and input/output. The sequential processing involved in these systems is sometimes inefficient in that a complete file consisting of several reels of magnetic tape may have to be read to extract or update relatively few records. The Bureau proposes to acquire large scale disk storage devices and appropriate software which will enable random access processing systems to be implemented. In addition, where appropriate, processing will take place on-line using cathode ray tube display terminals for input/output. The Integrated Register of enterprises and establishments will probably be the first application to use these disk and display facilities.

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REVIEW OF STATISTICAL ACTIVITIES SINCE THE  
SIXTH CONFERENCE OF COMMONWEALTH STATISTICIANS

1. General

Since the last Conference of Commonwealth Statisticians in Ottawa, Canada, Barbados has become (30th November, 1966) an independent member of the Commonwealth of Nations. The period under review may be described as one of increasing national awareness of the importance of quantitative data in decision making. This is, perhaps, the result of a number of developments in regional economic relations, and our greater participation in matters on the international scene. Thus, greater demands have been made on our services at a time at which we have been faced with a number of problems of movement of many of our trained and experienced officers. These losses have very adversely affected the maintenance of many of our statistical activities and presented some difficulty in the publication of many of the continuing series of statistics on a timely basis.

2. Collaboration and Planning

Mention has been made earlier of the national awareness of the importance of statistics. This often resulted in the creation of "bottle-necks" and in order to get maximum benefit from the existing limited resources, a Committee comprising the Heads of Administration, the Senior Officers of the Economic Planning Unit and the Statistical Service, has been established to plan and prepare appropriate and realistic statistical programmes. The Committee immediately realised the inadequacy of the resources available for carrying out such programmes, and supported very strongly our proposals for an increase of staff. The necessity for preparing and following a planned programme was also appreciated and recognised.

3. Conferences of Commonwealth Caribbean Government Statisticians

As a result of agreement having been reached from discussions at meetings of Heads of Governments of the Commonwealth Caribbean Countries held in the years 1963-65, Conferences of Commonwealth Caribbean Government Statisticians were organised on an annual basis from 1966 to 1969, when it was decided that the interval between Conferences should be extended to two or three years. The aim of these Conferences is to bring about regional collaboration in statistics and to obtain the maximum practicable uniformity and comparability in respect of the collection and publication of statistics throughout the various Commonwealth Caribbean Countries.

4. Statistical Training

The need for proper and adequate statistical training has been recognised by all the Commonwealth Caribbean Countries and this question has not ceased to engage the attention of the Conferences of the Commonwealth Caribbean Government Statisticians.

In 1969 Barbados was offered an integrated programme of training for statistical personnel by the Inter-American Statistical Institute. Four

officers - three from the Statistical Service and one from the Ministry of Education - attended in 1969 a training course for instructors at the U.S. Bureau of the Census in Washington under the first stage of this programme. On their return a National Training Course in Statistical Technology was conducted in 1970 as the second stage of this programme. Two officers are now receiving senior level training in Economic and Social Statistics in Washington as the third stage in this programme.

During the period under review the following types of training were undertaken:-

- (a) Overseas Training: Officers of the Statistical Service have received training in Economic Statistics, Economics, Health Statistics, Agricultural Statistics, Survey Techniques, etc. by means of scholarships, fellowships and attachments in the United Kingdom, Canada and the United States of America.
- (b) Local Training: Middle level training in statistics was introduced in an effort to increase interest and efficiency, not only among officers of the Statistical Service, but of the country as a whole.
- (c) In-service Training: In-service training proves extremely useful and effective. Not only are basic elementary statistical methods covered, but so are the contents of our publications.

## 5. 1970 Census of Population and Housing

As was done for the 1960 Census of Population, a Regional Census Co-ordinating Committee was set up to plan and prepare for the 1970 Census of Population and Housing. This Committee had as its Chairman a Professor of Demography of the University of the West Indies and comprised the Directors of Central Statistical Offices, who were also Census Officers of their respective territories, Census Officers and personnel of the University of the West Indies.

This regional collaboration established, as far as was practicable, uniformity of procedure as well as effective liaison between the Census Officers of the several Caribbean territories.

In an attempt to obtain final results more quickly than was possible for the 1960 Census, the Committee adopted, for all participating territories, a common questionnaire which contained basically a common set of concepts and definitions. Moreover the questions appear at the same positions on the questionnaire, and it is proposed to use a "mark-sensing" technique in processing.

The processing of census results will also be centralised at the University of the West Indies, Mona, Jamaica on an I.B.M. 360/30 Computer which has been provided under Canadian Technical Assistance Scheme.

The results, especially those on housing, will be anxiously awaited by Barbados as no detailed information on that area of statistics has been previously obtained.

6. Labour Force Statistics

During the period under review a Labour Force Programme was launched and half-yearly surveys (i.e. crop season and during out-of-crop season) carried out. These surveys had to be suspended due to the concentration of the limited staff on the intensive preparatory and actual work which the 1970 Census of Population necessitated. It is proposed to recommence work in this area of statistical information very shortly and on a continuing basis.

7. Balance of Payments

The Department has been engaged in the preparation of balance of payments estimates over the past four years and so far, two reports covering the periods 1964-66 and 1967-68 have been published.

8. Survey of Manufacturing Establishments

Because of very poor response and the incomplete nature of data submitted, it was decided not to publish the results of the last Survey of Manufacturing Establishments. It was felt that the lack of success of this survey was due, in part, to the length of the questionnaire employed and in part to a lack of rapport between our statistical personnel and the respondents.

A reassessment of our industrial statistics programme has been undertaken and efforts are being made to improve our contact with the industrial sector. Preparations are now underway for the introduction of a shortened questionnaire for the purpose of collecting minimal data. A more comprehensive questionnaire will be used for collecting bench-mark data from time to time, e.g. every five years.

9. Tourist and Migration Statistics

The constant increase of visitors to the island imposes quite a burden on that section of our staff responsible for the editing and coding of migration documents. Consequently, Embarkation/Disembarkation (E/D) cards of visitors are now matched, as visitors represent approximately eighty percent of all arrivals. This system not only reduces the workload, but permits the actual lengths-of-stay of visitors to be determined.

In addition the Department has been conducting Surveys of Bednights of visitors to Hotels and Guest-Houses. This exercise provided a check on the information entered by the visitors on the Embarkation/Disembarkation cards and also reveals the movement within, as well as rates of occupancy of, Hotels and Guest-Houses.

10. Demographic Research

The Statistical Service has introduced confidential statistical forms to obtain more detailed information on registrations of births and deaths. The response has been very good. The information collected will permit a more comprehensive demographic analysis.

### 11. External Trade Statistics

The Standard International Trade Classification (Revised) was adopted in Barbados with effect from January, 1967.

A Caribbean Free Trade Association - CARIFTA - was established with effect from May, 1968 and it is considered that a Common Tariff Nomenclature is essential for the efficient operation of the Free Trade Area. It would appear that at the moment the semi-integrated BTN tariff (i.e. a combination of the BTN and the S.I.T.C. (R) would be suitable for our purposes and resources.

### 12. Data Processing

During the period under review, Barbados continued to process trade statistics for the Islands of the Leewards and Windwards. It is proposed that the processing of trade statistics for these territories will shortly be undertaken by the Government of St. Vincent on a Computer (I.C.L. 1901 A model) which has recently been installed there. It is further proposed that Barbados will then in turn process the migration and tourist statistics for these territories.

A Computer (I.B.M. 1401 model) has recently been installed by the Government of Barbados and it is proposed that the processing of statistics currently undertaken by the Statistical Service on Conventional equipment, will be phased out and eventually undertaken by the newly established Data Processing Unit.

### 13. Education Statistics

A series of education statistics is being collected by the Ministry of Education in collaboration with the Institute of Education of the University of the West Indies and the Statistical Service. The need for information in this field of statistics is great and it is expected that much will be provided by way of the Census of Population recently conducted.

### 14. Financial Statistics

Although some finance statistics have been published previously, the publication Finance Statistics 1959-68 which was recently published by the Statistical Service is the first attempt at presenting a comprehensive set of data on the activities of financial institutions.

### 15. Census of Agriculture

As requested by the Food and Agricultural Organization, the Government of Barbados proposes to participate in the World Agriculture Census Programme by carrying out a Census in 1971.

### 16. Future Plans

Owing to staff limitations the Statistical Service has obtained most of the information collected on an ad hoc basis. It is now proposed that a continuing series of household surveys be launched as soon as it is convenient and practicable to do so. It is hoped that this approach will make information available on a continuing short-term basis.

It is also proposed that the National Income Programme will be resumed as soon as the necessary staff is acquired.

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REVIEW OF STATISTICAL ACTIVITIES SINCE THE SIXTH CONFERENCE

1. Statistics Organisation

The development of a statistical organisation in Botswana only started early in 1966 with the appointment of a Statistician to the Ministry of Finance. In October 1967 Parliament passed the Statistics Act which provided for the collection and publication of statistics and resulted in the establishment of a Central Statistics Office within the Ministry of Development Planning. Developments during the past three years have depended almost entirely on professional expatriate staff provided under international and bi-lateral technical assistance programmes and a considerable amount of attention has been given to training and the establishment of an organisational structure appropriate to the country's needs and resources. At present the statistical services consist of a small central office and two small units, one in the Ministry of Agriculture and the other in the Ministry of Education.

2. Population Census

The first population census of this country was carried out in 1904 and the most recent was the seventh, held in 1964. Plans are well advanced and preparatory work has started for a census to be held in August/September 1971 which will be the first since the country achieved its independence in 1966. Botswana is a relatively large country in area but has one of the lowest population densities of the world. Although a high proportion of the population is concentrated along the eastern border of the country it would be quite impracticable for the whole population to be enumerated on a single day. It is proposed therefore that enumerators will visit every dwelling in the country during the census period. It is anticipated that enumeration in the more densely populated area will be completed in less than two weeks and the whole country will be covered in at most four to six weeks. This will be the first census of the country to be carried out on a de facto basis and will include the collection of a certain amount of economic and social data regarded as essential for future economic development planning.

3. Agricultural Statistics

At the present time agriculture, particularly livestock production, is by far the dominant sector of the country's economy. Considerable resources have therefore been devoted

to the collection of basic data relating to this sector. A pilot sample survey of agriculture on non-freehold farms was carried out in one District of the country in 1966/67 and this was followed by a national sample survey of non-freehold farms in 1967/68. For various reasons a similar national survey was held again in 1968/69. In the 1969/70 season a limited sample survey was held on a national basis to provide current agricultural statistics and it is proposed to continue these surveys on an annual basis. The 1968/69 survey is regarded as being reasonably successful but it is known that the sampling frame based of the 1964 population census results was far from satisfactory. Particular attention is being paid to this problem in the design of the 1971 census to ensure that it will result in an adequate frame for future surveys of this nature. It is proposed therefore that another national sample survey of agriculture for both basic and current statistics will be held as soon as practicable after the results of the census are available.

The results of the 1968/69 survey indicate that a survey of agricultural holders is not the best method for obtaining reliable national livestock figures and a separate livestock census will be conducted in August/September of this year.

A limited amount of information relating to freehold farming sector for the past two years has been obtained by a combination of postal enquiry and enumeration. More detailed information is being sought in respect of 1969/70 and it is anticipated that this will become a regular feature of statistical activity.

The results of both the 1967/68 and 1968/69 surveys have been published by the Ministry of Agriculture.

#### 4. Education Statistics

The need for detailed statistics of education has resulted in considerable activity in this field. Comprehensive statistics are now available for 1965 onwards in respect of teachers, school facilities, and pupils, including pupils undergoing post-secondary education outside the country, and educational finance. Information for teachers and schools is available on an individual basis and a start has been made on similar individual records for all pupils. The maintenance of these records and the tabulation of information is the responsibility of the statistics unit within the Ministry of Education.



## 5. Employment

A census of all employers was undertaken during the early part of 1968 to establish the total number of persons employed and the total wage bill in each economic sector. The results of the census have been published by the Central Statistics Office. Arrangements have now been made for the regular collection of similar information on a six monthly basis.

## 6. Household Income and Expenditure and Prices

A series of detailed studies of household income and expenditure have been undertaken since the beginning of 1968 and the project will be completed in October of this year. These studies have been carried out over a period of twelve months in six centres, three urban and three rural, and will provide information on patterns of expenditure for different income groups in various parts of the country.

The regular collection of retail prices for a large range of goods in a number of centres in the country started in June 1969 and it will shortly be possible to produce on a regular basis retail price indices for the country and particular centres.

## 7. External Trade Statistics

The absence of any control on the flow of goods from South Africa has made it extremely difficult to prepare reliable statistics of external trade. Various attempts have been made to require known importers and exporters to make regular returns of their imports and exports, but none have been very satisfactory. At present all business concerns are required to report only the value of imports and exports and this is proving rather more satisfactory than previous attempts which required more detail. Acceptable trade figures will not, however, be available until some form of border control is provided and it is hoped that this will take place within the next year.

## 8. National Accounts

Sufficient data for the preparation of reliable national accounts even on a limited basis has not been readily available. An attempt to produce national accounts for 1964 to 1966 was made by the Central Statistics Office in 1968 and the results were published. Further work during the past year has indicated, however, that there are some serious errors and omissions in these results. More data is now becoming available and a set of accounts for 1967/68 has been prepared and will be published shortly. These results are more reliable than the previous estimates but must still be used with caution.

I. Introduction

1. The demand for statistics in Canada seems to have increased at a growing rate since the last Conference. This reflects the fact that contemporary Canadian society has been setting more exacting standards for the performance of the economy and its social institutions than formerly. The number of social and economic goals which Canadians have set for themselves have multiplied while the coordination of competing goals has become more complex. As the goals have become more numerous and complex, many new statistical requirements have emerged. At the same time, the computer is having an impact on demands for more information by augmenting the capability of users to employ data. Many of the demands stem from new or expanded federal and provincial government departments and agencies charged with implementing far-reaching social and economic programs but strong pressures for new or improved information also come from municipalities, universities, the business community and others.
2. The Bureau has responded to these demands by embarking on statistics and statistical support programs, which will take some years to complete, designed to accelerate its capacity for meeting contemporary needs. These programs have involved a substantial growth in its budget and staff. Thus, from April 1966 to April 1970 the DBS budget has grown from 17 million to 33 million dollars, excluding the Population Census. Its authorized establishment has grown from 2,650 in April 1966 to 3,650 in April 1970.
3. Aside from the acquisition of additional resources the goal of coming closer to meeting contemporary statistical needs has involved measures designed to render the statistical production process and management more efficient. These measures are described below. In what follows the most important statistical developments are listed.

II. Statistical ProgramsPopulation and agriculture census plans

4. Since the last Conference DBS has been actively advancing plans for the forthcoming 1971 Decennial Census of Canada on a broad front. A brief summary of the programme for developing and testing census-taking techniques, questionnaire content and format, and census data access follows:

Testing programmes and census methodology

5. The development of the proposed methodology for the 1971 Census received its initial impetus from the evaluation of the quality of the 1961 Census and from the study of international experience of a similar nature, particularly in the U.S.A. With the increased utilization of census data in the past decade, the need for more precise statistics, more detailed measurement of socio-economic characteristics, and more timely and flexible statistics it became evident that a number of methodological changes were necessary. Studies indicated that the largest reduction in error could be expected if the role of the respondent was maximized through self-enumeration and, therefore, a series of field tests were designed to investigate the

merits of new field methods and techniques, mainly self-enumeration and mailing techniques, for the 1971 Census.

6. A field test conducted in the City of London in October 1967 was designed primarily to test the use of self-enumeration methods and mailing techniques of questionnaires. This test was followed by one designed to test a number of alternatives in the content of the population and housing questionnaires in a sample of Toronto households in May 1968. A test conducted in selected rural areas in the fall of 1968 investigated self-enumeration techniques in localities involving agriculture questionnaires. Finally, a dress-rehearsal (Trial Census) was conducted in September 1969 in the cities of Sherbrooke and St. Catharines and surrounding areas, as well as rural localities centering around Souris, Manitoba.

7. The 1971 Census will employ a system of delivery by census enumerators ("drop-off") of self-enumeration questionnaires addressed to the householders for their completion and "mail-back" in the larger urban centres. In smaller centres and rural areas, enumerators will similarly drop off the questionnaires (including agriculture, where applicable) but will return to pick up the forms rather than their being mailed back. In certain remote areas, involving only a small percentage of the population (e.g., vast northern regions, coastal outports, military barracks, etc.), traditional methods of canvasser-enumeration will be employed.

8. While the use of self-enumeration techniques is expected to improve the quality of the census product, the development of plans for the use of extensive sampling in the 1971 Census was designed to reduce costs and provide more timely data. Field tests and sampling studies which have been undertaken since early 1967 indicate that the final selection of 33 1/3% of sample for all but a relatively few basic population and housing questions, combined with self-enumeration methods, will not adversely affect the amount of small-area data that can be provided as compared to earlier censuses. Sampling is an essential technique in reducing the burden on the respondent. Without sampling the enlarged subject-matter content of the census would have involved undue response burden on the public and a heavy processing load on DBS leading to unacceptable delays in publication. Thus, plans call for two households out of every three to complete a "short" questionnaire containing such basic questions as age, sex, marital status, mother tongue, and a few housing items such as tenure, type of dwelling, number of rooms, and sanitary facilities. Every third household will complete a "long" form containing the full range of socio-economic items.

#### Questionnaire content

9. The development of the content of the census questionnaires spanned a period of planning and consultations lasting almost three years, culminating in the final approval by the Cabinet in January 1970. Decisions to include or exclude specific items in the 1971 Census were based on: (1) the importance of a question, e.g., for the administration of government or other important needs; (2) relative costs; (3) the ease or difficulty in obtaining reliable data; and (4) respondent work loads and tolerance. Changes in questions recommended for the 1971 Population and Housing Censuses compared with the Census of 1961 result mainly from demands for more detail within existing subject fields such as occupation and education rather than for more subjects of inquiry. The number of individual questions increased from some 60

in 1961 to 90 in 1971; however, in contrast with 1961, most of these will be collected from a sample of 1 in 3. 57

10. In the 1971 Census of Agriculture, one general questionnaire is planned to replace the four questionnaires used in 1961. Irrigation questions and questions on forest products (on a reduced basis) form part of the general questionnaire for 1971. New questions relate to the use of fertilizers and sprays, and to the classification of the part-time work of farm operators by kind of work done. Additional items of farm machinery and equipment are included in the appropriate sections. On the whole, farm operators will have approximately the same number of agricultural questions to answer in 1971 as in the preceding decennial 1961 Census. The questionnaire on non-farm holdings is being dropped since their importance is now negligible.

#### Confidentiality and census data

11. It is hoped that the Statistics Act will be revised before June 1971 to permit the release of data on individual records, provided it cannot be related to any particular person or business. This might make it possible to publish records permitting users to process tapes containing data relating to individual persons from which names, addresses and other identifying information have been removed. However, aside from this modification, relaxing of confidentiality beyond prior census practices is not intended, notwithstanding pressures for access to individual records.

#### Data access and dissemination

12. The planning of the 1971 Census has also incorporated the development of new methods, procedures and programmes to introduce more flexibility in census data access by users. Emphasis is being given to extending the ranges and volumes of tabulations available in published print-out and machine readable form and in particular, to the speed with which both regular publications and access to tabulations specified by users will become available. Close examination is given to the preparation of working arrangements with provincial governments and other major user groups for efficient access to census data through more extensive and comprehensive utilization of user-oriented census data automated files. The extended capabilities of computer technology will also be used for the benefit of the continuously increasing number of census data users requesting a wide and diversified range of special tabulations by means of computer storage and retrieval programmes such as GRDSR (geocoding) referred to below. More user-oriented literature, catalogues and manuals on census data will be prepared in order to ease and increase the effective utilization of the vast potential of the 1971 Census data.

#### Quality control and evaluation

13. One of the main innovations of the 1971 Census will be the extensive application of quality control designed to control and reduce the errors accumulated during the processing of the census data. Four areas of the census operation will be subject to formal methods of quality control: 1) printing of Census questionnaires; 2) enumeration (the quality control plan here will primarily concentrate on ensuring that all the essential information that is supposed to be collected is, in fact, collected); 3) quality control of office coding; 4) quality control of document readers and other associated operations.

The second and third of these plans were tested out during the 1969 Trial Census and proved to be generally successful. The fourth plan was also tried out during 1969 but, due to general problems encountered with the document reader, it could not be adequately tested. The application of quality control to the 1969 Trial Census indicated that several minor modifications would be incorporated into future quality control plans of this kind. Many of these will be included in the final plans for the 1971 Census.

14. While quality control attempts to control and reduce errors of various kinds during the census operation itself, the evaluation program is designed to measure errors in the final output. The three largest evaluation projects are the so-called "Reverse Record Check" project, designed to estimate the coverage errors (number of people missed) in the 1971 Census; the "Response Variance" study, designed to estimate the contribution to census errors of errors of response; and the "Agriculture Quality Check" project, designed to estimate the coverage and content of errors of the Census of Agriculture. It is hoped that the analysis of the evaluation projects will not only provide guidance to users as to the quality of data but will point the direction for future improvements.

#### Education statistics

15. Education statistics are at present undergoing a major reorganization to meet more effectively a wide variety of contemporary needs and to take into account the changes which are taking place in the practices and organization of educational institutions in Canada and their effect on data collection.

16. Education is a matter of provincial jurisdiction in Canada and the ministers of all ten provinces have requested the Bureau to act as co-ordinator and developer of an integrated system of statistics, in collaboration with provincial departments of education. The aim of the system is to bring together the data on students, staff, facilities and finance in such a way that interrelationships can be studied within the framework of compatible classifications. It is expected that the resulting statistics will satisfy the needs for educational planning, manpower planning and various administrative and other applications.

17. As a result of changes in the educational system it is becoming increasingly difficult to identify students and teachers by grade and certain other institutional characteristics. A major feature of the new program is, therefore, greater concentration on characteristics of people in education rather than those of the institutions. In addition to annual stock statistics, it is planned to develop statistics on the flow of students within the educational system and those who leave it and their characteristics, particularly those who are most likely to enter the labour force. Some significant beginnings have been made in the creation of an up-to-date nation-wide data bank on the number and characteristics of elementary and secondary school teachers while a major in-depth survey of community college teaching staffs is in an advance stage of planning. New information on part-time educational opportunities at all levels of education is being developed. At the same time, data on educational plant and equipment (e.g., available class-room space) and school transportation are being developed while financial statistics pertaining to educational institutions are being strengthened.

18. The widespread interest in leisure activities, and in the quality of life enjoyed by Canadians has given rise to a number of new surveys in the field of cultural activities.

19. Feasibility studies are being carried out with a view to determining the extent to which quantifiable data can be produced in such areas as drama and handicrafts. Major revisions have been made in the survey instruments used to measure library, museum, and art gallery activity.

#### Job vacancy and other labour statistics

20. In recent years a growing emphasis on selective manpower policies has generated an insistent demand for more and better labour market data. Although there are still serious gaps in information on labour supply there is, in fact, an impressive network of information on the characteristics of the unemployed while a void on the demand side has persisted. Accordingly, in 1968, in response to data needs for policy formulation and implementation the Bureau undertook the development of a national survey to measure job vacancies on behalf of the Department of Manpower and Immigration.

21. To meet urgent requirements of the Department of Manpower and Immigration it was necessary to plunge into the development of the survey before the nature and dimensions of the data it intended to produce could be ascertained with adequate precision. However, there was time to carry out a pilot survey. It indicated among other things, that the "standard" units of companies which provide employment data (i.e., establishments) often cannot provide job vacancy information. Consequently, a special master file had to be created for at least the larger companies, the units of which were delineated, through extensive field work, into so-called job vacancy reporting units. A special requirement for the file maintenance system was the provision of well organized, readable print-outs which enumerators could use in the field to keep the file up-to-date with respect to internal organization changes of companies.

22. Following the analysis of the reporting errors and non-response, it was decided to design a two-phase sample consisting of a mail survey, and an interview survey of a subsample of the mail survey. The purpose of the latter was: (a) to correct the response error of the mail survey; (b) to provide estimates for non-respondents; and (c) to collect additional information for analysis. The tight (bi-weekly) schedule of the survey necessitated the selection of the samples for both phases of the survey by the computer as well as the comprehensive computer processing of the returns.

23. The pioneering nature of the survey--the fact that there has been little "hard" analysis in the past, of either the concept or uses of job vacancy statistics--generated a great deal of uncertainty in respect to data use and, therefore, data input-output specifications. An extremely flexible automated system has, accordingly, been developed, capable of carrying out the necessarily complex estimating procedures for any one of a very large number of potential domains of study (geographic regions by occupational classes).

24. The survey, including all mail and field interview phases, became operational for the complete non-agricultural universe early in 1970. At the time of writing, the data generated by the survey are being assessed for technical adequacy and analytical value. It is expected that the resulting information will enhance materially the value of the whole network of labour

market information. Meanwhile, a large-scale and flexible survey capacity has been established in the enterprise sector, comparable in size to the household survey capacity of the DBS labour force survey.

25. In response to the growing interest in labour costs data, the Bureau and the Federal Department of Labour jointly initiated a survey of selected employer labour costs in 1967, to meet the need for information on the composition of the total wage package and, in particular, to measure the non-wage items. The first three surveys covered manufacturing and mining, and now there is a pilot survey underway among a selected number of transportation and communications establishments. It is hoped in the future to conduct similar surveys in other major industry areas.

#### Merchandising and services

26. With the growth of the relative importance of the non-goods producing industries high priority has been accorded to statistical development in this sector of the economy. Thus beginning with the year 1966 a quinquennial census of merchandising and service establishments was instituted. Previously this census was taken only every ten years. Plans are now well advanced for the 1971 Census which will be more comprehensive in terms of industrial coverage and items collected. Automated mail-out, check-in, follow-up, as well as editing and correction programs are being developed which, it is expected, will yield faster and more accurate statistical results.

27. In the past, information on retail sales by commodity lines were obtained as part of the decennial census. Because of increasingly rapid changes in the commodity mix of retail outlets it was decided to undertake commodity surveys every five years. These surveys were planned to be taken for non-census years beginning with the year 1968. As part of this program, questions relating to sales by commodities (other than the details necessary for classification purposes) were eliminated from the 1966 and 1971 census questionnaires. The commodity survey for 1968 covered 30,000 retailers. It now appears that even a five-year span is too long and it has therefore been decided to carry out these surveys every second or third year, beginning with 1973.

28. As the first step in a long run program for improving current statistics of the service trades the Bureau is developing more information on accommodation (tourist and transient). DBS is working closely with the Office of Tourism, Department of Industry, Trade and Commerce, as well as with provincial tourist bureaux and various national and provincial tourist and hotel associations, in developing more comprehensive statistical information for this industry. For the year 1969, the hotel survey is being expanded to cover motels, tourist cabins, tourist camping grounds, hunting and fishing camps, recreation camps and tourist homes. Not only is the coverage to be expanded in this industry, but an exhaustive review of the data needs of users of accommodation statistics is presently being undertaken. It is expected that this review will indicate the need for a major change in the types of data which have been collected and published in the past for this industry.

29. A much improved probability sample design and automated processing system, begun in late 1968, is being completed for a new monthly survey of retail trades which will yield more comprehensive, detailed and reliable monthly statistics on a national and regional basis. The new design will employ an up-to-date list frame (from which a sample is drawn) supplemented

with an area sample (to pick outlets which may not appear on the list, especially outlets with zero employees). Special attention was given to securing unbiased estimates of births and deaths. It is expected that the new sample will be operational in the middle of 1971. 61

### Price Statistics

30. With widespread interest in containing inflationary pressures during the last few years much emphasis has been given to expanding and improving price statistics. The Consumer Price Index was brought into sharper focus for current analysis through its conversion early in 1969 to a 1961 time reference base. With the completion of the family expenditure survey earlier this year it is expected that the up-dating of the weights of the Consumer Price Index will take place in 1971. The survey results will also provide data for producing more reliable and detailed regional price indexes for trend and inter-regional price comparisons. Meanwhile, the coverage of retail price data has been expanded to include more completely the components of consumer budgets in urban areas.

31. In the industrial price field, revised industry selling price indexes relating to manufacturing industries in Canada were introduced early in 1970. The primary features of these indexes include the introduction of a 1961 time base, enlarged commodity content and weights based on 1961 industry shipments, and the use of the 1960 standard industrial classification of industries. Developmental work is proceeding to expand the number of manufacturing industries for which separate price measurements are available. An extensive program is underway to automate as much as possible the collection and processing of price statistics which it is hoped, will result in improved timeliness and efficiency, as well as in an increase in retrieval capability. In the field of prices of capital goods a new publication, Price Indexes of Electrical Utility Construction was released in mid-1967 which included price indexes for construction of transmission lines, distribution systems and switching stations. These indexes represent the first results of a much more comprehensive program of experimentation and development which is underway, designed to improve price information for residential and non residential structures, machinery and equipment. Indexes for measuring the movement of prices of rail transportation are also being developed while a study has been initiated to determine the conceptual and statistical basis for constructing price indexes for distributive margins.

### External and interprovincial trade statistics

32. A major development in the field of external trade statistics has been the introduction of sampling techniques for small value imports with a consequent substantial staff saving. The Bureau is planning to develop a similar sample for small value exports and is also planning to redesign its processing system for both imports and exports as part of an extensive automation program. Special quarterly tabulations have recently been developed of exports by U.S. Census sub-division of consignment, and it is planned to develop similar tabulations for imports by U.S. Census sub-division. These series are particularly valuable in studies of market development and penetration and of import substitution.

33. Imports, which at present are tabulated only on the basis of country of consignment, are planned to be tabulated also by country of origin as well as by mode of transport.



34. More emphasis is now being given by the Bureau to the development of commodity origin and destination statistics. For example, a pilot survey is planned for this year to determine the feasibility of obtaining commodity origin and destination data from trucking companies by sampling shipping documents known as "waybills". It is hoped to sample railway waybills in a similar way, if the trucking survey proves successful. Water shipping already has a commodity origin and destination survey in operation.

35. In order to help estimate the order of magnitude of interprovincial trade, a general survey of manufacturers was taken for the year 1967 in which the larger establishments reported a breakdown of their total value of shipments of own products by province of first destination. This provided useful estimates of origin and destination statistics by province and is being supplemented by similar surveys for specific commodities. These data are particularly useful to provinces in analyses of industrial and market developments and for purposes of regional input-output studies.

#### Air transport statistics

36. The Aviation Statistics Centre, established four years ago, represents a successful attempt by the DBS to provide in-house statistical services to specialized agencies of the federal government. The Centre is located several miles from the rest of the Bureau, in the same building as the Canadian Transport Commission, which regulates commercial aviation in Canada through its Air Transport Committee. As required for regional economic studies, quasi-judicial hearings allocating routes and services, and for negotiation of bilateral agreements concerning international scheduled air services, the Centre provides detailed analytical studies of the nature and extent of air travel between points and along routes. For the Ministry of Transport, the Centre collects and processes data on aircraft movements at airports across the country and presents the data in a variety of forms. Some twenty-five different reports are produced regularly for the several technical divisions in the Ministry responsible for the construction and operation of airports, and the provision of civil aviation facilities. This year, the Centre has launched a new survey and a publication on international charter flights to fill an important statistical gap. Another new publication makes available for the first time in a single volume passenger origin and destination data on air travel between the United States and Canada.

37. For the Bureau, organized as it is for the purpose of collecting and disseminating statistics for the general use of business, government and the public at large, the provision of such specialized service called for considerable adjustment and innovation. It has meant planning automated processing methods, not simply to produce industry and activity totals for publication, but to make provision for a flexible output capability which has to accommodate on short notice demands for all available data pertinent to a particular problem or specific economic area.

38. The Centre has demonstrated that it can become sufficiently familiar with complex subject-matter detail to understand the statistical requirements of technical experts engaged in long term planning of aviation facilities and in regulating and developing the country's air services.

39. The Centre has succeeded in establishing very good relations with the aviation industry by reducing the reporting burden through improved forms design and the use of shuttle questionnaires. Of particular significance, the statistics have provided the carriers themselves with informative, reliable and

timely data for use in planning their own operations and in measuring their competitive position. **63**

40. Although the statistical program of the Centre is developed in close collaboration with officials of the Ministry of Transport and the Air Transport Committee and is aimed principally at meeting the data requirements of these agencies, the direction, control and administration of the Centre's activities rest with the DBS.

#### Financial statistics

41. An important development since the last conference has been the beginning of regular quarterly publication of financial flow accounts. The first report, published last year, covered annual and quarterly historical data from 1962 to 1967. The accounts, which consist of approximately thirty transaction categories and thirty-five sectors and sub-sectors, represent the culmination of the major stage of a comprehensive developmental program initiated some ten years ago. Aside from improving annual financial statistics of corporations and governments, this program involved the development of quarterly surveys of assets and liabilities of financial and non-financial corporations and selected items in the balance sheets of governments.

42. In deriving flow data from balance sheets, procedures and information had to be developed to eliminate the impact of changes in corporate structure, accounting revaluations, the erratic nature of financing and so on. While important data gaps and imperfections remain, especially in the area of municipal and personal finance, coverage is now considered to be comprehensive.

43. The users of the Financial Flow Accounts are mainly the monetary authorities, who use these accounts to measure the impact of fiscal and monetary policies. The emerging behavioural patterns of the various credit flows and the sources and uses of savings in the different sectors of the economy are essential in the building of econometric models intended to explain and predict financial developments. The accounts are applied extensively by researchers involved in the building and analysis of such models. Due to the novelty and perhaps also the complexity of the F.F.A. widespread use by private industry has not yet developed, although the financial community, and primarily the chartered banks have shown a growing interest in the Accounts.

#### Input-output statistics

44. In 1969 the Bureau published two volumes entitled The Input-Output Structure of the Canadian Economy, 1961, containing input-output tables, a comprehensive description of methodology and associated analytical models which represent the culmination of extensive research effort over many years. The tables have been compiled for 187 industries and 664 commodities. At that level of detail many entries are confidential under the provisions of the Statistics Act. The tables are, therefore, published at three levels of aggregation involving 16 industries and 40 commodities, 65 industries and 65 commodities, and 110 industries and 197 commodities. Arrangements are being made to provide this information to users in machine-readable format upon request.

45. The Canadian 1961 Input-Output Tables have features which are not characteristic of conventional Input-Output Tables. In the latter, both the intermediate inputs of industries and the outputs of industries are shown in

a single table, the rows of which contain the flows of the output of each industry to the industries which use this output as an intermediate input, while the columns contain the intermediate inputs of each industry. This table is square, i.e., has the same number of rows and columns, both of which are classified by industry.

46. In the 1961 Canadian Tables, commodities are clearly distinguished from industries, the number of commodities being greater than the number of industries. Separate rectangular tables are presented for outputs and inputs. The output table shows commodities produced by industries; the input table shows commodities used by industries. The introduction of commodities as a dimension of the system has a number of advantages, not the least of which is realism; industries are portrayed as groupings of establishments which absorb a number of commodity and primary inputs to produce a number of commodity outputs. This formulation of the system poses explicitly a problem which is implicit in conventional Input-Output Tables, namely, the way in which the demand for a commodity is to be distributed among the industries which produce that commodity. The models based on these rectangular tables therefore require, in addition to the traditional production function, marketing functions which distribute commodity demands to producing industries.

47. A comprehensive program for updating input-output tables is being developed. This program consists of annual updating and deflation of input-output tables by means of extensively automated procedures involving large amounts of annual data. Plans are also being made for the construction of a new base year table for 1971. The Bureau has also collaborated with a number of provinces in the development of provincial input-output data and analysis. Recently, a considerable effort is being devoted to the development of a medium term simulation and projection model based on input-output and other data, in collaboration with a number of other federal government departments.

#### Investment and construction statistics

48. Following insistent demands by several government departments, a quarterly survey of capital and repair expenditures of business enterprises has been introduced in 1968 covering final expenditures for the past quarter, preliminary expenditures for the current quarter, and forecasts for each of the next two quarters. In combination with the annual survey of capital expenditure intentions the quarterly information is designed to provide an indication of turning points in capital expenditures occurring during any given year. The survey will gradually expand to provide a basis for estimation by industry and province.

49. Estimates of housing expenditures have utilized a fixed formula based on starts, completions, assumed construction times and average costs. Under stable economic conditions this method produces reasonably good annual estimates. In order to provide improved estimates for less than annual periods and for sub-national areas (provincial, regional, major urban) a new method has been developed. Data relating to starts and completions are still utilized but, in addition, reports of building inspectors have been added to provide a measure of the progress of construction. Actual costs of the units under construction are used rather than average costs. It is expected that these innovations, being introduced in 1970, will provide a more sensitive indicator of construction activity and expenditures on housing.

50. In 1967 a long-term survey program was initiated with a view to covering the major trades in the construction industry annually. The first

publication in this series, The Mechanical Contracting Industry, was released in 1969 and a survey is now being developed covering the electrical contracting industry. It is expected that in time most of the important trades will be covered in this way.

51. Measurements of stocks of fixed assets of business firms have been available in Canada since 1967. Recently, however, two of the main limitations of earlier series have been dealt with. The industrial detail has been converted to the currently used industrial classification and the estimates which previously included only the manufacturing industry, now include all sectors of the economy. These two improvements will increase substantially the usefulness of capital stock estimates. An information file of punched cards and computer tapes has been developed. It is being used as the basic source from which specific data requested by users is retrieved.

52. The perpetual inventory method, assuming a standard length of usefulness of fixed assets, is employed in the capital stock estimates. Further improvements in capital stock data will depend upon empirical assessments of the economic life of fixed assets.

### Revision of the national accounts

53. After several years of intensive work, the national income and expenditure accounts have been revised from 1926 to date, on an annual basis, and from 1947 on a quarterly basis. This revision was necessitated by a new census as well as by other statistical information which became available. It was also felt necessary to incorporate certain conceptual improvements in this revision and to come closer to the United Nations Standard System of National Accounts. However, the new UNSNA was not adopted in its entirety because it was felt desirable to maintain continuity with the previous Canadian accounts and because some of the tables and accounts of the UNSNA were not believed to be suitable to Canadian circumstances.

### III. Other major developments

#### Enlarged household survey capability

54. The Job Vacancy Survey described above represents a new survey capability in the business sector of the economy. At the same time, the capability of the monthly labour force survey has been overtaxed. Thus, there has been a long-standing need on the part of provincial and federal government departments for household survey information substantially beyond the present DBS capacities. A modest start has been made during the past two years which is expected to culminate in a major program during the next few years, designed to double the DBS household survey capability. The work on the family expenditure and income surveys, described in separate papers will contribute to this objective.

#### Timeliness

55. Early in 1967, the Bureau embarked on a comprehensive program designed to effect gains in timeliness of as many statistical series as possible. As a start, a number of key economic indicators were chosen for immediate attention. These included the monthly Index of Industrial Production,

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the bulk of whose data inputs emanate from many monthly commodity surveys as well as the monthly employment surveys. Marked improvements were achieved in these series as well as in imports, exports, and retail trade.

56. The monthly index of industrial production is now published after a six-week interval, a gain of 20 days with still greater gains in many of the component series. More recently a gain of 30 days has been achieved in the release of the quarterly national income and expenditure accounts and the summary balance of payment statements. They are now published 45 days after the reference period. A monthly index of real domestic product has recently been published, following a lengthy period of research and development.

57. Attention is now being focussed on improving the timeliness of annual publications and the remainder of the Bureau's monthly and quarterly reports. To achieve this objective, as well as for other reasons, plans are being studied for developing a comprehensive scheduling and production control facility. Another major contributing factor to improved timeliness is expected to be the automation of most of the processing of all major surveys of the Bureau.

#### Standard classifications systems

58. A noteworthy occurrence in the area of classifications since 1966 has been the initiation, jointly with the Department of Manpower and Immigration of a project for the development of a Canadian Classification and Dictionary of Occupations (CCDO). The need for a better framework of analysis for statistical surveys such as the Census of Population has been a long standing one, and this has been reinforced in recent years by urgent policy requirements in the area of manpower planning and utilization.

59. Both a standard occupational classification and a dictionary of occupations are being prepared as a co-ordinated system in one volume. A 1971 Census edition designed especially for coding census returns is also planned for publication late in 1970. (The complete classification and dictionary in all detail will be published late in 1971).

60. The CCDO project has involved basic research into Canadian occupations consisting of job analyses leading to occupational analysis and the preparation of definitions for the occupations identified. In addition it comprises the development of an occupational classification suitable for census and other statistical work in its broader groupings and for employment placement, immigrant selection, vocational guidance, etc., in its detailed categories.

61. The field work, based upon a sample of work places representing all industries and areas, is nearing completion. Some 30,000 job analyses have resulted in the identification of some 12,000 occupations which have been grouped into a system of Major, Minor, and unit groups (about 400) for statistical coding and reporting.

62. A standard geographic classification manual has been prepared and published while the standard industrial and commodity classifications have been reviewed and up-dated.

63. In the government area the development of program budgeting and the national accounts budget, together with the use of the financial flows as a

monitor on the cash budget of governments, has necessitated a new look at the method of keeping governmental accounts. It was recognized that the accounting framework of governments at all three levels needed to be reorganized in order to provide the detail required for both micro and macro-economic analyses. Furthermore, the accounting frameworks as between governments should be designed in such a way as to provide the greatest degree of comparability.

64. DBS officers have played an active role in the work of the Federal Expenditure Coding Committee. A classification system of expenditures reflecting both services provided (functions of expenditure) and economic objects (resources utilized or consumed) was completed and implemented effective April 1, 1969. The data derived therefrom has already contributed significantly to the DBS macro-economic statistical series.

65. Consultations have also been carried out with two provincial governments concerning the development of accounts classification systems that will be compatible with the federal government accounts structure.

66. Perhaps the most important work has been done with respect to accounts classifications systems of local governments in Canada. A series of conferences have been held with provincial government Departments of Municipal Affairs. As a result an information system covering all financial transactions of local governments in Canada has been devised. It contains sufficient detail to meet the analytical requirements inherent in Canada's national income and expenditure accounts and the financial flows accounts. This classification system has the unanimous approval in principle of all provincial Departments of Municipal Affairs in Canada. The degree of acceptance and implementation by municipal governments is expected to vary from one province to another.

#### Automation

67. Until a short time ago the computer facilities available to DBS imposed serious restrictions on both production and research work. The acquisition of a new major computer installation in July of 1969 has augmented substantially DBS computer capability. The selection of this computer system was preceded by a detailed study of the nature and size of the probable DBS workload for several years and the development of a series of selection tests.

68. This modern installation, together with a much enlarged complement of computer programming and systems personnel, provide the foundation on which DBS is developing comprehensive plans for automating its operations over the next few years, under the guidance of an Automation Committee composed of senior officials. Through comprehensive automation DBS hopes to contribute to the achievement of the following objectives: flexible storage and retrieval capabilities for extensive use of the collected data to serve modern, often unanticipated needs, raise substantially output per man year, improve time-liness, produce aggregate data in machine-readable form for storage in our time series data bank, CANSIM (see below).

69. The greatest part of DBS production already makes use of computers. However, as it is true in so many organizations, it took some years of experience to appreciate fully the fact that the most effective utilization of computers requires a fundamental restructuring of the entire statistical operation being automated. The superimposition of the computer on existing procedures is often very inefficient as is its application to only some of the phases of statistical production, in isolation from the others. From the very

outset, the entire survey process should, whenever possible, be conceived and designed keeping in mind the role of the computer and with the aim of rendering efficient the operation as a whole, given its objectives, not just its parts. Furthermore, we have learnt that automation of individual surveys should be planned in the context of other related surveys so as to facilitate their integration and to prepare the ground for the automation of derived major aggregates, e.g., the national accounts and indexes of production. In addition to the automation of the individual projects, the automation program of the Bureau places great emphasis on the development of general retrieval and other generalized programs. These are designed to be usable as parts in the processing of a variety of surveys. They, particularly the retrieval programs, are also designed to be usable by subject matter personnel without programmer intervention. Effective automation involves some basic changes in the working environment and approaches used and, for the development of large projects, the utilization of inter-disciplinary teams from the outset. The most advanced automated generalized systems developed to date are briefly described:

(a) Geographically referenced data storage and retrieval system

70. This system, which DBS hopes to apply to the retrieval of the data from the 1971 Census, as well as to other universes and surveys, is being developed with a view to effect substantial improvements in rendering census (and other data) available quickly on the basis of geographic areas defined by users according to their own specifications. Underlying this system are computer programs which will assign geographic latitude and longitude coordinates to every census record in major urban areas. The coordinates will represent the approximate location of each household. Similar, but less precise, location identifiers will be developed to attach to the census records in the rest of the country. This system, together with some related developments, is being designed to make it possible for any user to identify on a map any geographic area for which he wants tabulation. An important element of the system is a generalized retrieval language, which users could employ and which will make it possible to retrieve specific data without programmer intervention, economically and with a fast turn around time. Confidentiality restrictions will, of course, be applied.

(b) CANSIM

71. DBS substantially increased the utility of its statistical output to users by the construction of a time series data bank from which, at the present time, about 17,000 major publishable and non-confidential disaggregated economic time series indicators are available in machine-readable form. This data bank, known as CANSIM (Canadian Socio-Economic Information Management System), had its origin in work carried on at the Economic Council of Canada but was further developed and made operational in the DBS. The information is stored in direct access devices, coupled with appropriate data entry and retrieval programs. The information thus stored can easily be linked to manipulative utility programs and work is now in process on the direct integration of some of these manipulative programs or some variations of them into CANSIM. Data and appropriate programs are for sale to users and it is the Bureau's aim to make the data bank a self-paying proposition with respect to its current operation.

Extension and automation of central register of companies and establishments 69

72. A major element in the DBS automation (and integration) program is the extension and automation of its central register of companies and establishments.

73. A central register of "companies" and establishments reporting annually or more frequently on DBS surveys was begun in 1960 with two principal objectives - to ensure uniform treatment of respondents reporting for more than one statistical unit and that the same standard industrial classification code was applied to each unit. The Central List has served these purposes and in the process has demonstrated further potentialities particularly as a consistent sampling frame and as a coordinating mechanism for integrating survey coverage and procedures. Its integrating possibilities have assumed even greater importance with advances in survey mechanization. It was therefore decided to extend the register to include all business and similar units, whether or not covered by DBS censuses, and to change its role and form so that it can act as a central instrument to ensure survey coverage and respondent identification to a greater extent than hitherto.

74. This major program of extension and mechanization of the central register is expected to be completed early in 1972. At the same time the register's record system for each unit is being extended to permit the association of other registers of business units maintained by the other government departments, as each associated register recognizes the basic unit ("company"). When complete, this will provide means for accumulation of data over a wide range of administrative sources, and for the exchange and integration of data collected in different surveys of DBS.

75. The principal advantages expected from expansion and automation of the register may be summarized as follows:

1. The present system of business-unit identification numbers will be extended to enable the unique identification of each unit engaged in economic activity throughout its lifetime. This will enable those operating various Bureau surveys to maintain historical records of individual units over the years in terms of unique identification numbers.
2. A comprehensive register of business units (including those having no employees) will provide a substitute for the present practice of developing registers ad hoc to meet the needs of particular censuses or surveys. This feature will be particularly advantageous in connection with current efforts to extend DBS survey coverage in trade and service industries, construction and parts of transportation characterized by a relatively large concentration of small-sized firms.
3. The expanded register in its new form will provide a comprehensive, consistent and efficient sampling frame for general application. Sampling frames drawn from the expanded register will be used for intercensal surveys of industries containing a large number of relatively small units (e.g., construction, retail trade and services), and maintenance of universes consistent with coverage of the various censuses will provide sampling frames for related current surveys.
4. The system of identification numbers for business units is designed to provide a link between the units used for different "operational" survey registers at least at the level of "legal entities" (generally companies).



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Thus, information collected from any source could be related to that from another source with assurance of agreement on coverage. Information could be transferred from one survey to another at the level of individual respondents or "legal entities" thus minimizing the necessity for duplication in collection of data. Among other uses, this will permit the identification and, to some extent, control of the response burden placed on the same units by different surveys.

5. Automation of the Central Register is basic to systematic automation and integrated operation of related DBS surveys. The various aspects of survey operation from register maintenance and mail out of questionnaires to printing of reports must be considered when the different surveys are being prepared for computer processing.

6. Finally, it may be noted that the plan for expansion and automation of the Central Register makes provision for tie-in of non-statistical registers such as those maintained by the Unemployment Insurance Commission, Department of National Revenue and various provincial agencies. Units on these registers can be related to the units on the Central Register in terms of "legal entities". Thus, the Central Register is expected to become, in effect, a focal point for the rationalization of register of business entities maintained throughout the federal government and in the provinces.

#### Management information and planning systems

76. For some time it has become evident that DBS needed improved information to provide a more effective basis for management analysis, planning and control, with special reference to costs in relation to end products. An automated weekly reporting system was, therefore, developed and introduced in April 1970, consisting of three main parts: resource utilization, progress reporting and timeliness of releases. Some 500 statistical projects have been identified as the foundation of the system. Each statistical project consumes identifiable resources and is associated with an identifiable end-product (or benefit) and the sum of all statistical projects represents the approximate statistical output of the Bureau. In addition to a standard list of projects, seven standard types of operation performed within the Bureau have also been identified and reported on - plan/develop, coordination, collection, edit/code, compilation, analysis and publication. When applied to individual projects, these will permit further analysis of DBS undertakings. It is anticipated that all modules of the system will be operational in April 1971.

77. Among the uses of this reporting system is to provide a factual cost basis, broken down by "responsibility center", project and function, for improved planning. Simultaneously with this work, a considerable effort has been made to develop a comprehensive system for long-range planning of statistical inputs and outputs. The development of this latter system is, however, taking longer than anticipated.

Review Of Statistical Activities In Ceylon  
1966 - 1970

I - Population And Vital Statistics

1. Census of Population and Housing, 1963.

In order to provide advance data on the Census as early as possible, a 10% sample tabulation was carried out, and a Census publication was issued in two parts in 1967 - Part I: General Characteristics, Part II: Gainfully Occupied Population. The final report of the Census based on complete data was prepared in 1969.

A supplementary report on the Census of Housing (1963) was also issued.

2. Census of Population, 1971.

Preliminary work on the next Census of Population (Scheduled for 1971) commenced in 1969. A limited pilot census was conducted in January, 1970 with the object of testing the draft questionnaires. The Census questionnaires have been prepared more or less on the same lines as those used in 1963, but provision is being made for the collection of additional information on fertility and migration on a sample basis.

3. Population Projections.

Population projections by age and sex up to the year 2003 A.D. was prepared and published in the Ceylon Statistical Abstract. The low projection was based on the assumption that fertility will be reduced by 1/3 in 10 years time (commencing from 1962) and that it will decline linearly to 50% of the 1962 figure by the year 2003 A.D. Even under this assumption, the population will be doubled by the year 2000 A.D.

4. Vital Statistics.

Vital statistics are compiled and published by the Registrar General's Department. In order to minimise the delay in the publication of the annual report, the Department of Census and Statistics undertook the processing of the death returns by machine tabulation on a request made by the Registrar General in 1967. This procedure has enabled the Registrar General's Office to issue its annual reports more expeditiously.

A sample survey to assess the completeness of birth and death registration was carried out in 1967. The survey showed that birth registration was 98.7 per cent complete while death registration was 94.5 per cent complete.

A complete life table was prepared for the 3 year period 1962 to 1964 centred on the census year 1963. Abridged life tables up to 1967 have also been prepared. The expectation of life at birth for the year 1967 is 64.8 for males and 66.9 for females. Up to 1962, the female expectation of life at birth had always been lower than the male expectation. This pattern has

shown a change since 1963 with the female expectation being higher.

## II - Manpower

### 1. Employment

Statistics of Employment in the Public Sector are collected annually by the Department of Census and Statistics and published in the Statistical Abstract.

In the case of the private sector, the main source of information is the Employees' Provident Fund. Under the E.P.F. Act all establishments employing three or more persons are obliged to send monthly returns in respect of their regular work force to the Fund. According to current estimates, over two-thirds of all paid employees in the private sector are covered by this Act. A classification of such workers by districts and by industrial category has been made by the Central Bank.

### 2. Labour Force Survey

This survey which commenced in 1968, was undertaken by the Department of Census and Statistics in order to obtain current data on the composition and the characteristics of the labour force. The Department of Census and Statistics was responsible for the sampling design, the field operations and the processing of the data. The questionnaire for the survey was prepared in consultation with the Ministry of Planning and Economic Affairs. The survey was planned so as to provide the required information for the island as a whole, as well as for the urban, rural and estate sectors. It was conducted in two rounds each of 3 months duration.

The Administrative Districts of the island (22 in number) formed the basic strata. Each district was further demarcated into urban, rural and estate sectors. In designing the survey, a two-stage sampling scheme was adopted. The first stage units were the census blocks and the second stage units were households. The census blocks were selected with probability proportional to the number of households as reported at the 1963 Census of Population. Within each selected census block a proportion of households was selected at random for purposes of investigation. In all 13,00 households were enumerated during the first round and an equal number during the second round. In the first round, information was collected by Statistical Investigators of the Department of Census and Statistics by personal interview. In the second round, field investigations were carried out by Statistical Investigators as well as Enumerators specially recruited for the purpose.

The reference period for this survey was the week preceding the date of survey and the year preceding the date of survey. Field investigations for the first and second rounds were completed in 1968/69. The data collected during the first round of the survey were processed and the tabulations were sent to the Ministry of Planning and Economic Affairs for analysis.

## III - Agriculture

1. Paddy

The crop curves for the estimation of paddy yields at the district and all-island level, which were introduced in 1951, were re-designed so as to obtain yields for D.R.O. divisions in the major paddy growing areas.

The Central Bank of Ceylon undertook a survey on the cost of production of paddy in 1967. The main objective of this survey was to get estimates of the cost of various inputs (both labour and material) going into paddy production. A stratified random sample of 3,000 parcels of paddy land was selected for the purpose of the survey. Field investigations were carried out by Food Production Overseers of the Department of Agriculture.

The results of survey are published in the report "Survey on Cost of Production of Paddy" issued by the Central Bank in 1969.

2. Highland Crops

The services of an F.A.O. Statistician were obtained for a study of the present system of collecting agricultural statistics. A recommendation made in his report for the collection of basic data in respect of minor agricultural crops on a sample basis in preference to the present system whereby Grama Sevakas (Village Headmen) provide estimates on crop area and production in respect of all villages is now being examined by the Department.

3. Vegetable Surveys

A pilot study to determine the acreage and production of vegetables was undertaken by the Department in 1966-67 in two major vegetable growing areas in the island.

A stratified two-stage sampling design was adopted with villages as the first stage units and farm-households as the second stage units. The surveys were conducted by a series of personal visits to the selected sample households located in each selected sample of villages, and information was obtained from cultivators.

The results of the survey were published in two reports: "Survey of Vegetable Production (Kandy and Badulla)" issued by the Department in 1968.

Another pilot survey to estimate the acreage and production of chillies was undertaken in one district during the Maha 1968/69 season. The acreage under chillie cultivation was obtained by a complete enumeration of parcels over 1/16 acre and a sample enumeration of parcels less than 1/16 acre. A three-stage sample design was adopted for estimating the yield rate. The field experiments were conducted mainly by school teachers who were specially trained for the purpose.

The results of the survey were published by the Department in 1969 in the report "Survey of Chillie Production (Anuradhapura district)".

#### 4. Coconut Survey

Coconut is one of the major crops grown in Ceylon. But, since a large proportion of the acreage under coconut is in small-holdings, the collection of reliable basic statistics on the coconut industry has been a perennial problem. The Department of Census and Statistics initiated a programme for conducting a survey in the early sixties and in 1968 a full-scale coconut survey was launched.

The main objective of this survey was to estimate the palm population, total production of coconuts, yields per palm, specific characteristics such as age group, bearing status, etc. and the extent to which cultural practices were followed. Eight major coconut growing districts covering about 86 per cent of the coconut area were covered by this survey.

The frame for this survey was the list of estates and the extents of small holdings of all crops obtained at the pre-listing stage of the Census of Agriculture, 1962.

A stratified 2-stage sampling design was used for the estate sector while in the case of the small holdings sector, a stratified 3-stage design was adopted. Estates were selected with probability proportional to the acreage under coconut as at 1962. One section of this estate was selected at random for palm count. A square block of 40 x 40 square yards was sited inside this section of the estate for palm characteristics, and two clusters of 4 palms each for yield estimation. For the small holdings, survey blocks of 500 acres of cultivated land were selected with equal probability for palm count. Two clusters of 5 parcels were selected at random for getting palm characteristics, and 2 clusters of 4 palms each in two different parcels for yield estimation.

The size of the sample was determined on the basis of the standard errors worked out in the pilot survey, and apportioned to each district in proportion to its coconut area subject to a minimum in each district. In all, 180 estates and 200 survey blocks of small holdings were selected for the survey.

The first stage of the survey, i.e. listing of all parcels in the selected blocks, commenced in May, 1968, and was completed by April, 1969. The second stage of the survey consisted of the physical enumeration by age group and bearing status and study of agronomic, cultural and management practices in systematic clusters of 10 in each survey block and one in each estate. The third stage involves the collection of production data, harvesting and disposal practices, etc. For this purpose, 2 clusters of 4 palms in each selected parcel or estate are chosen for six consecutive picks. The second and third stages of the survey were begun in October, 1969 and will be completed by the end of the year.

#### 5. Livestock

In view of the limited data now available on livestock population and milk production, the Department proposes to conduct studies in selected areas. The first survey of this nature will be undertaken in one of the major milk producing areas in June this year.

## 6. Census of Agriculture

The report on the Census of Agriculture, 1962 was published in 4 Volumes: Volume I: Agricultural Land, Agricultural Operators and Tenure; Volume II: Land Utilization; Volume III: Paddy Land; and Volume IV: Minor Crops, Livestock and Employment in Agriculture.

The next Census of Agriculture is scheduled to be held in 1972. A publication setting out the scope and coverage of Census has been published.

## IV - Manufacturing And Mining

### 1. Current Statistics

Statistical data from manufacturing establishments have been collected and compiled regularly by the Ministry of Industries (bi-annually) and the Central Bank of Ceylon (annually). The coverage of data collected is confined to industrial establishments registered and approved by the Ministry of Industries. These manufacturing units (numbering nearly 2,700 in 1969) account for a very large proportion of output in the manufacturing sector.

The data collected relates to production, sales, raw materials used, employment, etc. These basic statistics are published regularly in the publication "Statistics of Industrial Production" issued by the Ministry of Industries, and in the annual report of the Central Bank of Ceylon.

The Central Bank also conducts an annual survey of all State Industrial Corporations. Comprehensive data on capital investment, production capacity, production, sales, profit and loss, employment, etc. are collected and published in the annual report.

### 2. Survey of Industrial Production

In view of the growing demand for statistical data in the field of industry, a survey on industrial production was carried out in 1968 by the Department of Census and Statistics. The principal objective was to collect information on the pattern and structure of industrial activity in Ceylon. The information obtained from the survey would be used in revising the present Index of Industrial Production. The data would also be useful for the preparation of input/output tables and for improving national accounts estimates.

In carrying out this survey, all industrial establishments were categorised according to registered industries, estate industries and other industries (small-scale). A directory of all industrial establishments classified by revenue districts was used as a basic frame. The survey was conducted by mail inquiry, but in the case of small establishments, Statistical Investigators were deployed to collect the information.

In the case of large establishments, the response rate was satisfactory, but difficulties were experienced in collecting the information from small-scale units. This was largely due to the fact that a majority of these establishments did not maintain systematic accounts to furnish detailed information called for in the questionnaire. The information collected from the survey is now being processed and analysed.

### 3. Mining

The present coverage of mining and quarrying industries is almost entirely confined to data collected and published by the Department of Geological Surveys.

## V - Transport And Communication

The major Transport and Telecommunication Organizations in Ceylon come under the purview of the Central Government:: Railway (Government Enterprise), Ceylon Transport Board (State Corporation), Port Commission (Government Enterprise), Port Cargo Corporation (State Corporation), Air Ceylon (State Corporation), Port and Telecommunications (Government Enterprise), Ceylon Broadcasting Corporation (State Corporation). These enterprises maintain systematic statistical records on their day to day operations and the basic statistical data are published in their annual reports.

It is only in the case of transport of goods by road, which is essentially an area managed by the private sector that adequate statistical information is not available. Such data have, therefore, to be obtained through special surveys.

## VI - Trade

### 1. External Trade Statistics

From 1965 to 1968, trade returns were compiled monthly and annually by the Customs Department on the SITC (revised classification). From January 1968, a new classification based on the Brussels Tariff Nomenclature (BTN) was adopted in order to fix Customs tariff on a systematic basis. Provision is being made, however, for including the SITC codes alongside the BTN codes when publishing the trade returns in order to facilitate the analysis of trade data according to international classifications.

The request of the Economic and Social Council of the United Nations to categorise commodities imported and exported broadly under food, industrial supplies, capital equipment, consumer non-durables and consumer durables to supplement the summary data supplied on the basis of the SITC was examined, but with the adoption of the BTN for trade classification from 1969, it was felt that further classification according to broad economic categories would cause difficulties, and hence, it has been decided to defer this work until the mechanization of Customs data is adopted.

In recent years, certain discrepancies have been observed in Customs and Balance of Payments statistics. A Committee was appointed to inquire into this and suggest ways and means of improving the present method of collecting and compiling import and export statistics. Some of the recommendations of this Committee have already been implemented.

### 2. Trade Indices

Price and volume indices of exports and imports are compiled by the Department of Census and Statistics and by the Central Bank of Ceylon. Until 1968, trade indices compiled by the Central Bank were worked with fixed weights based on the experience of five years (1954-58) using 1958 as

the base year. The Department of Census and Statistics published price and volume indices with 1948 as the base year.

In recent years these have had many significant changes in the commodity composition of imports consequent to the new import policies pursued by the Government. There have been important shifts in the export sector too as a result of a steady expansion in non-traditional export. The current trade index series were gradually becoming outdated. The situation therefore, warranted a revision of the indices to a more recent base period.

In 1969 the Central Bank prepared a revised series based on the experience of three years (1965-67) with 1967 as the base year. The original series were spliced into the new index. The Department of Census and Statistics has also taken similar action to revise its own series.

### 3. Internal Trade Statistics

An island-wide census of distributive trades was carried out in 1967 under the provisions of the Census Ordinance. This census was undertaken with a view to obtaining a wide range of reliable and up-to-date statistics relating to the distributive trades. The last inquiry in this field was the Census of Merchandising and Services, 1952.

A census of distribution, 1967, covered wholesale trade, retail trade and other services which include hotels, restaurants, cafes, and taverns, cinemas, laundries, barber saloons and beauty shops, portrait and photographic studios, motor vehicles repair shops etc. etc. The items of data sought include general establishments characteristics, employment and wages, capital assets acquired and sold during the year, depreciation of capital assets and interest paid, operating expenses, sales or turnover, purchases and value of stocks.

Information was collected from nearly a hundred thousand establishments. The data is now being processed and analysed.

## VII - Prices

### 1. Colombo Consumers Price Index

The Colombo Consumers Price Index is the country's only official cost of living index. Although the technical framework of the index remains unchanged, the following refinements in pricing methods have been introduced with a view to ensuring that the index remains a sensitive measure of current changes in retail prices.

- (a) 3 weekly test purchases are carried out for food items in respect of market areas of Colombo city for obtaining the "transaction prices" which are used for computing the food index.
- (b) The pricing schedules used for price collection, especially in the clothing and miscellaneous groups, have been periodically revised to take account of the new range and grades of local items available to consumers; and



- (c) Current changes in the cost of personal services such as hair dressing and laundry in the "Miscellaneous Group" have been ascertained and incorporated into index on the basis of bi-annual surveys.

2. District Town Retail Prices

A system of retail price collection for consumer items in all major district towns of the island (22 towns corresponding to the 22 district Kachcheries in Ceylon), which was begun in 1959, is being continued. An all-island price index series covering the food group is computed quarterly and annually on the basis of price data collected.

As in the case of the Colombo Consumers' Price Index, pricing schedules used for regional retail price collection have been substantially revised during the last few years to take account of current changes in the commodity composition of both local and imported consumer items entering the market.

## VIII - Finance

1. Public Finance

A Special Committee of officers from the Treasury, the Ministry of Planning and Economic Affairs and the Central Bank is at present examining the question of presenting budgetary accounts in a revised form with a view to facilitating their adoption for social accounts purposes. As a first step, the revenue side of the budgetary estimates for the year 1970/71 will be presented on the lines recommended by this Committee.

The series "Economic and Functional Classification of Government Receipts and Payments" has been revised and re-classified by the Central Bank to conform, to greater extent than previously, to the recommendations given in the United Nations Manual.

2. Banking

The Central Bank has prepared a new series of figures for the following transactions -

- (a) Sources and utilization of funds of Commercial Banks.
- (b) Commercial Bank advances for industrial purposes according to type of product.
- (c) Savings and fixed deposits in the Rural Banks.
- (d) Loans given by Rural Banks according to purpose.

3. Foreign Aid

Classification of Foreign Aid according to type and country of origin has been compiled by the Central Bank and presented in the Annual Report.

## IX - National Accounts And Input/Output Studies

1(a). National Accounts

The Department of Census and Statistics prepared a revised series of National Accounts for the period 1963/68. Modifications introduced aim at removing some of the limitations in the earlier estimates by -

- (a) improving the conceptual basis of the estimates;
- (b) providing better coverage of economic activity;
- (c) securing consistency of treatment in the detailed estimates of items on the respective product and expenditure approaches; and
- (d) adopting more refined techniques for the compilation of constant price series.

New data obtained from recent Censuses, Surveys and other sources have been utilised in building up the new series, but there are still a few areas where the basic data used in preparing these estimates are weak. This relates mainly to production data in respect of minor crops, small-scale industry, and constructional activity and capital formation data in respect of the private sector.

1(b). Input/Output Table

In 1968, the Ministry of Planning and Economic Affairs started work on an input/output table for 1965 with the objective of (a) locating the particular areas in which National Accounts data were deficient; and (b) using the table for purposes of projecting the performance of the economy under alternative assumptions of investment patterns and policy variants.

The primary data for the table were obtained from the National Accounts Division of the Department of Census and Statistics. Supplementary data were obtained from the Economic Research Department of the Central Bank from independent inquiries in respect of some of the more important industrial establishments.

For the purpose of the current transactions table, the economy was divided into 40 sectors. In the construction of the Table, the practice adopted was to fill a row or a column depending on the type of data available. As was expected, the data in this first table stands in need of further refinement, and it is expected that much of the work in the future would be concentrated in conducting inquiries into the input structure of various industries.

## X - Social Statistics

1. Education

Since 1962, a separate day has been sought as schools census day. Apart from the basic data on schools, pupils, teachers, finance etc. other information relating to school curricula, teachers requirements for various

subjects, occupational ambitions of pupils, etc. are collected. At the early stages, information in respect of only a limited number of subjects were tabulated. Action has been taken in recent years to process and tabulate the bulk of the data collected.

## 2. Health

Hospital statistics relating to both in-patients and out-patients are collected and compiled regularly by the Department of Health Services on the basis of returns sent by all Government medical institutions.

In recent years, increasing importance has been attached to the collection of basic statistics on family planning activities with a view to assessing the progress of the national family planning programme. A paper entitled "Fertility trends in Ceylon, 1953-1968 and the National Family Planning Programme" was prepared for publication.

## 3. Local Government

A statistical digest entitled "Local Government Statistical Year Book, 1969" containing basic statistical information in respect of all local authorities (Municipal, Urban, Town and Village Councils) was prepared to as a ready-reference publication to facilitate efficient planning of Local Government administration and to be of use to students for research work on Local Government.

# XI - Special Surveys

## 1. Socio-Economic Survey, 1969/70

The Department is at present engaged in conducting a socio-economic Survey of households in Ceylon. This survey is of the multi-subject type and is designed to collect detailed information required for a proper assessment of the levels of living and changes in living conditions of the community, with special emphasis on expenditure patterns.

The survey will be conducted in 4 rounds each of 3 months duration. In each round, approximately 3,000 households selected at random will be surveyed. The survey has been designed so as to get separate information for the urban, rural and estate sectors. The field enumeration is conducted by trained Investigators of the Department by personal interview. Field work on the first two rounds is now complete, and data in respect of the first round are now being processed and analysed.

It is expected that the information collected from this survey would prove invaluable to planners, policy makers and research workers, more so, since the data collected from previous surveys have ceased to be of much value in making a proper assessment of current trends in the economic and social well-being of the community.

## 2. Survey of Rural Credit and Indebtedness

During the second half of 1969, the Central Bank designed a survey of rural credit and indebtedness, field work on which was completed during the last quarter.

The main objectives of the survey were to obtain data on the incidence of debt, the sources and conditions of borrowing, the purposes of borrowing, and methods of repayment. This information will be valuable in assessing and formulating agricultural policies, as well as in expanding credit and banking facilities to the rural sector.

A stratified random sample of 159 villages covering nearly 30,000 households was selected for the survey. This sample is estimated to include about 2 per cent of all rural households. The investigation was carried out by graduate Investigators trained and employed specifically for the survey.

### 3. Private Investment Survey

In November 1967, the Central Bank undertook a survey of private investment. It was planned more or less on the same lines as the survey conducted by the Bank in 1964. This survey sought data on investment by type of asset from -

- (a) Company establishments;
- (b) Non-Company establishments;
- (c) Urban households;
- (d) Rural households; and
- (e) Fisher households.

Company and non-Company establishments were divided into three strata, namely, agriculture, manufacturing and services. Except for manufacturing companies, where a complete enumeration was undertaken, a random sample from each of the other strata was selected for investigation. In the case of the household sector, separate samples were drawn from urban, rural and fishing households.

The questionnaires to the Company and Non-Company establishments were sent by post and, where necessary, followed by personal interviews. The urban, rural and fishing surveys were carried out by personal interviews.

The report on the survey is now under preparation and will be released shortly.

## XII - Data Processing

During the past few years the Department of Census and Statistics has undertaken the processing of data on a number of Censuses and Surveys conducted by the Department and has also assisted several other institutions and Departments in this field of work. All this work was handled by the Unit Record Installation.

In view of the large volume of data processing work that is anticipated in the near future, especially in connection with the forthcoming Censuses of Population and Agriculture, the Department has installed on a rental basis an I.B.M. System 360 Model 25 Computer. The programming

and operational staff were also recruited and have undergone training.

For a few months it is hoped to do a parallel run of all jobs on the Unit Record Installation as well as on the Computer and thereafter process all jobs on the System. Among the first jobs to be handled by the Computer System, is an islandwide Socio-Economic Survey - presently being conducted by the Department. The programming staff has also commenced work for the Census of Population 1971. The pilot census of population to be conducted during the latter part of the year will be designed so as to enable the division to test the programmes written. In fact the entire key punching and tabulation process will be gone through for the pilot census to enable the division to test all its procedures.

With the full commissioning of the system, all statistical work of other Government Departments too will be handled by the Data Processing Division. It might be mentioned, however, that besides the Department of Census and Statistics, several other institutions in the public sector such as the Central Bank of Ceylon, the State Engineering Corporation, the Petroleum Corporation, and the Insurance Corporation of Ceylon have installed Computers to facilitate the processing and computerization of data in their own establishments.

## Review Of Statistical Activities Since The Sixth Conference

Cyprus, a former British Colony, was declared as the independent Republic of Cyprus in August 1960. The Republic did not participate in the Sixth Conference of Commonwealth Statisticians. Since 1960, however, a number of developments have taken place in the statistical services of the young Republic.

2. Bearing in mind the volume of papers and reports to be studied by the delegates at the Conference, this report is designed merely to point to recent developments of salient importance in the work of the Statistics and Research Department. A more comprehensive picture of the work of the Department is available in the Statistical Abstract, a special annual report.

### Growing Demands of Statistics

3. A great increase of needs of statistical information emanates from the various Ministries and Departments but particularly by the Planning Bureau, the Department responsible for the various Five-year Plans. Cyprus is at present in its second Five-year Plan with a greater need of more statistical information for the drawing up of its third Five-year Plan.

4. The private sector, entrepreneurs and other business people come to rely to a very great extent on the information given to them by the Department for the development either of existing industries or starting new enterprises.

### Statistics Law

5. Prior to 1967 statistical information was collected in accordance with a statistics law of very limited meaning, scope and interpretation.

6. A new and revised law of wider powers up-dated and adjusted to current and developed needs has been introduced since 1967. The new law inter alia centralises all statistical services, censuses and surveys of a statistical nature under the Department of Statistics and Research. Three statistical units under the Ministries of Agriculture and Natural Resources, the Ministry of Labour and Social Insurance and the Ministry of Health have been absorbed and are functioning under the administration of the Department of Statistics and Research. The Department out of historical evolution under the Colonial Administration and functioning as a section of the then Secretariat was allocated, after Independence and the creation of the ten Ministries, to the Ministry of Finance.

### Census of Population, Housing and Agriculture

7. The last comprehensive Census covering Population, Housing and Agriculture was taken late in December 1960. This Census was taken under the Census Law No. 10 of 1946 and in accordance with Council Order No.3141 of 7th July 1960. The exploitation of the results was rather delayed due to the limited capacity of the data processing machinery available in the Department. Full results of the Census were available in six volumes published late in 1962.

8. The three Censuses were most comprehensive. The Housing Census,

in addition to dealing with occupancy, rents and construction materials extended its scope to include interior facilities i.e. kitchen, bathroom and hygienic equipment, lighting and heating either through kerosene or electricity. Particular questions were set on refrigerators and washing machines.

9. The Population Census dealt mainly with demographic characteristics i.e. date and place of birth, sex, race, religion, marital status, languages spoken in addition to the mother tongue, level of education, disabilities, occupation and industry, earnings and other income as well as hours of work during a specific week before the census date.

10. The Census of Agriculture dealt mainly with area of holdings, cultivation of agricultural land, fertilizers and irrigation. Specific questions were asked on trees, perennial and temporary crops, area under crops and related production.

### National Accounts

11. The need was felt in 1966 that the method whereby Value Added in some sectors of the economy was calculated should be revised. A request was placed at the United Nations through the appropriate channels for expert advice. A U.N. Regional Adviser on statistics, paid a number of visits to Cyprus during which a number of sectors, those presenting the most serious problems, were studied and revised in view of the existing situation. The following sectors were thoroughly examined and revised:

#### 12. Agriculture:

Prior to the revision, the Index of Gross Output in the sector was calculated and compared to 1962 (for which value added was also available). Then Value Added for the current year was calculated by applying the relationship of the two indices. This crude method had the serious defect that it unduly pulled Value Added either upwards or downwards, as it took no account of the fact that inputs, whatever the outputs, might have changed only slightly.

13. The revision of the methodology mainly centered on finding a method of estimating inputs and thus arriving at Value Added by direct calculation. A number of specific enquiries were conducted for this purpose and tables were prepared showing input costs to farmer. Some of the inputs e.g. seeds are estimated on the basis of area planted and standard rates per unit area, other inputs are extracted from imports statistics, e.g. fertilizers and weedicides, while others are collected from local feeding stuff factories. Still other inputs are produced by the farmers themselves and the problem here is closely related to the accuracy of the data on output (about which more will be said herebelow). In short, Value Added is calculated directly and in this way, variations in output do not unduly influence variations in Value Added.

#### 14. Wholesale and Retail Trade:

The method applied for the calculation of Value Added in this sector was, generally, the index method described in the case of the agricultural sector.

15. In the present case use was made of another method in estimating Value Added generated in the sector, namely the flow-of-product approach.

Local agricultural, mining and manufacturing output consumed locally, imports and exports were closely studied and the gross trade and transport margins generated in each group of economic activity estimated. The respective gross margins were established by selecting representative items from each group and following them till they reached the final user, or the ship's side, in the case of exports. By subtracting transport margins involved (estimated through a similar procedure), one is left with gross trade margins including material inputs. An estimate of deductible material inputs was provided by the 1967 Census of Distribution and amounted to approximately 20% of gross trade margins. Consequently, 20% of gross trade margins is deducted as an estimate for material inputs and Value Added derived in the sector obtained accordingly.

16. The revision of the methodology in connection with Manufacturing and Construction completed a major effort which resulted in a significant improvement of the quality of Cyprus National Accounts Statistics.

17. Agricultural Statistics:

As mentioned earlier, use is now being made of data on the Gross Output of the agricultural sector for the purpose of calculating Value Added. Therefore, the need for accurate production data appeared imperative. With the assistance of an Agricultural Statistician from the University of Cambridge a plan was worked out for collecting agricultural statistics on a sample basis to replace the earlier crude method of presenting total agricultural production either as a result of increasing export figures to allow for local consumption (e.g. potatoes, carrots, citrus) or of increasing deliveries to Government Agencies (e.g. wheat, barley, grapes, raisins etc.) to allow for local consumption.

18. The new method consisted of selecting a random sample from Land Registry maps which, in the case of Cyprus, are satisfactorily detailed; the whole of the island is divided into 61 sheets, each sheet containing 64 plans, each plan representing an area of 1.5 sq. miles. Each plan is divided into 4 subplans W1, W2, E1, E2, each subplan consisting of actual, numbered plots. The selection of the sample consisted of recording the plot number, name of registered owner and a few more details in respect of plots located at the extreme corners of subplan W2. By later examining land use to each plot one comes up with a representative list of agricultural points, the holders of which are the members of the sample; data on land use, production, prices, employment etc. are collected from each member of the sample, in respect of his complete holding. A computer programme was prepared to calculate island totals, of area, production etc. taking into account the area of each District and the area planted to each crop. It also calculates the coefficients of variation and standard errors for each crop.

19. With regard to livestock production, the Census of Animals (May, 1969) provided the frame from which a representative stratified random sample was selected and a sample enquiry, the first of its kind, was conducted early in 1970 covering the previous year. Questions relate to stocks at the beginning and end of the year, production, sales of livestock and livestock products. It is intended to make use of another computer programme for producing island totals, although the results of this first survey will be processed manually.



20. Census of Animals and Registration of Vines, 1965:

During 1965 the above two censuses were conducted by the Department of Statistics and Research with a view to securing detailed and accurate data, necessary to the Government from the planning, subsidization and other points of view: Both censuses covered only Greek holders, owing to the prevailing political conditions at the time. The data secured through the above two censuses were valuable, especially in the case of vines, which were the object of a specific census for the first time in the history of the island. The results later proved of immense use to the authorities concerned in issuing certificates of ownership to each holder and in subsidizing uprootings of some varieties, whilst encouraging the planting of other varieties.

21. In the case of animals, the bench-mark data provided were necessary for comparison purposes as the earlier data available were in respect of 1960. Apart from this use and the preparation of tables by location and type of animals for use by the Animal Husbandry Authorities in their ordinary extension services, no further use was made of the results (e.g. the selection of a sample for further studies, as happened with the Census of Animals, 1969).

22. Census of Orchards, 1966:

Citrus growing in Cyprus had been expanding at a very fast rate during the period 1960-1966. The need, therefore, arose for accurate knowledge of the area planted to each variety of citrus as well as for the regulation of the rate at which the new plantations were formed, on the basis of the availability of underground water, foreign markets etc. The Registration of Orchards in 1966 was intended to take care of the above requirements and covered, again, only Greek holders. The results, besides providing details of citrus by location, age, variety, etc., were of considerable assistance to the authorities responsible for issuing certificates of ownership and applying the relevant law on new orchard plantations.

Census of Distribution

23. A complete registration of all establishments was undertaken in 1967 covering the whole island. The information collected related to the urban and the rural areas covered all economic activity as well as employment and number of people employed.

24. Using this registration a Census of Distribution was attempted in 1968 covering Wholesale and Retail Trade with data collected related to employment, turnover, expenses and capital formation. The Census was undertaken on a sample basis covering all those enterprises to which five or more persons were engaged and 5% of those employing less than five persons.

Census of Industrial Production

25. A full Census of Industrial Production, the first undertaking of this nature to be attempted in Cyprus, was taken in 1962. The results were exploited in two stages, the first stage covering the registration of all establishments engaged in mining and quarrying, manufacturing, construction, electricity, gas and water. In addition, retail trade establishments were registered together with the registration of the industrial ones and this mainly because in Cyprus there exists a great overlap between industrial and retail trade activities. The data relate to the number of establishments

and number of persons engaged.

26. The second stage of the Census covers gross and net output, stocks, raw materials and the auxiliary products consumed, compensation of employees and capital formation in mining and quarrying, manufacturing and electricity, gas and water.

27. A second Census of Industrial Production was carried out in 1967 with a main purpose of determining the contribution of the industrial sector to the economy of the country in terms of employment, gross and net output and capital formation. It covered mining and quarrying, manufacturing, gas and water. A second aim of the Census was the eventual construction of an input-output table for the Cyprus economy in addition to the revision of the weights and base of the index of industrial production calculated since the first industrial census in 1962.

28. The Census is carried out on a sample basis with a 100% coverage of all industrial establishments employing five or more persons and a 10% coverage of those establishments in which 1-4 persons are engaged. The frame for the census was provided by an island-wide registration of all establishments.

### Construction Statistics

29. The regular system of collecting statistics on Construction has been through building permits issued by the Municipalities for the urban areas and by the District Administration for rural areas.

30. A pilot construction survey covering the whole island was conducted, however, in 1966, which included besides construction proper, additions to existing constructions, repairs and demolitions of buildings, roads, bridges, harbours and airports.

31. The survey included construction undertaken by the central government, autonomous government organisations, municipalities and improvement boards. It also contained irrigation and other projects which were partly financed by government and partly by the private sector.

32. This undertaking collected data on method of construction of buildings, materials used, number of persons engaged as well as wages and salaries.

33. Thus the survey, among other things, gave information on gross output, value added and capital formation.

### Cottage Industry Survey

34. A survey covering the whole cottage industry was carried out in 1967. It was the first detailed study on the cottage activities undertaken in the country, although some data on such activities were collected in the two Censuses of Industrial Production.

35. Cottage industry was defined to include chiefly folk art activities, undertaken at home and the items produced were offered for sale.

36. The aim of the survey was to determine the contribution of the cottage industry to the economy of the country in terms of employment, gross and net output and in extension the types of folk art goods produced in Cyprus.

Moreover, Cyprus with an expanding tourist industry needs not only to preserve but to develop its folk art industry into a remunerative undertaking for those persons engaged in it.

### Survey on Hotels and Lodging Houses

37. This survey covering all Hotels and Lodging Houses was undertaken in 1967 to obtain detailed information on employment, capacity, occupancy, receipts, costs and capital formation in these undertakings. The inquiry was carried out through a mailed questionnaire followed where necessary, by personal interviews.

### Indices

#### 38. Index of Industrial Production:

An index of industrial production is compiled annually since 1966 with 1962 as base year, for the period 1962-1969. The index covers mining and quarrying, manufacturing, gas and electricity. Water and sanitary services involving a considerable non-industrial element have been omitted. The index is a base weighed arithmetic average of quantity relatives computed according to the Laspeyres formula.

39. The weights are proportional to Census Value Added. A regular review of the weights is carried out every five years on the basis of the Censuses of Industrial Production. Thus the index was re-weighted on the strength of the second Industrial Census of 1967.

#### 40. Index of Labour Productivity:

In conjunction with the compilation of the Index of Industrial Production an Index of "Labour" Productivity is compiled annually for the period 1962-1967. The index measures changes in output per unit of labour input and is defined to be, Index of the Industrial Production/Index of Employment. The Index of Employment is based on the annual average number of persons employed adjusted for overtime work etc. The same sample was used as in the Index of Industrial Production for 1962-1967.

41. A Quarterly Index of Earnings in Construction is compiled for every major occupation in the construction sector as from 1969.

42. This enquiry is based on a sample covering 113 employers engaging about 7% of the total labour force in the construction activity.

43. The sampling ratios were approximately:

20%	of those employers engaging	1 - 9 persons
30%	" " " "	10 - 49 "
100%	" " " "	50 - 99 "
100%	" " " "	100 and over

#### 44. Wholesale Price Index:

The Department of Statistics and Research ventured in 1968 in compiling a Wholesale Price Index.

45. The Index published on a monthly basis covers the main items passing

through the wholesale trade. It refers to the market of the capital city only.

46. The Index is measuring the level of wholesale prices of the main items both imported and locally produced as they appear at the wholesale output. The items included in the Index are classified into four main sectors:

- (i) Items of primary local production
- (ii) Items of local industrial production for home consumption
- (iii) Items of exports
- (iv) Items of imports

47. For each item in the sector, an analytical index is compiled with these indices grouped to form the sectorial Index. The sectorial indices are finally grouped to form the general index.

48. All items of the index are classified in accordance with the Standard International Classification which is adopted in the Imports and Exports Statistics.

49. The following summary table shows the number of items included in each sector:

Sector 1	89 Items
Sector 2	98 Items
Sector 3	102 Items
Sector 4	277 Items
	566 Items

50. Retail Price Index:

The Department of Statistics and Research initiated and carried out late in 1967 and throughout 1968 a number of Household Expenditure Surveys with the main objective of revising the Retail Price Index. These surveys were undertaken mainly in view of the considerable changes that had taken place in the consumer's consumption habits since 1957, when the Retail Price Index was last revised. The four surveys of a fortnight's duration each (covering the urban areas only) were aimed at covering the seasonal variations of the consumption habits of the population. This was the first time that Cyprus introduced a Retail Price Index based on results of a full and scientific survey on Household Expenditure.

51. The index is a weighted average of percentage changes in the price of all items in the Index. All goods and services consumed by Households and not being of the same significance, gave rise to different weights, assigned to the various commodities of the Index, representing their relative importance in Household Expenditures during the survey period (1967-1968). In the Index the total weight of all items was taken as 10,000 in order to avoid decimals and other complications in the calculation of the Index.

52. For the baskets of fresh fruit and vegetables and due to the seasonality of such items, a different vegetable-fruit basket was prepared for each month, based on data collected daily from all town wholesale markets for the years 1966 and 1967, i.e. the weight allocated to the various kinds of fruit and vegetables were proportional to their total value as recorded at the wholesale markets. A point which needs clarification is that, although the

items and the weights allocated to each item of the two baskets vary from month to month the total weight of each basket remains constant. All commodities included in the Retail Price Index are classified in seven groups as follows:

<u>Group</u>	<u>Weight</u>
I Food	3386
II Rent and Housing	1494
III Fuel and Light	400
IV Household Equipment	519
V Household Operations	235
VI Clothing and Footwear	2083
VII Miscellaneous	1883
	<hr/>
	10000
	<hr/>

53. The grouping of commodities was based on the international classification for comparability purposes. Some of the main groups are subdivided into a number of sections and each section subdivided into a number of commodities.

54. The prices of commodities included in the Index are collected on a monthly basis from retail outlets in the four main towns only, with the capital city having a double coefficient in comparison with each of the other three towns.

#### External Trade and Balance of Payments

55. Cyprus was using until 1967 the SITC code for its external trade. As from 1/1/69 the country has adopted the statistical classification based on SITC Revised. Side by side with this classification the Brussels Trade Nomenclature (BTN) is used mainly for tariff purposes. Both codes are used, the former for purely statistical records and economic analysis, the latter for use by the Department of Customs and Excise.

56. With the creation of a central bank organisation in 1964 for an overall control of the banking transactions in the country through its supervisory capacity on all banks operating in Cyprus the balance of payments estimates have been transferred from the Department of Statistics and Research to the Central Bank.

#### Survey on Blindness

57. A comprehensive survey on Blindness, the first of its kind, was undertaken by the Department in 1965 although some data on blindness have been available through the censuses of Population carried out decennially since 1881 and a preliminary survey conducted by the School for the Blind in 1962. The survey covered detailed data on the prevalence of blindness in Cyprus. It included inter alia, information on blind persons by age, sex, causes and degree of blindness, occupation and level of education. The survey dealt in addition, on the functions of the School for the Blind, the legal status and the rehabilitation, as well as the organisation for the Blind in Cyprus.

#### Survey on the Disabled

58. A first comprehensive study on the disabled persons to have ever

been undertaken in Cyprus, was carried out in 1966, although some data on infirmities have been available through censuses of population since 1881.

59. The study covered detailed data on prevalence of various disabilities in Cyprus. It included kind of disability, age, sex, marital status and level of education. In addition, the survey dealt with the functioning of the existing institutions for the disabled in Cyprus.

60. Suffice to add that this data was used by the Cyprus Government, in cooperation with the United Nations, in the establishment recently of a Rehabilitation Centre.

### Educational Statistics

61. The Department of Statistics and Research began to compile statistics of education in 1964. The first Survey on Educational Statistics came out in December 1965. This report became an annual event and it was mainly restricted to secondary and higher education as statistics on primary education were available through the Ministry of Education.

62. The necessary data used to be collected at the beginning of the following year referring to data for the school year 1964/1965. This was thought to be necessary so that information could be collected referring to failures, repeaters and drop-outs during the previous school year. In addition, information was collected on actual enrolment by class, sex and age. This method was employed until 1968 when a qualified statistician was recruited who was trained on a Unesco fellowship in educational statistics.

63. A statistical unit dealing mainly on statistics of education is now functioning assisting the work on planning in education.

64. The survey on education was extended to include data on all levels and aspects of education in the country. An attempt has been made to delve into the economics of education, with data on teachers as a sidelight.

65. In 1969 a study was undertaken on failures, repeaters and drop-outs in all Public Secondary Schools for the school year 1967/1968. The study referred to subjects in which boys and girls commonly fail. Statistics on primary and secondary education have been extended to include information on the flow of pupils, detailed wastage, mobility of pupils not only from class to class but also from one status of school to another.

66. At present a study is about to be completed referring to a five year period on the costing of education at its various levels.

### Labour Statistics

67. As mentioned earlier this statistical unit functioning under the Ministry of Labour and Social Insurance, has, through the Statistics Law of 1967, been absorbed and functions at present administratively under the Department of Statistics and Research.

68. The Labour Research and Statistics Section was established in the Ministry of Labour and Social Insurance in 1963 in order to take over and coordinate the statistical work of the Ministry, and to carry out surveys on matters of special interest to the Ministry.

69. The objectives of the Section were, briefly, to undertake surveys and research in order to fill gaps in the available data, for the purpose of making possible a comprehensive as well as detailed study of the manpower and labour problems of the Island, thus facilitating the Ministry in the formulation and execution of its policies and objectives, and Government in the formulation of its overall economic and social policy. Particular attention was given to the question of the supply and demand for labour and the identification of labour and skill shortages and surpluses.

70. Local Manpower Surveys:

With the assistance of I.L.O. experts the section initiated at first (1963-1965) a series of Local Manpower Surveys covering the largest towns of Cyprus (Nicosia, Famagusta, Limassol and Larnaca). The object of these surveys was to obtain data on the employment situation and trends and on manpower requirements in these areas.

71. Unemployment and Vacancy Statistics:

At the same time the rudimentary data on Registered Unemployment obtained from the Local Employment Exchanges was improved so as to provide satisfactory Regional, Industrial and Occupational analysis both on those Registered as Unemployed as well as on Vacancies Notified to the Employment Exchanges.

72. Port Labour Statistics:

The Port Labour Statistics series was improved and expanded to cover all the ports of the Island. The series makes available monthly data on the employment and earnings of Port Workers.

73. Surveys of the Catering Industry:

Two surveys of the Catering Industry (one in 1965 and one in 1967) were undertaken in order to obtain data on employment trends and on the manpower and training needs of this Industry.

74. Other Surveys:

From time to time certain Surveys are carried out to collect information on specific problems which are of interest to the Ministry - such as the Survey of Wages and Conditions of Work in Non-unionized establishments which was carried out in 1964.

75. Surveys of the Intentions of School-leavers and of the Output of Technical Schools:

76. Three surveys (1963-1964-1965) were carried out in order to obtain information on:-

- (i) Numbers graduating from each level of education yearly;
- (ii) How many intend to continue their studies, and
- (iii) How many will enter the labour force.

77. At the same time data are collected annually on the occupational specialization of those graduating from Technical Schools.

#### land-wide Manpower Survey:

6 it was decided to abandon the Local Manpower Surveys in land-wide Survey covering all non-agricultural establishments or more persons.

Survey covers approximately 42% of non-agricultural employment to give indications of the occupational structure, employment of the manpower and training needs of industry.

#### Monthly Reports on the Employment Situation:

In conjunction with the Manpower Survey mentioned above, a monthly mail reports covering the same establishments as those in the Survey was initiated. The response has been very satisfactory and the programme has been continued to date. This programme is the available information on employment trends in these large establishments, and the data needed in order to evaluate the degree of accuracy of employer's forecasts as regards their annual labour require-



REVIEW OF STATISTICAL ACTIVITIESIntroduction

1. For various reasons Fiji did not participate in the Sixth Conference of Commonwealth Statisticians at Ottawa. Our last participation was in the Fifth Conference at Wellington, New Zealand in November 1960. Therefore this review could conceivably extend over a period of ten years. However the Bureau of Statistics was formally organized as a separate unit in the Ministry of Finance in October 1967 which date also coincided with the appointment of the first full-time Government Statistician. A new period for rapid development of statistical services ensued. Many of the older series were redesigned and extended, plans were laid and executed for new surveys and exercises, and many ad hoc projects were undertaken largely to meet specific needs for development planning and for other policy decisions. Therefore although this review supposedly covers an extended period, all important developments in the field of statistics took place within a relatively short period, more specifically after the creation of the Bureau of Statistics.

Population

2. The decennial population census was undertaken in September, 1966. The census data was processed on a computer. The company owning the computer had set up shop in Fiji to process the data as well as provide computer facilities in Fiji and other territories of the region. The full census report was published early in 1968, but many facets of population data were available to Government during the latter part of 1967.

3. Following the publication of the census report, the age tables were used to construct a series of life tables by ethnic groups, using death and birth data from the Registrar General's department. Because of defects in these statistics - incomplete registration being a principal one - rather high life expectancy rates were obtained. Nevertheless the life tables were used to project future population totals. These estimates are now used for all planning purposes and also quoted officially.

4. Because of rapid economic and social changes in the country, the idea of quinquennial census has been mooted. If this is accepted a new census will be organized for 1971, when opportunity will be taken to include special questions on occupation and industry to provide data for manpower planning. In the meantime the Medical Department has mounted a comprehensive plan to reach people in all parts of Fiji with preventive medical counsel and family planning guidance. Divisional, district, sub-district and area medical stations have been established and health nurses visit every household in their areas. While dealing with health matters they also count the number of people and record all births occurring in their areas. This information is then transmitted to the head office through divisional head quarters. Although this system is just taking root, it promises to fulfil two very important statistical needs:

- (a) it will provide population estimates by areas, such estimates not being available for inter censal years at the moment; and

- (b) there is hope for more complete birth records; the Registrar General's estimates of total annual births have been known to be defective because of incomplete registration.

### Agriculture

5. Conforming to the world programme of agricultural census around the year 1970, Fiji held its first census of agriculture in 1968/69. The date was slightly advanced mainly to avail the services of an FAO statistical expert who was made available for two years, 1967 to 1969. The Fiji Census of Agriculture was conducted on a sample basis. The 1966 Census of Population list of heads of households provided the frame for the selection of the elementary units (heads of households). The country was divided into 35 geographical strata and within each stratum the heads of households were further stratified into six categories according to their occupation. Using variable sampling fraction techniques, the required heads of households were selected from each stratum for enumeration. Details on methodology and the actual census results are contained in a comprehensive Report on the Census of Agriculture 1968 by D J L Casley.

6. Although predominantly an agricultural country, Fiji's agricultural statistics were in poor state for a long time with the sole exception of data on sugar cane which is a highly commercialized crop. However with the census providing bench mark data, a system of 12-monthly surveys have been introduced, the first of which ended in March, 1970 and the second survey is in progress. Twenty permanent field enumerators are stationed in different parts of the country. They each have 30 holders to seek information from on farm population, live-stock, crops, yields and disposals, farming implements, chemical materials used, etc. Holders and/or areas are varied each year and it is hoped that through these surveys, agricultural statistics will be regularized.

### Overseas Trade

7. This is one series with reliable statistics extending over almost half a century. Until 1954 an old trade classification was used. In 1955 the United Kingdom Standard International Trade Classification was adopted. Following the introduction of decimal currency on 13th January 1969 and the new tariff based on the Brussels Tariff Nomenclature, the opportunity was taken to adopt the S.I.T.C. (Revised). The trade information is also classified by tariff items. There are 991 different tariff items and 1,297 separate S.I.T.C. (Revised) codes which have been adapted to Fiji's requirements. Import and export prices and quanta indices have also been compiled for over ten years and recently the classification of imports by broad economic categories recommended by the U.N. has also been completed.

### Production

8. Statistics on production are collected by regular returns from manufacturing enterprises showing only quantity produced. The items covered now include sugar and sugar cane, cement, unrefined gold, coconut oil, cigarettes and tobacco, beer, butter, soap and paints. Figures on copra production are supplied by the Copra Board. In cases where there are less than three separate producers of a single item, an approach is made to the producers for permission to publish the amalgamated production figures and it is interesting to note that the Bureau has not encountered any objections at all.

9. The Bureau of Statistics this year completed a Census of Industries covering three sectors only: manufacturing, mining and building. The survey was very comprehensive and sought data on the level and trend of productive activities, the relationship between value of output and costs, estimation of capital requirements, and valuation of capital assets. The classification of industries was based on the new I.S.I.C. (Revised 2) adapted to Fiji's needs. On the problem of classifying occupations, the Bureau produced a list adapted from the latest I.L.O. recommendations (Revised Edition, 1968).

10. A survey of private sector capital investment expenditure was also carried out for 1967 and 1968 very successfully.

#### Wholesale and Retail Trade

11. Work has still to be done in the collection of wholesale prices, business turnover and statistics of inventories. However, this sector of the economy is not neglected entirely since it is asked to supply information relating to employment and private capital investment each year.

12. It is envisaged at this stage that any work programme relating to the wholesale trade should not encounter too many difficulties simply because of the relatively small but well defined number of enterprises which are engaged in the wholesale trade. However, with the retail trade, there exist inherent difficulties which are common to most developing countries. There are numerous small family establishments accounting for a large proportion of the total merchandise traded in the rural areas where subsistence economic activities are also prevalent. Book-keeping, particularly in small establishments both in the rural and urban areas, is often primitive and fragmentary.

#### Consumption and Prices

13. In 1968 a comprehensive Urban Household Income and Expenditure Survey was conducted with three primary objectives. Firstly, the Government wished to revise the existing Retail Prices Index which was based on the 1959 pattern of expenditure of working class households in a specific income range. This index, as it turned out, was used for a variety of purposes on a national scale in spite of its limited coverage and lasted for a period of some nine years (1960-1968). Secondly, from the economic and social point of view, it was important that Government should know how people's spending habits had been affected by significant international monetary changes and local fiscal policies. Lastly, the Bureau of Statistics required fairly detailed and comprehensive expenditure information in order to revise and compile the additional aggregate consumption estimates which were to be incorporated into the national income and expenditure tables. A detailed report containing the results of the 1968 survey has been published.

14. Past retail price indices in Fiji were of very specific coverage with respect to geographical areas, income levels and population groups. Nevertheless, despite these serious limitations, it was known that because there were no other official indicators showing price movements over the years these indices were used for a variety of purposes for which they were clearly inappropriate or inadequate. A completely new prices index has now been compiled by the Bureau of Statistics with the prime intention of providing an index which can at the same time be both comprehensive and specific. The new

price index is officially known as the Consumer Prices Index which replaces the previous official quarterly index known as the Retail Prices Index. The new index is more representative of existing consumption patterns in urban areas, being based on findings of the Urban Household Expenditure Survey referred to in the previous paragraph.

15. Another prices indicator is the Food Imports; Average Unit Value Index which is based on Fisher's Ideal formula. The base quantities and values (c.i.f.) are the average of the first two quarters of 1969. This index was originally compiled and calculated on a monthly basis but serious problems arose because of the change over to the revised S.I.T.C. system and the nature of Fiji's import trade. A quarterly index was then decided upon and the main purpose of this index is to provide quarterly comparisons of the movements of average unit prices (c.i.f.) of relatively homogeneous types of imported food items.

#### Employment and Manpower

16. Annual employment figures relating solely to manual workers in regular wage earning employment, together with wage rates, have been collected each mid-year since 1960. Self employed persons, casual and seasonal workers were not included in these annual surveys. Wage rates were the daily mean wages on the bases of eight-hour day. For contract workers and other piece rate workers the wage rates had to be estimated or imputed from additional information. The 1969 survey was extended in scope to cover everyone in regular employment and other unpaid family workers. When the analysis of the data is complete, it is hoped that some estimations of economically active population in the Cash economy will be obtained.

17. Manpower planning has gained importance in recent years. Population censuses provide benchmarks for fixing the size of labour force. The employment surveys are geared to obtain an occupation by industry matrix of the labour force each year. Measures of output and productivity will be derived from the statistical studies now undertaken constantly. On the supply side, reliable measures of population growth provide the changes in labour force. Records of the educational institutions are now being collected centrally so as to form part of our manpower statistics. It is expected that the educational and skill levels of the labour force in each occupation and industry will be available in the near future and will enable us to determine with some accuracy not only the quantity but also the quality of labour supply.

#### Transport and Communications

18. Statistics on overseas shipping have developed considerably over the last few years. Information on ships entered and cleared by size, nationality, country of origin and destination is available on a monthly basis. Port statistics relating to the volume of cargo handled are also available. However, no work has yet been done on the domestic inter-island shipping services in spite of their importance to Fiji. It has been estimated that more than 95% of the value of goods involved in inter-island trade is carried by sea.

19. Statistics on overseas, regional and domestic air transport services have also improved considerably in recent years. Aircraft arrivals and departures, nationality, type and size of aircraft, country of origin and final destination are available for every month.

20. As for land transport services, statistics relating to registration by type of vehicles is available. No work has yet been done to determine more detailed information relating to the movement and cost of the public transport system.

### Tourism

21. Tourism as an industry has now emerged as a significant source of income for Fiji in recent years. The Bureau of Statistics now publishes regular figures relating to visitor arrivals, hotel statistics and tourist receipt estimates. The main source of visitor statistics is the international Embarkation/Disembarkation card and the airline and shipping manifests. Detailed information relating to mode of arrival of visitors, nationalities, age, sex and length of stay are available on a monthly basis. A new E/D card, designed principally for computer processing, is now in use and replaces the standard international card.

22. Hotel statistics are compiled from monthly returns submitted by all hotels, motels, guest houses and other tourist resorts. This monthly questionnaire is collected under the Statistics Ordinance and provides information on hotel turnover, bed and room occupancy rates and employment in the industry.

23. Estimates of gross tourist receipts are based on monthly figures supplied by the trading banks and the Post Office. These estimates largely comprise receipts from notes and travellers' cheques, payments to firms engaged in the travel industry, Fiji notes sent to banks abroad (net) and other travel receipts passing through the banking system. It is essential to note that to the extent that any foreign notes and travellers' cheques are not passed through the banking system, these estimates are understated, but there is reason to believe that only a small amount of foreign currency does not get cleared through the local banking system.

### Financial Statistics

24. Statistics relating to the activities of both commercial and savings banks are well established. The operating banks provide various returns containing, among other things, information on loans and advances made locally and on overseas receipts and payments for balance of payments needs. The total money supply is also estimated regularly from net deposit figures from banks and other data from the Currency Board. The collection of insurance statistics commenced with a pilot survey on insurance companies in Fiji in 1968. The pilot survey related to the years 1966 to 1968. The information collected is basically divided into two sections relating to non-life and life insurance business. A more ambitious survey has already started this year to cover the activities of insurance firms in 1969 and it is expected that this will become established as an annual exercise. Nothing at the moment is known about the activities of other financial institutions such as credit unions and similar financial societies. Statistics relating to the activities of co-operative societies appear regularly in the Co-operatives Department annual report.

25. Public finance statistics are readily available in official publications, but unfortunately they basically follow the accounting procedures showing revenues and expenditures. Therefore an economic and functional classification of the central government accounts was undertaken and a preliminary report covering the period 1965 to 1969 was recently released. The presentation adopted is based on the U.N. recommendations and should prove a useful guide for planning and development purposes while providing government sector accounts for national income estimates.

#### Balance of Payments

26. Balance of payments estimates are available from as far back as 1946 but no figures were officially published until early this year when estimates for the years 1965 to 1968 were released in a Bureau of Statistics publication.

27. One of the main problems facing the Bureau of Statistics in producing meaningful estimates is the estimation of both inflow and outflow of funds in the private sector. Fiji has no Central Bank (at the time of writing this paper) or other central monetary authority exercising any form of effective control of foreign exchange. It is generally believed that a considerable amount of financial transactions between the subsidiary or a branch and its overseas parent company is not channelled through the local banking system. Such transactions usually take the form of book transfers of inter-company accounts or by other means. Also such foreign controlled enterprises may have their own overseas bank balances for financing trade and outside investments. It is felt within the Bureau of Statistics that to cover up this deficiency, a survey of capital flow of these foreign controlled firms should be undertaken. Such a survey, if carried out, will naturally arouse among investors unnecessary fear and immediate suspicion of official control. Nevertheless it could be stressed that for a country approaching political independence, the need to control and conserve foreign exchange is perhaps of vital importance and is one of the means by which repayment of foreign capital can be guaranteed.

#### National Accounting

28. It can be ascertained from the foregoing that for certain sectors there is ample information for national accounts studies, but there are other sectors where very little data is available - important among these being commerce, transport, personal and professional services. For these sectors as well as others, data from tax returns and other sources are analysed and meaningful aggregates are estimated. Since national accounts data are increasingly in demand for planning purposes and for obtaining aid, these estimates are on the verge of being regularised with a first report containing estimates for the years 1965 to 1968 to be released shortly. The format used for presentation of data is the revised United Nation's System of National Accounts.

Progress Report on Statistical Development in Ghana  
General Review of the Central Bureau of Statistics

During the period under review there has not been any radical changes in the organisation and structure of the Bureau. There are, however, a few observations which could be made about the more significant problems in the Bureau. These relate to financial and staff problems and steps which have been taken to resolve them.

Financial Resources

As a result of the present economic situation of Ghana it has been increasingly difficult for the Bureau to obtain the necessary funds to finance its statistical programmes. In the first place, there are gaps in our statistical series which must be filled, such as information relating to income distribution and wealth, which at the moment is virtually non-existent. Moreover, there is the need to increase the coverage and accuracy of some of our statistical data such as labour statistics, industrial statistics (now restricted only to large firms), prices etc. But improvement in the accuracy and adequacy of statistical information has its cost, and as our vote during the past few years has been much lower than what we have budgeted for, it has been increasingly difficult to implement our statistical programmes.

Staff

During the period under review a number of our experienced professional staff resigned from the Bureau for employment in other institutions where conditions of service, especially salaries, were much more attractive. This drain of professional staff has had a very adverse effect on the maintenance of our normal statistical activities. As a result, there are now some units which are being headed, not by statisticians, but by technical non professional staff.

## Re-organisation of the Central Bureau of Statistics

The problems of the Bureau became so serious that a recommendation was submitted to the Cabinet to appoint a committee to study these problems and in the process submit recommendations for the re-organisation of the Bureau. The Re-organisation Committee was appointed early 1969 and submitted its recommendations to the Government in May, 1969. The recommendations of the Bureau include an increase in the divisions of the Bureau from 4 to 7 together with an increase in staff. The programme of work and order of priorities were revised with the main objective of providing statistical information that could be used in resolving the manifold economic problems of the country. A review of the conditions of service of staff in the Bureau was made and recommendations were also made for their improvement. Lastly, it was proposed that a Statistical Board or Council should be instituted comprising representatives of the major users of statistical information including the universities. These recommendations are being studied by the Government at the moment and no official pronouncement has yet been made on the report.

### STATISTICAL TRAINING

#### Middle Level Training

Middle Level Training course in statistics has, since 1961, been undertaken at the Statistical Training Centre at Achimota established as a joint project by the Ghana Government and the United Nations. This Centre provides training courses for statistical personnel from English speaking West African countries. In 1966, it was decided that the Centre should be merged with the University of Ghana because from that year the Centre was transferred to the Ghana Government, with just a partial U.N. assistance. This merger took place during the academic year 1966-67.



The Economic Commission for Africa, however, continued to assist the Centre with the provision of a Director of studies and fellowships for foreign trainees until the end of 1968. During the period 1966-69, 96 candidates were trained at the Centre, 50 of whom were from Ghana and the rest from West African English speaking countries such as Nigeria, Liberia, Sierra Leone and Gambia.

#### Higher Certificate Course

After the merger of the Statistical Training Centre with the University, proposals were made to introduce a higher certificate course as a sequel to the middle level course. Regulations and syllabi for the new course were formulated in consultation with the staff of the University of Ghana, the Institute of Statistics, the Central Bureau of Statistics, and were submitted to the University Authorities for approval. There was initially some setbacks because of objections raised by the Department of Mathematics; but now it has been possible to have the course approved at a recent meeting of the Faculty Board of Social Studies and the Academic Board, and it is now expected that the course will start in the academic year starting in October, 1970. It is our expectation that this course will fill a long felt gap between sub-professional and professional level statistical personnel in statistical offices in Ghana and other countries in West Africa.

#### Professional and analogous Courses

The Institute of Statistics of the University of Ghana has been conducting statistical training courses at the professional level, that is, one year post-graduate diploma course in Applied Statistics and a two-year M.Sc. degree course in statistics. These courses are expected to improve the demand of professional statisticians in government departments, business organisations, research institutions and universities in the country and will in the end reduce their reliance on expatriate staff.

Training of Staff in the Bureau

During the period under review a number of candidates from the Central Bureau of Statistics were given post-graduate training overseas as this training is an important pre-requisite to advancement in the statistical service. On the whole twenty-two candidates were trained and the courses taken by them covered such subjects as Master's degrees in demography, Masters and Doctorate degrees in Mathematical Statistics, Diploma courses in Sampling, Data Processing, national accounting and geographical work in censuses and surveys, Judicial Statistics, Vital Statistics and Agricultural Statistics. Apart from the training of candidates from the Bureau at the Statistical Training Centre at Achimota, departmental training courses are organised for the different grades of officers in preparation for departmental promotional examinations.

Conclusion

Efforts being made to train statisticians both locally, that is, at the Statistical Training Centre and the Institute of Statistics at Legon and also overseas during the period under review, have contributed substantially to the reduction of acute shortage of trained personnel in statistical offices not only in Ghana but in other English speaking countries in West Africa. It is, however, the feeling that there is still a continuing need for statistical training at all levels and this need is likely to be much more pronounced with increases in economic growth and governmental activity in various fields. The authorities both at the Statistical Training Centre and the Institute of Statistics are therefore reviewing their training programmes in the light of past experience in order to expand their training programmes and make the content of their training much more related to current economic and social conditions and thereby increase the usefulness of candidates in the solution of current problems.

### NATIONAL ACCOUNTS

The system of the Revised S.N.A. is useful as a comprehensive programme for developing a meaningful national account system for individual countries. The system has been so designed that countries in different degrees of economic development can make use of it in developing their accounting procedures. It is, however, obvious that the developing countries as a whole will take some time in order to develop the full system of accounts in the revised S.N.A. It is the view of a number of experts in this field that this may take about a decade. But there is every reason to believe that some countries may take much more than that.

#### Problems in National Accounts Studies

There have been a number of factors which have been militating against the development of a comprehensive system of national accounts in Ghana. In the first place, lack of communication between the Central Bureau of Statistics and the various organs of the Central Government, public corporations and other institutions has been such that the Bureau, for some time, has not been making use of the material available in these bodies. Moreover, the inadequacy of existing statistical data in some of the major public institutions, and even in the Bureau, has been a limiting factor, because the availability of statistical material is a sine qua non to the preparation of a comprehensive national accounts. Another important factor is the shortage of trained senior professional staff in the National Accounts and Economic Research Division of the Bureau.

During the period under review some improvement has been made in filling in the gaps and making some improvements in relation to these deficiencies. The co-ordinating functions of the Central Bureau of Statistics is now being progressively developed, and some of the steps taken in this direction are the establishment of statistical units in some major institutions,

and special studies of the statistical material in the major public institutions in order to advise them on methods that should be used to improve them. Moreover, there has been some improvement in the basic statistical data compiled in this Bureau as a result of systematic investigation into the accuracy and adequacy of existing data prepared in the Bureau; but much work still remains to be done in this field. As regards the availability of professional staff much effort has been made in training a number of officers, a programme of intensive training of professionals and other grades of officers in the Bureau has been undertaken, and the staff position of the National Accounts Section is being improved. But this does not, by any means, imply that the staff position in this Section is such as to cope with the programme of work which remains to be done on national accounts. There is still need for additional staff, but this is being taken care of in our training programme.

#### Progress in the adoption of the Revised S.N.A.

As a result of these improvements it has been possible for the Bureau to prepare estimates covering the accounts of standard tables on Priority I of the Revised S.N.A. with the exception of standard account IIIA3, IIIA5, IIIB3, IIIB5, IIIC3, IIIC5. Some of these tables have, however, been slightly modified in order to take account of the distinctive characteristics in the structure of the Ghana economy, and the availability of statistical material in general. Moreover, the following tables of lower priority have also been prepared - Tables 3, 8, 9, 10, 13 and 16A.

#### Sector Studies

(i) Agriculture: The material on agriculture produced by the Ministry of Agriculture was subjected to a very meticulous scrutiny, and it was discovered that it was subject to highly significant fluctuations at the country level. In view of this, improved methodology in the processing

of the basic data relating to a number of crops was introduced by the Bureau. This has helped considerably in increasing the accuracy and reliability of the agricultural production estimates. In the case of cost of production, a pilot survey has been conducted in some parts of the country by the Bureau and the data collected has been used in the preparation of the estimates. As a result of these improvements it has been possible to obtain a reasonably reliable idea about the contribution of agriculture to the economy of Ghana.

(ii) Forestry and Logging: It was discovered that the information provided by the Ministry of Forestry on this subject was defective in that it does not cover some items of forest produce. The Bureau therefore compiled the necessary data relating to these items and it is now possible to provide more reliable estimates of forestry and logging.

(iii) Fishery: The main defect in the estimate of fish production relates to the estimation of fresh water fish. The Bureau has therefore made suggestions for the improvement of these estimates and this has now made the estimates much more reliable.

(iv) Mining and Quarrying: The basic drawback of material relating to this sector is that the data did not cover the output of diamonds of African diggers and the quarrying activity. Estimates relating to these activities were therefore prepared by the Bureau and included in the estimates of the mining and quarrying sector.

(v) Manufacturing: The contribution of this sector to the gross domestic product was found to be highly defective. The reason for this is that medium scale and small scale establishments were not covered in the information collected by the Bureau relating to this sector. Even in the case of large scale manufacturing establishments it was discovered that the estimates were defective in that such activities as the repair of

manufacturing and electrical machinery, as well as motor vehicles were not covered. Estimates have been made in relation to these activities, and all these have now been included in the estimates relating to the manufacturing sector.

(vi) Electricity: In the case of electricity it was discovered on a close scrutiny of the figures that there has been double counting. This drawback has now been corrected and the figures are now reasonably accurate.

(vii) Wholesale and Retail Trade: The collection of information relating to this sector was a recent development in the Bureau. This is due to the highly complicated nature of this exercise in the context of Ghanaian conditions. In view of this it was observed that the material collected at the initial stages of the exercise was highly defective and unsuitable for estimation of gross profit margins. An exercise was therefore mounted by the National Accounts Section with the co-operation of the Distributive Trade Section and the Income Tax Department and more reliable data have now been obtained. The estimate of value added from this sector is now regarded as reliable.

(viii) Government Consumption Expenditure: A careful scrutiny of the figures of the consumption expenditure of the Government has shown that the treatment of the finances of public boards and corporations was wrong. This resulted in over-estimation of the expenditure of these institutions. These errors have now been corrected and the cost composition by functional classification of Government consumption expenditure, which has now been prepared, is now reasonably accurate.

## EXTERNAL TRADE

There has been no major changes in the compilation of the statistics of external trade during the period under review. There are, however, a few items of interest in this field, during the period, which may be mentioned.

### Revision of Imports and Exports List

The import and export list of Ghana based on the revised S.I.T.C. came into effect on the 1st of January 1961. The list has, however, been revised and the revision came into effect on the 1st of January 1966. This revision was undertaken primarily to amend the list and thereby make it possible for Ghana to change over to the B.T.N. for tariff purposes. In other words, the revision was conducted in order that the B.T.N. which was then introduced into Ghana might correspond with the items in the Import and Export List. Advantage was also taken of the revision to make amendments relating to errors in the list which were discovered some time after the publication of the 1961 List.

### Devaluation of the New Cedi

On the 8th July 1967, the Ghana New Cedi was devalued by 30 per cent and the devaluation affected the external value of the currency and as such the value of imports in the External Trade Statistics. There was a great deal of difficulty about the presentation of the external trade figures in the year of devaluation. The problem was to distinguish between the value of external trade before and after the date of the devaluation. After considerable thought on the subject, the solution which was adopted was that the detailed tables of the external trade statistics should be compiled in the normal way without distinguishing, in these tables, the value of goods before the devaluation and the value of goods after the devaluation. But foot notes were provided showing the total goods imported into the country before the 8th of July 1967, that is, before the devaluation

became effective. This information, it was hoped, would be useful to those who need it for analytical purposes.

#### Publication

There has been a great deal of delay in recent years in the publication of External Trade Statistics. This has been due to a number of causes - delay in the submission of bills from the Customs and Excise Department, as well as continuous breakdown of the Electronic Computer used in processing the external trade material. In order to reduce the adverse effects of these delays, it was considered necessary to provide advance information about External Trade, and this took the form of issuing out Monthly Newsletters of External Trade figures in relation to total imports and total exports. This information is available and issued normally one month after the month to which the information relates. Moreover, details relating to direction of trade are also provided about a month after the issue of the total external trade figures. In view of the fact that the External Trade detailed figures are sometimes published 4 or 5 months in arrears, the publication of these newsletters has been very useful in providing advance information of external trade before publication of the detailed tables.

#### DISTRIBUTIVE TRADE STATISTICS

Before 1967 there was no information relating to distributive trade statistics in Ghana but in that year the Distributive Trade Section was established, charged with the responsibility of collecting information relating to distributive trade statistics.

#### Directory of Distributive Trade Establishment

The first responsibility of the Section was to compile an up-to-date Directory of Distributive Trade Establishments. Before this



time the only available information on distributive trade establishments was contained in the Directory of Distributive Trade Establishments based on the 1962 Industrial Census. This was, however, very much out of date in 1967. An enquiry into the distributive trade in the country was therefore launched in June, 1967 and material was collected in respect of distributive trade establishments throughout Ghana. The result of this enquiry was embodied in a new publication entitled "Directory of Distributive Trade Establishments" which was published in May, 1968. The Directory provided information relating to the name of establishment, the proprietor, the postal address, physical location, kind of business, employment size and financial year. The Directory was arranged alphabetically and administratively on regional basis.

#### Enquiry into Large Wholesale and Retail Trade Establishments

The next object was to conduct an enquiry into the large wholesale and retail trade establishments; and this was started at the end of June, 1967. A questionnaire was designed for the establishments together with instructions for completing it. There were a number of problems both theoretical and organisational encountered in this enquiry. In order to provide reliable and comprehensive data on sales, purchases and inventories, according to broad commodity groups, a special classification of commodities was designed, but this classification could be easily re-grouped in accordance with I.S.I.C. for purposes of international comparability of statistical data. Information was obtained on the kind of activity, type of operation, kind of business, sales, purchases, stocks, employment, wages and salaries paid, accounts receivable and fixed assets. It was observed from this enquiry that the use of mailed questionnaire was not effective in the collection of data in Ghana and this may as well apply to other developing countries. As a result of this the field staff of the Bureau all over the country were used to contact

the respondents, explain the contents of the questionnaire to them and collect the questionnaire after completion for onward transmission to head office. After the collection of the data a comprehensive analysis of the data was undertaken and the results were published in a summarised form in a publication entitled "Distributive Trade Statistics - 1st January, 1967 to 30th June, 1967".

#### Future Work on the Subject

The problems of distributive trade statistics have not yet been completely resolved because an enquiry has not yet been made into the small scale retailing establishments. The importance of this group derives from the fact that there is a very large number of small retailing establishments in Ghana and there are formidable organisation and technical problems involved in collecting information relating to this group. But studies have been, and are still being made in this area and it is our expectation that in course of time, it would be possible to conduct an enquiry into the small scale retailing establishments in Ghana and publish the results.

#### BALANCE OF PAYMENTS ESTIMATES

There has been a steady improvement in the balance of payments estimates of Ghana. Although this improvement has not been as significant as that in other subjects. Apart from merchandise and non-monetary gold, the rest of the current items are derived from exchange control sources. Improvements in the collection of data on exchange control transactions have therefore had a corresponding improvement in the data used in the preparation of the balance of payments on current account.

As regards capital transactions, there has been a few changes in recent years as a result of a sample survey carried out into the issue and utilisation of import licences to the private sector. As a result of this

survey, it has been possible to obtain a more reliable estimate for "other private long term capital" in the estimates. Moreover, as a result of rescheduling exercises in 1966 and 1968, which required extensive documentation, a better coverage has been obtained for official long term capital transactions. It has therefore become possible to create a separate External Debt Office for the collection of information relating to external debt.

In the past, I.M.F. transactions have been of less importance and therefore have not been separately classified in the balance of payment estimates. These transactions have in the past been included in the official long term capital transactions. With the increase in I.M.F. transactions, that is, drawings under annual stand-by arrangements, it has now become necessary for I.M.F. transactions to be shown separately in the capital account of the balance of payments estimates. These transactions are represented net in the estimates.

#### FINANCIAL STATISTICS

There has been no radical changes in Financial Statistics of Ghana during the period under review. But there have been some improvements which may be mentioned. These improvements cover classification of Central Government Revenue and Expenditure, as well as the classification of Local Government Revenue and Expenditure.

In 1966 a concerted effort was made to comply more closely with the recommendations of the United Nations in respect of "Economic and Financial Classification". The first change which was made was a change in the period to which the Statistics relate. Before 1968 the classification has been made on fiscal year basis, but from 1968 it has and is being made on calendar year basis. This change has been made in order to make the figures more useful for national accounting purposes.

With regard to Local Government Finances, there has been a significant improvement because the accounts of Local Authorities have not been included in the Public Accounts in the past. A decision was therefore taken by the Bureau that immediate steps should be taken to compile information relating to the finances of the Local Authorities in order that it may be possible to produce consolidated accounts of the Public Sector comprising Central Government, the Local Authorities and the Public Boards and Corporations. Work on the Local Authorities was started in 1968 and considerable progress has been made. The accounts from 1961 to 1968 have now been completed and these have been classified in accordance with the recommendations of the United Nations. A publication embodying the results of this exercise will be issued sometime this year.

#### LABOUR STATISTICS

The Statistics of Labour are compiled to provide information on employment and earnings. The information is collected by means of mailed questionnaire submitted to "establishments" for completion. A new questionnaire for the collection of information relating to labour and earnings came into use in 1966. But in 1969 this questionnaire was improved further by the addition of more sections for the collection of additional information.

Information is now collected on earnings by nationality together with a break-down of total earnings by occupation. Information is also now being provided on employment by occupation. Moreover, a new section has been added on to the questionnaire for the purpose of providing information relating to "payments in kind". All these types of information were not collected before the revision of the questionnaire.

A new register has been adopted which records the earnings, employment, location and address of each reporting establishment and there

has been improvement in the administrative procedures for the collection of material on labour, especially by using the field staff instead of the system of mailed questionnaire as the main medium of collecting labour information. The methodology of preparing the estimates is also being improved by the introduction of marked sample - linked relative - bench marked procedure. This method is being introduced for the purpose of making estimates for non-respondents. Efforts are also being made to utilize social security fund material as supplementary information to check the adequacy of the labour statistics.

There has been an additional medium for the collection of information relating to unemployment during the period under review. This exercise is being handled by a unit of the Department of Labour. After the February 1966 Revolution, a Government's stabilization programme resulted in redundancy of labour and retrenchment of some employees in the public services. A research and Employment Promotion Unit was therefore established in the Department of Labour for the registration of persons who had been retrenched as a result of the stabilization exercise. Until 1968, it was known as the Office of the Special Commissioner for Deployment of Labour and it was made obligatory for an employer, public or private, who lays off 10 or more workers at a time, to inform the office of his intention before the workers are laid off. This procedure has been followed after the Office of the Special Commissioner was integrated with the Ministry of Labour and Social Welfare and re-designated the Research and Employment Promotion Unit. The information collected by the Unit relates to all categories of workers; skilled, semi-skilled, unskilled, and professionals.

AGRICULTURAL STATISTICS

In the past data relating to agriculture had been collected by the Central Bureau of Statistics. In 1965, however, the Ministry of Agriculture, which had in previous years been dissolved, was re-established and with that the Economic Division of the Ministry of Agriculture. As a result of this, the responsibility of collecting information relating to agriculture was delegated by the Bureau to the Economics Division of the Ministry of Agriculture and the Division has since been responsible for the collection of current data on agriculture.

In 1963 there was a pilot agricultural survey in Ghana designed to collect information on agricultural production, acreage and yield but the coverage was very limited in that it covered only 1,000 agricultural holdings. In view of this incomplete coverage, the results obtained from the pilot survey were assessed as unreliable and not worthy of publication. But the collection of information was established on an annual basis. In 1966, the number of holdings was increased to 2,000. Since then there has been the need to provide agricultural data not only on the national level, but on regional basis in view of the Government's policy of devolving administrative and other functions to Regional Authorities. As a result of this policy decision, and in order to obtain information relating to agricultural production on regional basis, the number of agricultural holdings was increased in 1969 to 5,000. It is expected that with this number of holdings it will be possible to make reasonable estimates of agricultural production in the various regions of Ghana.

The year 1969 also witnessed the beginning of the preparation for the Agricultural Census, phase 1 which has been scheduled for 1970. Phase 2 will be undertaken in 1971. In the course of preparing the census, it was decided that the census should be a stratified random sample in which

the units will be selected in each district. The selected areas in the districts will be completely enumerated and it is hoped that this will enable agricultural data on the district level to be provided. Information will be collected on the holder, farm population, number of farms, the tenure basis, employment of labour and livestock population on each farm. It is expected that on the whole between 60,000 and 70,000 holders will be interviewed in the course of this census.

### INDUSTRIAL STATISTICS

The Statistics of Industry compiled in the Bureau relates to mining and quarrying, manufacturing, electricity, gas and steam. In addition, information is provided in relation to some non-industrial sectors of the economy such as agriculture, transport and communication, and distributive trade. The scope and coverage of these statistics did not undergo any radical changes during the period covered in this review. There were, however, some improvements which may be mentioned. The number of establishments, for both the annual and quarterly enquiries was increased, and the forms used were revised to cope with changes in the demand for statistical information, and to allow more detailed information to be provided for economic analysis. Moreover, new methods in the estimation of gross output and value added were introduced in respect of electricity.

#### Revision of Directory

A major revision of the Directory of Enterprises was undertaken for the purpose of improving the coverage of establishments in the industrial enquiries. This resulted in the publication of "Directory of Industrial Enterprises and Establishments" in September 1969. The directory covered a total of 1,057 establishments in mining and quarrying, manufacturing, construction, electricity, gas and steam.

### Changes in Questionnaire

Improvement in the basic questionnaire for the collection of information relating to industry has been under-going a gradual improvement over the years. Some types of information which were not being previously provided were added on to the questionnaire. This addition included the following: "paid up capital of establishment" and "planned investment for following year". Moreover a supplementary questionnaire was attached to the main questionnaire asking for information relating to capital formation during the year, capacity of establishments and planned investment and capacity changes in the year. There is also an item relating to "other non-labour costs" of the establishments.

### Conclusion

It may be mentioned that although a great deal of work has been done in the field of industrial statistics, much more still remains to be done. There has been a complete coverage of all large industrial units in the quarterly and annual enquiries. But there is still much to be done as regards the coverage of medium sized industrial units by means of annual sample surveys, and an area sample survey to cover small units once in every 4 years. These projects have been proposed but they have not yet been implemented because of lack of professional staff and financial resources.

## POPULATION STATISTICS

### 1960 Post-Enumeration Survey

In view of the length of time taken to process the material collected in the population census of 1960 the processing of the Post-Enumeration Survey, held immediately after the census enumeration, was held up for some time. It was only in 1966 after the publication of the main volumes of the Census Reports that work was started on the processing



of the material collected in the Survey. During the period under review the compilation of the tables of the survey was completed and were edited by using data from the main census as controls and necessary adjustments were made. These adjustments proved to be a time consuming operation and delayed considerably the final publication of the results. The tables have already been vari-typed and are now in the process of being printed for publication.

#### Ghana Population Survey 1966

In 1966 a population survey was carried out in September. The main purpose of this survey was to collect demographic data on the population of Ghana as an inter-censal exercise, and also to test the efficiency of the methods and procedures which were intended to be used during the 1970 Population Census. Initial results from the survey indicated that there had been an under-count and as a result of this a post-enumeration check was conducted. The result confirmed that there had been an under enumeration of the total population in the main census. In view of the acute shortage of technical staff it was not possible to conduct a detailed analysis of this survey because of the deployment of the staff to the preparation of the 1970 Population Census.

#### 1970 Population Census

Work on this census was started in 1967 with a preliminary preparation of the census questionnaire, instructional manuals and other training documents. Moreover, training of the census field personnel was undertaken in 1969. The census questionnaire was pre-tested in a trial census, which proved very invaluable in that it provided information relating to the latent defects and other deficiencies in the design and planning of the census operation. As a result of the information gathered in this trial census the whole census questionnaire was revised and it was the revised version that was used in the actual enumeration in 1970.

New Techniques

The 1970 Population Census was designed to be an improvement on the techniques used in 1960. One of the changes introduced in this census is the use of the household as an additional unit of enumeration instead of house as was done in 1960. It was felt that the household is a more useful concept for analysis and research than the house. Moreover, it has been found desirable to separate the evaluation programme of the census from the sample enquiry since the merger of the two in the 1960 Census did not prove very satisfactory.

EDUCATION STATISTICS

The compilation of Statistics relating to Education is a joint effort of the Central Bureau of Statistics and the Ministry of Education. The Ministry of Education normally sends out the questionnaire to the educational institutions and ensures that these are fully completed. The Education Statistics Unit in the Bureau is however responsible for the statistical processing and publication of material.

In 1968 the Education Statistics Unit published the second of its publications on education statistics. This publication covered secondary schools, teacher training colleges and commercial and technical institutes. The material in this publication is more elaborate than previous education statistics compiled by the Ministry of Education. It is only in this volume that data have been provided on students, classified by their socio-economic characteristics as well as occupation of father and mother, place of birth and usual residence etc. Moreover, during the 1967-68 school-year the Bureau made an attempt to collect, for the first time, data on educational finance. The questionnaires are still being processed.

### JUDICIAL STATISTICS

The establishment of a Judicial Statistics Unit is a recent development in the Central Bureau of Statistics. The Unit was established in August 1969. This Unit has since its establishment been working very closely with other agencies, such as the Prisons Services, the Department of Social Welfare and Community Development, the Judicial Services and the Ghana Police Services. The Unit is now collecting data on Prison's Administration and Releases, as well as juvenile delinquents. The data relate to the demographic and social characteristics of prisoners and juvenile delinquents. In order to facilitate the collection of the data the material is collected through the Headquarters of the various agencies. This method has been adopted to ensure that adequate control is maintained by Headquarters on the completion of the various forms and also to enable the completed forms to be submitted through the Headquarters in time.

### VITAL STATISTICS

The Unit responsible for the processing of material relating to Vital Statistics was established in 1966. It may however be pointed out that the collection of the basic data on births and deaths is the responsibility of the Births and Deaths Registration Division of the Ministry of Local Administration and the Biostatic Unit of the Ministry of Health. The Ministry of Local Administration was used as the venue for the collection of material in view of the fact that the Ministry has branches scattered all over the country and has direct control of the District Authorities where the offices of the Births and Deaths Registration Division are located.

When the data are collected, they are submitted by the Division of Births and Deaths to the Vital Statistics Unit of the Central Bureau of

Statistics for processing. A new registration form was designed by the Vital Statistics Unit in 1969 in consultation with the Division of Births and Deaths and the Biostatic Unit of the Ministry of Health. This new registration form came into effective use in January 1970. The new registration form includes such items as age of mother, number of children born alive of mother, as well as her occupation and educational background. It is envisaged that the data provided will be more meaningful for planning and research purposes.

REVIEW OF STATISTICAL ACTIVITIES SINCE THE SIXTH  
CONFERENCE, INCLUDING POPULATION AND  
AGRICULTURE CENSUS PLANS.

Since the last conference of Commonwealth Statisticians held in Ottawa in 1966, the Statistical Bureau, which is the Central office for Statistics in Guyana was engaged in several statistical projects; and saw a number of important developments in the area of its responsibility.

2. Between 1968 and 1970, the Statistical Bureau carried out a Census of Agriculture in 1968, a Consumer Expenditure Survey in 1969 - 1970, and a Population Census in 1970.

Census of Agriculture:

3. This Census was commenced in 1968 and the field work was not completed until 1969, because of difficulties encountered in securing completed returns from certain respondents. The Census was taken as part of the 1970 World Programme of Censuses of Agriculture sponsored by F.A.O. As a Census of Agriculture had not been taken in Guyana since in 1952, and because it was considered important for future work that the census should yield a complete list of farm households by size of farms, the 1968 Census of Agriculture was organised and carried out as a 100% count of farm households and holdings. These households were identified at the first stage during which all households were listed and the farm households selected on the basis of a predetermined definition. At the second stage all farm households were investigated on the basis of a fairly detailed questionnaire.

4. A number of questions included in the questionnaires related to the demographic structure of the farm households such as its size, and the age and its sex distribution of its members. Other questions covered the utilization and tenure of holdings, the fragmentations of farms, drainage and irrigation facilities, acreages under various crops, production of agricultural commodities and livestock, the population of livestock, farm machinery and implements utilised; and the association of Agricultural householdings with other occupational activities.

5. The data collected have been put on punched cards, and processing is in progress.

Consumer Expenditure Survey:

6. In order to provide the basic information for a revision of the Official Consumer Price Index, the Statistical Bureau carried out a Survey of household consumption expenditures from March 1969 to February 1970. The main purpose of the survey was to establish an updated pattern of family living expenditures for the purpose of revising the weighting system used in the calculation of the Consumer Price Indices. The Current index continues to be based on a study done in 1956; it is however anticipated that living standards and consumption patterns may have undergone substantial changes during the fourteen years since the 1956 study.

7. In addition to the foregoing, the information would be used in National Accounting for the calculation of Domestic Consumption Expenditures, and for a number of other economic and social purposes. The questions were therefore framed with these objectives in mind.

The information collected related to:-

- (i) Cash purchases, including consumption from home grown stock of food, beverages and tobacco, fuel and lighting.
- (ii) Expenditure on -  
Housing, durable and semi-durable goods for household use, and household appliances and utilities.
- (iii) Purchase and consumption of clothing, footwear, headwear.
- (iv) Expenditures (cash and kind) on miscellaneous goods and services.

8. In addition data were collected on household receipts i.e. wages and salaries, allowances etc., and income from various forms of self-employment. An attempt was also made to secure data on Savings and other Assets, as well as the general levels of living of households. For the latter data were collected on the number and value of certain durable goods possessed by households e.g. tables, chairs, stoves, motor cars, radios etc.

9. Information was also collected on the size of households, as well as the demographic characteristics and economic activity of the persons who constituted the households.

10. The sample was in two stages. At the first stage Population Census Enumeration Districts (ED's) were chosen with selection proportionate to size measured in terms of the population of the ED's. Then within ED's the second stage of the sample was taken. At this stage the selection was of households within the ED, with selection of household proportionate to size and income group.

11. The sample was also stratified. The country was divided into a number of strata considered relevant to circumstances in Guyana; and the selection of first stage sampling units, (ED's) was taken from within these strata.

12. The overall theoretical sampling fraction was 1 in 40 of households. The information was collected in six rounds, each round lasting two months. In this way expenditure data were collected for all periods of the year and so caught any seasonal variations in consumption. In addition there was no limitation of income groups in the selection of the households. The field work connected with the survey was completed about five months ago. The staff is now engaged in checking and preparing the data for punched card data-processing in the Statistical Bureau.

#### Population Census - 1970:

13. In collaboration with the other territories of the Commonwealth Caribbean, Guyana took a Census of Population in April 1970. Census day

was April 7th, the preliminary enumeration commenced on March 11th. In order to take the Census more than 2,000 field workers at various levels were recruited. The Census was completed on April 7th as was originally proposed and all parts of the country were adequately covered. Unlike previous ones of the type, the Census was conducted by the Statistical Bureau, under the general Statistics Law which govern all central statistical work in Guyana. Preliminary editing and coding of the Census schedules, is now in progress prior to computer processing in a Central Data Processing centre located on the Mona Campus of the U.W.I. in Jamaica, and set-up specifically for the purpose.

#### Current Agricultural Statistics:

14. The responsibility for the collection of annual and crop-end statistics in relation to the Agricultural Sector in Guyana has traditionally been the function of the Ministry of Agriculture. In the past planning in this sector has been handicapped by the absence of reliable statistics of production, yields etc., of crops and livestock. Because of these circumstances and the fact that official economic policy recognises the primary role Agriculture must play for some time to come in economic development of Guyana, increasing attention has been given to the need to organise the collection of Agricultural Statistics on a systematic basis. The Statistical Bureau has accordingly been given the responsibility for organising and implementing a system for the collection of current agricultural statistics. Planning is actively being pursued in this connexion.

15. Our basic approach would be to determine through field observations, and then to map the distribution of crops in defined areas, called crop reporting areas into which the Agricultural regions of the country has been divided. Data on acreage under cultivation will be combined with sample information on yields to derive crop forecasts, and crop-end estimates of production. Sampling will be done where appropriate. For instance the production of coconuts on farms below a certain size will be determined by sampling, and the production of ground vegetables will also be measured on the basis of a sample of farming areas and farm households. Where sampling is done, the sample frame would be an up-dated list secured from the last Census of Agriculture.

16. It is hoped that the data would be collected by part-time local officials and farmers, working in defined geographical areas. There will be supervision by permanent field staff of the Statistical Bureau. The present timetable of operations require that the system should be introduced early in 1971.

#### Vital Statistics and Immigration Statistics:

17. Since the Sixth Conference the Statistical Bureau assumed responsibility for the processing and analysis of statistics of births, deaths, marriages and international travel.

18. In the past Vital Statistics were compiled and published by the Office of the Registrar General, and the Police Department prepared and issued certain limited tabulations on external migration and travel. In so far as Vital Statistics are concerned information on births and deaths is now submitted directly to the Statistical Bureau by the Registrars of Births and Deaths, who normally are the responsible agencies for the recording

of vital events in Guyana. However in their reports which are submitted directly to the Statistical Bureau, the Registrars are required to provide additional information over and above that provided under the Registration requirements.

19. These reports are submitted monthly and are checked for full coverage with the records of the Registrar General. Thus a number of more informative tabulations are now being made available dating back to the year 1967. For the period from 1962 to 1966 the Bureau is also preparing a number of extra analyses and a full set of tables based on information taken from the records of the Registrar General. The exercise has been quite a substantial one viewed against available resources in the Bureau. Consequently analyses are only now becoming available, and will be published shortly in special reports now being compiled in the Bureau of Statistics.

20. Since 1968, the Police Department has been making available to the Statistical Bureau their E/D cards. The information from these cards is being processed and analysed in the Bureau. A number of interesting and fairly detailed analyses of movements of persons from and into Guyana, are now being compiled and will soon be issued in a special report on external migration and international travel for Guyana.



2 - HONG KONGREVIEW OF STATISTICAL ACTIVITIES SINCE THE SIXTH  
CONFERENCE, INCLUDING POPULATION AND  
AGRICULTURE CENSUS PLANS

## I - Population and Vital Statistics

Hong Kong By-Census, 1966

A two-stage sample census of population was conducted in 1966. About 1% of the population was interviewed. The results were published in "Report of the By-Census, 1966" and "The Census and You, 1966". Following this, a new set of life tables and population projections by age and sex was prepared and the details were published in 1968 in two separate volumes: "Population Projections, 1966 - 1981" and "Hong Kong Life Tables, 1963 - 1978".

Census of Population and Housing, 1971

2. Planning for the next Census of Population to be held in March 1971 commenced in early 1968. Three Pilot Censuses have been conducted with the object of testing the questionnaires, the field organisation and the data processing system including data input, imputation and tabulation.
3. Questions included in the forthcoming Population and Housing Census are on the same lines as those adopted in 1961 and 1966 but additional information on fertility, transport habits, physical disability, household income and rent will also be collected. The questionnaires are in the form of bar-format documents to be marked by pencil and fed direct into the computer.
4. The 1971 Census will be processed by an ICL (International Computer Limited) 1903A computer in the Hong Kong Government Computer Centre with a 48K words core store central processor, 2 line-printers, 1 card reader, 4 magnetic tape units, 3 disc drives and one document reader.
5. The Marine Census is scheduled to be held from 23rd to 26th January, 1971 and the Land Census from 27th February to 9th March, 1971.

Vital Statistics

6. Vital statistics are compiled and published by the Registrar General's Department. Since January 1969, more detailed questions have been asked at birth and death registration, including the age of the baby's parents, their duration of marriage, their place of origin and occupation, and the birth order, and for the deceased, his marital status, occupation, place of origin and length of stay in Hong Kong. Processing is undertaken by the Hong Kong Government Computer Centre where currently, tabulations are produced for United Nations publications. Planning is underway for additional tabulations to be made so that more useful information can be available for comprehensive fertility and mortality studies.

## II - Manpower

Employment Statistics

7. Statistics of employment are collected by the Labour Department of all persons working in industrial undertakings registered and recorded with the Labour Department and persons working in non-industrial establishments in medical and educational services, import and export business, banks, insurance, ocean and air transport, hotels and the catering trades. The survey is carried out at quarterly intervals for the former type and at half-yearly intervals for the latter type. All data are classified by industrial groups and published in the Labour Department Annual Reports.

8. It is planned to extend the coverage of employment statistics to include persons at work in business services, theatres and related recreational services, and non-registrable industrial undertakings.

9. The present system of collecting employment statistics does not make it compulsory for the undertakings to submit quarterly returns to the Labour Department, but plans are being made to change the present voluntary system of submission of employment statistics to the compulsory submission of returns to the central statistical agency.

Statistics of Wages and Earnings

10. Statistics of wages and earnings are collected from sample surveys of establishments carried out at half-yearly intervals by the Labour Department. Statistics of wage rates computed include weighted minimum, average and maximum wage rates by occupation in selected industries and public utilities, and also index of wage changes with 1964 as the base period. These statistics are published in the Labour Department quarterly reports. It is planned to extend the coverage of wage statistics to include more manufacturing industries so that occupational wage rates are available for more industries.

Statistics of Unemployment

11. There is no regular collection of statistics on unemployment, except information gathered from population censuses. In the population census, unemployed persons are defined as all those who are aged 15 to 64 inclusive, who have no work, are not of independent means and are looking for work. Tabulations of unemployed persons by sex, age, last industry and last occupation have been made and are contained in the 1961 and 1966 Census Reports. Similar information will again be made available in the 1971 Population Census Reports.

Manpower Surveys

12. A number of ad hoc sample surveys has been carried out by the Labour Department since October 1966 to find out the existing employment strength and vacancies in various branches of industrial undertakings so as to assess the requirements for manpower and training of such manpower in these selected industrial fields. So far, surveys have been carried out in the plastics, textile, electronics, automobile, machine shops and metal working trade, electrical trade, clothing, printing and building and construction industries. Broad subject heads covered in these surveys include, for each occupational group, number of employees, wage range, working hours,

vacancies in establishments, and desired educational standard of employees. The results of these surveys are for the assessment of the Industrial Committees of the Industrial Training Advisory Committee which first initiated these surveys.

### III - Industrial Production

#### Census of Manufacturing Establishments

13. Plans have been made for a census of industrial production to be taken in 1973. As a preliminary test of the scope and organisation required for this new project, a pilot census of manufacturing establishments was taken in August 1970. Following this will be a complete enumeration of manufacturing establishments in July to August 1971 according to a list of all manufacturing establishments to be prepared in the course of the Population and Housing Census in March 1971.

14. The data collected in this pilot census relate to employment, power machinery, floor space, value of sales and work done, type of business and ownership, etc. The pilot census was conducted by census district supervisors but individual establishments had the option to fill in the questionnaires themselves if they preferred. The information collected from the survey is now being processed and analysed.

#### Textile Production Statistics

15. Textile production statistics are compiled by the Census & Statistics Department from quarterly returns collected from spinning and weaving mills registered with the Commerce & Industry Department for certification purposes. Statistics compiled include production of cotton yarn, cotton fabrics, woollen yarn and installation of cotton spindles, cotton looms and wool spindles. These statistics are supplied to the United Kingdom Textile Council, the Commerce & Industry Department, the International Cotton Advisory Committee, and are also published in the Monthly Digest of Statistics.

### IV - Trade

16. Trade statistics for Hong Kong are collected and compiled by the Census & Statistics Department from trade declarations lodged with the Director of Commerce & Industry. Checking of declarations on coding of commodity and country and punching of cards are carried out by the Census & Statistics Department, but tabulations are prepared by the Government Computer. Each month, two volumes of trade statistics are published, one for imports and the other for exports and re-exports, both volumes containing detailed tables of commodity items by countries as declared during the month under review. A separate supplement of trade statistics, country of commodity, is also published at the end of the year.

17. Apart from the published volumes, special analyses are made of Hong Kong's trade with major countries and exports of major importance to Hong Kong. These are contained in the External Trade Report issued monthly and distributed free to large organisations dealing with trade.

18. An intensive programme is being formulated on trade research.

## V - Transport and Communications

19. Surveys of public passenger transport behaviour are regularly carried out by the Traffic and Transport Survey Unit of the Public Works Department and published in their technical reports.

20. In order to study the transport behaviour of the population with their personal characteristics and socio-economic backgrounds, three questions on Place of Study and Place of Work, Mode of Transport and Time of Arrival at Place of Study/Work have been included in the 1971 Population Census questionnaire. With these additional data, heavy cross-tabulations will be made with other personal characteristics of the population.

## VI - Prices

Household Expenditure Survey

21. A Household Expenditure Survey was conducted in the period September 1963 to August 1964 with the object of collecting information about the commodities and services purchased by the households selected to be studied in the survey and of using that information to set a weighting pattern and a series of base-period price levels upon which a Consumer Price Index could be constructed. The survey covered all strata of urban land areas in Hong Kong and included households whose monthly income was within the range of \$100 to \$3,999.

22. This survey has been continuing since July 1965 with a different sample of 60 households being interviewed every month in order to keep in view whether the weighting pattern established with the data from the main survey is still valid and applicable.

23. In view of the fact that many changes have taken place since 1963, plans are being made to carry out another Household Expenditure Survey of about 6,000 households possibly in 1972.

Consumer Price Index

24. The Consumer Price Index was constructed with information from the Household Expenditure Survey 1963/64 described in paragraph 1 and referred to the period September 1963 to August 1964 as its base. The Index is compiled monthly with prices of different groups of commodities and services collected at regular intervals, either daily (in the case of some commodities whose prices are very elastic and sensitive to changes), weekly or monthly.

25. It is planned to construct a new Consumer Price Index following the completion of the Household Expenditure Survey scheduled to be held in 1972.

## VII - Agriculture and Fisheries

Agriculture

26. The Agriculture & Fisheries Department has been compiling statistics of arable land, and production statistics on crops and livestock and competitive food imports. Sample surveys of livestock and poultry were also carried out.

27. It is intended to conduct a survey on agricultural marketing some time after 1971.

### Fisheries

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28. The Agriculture & Fisheries Department has also been compiling statistics of fish and fisheries products. A physical count of local fishing fleet was conducted.

29. The Marine Census of Population to be held in January 1971 will give information on the size, nature and engine capacity of craft in the fishing fleet.

## VIII - Social Statistics

### Education

30. The Education Department collects, from all schools in Hong Kong, statistics on enrolment, teaching staff and school accommodation. Tabulations are processed by the Government Computer and kept in the Education Department for internal use. Plans are being made to revise the tabulation programme so as to produce more cross-tabulations for use by other departments or organisations.

### Housing

31. There is at present no up-to-date statistics relating to the number of housing units or living quarters available in Hong Kong, except those relating to public housing estates and government quarters. Decision has been made to include a Housing Census in the 1971 Population Census with the main object of building up a list of housing units by type covering the whole Colony and of cross-tabulating the housing characteristics with the characteristics of the households and persons living in them.

## IX - International Migration

32. Statistics of in-coming and out-going persons previously collected by the Immigration Department are only the by-product of administrative control over movements of persons across the boundaries of Hong Kong. There is no information collected on the type of persons coming to Hong Kong either for settlement or for employment, or information on type of local residents migrating to other countries for the same purposes.

33. In view of the fact that such information is very useful for planning and policy-making purposes, an attempt has been made to obtain, as from 1st May 1970, some additional data from persons coming to Hong Kong for settlement or to take up employment. Particulars relating to age, sex, nationality, date of arrival and occupation are transcribed from the arrival cards to punched cards. These are then sorted by the sorter-counter into five tables showing the age and sex distribution of legal immigrants by nationality/occupation, and the age and sex distribution of illegal immigrants by time of arrival/occupation. Information on education attainment has not been included because the method of classifying and coding this question is still being studied.

34. It is also decided that as from the third quarter of 1970, information relating to age, sex, nationality, occupation, education attainment and type

of visa issued will be obtained of persons emigrating to other countries from visa officers of Commonwealth and Foreign Consulates in Hong Kong every three months.

### X - Special Surveys

#### Survey in Public Housing Estates in Kwun Tong District

35. This survey is being undertaken by City District Office (Kwun Tong) in collaboration with the Census & Statistics Department to find out the occupations of people resettled in public housing estates in Kwun Tong, their means of transport to work, their housing requirements and their family particulars. About 5,700 households will be interviewed, which is roughly a 10% random sample of all households accommodated in low cost housing and resettlement estates in Kwun Tong.

36. Students and teachers living in Kwun Tong district have volunteered as interviewers. At the time of writing this review, the survey is still progressing. Data processing including editing, coding and preparation of tabulations will be carried out by the Census & Statistics Department with punched cards and sorter-counter.

#### Survey of Resettlement Estates

37. This survey was undertaken by the Resettlement Department also in collaboration with the Census & Statistics Department. The object of the survey was to find out the opinion the residents of large resettlement estates had about the premises they were living in, their feeling towards moving to another district, the occupational types and transport habits of the residents.

38. A 20% random sample of households in the Li Cheng Uk, Tung Tau and Wang Tau Hom Resettlement Estates was selected, giving a total sample of just under 6,000 households. Fifteen university undergraduates were engaged as interviewers. The survey was completed in one month. The results are being processed and analysed by the Census & Statistics Department.

#### Survey of Multi-Storeyed Buildings in Wan Chai District

39. This survey was initiated by the City District Officer (Wan Chai) to find out the problems connected with the management of multi-storeyed buildings. All buildings over 8-storeys in Wan Chai were included in the survey carried out in July 1970. Members of the management staff of these buildings were interviewed by secondary school students and were asked questions about the building itself, the management staff and fees, water supply, cleaning and fire prevention facilities, the personal particulars of the caretakers, and whether the flat owners of the buildings had formed management corporations in accordance with the Owners Incorporation Ordinance 1970.

40. The collection of survey data was supervised by the City District Office and a total of 213 buildings were interviewed. The planning and design of the questionnaire and the processing of the results were undertaken by the Census & Statistics Department.

41. The survey was undertaken by the Social Service Section of The College Student Association of Hong Kong to find out the problems of youths living in resettlement estates. The survey was carried out by the college students in August 1970 in the Wong Tai Sin, Tze Wan Shan and Ngau Tau Kok Resettlement Estates. All households living in these three estates were visited but only the eldest member of household who was within the age group of 15 to 24 was selected to be interviewed. Altogether 833 persons within the 15-24 age group were interviewed.

42. The planning of the survey and the design of the questionnaire were done by the college students themselves but the processing of the results was undertaken by the Census & Statistics Department.

REVIEW OF STATISTICAL ACTIVITIES SINCE THE  
SIXTH CONFERENCE INCLUDING POPULATION AND  
AGRICULTURE CENSUS PLANS

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1. At the Sixth Session of the Conference of Commonwealth Statisticians India had presented a paper reviewing the developments in various fields of official statistics for the period 1961-66. The present paper gives a brief review of the main developments which have taken place since then.

POPULATION AND VITAL STATISTICS

Census of population

2. The tenth decennial Census was conducted with March 1, 1961, as the reference date. The progress regarding the publication of the Census results as well as other essential items of information collected at the time of house listing operations was reported at the last Conference. The programme of bringing out remaining census publications as well as a series of monographs based on the socio-economic data collected in respect of purposively selected villages was completed during the period since 1966. Among the publications mention may be made of the Vital Statistics Report, which discusses the vital statistics data over the decade 1951-61, Subsidiary Tables, which give information on economic, social, cultural and migration aspects of the population, the special tables on scheduled castes and scheduled tribes giving information on economic activity, age/marital status, education, religion, etc.. The monographs so far published relate to (i) village surveys (400 published so far out of 580) giving an ecological background of the villages and describing the social, cultural and economic aspects of life in them, (ii) Craft surveys for traditional crafts (about 120 published so far out of 197) covering the caste, occupational, social and economic stratifications, the persistence of traditional tools and design forms, the limitations of credit and marketing facilities, etc., (iii) studies of fairs and festivals which present a geographical distribution of religious beliefs and their influence on social and economic life, (iv) Census Atlas, which is a cartographic depiction of census data and deals with various aspects such as physical conditions, demographic structure and trends, economic growth, level of socio-cultural development, and (v) ethnographic notes for groups such as scheduled castes/tribes, nomadic tribes etc. providing information on social, cultural and economic life of the groups. By the beginning of next year all the publications relating to the 1961 census, numbering about 1300, will have been brought out.



3. The work of developing suitable definitions and concepts to be used and schedules to be canvassed during the 1971 population Census was completed on the basis of experience gained through pretests in the field. The Census will be taken on a universal basis through interview method employing nearly a million census-takers to cover the population of the order of 560 million. The actual enumeration will take place during the period 10th to 28th February, 1971, with a revisional round from 1st to 3rd March, 1971, the reference date being the first of March (sunrise).

4. The following schedules will be canvassed during the Census:

(i) House list, which is an inventory of the houses, will provide information on the material of walls and roof, the use to which the house is put, number of rooms in occupation of a household, whether the house is owned/rented, etc.

(ii) Establishment Schedule, which will be filled in case a house is being used as an establishment for production, processing, servicing or conducting commercial transactions. It would provide details such as the goods produced or services rendered, number of workers employed, type of fuel or power used, type of establishment i.e. public or private, or a cooperative, etc. .

(iii) Individual Slip, which is the fundamental Census schedule, contains 17 questions and will provide information on demographic, social, cultural and economic characteristics of the population. This will include two questions on fertility for currently married women, a question on the last residence of the individual and a new classification of economic activity wherein the reference period of one week will be adopted to classify workers and non-workers in the case of regular work in trade, profession, service or business. In the case of types of work which are seasonal such as cultivation, the person will be classified with reference to such work during the previous one year. Data compiled from the Individual Slip will be the main source material for the 'Primary Census Abstract' (PCA) at the village/ward level in the rural/urban areas. The Abstract will provide information on the area of the village/ward, number of houses and households, literates, scheduled castes and tribes, workers and non-workers—workers being further divided into broad industrial categories.

(iv) The Census Population Record (CPR), will be filled in respect of each household from the entries made in the Individual Slip and will provide data on sex, age, marital

status, literacy, activity status, etc., of the population.

5. A post enumeration check will be conducted in selected Census blocks soon after the Census to find out the coverage error as well as the content error in canvassing the Census schedules. Since the Census is a large operation involving millions of enumerators on a part time basis, it is essential to impart careful training to them. Well organised training programmes constitute an important aspect of preparatory work for the 1971 Census.

6. Sampling procedures will be adopted for the processing of the Census data more quickly. In the case of the house list, a 20 per cent systematic sample of the houses will be tabulated. In the case of Individual Slips, a 10 per cent sample in the rural areas and a 20 per cent sample in the urban areas will be tabulated for preparing the regular Census tables. For advanced tabulations, one per cent of the Individual Slips will be taken.

7. The Primary Census Abstract (PCA), prepared from the Individual Slips, on a complete enumeration basis, will be compiled through manual sorting and tabulation. The general Census tables, to be generated from a sample of 10 per cent of Individual Slips for rural areas, will also be prepared on manual basis, since the equipment required for mechanical tabulation would be prohibitive.

8. Electronic data processing system will be utilised for the processing and compilation of the general tables to be generated from a 20 per cent sample of individual slips for the urban areas. All the Census tables to be generated from the house listing schedule and the establishment schedule will also be processed on electronic computers. The data will be coded and punched at the State Headquarters and passed on to the Regional Computing Centres for being put on electronic tapes and the tapes passed on to the Office of the Registrar General for further processing and tabulation. This is expected to reduce the timelag in the publication of the Census results by about two years.

9. Sample censuses (with a sampling fraction of one per cent) were conducted in 1966 and 1968 in collaboration with the State Statistical Bureaus to provide reliable intercensal estimates of population at the State level. A stratified unistage sampling design (with village as the sampling unit) in the rural areas and a two stage stratified design (with town and an urban block as the sample units at the two stages) in the urban areas was adopted. The results have been utilised to obtain annual estimates of population at the State level.

Vital Statistics

10. Having regard to the need for a sound system of vital statistics to provide reliable estimates of births and deaths, the following schemes were introduced during the period under review:

- i) Sample Registration Scheme: The scheme which was started on a pilot basis in 1963-64 and was extended to the whole country during the period under review is meant to provide reliable estimates of rates of births and deaths at the State level. Under the scheme special whole time local Registrars have been appointed for the registration of vital events as and when these occur. The continuous enumeration is supplemented by an independent half-yearly survey by a supervisor. The rural sample consists of about 150 units in every major State, each unit being a village or its segment with a population of 2000 or more. In the urban areas, a sample of 60-100 blocks, each of size 1000 population, is selected per State. Stratification on the basis of population size is adopted in both the areas.
- ii) Model registration scheme for statistics of causes of death: A purposive sample of 700 Primary Health Centres, each of which caters to a group of villages with a population of 80-100 thousand, is taken to provide cause-of-death statistics recorded by paramedical personnel based largely on symptoms. These data would help the epidemiologists to identify the cause of death and in taking suitable remedial measures.
- iii) Under-registration survey: Along with the sample census for inter-censal estimates, an under-registration survey was initiated in 1966 to assess the extent of under-registration of vital events. In a sub-sample of villages and blocks (selected for the sample census) the vital events recorded in the course of sample census were matched with the registration records to estimate the extent of under-registration.

11. In addition to the foregoing measures the machinery for the regular collection of vital statistics at the State level has been strengthened and mechanical tabulation systems have been set up in some States in order to produce the results more expeditiously. In order to have legal powers to enforce compulsory registration of births and deaths, a 'Births and Deaths Registration Act, 1969' has been enacted.

N.S.S. demographic data

12. Data are also being collected on the demographic characteristics of the population in the various rounds of the National Sample Survey (NSS) - a multi-purpose sample survey organisation which was created in 1950 to collect statistics on sampling basis on the socio-economic, demographic and other characteristics of the population. Data on vital events were being collected from the 19th round (1964-65) in a distinct schedule and also in less detail from a smaller sample of households in the Integrated Household Schedule in which socio-economic data about the population are collected. The detailed schedule was discontinued from the 24th round (1969-70).

13. An independent cross-checking of the Sample Registration Scheme data has been undertaken by the NSS in the States of West Bengal and Tamil Nadu. The sample villages covered by the SRS have been completely enumerated by the NSS investigators. The results available for West Bengal indicate deficiencies in the enumeration of births and deaths by both NSS and SRS agencies. The results of Tamil Nadu study are not yet available.

Population projections

14. An Expert Committee on Population Projections has prepared estimates of population by age and sex with rural and urban breakdowns, as well as labour force projections for the period 1961-81. The population projection by age and sex has been extended to the period 1981-86.

The following assumptions have been made for three alternative sets of projections based on 'high', 'medium' and 'low' levels of fertility:

(i) Fertility: A General Fertility Rate (G.F.R.) of 195 worked out for the period 1951-60 has been taken to remain unchanged up to 1966 and then undergo a percentage decline as per following schedule:

Projection	Percentage decline in GFR of 195			
	1966-70	1971-75	1976-80	1981-85
High fertility	0	5	15	25
Medium fertility	5	10	20	25
Low fertility	10	15	25	25

(ii) Mortality: Starting with the expectation of life at birth ( $e_0^0$ ) of 41.9 (Males) and 40.6 (Females) for 1951-60 (taken to be centred at 1956), the same was assumed to increase by 0.9 of a year per annum upto 1970, by 0.75 of a year per annum during 1971-80 and by 0.4 of a year per annum during 1981-85.

(iii) Sex Ratio at birth is assumed to be 105 males per 100 females.

(iv) Migration: This factor has been ignored as insignificant.

A publication containing the methodology as well as the actual projections was brought out during 1969.

#### LABOUR AND EMPLOYMENT STATISTICS

15. The Directorate General of Employment and Training (DGET) in the Ministry of Labour and Employment continued to conduct a detailed census of Central Government employees each year to obtain their distribution in different pay ranges by sex, status and tenure of service. The Employment Market Information (EMI) programme covers on a statutory basis all the public sector establishments and such non-agricultural establishments in the private sector as employ 25 or more workers, and provides data, at quarterly interval on employment and vacancies and at biennial interval on the occupational pattern of employees collected in alternate years from the public and private sectors. Since March, 1966, establishments in the private sector employing 10 to 24 workers are also being covered on a voluntary basis. Attempts are also being made to collect statistics of employment, on a voluntary basis, from small establishments in the private sector employing 5 to 9 workers. An important development in the programme since 1966 has been the collection of data on educational qualifications of selected categories of personnel in different occupations.

16. The live-registers of 423 employment exchanges in India provide information on the number and characteristics of persons seeking employment assistance. A special study was conducted in 1968 to estimate the proportion of employed persons on the live-registers of the employment exchanges and to ascertain the proportion of job-seekers in rural areas registering with employment exchanges. The results of this survey together with the information provided by the NSS surveys relating to the proportion of unemployed who register with the employment exchanges will be utilised for evolving correction factors to the live-register data for estimating the size of the urban unemployment.

17. Data on employment and unemployment were collected as part of the labour force surveys of the NSS. The current-status approach with a short reference period and the priority-criteria used in the labour force surveys for determining the labour force-status of a person was found more difficult in practice in rural areas where under-employment would often masquerade as unemployment than in urban areas. The labour force surveys were discontinued in rural areas from the 18th round of NSS(1962-63). In this regard, intensive type-studies of rural unemployment and under-employment have been undertaken by the Labour Bureau in 60 villages located in 20 regions of India. The results of this study when available would help in standardisation of the technique for conducting labour force surveys in rural areas.

18. In order to gain an insight into the degree of suitability or otherwise of the concepts and definitions in vogue in urban surveys, a pilot study was conducted during 1968-69 and the results are awaited. The Planning Commission also appointed an Expert Committee in August, 1968, to go into the estimates of unemployment worked out for the previous plans and the data and methodology used in arriving at them and to advise on the alternative methods of analysis, computation and presentation which may be adopted for the Fourth Five Year Plan(1969-74) in the ten-year perspective of 1969-79. The Expert Committee has since submitted its report which is currently under review.

19. Labour statistics including data on absenteeism and labour turnover, working days, man-hours worked, earnings etc., were continued to be collected through the Annual Survey of Industries. Surveys for comprehensive study of labour conditions in various industries were conducted by the Labour Bureau. Forty-six industries had been covered till 1966. Two industries are selected every year for the study.

#### Occupational classification

20. The National Classification of Occupations was revised in 1968 and designated as NCO - 1968. The NCO-1968 broadly follows the ISCO-1966 except for a few departures.

## AGRICULTURAL STATISTICS

Crop statistics

21. Improvements continued to be made in the coverage of land utilisation statistics and statistics of agricultural production. The present coverage of statistics of land-use and crop area is 94 per cent of the geographical area of the country, of which 77 per cent is covered by complete enumeration, 5 per cent by sample surveys and 12 per cent by conventional estimates. In some of the States in which a land record agency exists at the village level, in order to improve the reliability of data the jurisdiction of the village land record official has been reduced by augmenting the staff. Further, basic land record forms have been revised to ensure nationwide uniformity of data. Steps were taken to improve the quality of statistics in other areas through the adoption of random sample survey technique in some States, and by extending the coverage under complete enumeration by the appointment of recording staff in other States.

22. Periodical estimates during the various stages of crop growth called crop forecasts are available for 38 important crops (8 cereals, 4 pulses, 8 oil seeds, 4 fibre crops and 14 other crops). Besides these forecast crops, data regarding area and yield are also available for plantation crops such as tea, coffee and rubber and 'other minor crops'. Estimates of yield rates are obtained increasingly through the objective method of crop cutting experiments conducted in randomly selected fields, which number annually about a hundred thousand in the case of food crops and 35 thousand in the case of non-food crops.

In order to provide the estimates of area under various crops soon after the sowing season is over and the production estimates soon after the harvesting, a scheme for timely reporting of crop estimates has been formulated. This is being implemented in a phased manner. It is proposed to integrate this scheme with the land utilisation surveys and crop cutting experiments conducted through the NSS.

Agricultural Census

23. India will be participating in the Third Decennial World Agricultural Census sponsored by the FAO and the data will be collected in collaboration with the States. A Working Group of technical experts has been appointed to examine, (i) the items on which information should be obtained by re-tabulating the data collected on complete enumeration

basis, (ii) the items on which enquiries on sampling basis should be conducted, (iii) the concepts and definitions to be adopted, preparation of schedules and instructions, and (iv) the organisational set up required for the census including tabulation, etc. An FAO training centre in agricultural census techniques was organised at the Institute of Agricultural Research Statistics (IARS) and 39 officers from the countries of Asia and the Far East attended the course.

#### Livestock statistics

24. The tenth quinquennial livestock Census was conducted during 1966 and provided data on the number of livestock and poultry. (Information was also collected on agricultural implements and machinery, and fishing crafts and tackles.) For improving the quality of census enumeration, a scheme of rationalised supervision was carried out in five per cent of the rural and urban areas. In addition, a post-enumeration sample survey was conducted to provide information on additional items like age and breed composition, lactation period, immunisation against rinderpest, etc.. An independent post-enumeration sample check was also conducted by the NSS.

25. IARS continued to develop survey techniques for the estimation of milk and other livestock products. It is proposed to launch a scheme during the Fourth Five Year Plan (1969-74) to extend the surveys for estimating the production of major livestock and poultry products to all the States.

#### Fishery statistics

26. During the tenth livestock Census conducted in 1966, data were also collected on fishing crafts and tackles on a complete enumeration basis for the first time. Sampling techniques are being applied to collect regularly data on the catch of marine fish. It is proposed to conduct pilot surveys to develop suitable sampling techniques for the estimation of fish catch from inland water resources.

#### Forestry statistics

27. A project on "Pre-investment Survey of Forest Resources", initiated in collaboration with the FAO, is in progress since 1965. The main objective of the Project is to investigate into the economic availability of technically suitable raw material for the forest industries development in the country. The investigations include sample surveys for assessing the



growing stock, growth and decay, transport studies to find out the cost of transport of raw material from the forest to alternative mill sites, market studies to find out the raw material balance and industrial feasibility studies to find out economics of alternative mill sites and mill capacity. Sample surveys make use of aerial photo-interpretation technique and is supplemented by a low intensity of field work. All the data processing activity has been computerised. For this purpose pre-coded field and aerial photo-interpretation forms have been developed. Surveys have been carried out in three areas, viz., the Central Zone comprising parts of Madhya Pradesh, Andhra Pradesh and Orissa, the Northern Zone comprising parts of Himachal Pradesh, Uttar Pradesh and Haryana and the Southern Zone comprising parts of Kerala and Tamil Nadu. Field investigations have been carried out into accessibility, logging and transport methods and costs.

## INDUSTRIAL STATISTICS

### Annual Survey of Industries

28. As reported at the last Conference, the statistics of manufacturing industries in the organised sector are being collected, on a statutory basis, through the Annual Survey of Industries (ASI) since 1959. This survey covers the entire factory sector (i.e. establishments employing 10 or more persons and using power, or employing 20 or more persons without using power) excluding the defence installations, oil and storage depots and industrial training institutes. Data are collected on capital, employment, wages, inputs, products and by-products. Factories employing 50 or more workers and using power, or those employing 100 or more workers without using power are completely enumerated. The remaining factories are covered on a probability sample basis. Summary of the information on important characteristics of census and sample sectors have been prepared for the year 1966. Detailed results for 1965 are also available.

### Industrial classification

29. The Industrial classification has been revised and designated as National Industrial Classification (NIC-1970). The NIC-1970 incorporates, as far as possible, the major revisions contained in the ISIC-1968 with a few exceptions. The NIC-1970 has been so designed that each major division (1-digit level), division (2-digit level), major group (3-digit level) and group (4-digit level) of the ISIC-1968 could be arrived at by a suitable combination of major

group(s) and/or by a combination of major group(s) and/or group(s) of NIC-1970. To meet the national requirements the NIC-1970 has been extended to the 4th digit for Mining and Manufacturing divisions.

#### Small-scale sector

30. As mentioned earlier, industrial units employing 10 to 49 workers and using power, or employing 20 to 99 workers without using power are covered on a sample basis. The sampling design which used to provide estimates in respect of these units upto the third digit level has been revised since ASI-1968, so as to cover a 33% non-overlapping random sample of the sample sector universe each year, thus covering the entire sector in three successive years.

31. In order to provide comprehensive data on units in the factory sector having a gross investment on plant and machinery of Rs.0.75 million or less, a programme was initiated in 1966 to collect in a phased manner, through ASI, data on complete enumeration basis in respect of certain priority industries falling in the sample sector. During 1966 and 1967 metal and metal based industries were covered on a census basis. In 1968 industries concerning leather and rubber products, chemicals and chemical products, petroleum and petroleum products, transport equipment, etc., were covered. It is proposed to cover other industries in subsequent years. The tabulation plan provides for the publication of estimates of production, consumption, and stocks at the district, State and all India level. Electronic data processing system is being utilised for quicker processing and tabulation of results.

32. However, for the bulk of the small industrial units in the non-factory sector i.e. units employing less than 10 workers and using power, or less than 20 workers without using power, hardly any reliable statistics are available. In order to fill up this gap, data were collected in the 23rd round(1968-69) of the NSS on capital, employment, inputs and outputs in respect of both household and non-household small establishments. During the Fourth Plan(1969-74) it is proposed to have a survey to collect data in respect of all the units in the non-factory sector employing five or more workers in the urban areas.

### TRADE STATISTICS

#### External trade statistics

33. The scheme for streamlining of the system of collection, compilation and publication of integrated statistics on the issue of import licences/Government orders, payments and

actual imports of goods continued to be implemented in the concerned organisations viz. Directorate General of Commercial Intelligence and Statistics(DGCIS), Office of the Chief Controller of Imports and Exports(CCIE), Directorate General of Supplies and Disposals(DGSD) and the Reserve Bank of India(RBI). For this purpose a mechanical tabulation unit was set up in the Office of the CCIE in April, 1967, the computational facilities in the DGSD were expanded and electronic data processing system was set up in the RBI.

34. Since April, 1965, foreign trade statistics are being published according to the Revised Indian Trade Classification except in the case of petroleum products and substances 'prescribed' under the Atomic Energy Act. The classification has been amplified and 5000 commodities are separately specified. With a view to getting over the deficiency inherent in the data received from the Customs based on the note pass system, it is proposed to publish monthly figures of food imports as maintained by the Ministry of Food and Agriculture who are the actual importers. As from April, 1968, advance estimates of exports in a month, of 18 principal commodities, prepared on the basis of a regression model, are being compiled within a week after the close of the month.

#### Road-borne trade

35. Data on movement of goods traffic by road are available for the public road transport undertakings. Pilot studies have been undertaken by the Ministry of Transport and the National Council of Applied Economic Research in the case of private goods transport operators. A proposal is under consideration to invoke the legal powers under the Motor Vehicles Act so that each lorry owner is required to keep a log-book for the registration of goods transported by him.

#### Distributive trade

36. No reliable data of distributive trade are available. Some States have analysed the Sales Tax returns from registered traders to secure information on sales turnover by commodity groups and by types of establishments. In order to collect the data on a uniform basis throughout the country, the survey of distributive trade was included as one of the nine 'core schemes' to be implemented during the Fourth Five Year Plan (1969-74). To facilitate a coordinated approach guide-lines were drawn up on various aspects of the survey by the CSO and circulated among the States. Work has been initiated in several States.

37. In the 24th round(1969-70) of the NSS a survey of non-registered trading households was conducted. Non-household establishments were excluded from the survey. A sample of the order of 8,400 villages and 30,000 households in the rural areas, and 4,600 blocks and 10,000 households in the urban areas was envisaged. Information sought to be collected includes general particulars of trade, value of fixed capital, changes in assets, rent paid, value of purchases and sales, personnel engaged, gross trade margin, etc. The data are under tabulation.

#### TRANSPORT STATISTICS

38. In the transport sector technical and economic studies have been organised to assist in the planning of transport on regional basis. A detailed study of traffic flow by different modes of transport was conducted in different regions. The information from the study would be utilised to identify the nature of transport problems of different regions. The Directorate of Transport Research in the Ministry of Transport completed during the period economic investigations relating to the preparation of a Master Plan for Bombay port, and a study of perspective growth of traffic at major Indian ports upto 1985-86. These studies inter-alia involved projection of the entire Indian economy upto 1985-86 in sectoral terms and also working out efficient location patterns of the economy in 1975-76 and 1985-86. Benefit-cost studies of a number of road and bridge projects were conducted.

#### WAGE AND PRICE STATISTICS

##### Wage statistics

39. The data collected in the Second Occupational Wage Survey(1963-65) covering 45 major manufacturing, mining and plantation industries were analysed and reports were brought out. In order to construct wage rate indices data were collected, through mail enquiry method, from 456 establishments in 12 selected industries. A new series of wage rate indices for 40 selected industries has been prepared.

##### Wholesale price index numbers

40. In accordance with the recommendations of Wholesale Prices Index Revision Committee in 1961 the index was revised to include a large number of engineering and chemical items than was possible in the earlier series and the base year was shifted from 1952-53 to 1961-62. This series is being

issued from July 1969 and includes 139 commodities and 774 quotations. A Working Group is making a study of the changes which have taken place during 1961-70. For the construction of a new index, the Working Group will review the classification and composition of commodities and their weighting pattern and existing arrangements for price collection, their supervision and other ancillary factors. It will also examine the feasibility of constructing sectoral indices.

#### Consumer price index numbers

41. As from 1968-69 the Labour Bureau is bringing out a new series of consumer price index numbers for working classes, with 1960 as the base, for 50 industrial centres in the country. It is proposed to undertake a fresh family budget enquiry for working classes in 1970-71. A preliminary survey was conducted during the year at each centre with a view to securing the necessary information for the adoption of an efficient sampling design and suitable sampling frame. The designing work has been completed. The main survey will be conducted at 60 industrial centres in the country and two schedules, viz. (i) family receipts and expenditure and (ii) house rent, will be canvassed. The sample size at each centre has been so determined as to provide estimates of the consumer price index number for that centre with a margin of error of not more than two per cent. Two types of sampling procedures namely (a) tenement sampling (b) pay-roll sampling will be adopted. The choice of type of sampling method to be adopted for a particular centre has been decided on the basis of a preliminary enquiry carried out at each of the centres. The sampling design at a centre, is basically a stratified two stage sampling with clusters of blocks comprising compact geographic segments in the urban areas having 150 households approximately in factories/mines/plantations as the first stage units and as a working class family or a worker in the establishment as the second stage unit. The blocks have been arranged in a suitable manner and a systematic sample of 12 clusters of blocks have been drawn and will be surveyed within a period of 12 months. In the case of pay-roll sampling, a systematic sample of 12 clusters of factories/plantations/mines have been selected with probability proportional to the number of workers in them.

42. The current series of consumer price index numbers for agricultural labour is available with base 1960-61. The latest rural labour enquiry was conducted in the 18th and 19th rounds of NSS(1963-65). The new series of index numbers for rural labour will be brought out shortly.

43. Consumer price index number for urban non-manual employees with 1960 as base is being brought out by the CSO. This work has been partially computerised.

44. The Government's desire to make available to the consumers cereals and other important items of food at reasonable prices by introducing statutory rationing or by distribution through fair price shops necessitated certain adjustments in the procedure for compilation of consumer price index numbers. In the case of food items for which statutory rationing was introduced, no cognisance was taken of the 'black-market' transactions, if any, and only statutory prices were considered for compilation of the index numbers. The statutory prices were taken without any adjustment for difference in quality on the assumption that the consumers had no other alternative than to purchase whatever variety was available. In a situation of statutory rationing when the rationed commodity is quite often not available according to the prescribed variety and the required quantity, it is quite possible that the consumers would prefer to purchase other types of commodities, which are available and satisfy similar wants. It may be argued that consumers' preference for such substitutes should be adequately represented in the compilation of consumer price index numbers. This approach is, however, beset with practical difficulties. It is not possible to determine the shifts in consumption pattern without undertaking proper enquiry and even if such an enquiry is conducted, the determination of the base year prices and adjustment of weighting diagram in order to accommodate the substitutes pose considerable difficulties.

45. When statutory rationing is lifted, generally fair price shops are set up by the Government to make available to the consumers the concerned commodities at reasonable prices. These fair price shops operate side by side with the open market. In such a situation, a weighted average of the price quotations from the fair price shops and the open market was taken for compilation of the consumer price index numbers, the weights being proportional to the off-take of the concerned commodities from the fair price shops and the open market as estimated from half-yearly surveys. In case more than one variety of the commodity were available in the fair price shops, a weighted average of the prices of the different varieties was taken, the weights being proportional to the quantity of each variety issued by the Government.

46. Compilation of indices of comparative costliness of cities for urban non-manual employees with Delhi as the base was started in 1963-64 by the CSO and indices have

been compiled for the years 1960-66. The number of centres for which indices are available has increased from 15 to 45 over the period. The Labour Bureau proposes to compile such indices for working class employees for 50 centres. In the first instance compilation of indices for six centres with Delhi as the base for the years 1964-68 has been taken up.

#### FINANCIAL STATISTICS

47 Some of the studies undertaken during the period by the Reserve Bank of India to improve balance of payments statistics are: (i) survey of unclassified receipts with a view to make purpose-wise analysis; (ii) survey of foreign investments in India during the period 1965-67; and (iii) sample survey of exchange control forms for declaring exports to assess the valuation differences between the customs and exchange control data, and to estimate freight, insurance rates and the time lag between the shipment of goods and the realisation of proceeds thereof.

48. A committee on data improvement was appointed to look into the problems of improving the quality and timeliness of short-run data series as well as the problems of systematic forecasting of short-run economic trends.

#### NATIONAL ACCOUNTS

##### Revised Series of National Product:

49. The Central Statistical Organisation brought out a brochure giving in summary form the revised methodology of estimation of national product from various sectors along with the revised estimates for the period 1960-61 to 1964-65. The industrial classification adopted for measurement of national product, is now more detailed; for instance, separate estimates have been presented for (i) construction (ii) transport other than railways, (iii) trade, storage, hotels and restaurants and (iv) electricity, gas and water supply. Apart from the improvements brought about by the use of upto date available information from Annual Survey of Industries, National Sample Surveys and other ad-hoc surveys, efforts have also been made to prepare, to the extent possible, separate estimates in respect of organised and unorganised sectors of the economy. For example, in the case of transport and communication, detailed estimates of net/gross product have been worked out separately for mechanised and non-mechanised road transport and organised and unorganised water transport. In the case of construction, separate estimates have been prepared for government construction and private construction whereas in the case of wholesale and retail trade and hotels and restaurants separate

estimates have been prepared for corporate and non-corporate sectors. Separate estimates of gross and net product have been presented for each sector. The estimates at constant prices have been improved by identifying more explicitly the nature of outputs and inputs so as to build up comparatively firm quantum indices to reflect year to year changes in the gross/net product for various industries. The method of estimation has been made more broad-based in sectors like agriculture and other commodity producing sectors where the estimates are built up by aggregating the estimates at State level. In the case of construction industry, both the commodity flow and expenditure approaches have been followed instead of the income approach adopted in the conventional series.

#### Estimates of Capital Formation and Savings

50. A brochure giving official estimates of capital formation for the period 1960-61 to 1965-66 was brought out by the CSO in November 1969. Estimates are given both at the current and constant prices separately for the private and public sectors. Another brochure giving official estimates of savings for the period 1960-61 to 1965-66 was also brought out in November 1969. The estimates of savings are given separately for the three major sectors of the economy viz., public sector, private corporate sector and household sector, along with the detailed methodology adopted in the preparation of these estimates. A study conducted in the RBI viz., "Savings of government and the domestic corporate sector, and household savings in the form of financial assets", was revised and brought upto 1965-66.

#### Comparable estimates of State Domestic Product

51. In order to develop a uniform system of regional accounts the CSO took up, in collaboration with the States, the development of appropriate methodology in the first instance for six commodity producing sectors viz., agriculture, animal husbandry, forestry, fishing, mining and quarrying, and large scale manufacturing. Comparable estimates for these sectors are now being compiled in almost all the States. To meet the requirements of Planning Commission preliminary estimates for the non-commodity producing sectors for the period 1962-63 to 1964-65 were also prepared. The CSO has since finalised the methodology for the estimation of income from education, electricity, gas and water supply, government services (State Governments/Local Bodies), and medical and health services to be adopted by the State Governments.



International Comparison of National Accounts

52. India is participating in the India-USA Comparison as a part of the U.N. Project on International Comparison (I.C.P.) of National Income Aggregates and Purchasing Power Parity. It is also proposed to take up India-Japan Comparison.

The main objective of the ICP is to explore the problems and methods of valuing - on a common basis - the national accounts data of a selected group of countries. The ICP was undertaken to fill in one of the major gaps in international statistics viz. lack of a meaningful inter-country set of real products and purchasing power comparisons. The ICP proposes to develop methods of comparative valuation with regard to product, income and expenditure aggregates of the various participating countries, without taking recourse to the official exchange rates, which have often been found to be extremely inadequate to convert the country-wise estimates.

One major requirement of the work undertaken by India will be to have her National Accounts cast into the expenditure framework of the revised SNA. This is not readily available in India and will entail tremendous amount of efforts on our part, specially for certain consumption categories. The total domestic expenditure will have to be distributed among more than 200 expenditure categories and then in each of the these categories a number of representative goods will be selected for the binary comparison. Secondly our plan is to compare urban-India directly with USA and to link rural-India via a rural-urban comparison within India. As existing urban price indices in India are centre-specific, some special processing of the urban index numbers available will be required to arrive at national averages for the urban prices. A comparison of itemwise rural and urban prices is beset with specification problems. Certain sectors which present very special problems are Construction, House-rents, and Medical and Education Services. Special enquiries would have to be taken up to fill in these gaps in the requisite information for the ICP.

Specific problems encountered in the India-USA comparison work are being sorted out. Mention may be made of the difficulties in matching consumer goods in these two countries. These relate to (i) items that are used as luxury goods in one country but are commonly used in the other, (ii) difficulties in data collection of the prices of specified varieties of commonly consumed goods - specifications being widely different in different countries, (iii) the nature of price data utilised for comparison work, etc. The selection of comparable producer and

consumer durables in India and USA - with completely different industrial backgrounds - are beset with various problems owing to differences in product specifications and in the characteristics of the products. The method of compiling regression based index numbers is being utilised for those commodities which are difficult or impossible to price by traditional method. In the process of sorting out the above problems some working procedures have been arrived at to produce satisfactory comparability between India and USA. It is expected that improved techniques would be developed at the end of the exploratory stage of the ICP.

#### Input-output tables

53. A number of agencies such as the Indian Statistical Institute, Gokhale Institute of Politics and Economics, Planning Commission, have prepared input-output tables for the Indian economy. Recently an input-output table for the Indian economy for the year 1964-65 identifying 144 sectors has been prepared.

#### Personal income and expenditure

54. Collection of data, through the NSS, on household receipts and disbursements, and household consumer expenditure was continued. The second part of the report of the Committee on "Distribution of Income and Levels of Living", dealing with the changes in the levels of living was brought out.

### PLANNING STATISTICS

55. To meet the growing demands of data for plan formulation, implementation and evaluation, the statistical machinery in the country has been expanded considerably and the quality and coverage of data have substantially improved. There are, however, still gaps in the availability of statistics in various sectors and to fill up these an integrated programme of development of statistics during the Fourth Five Year Plan (1969-74) has been drawn up in consultation with the State Governments. Nine core statistical schemes such as State Income Estimation, district statistical hand-book and municipal statistical year book, distributive trade, housing statistics, etc. have been formulated for implementation on uniform lines. Guidelines have been prepared to ensure uniformity in the implementation of the schemes.

56. In order to ensure balanced regional development of the various parts of the country, 15 regional indicators of development have been evolved to identify the backward areas so that necessary steps could be taken for accelerated development of these regions.

57. With the expansion and intensification of planning in various directions, the need for more extensive and reliable statistical data has been increasingly felt and an appraisal of the availability of statistics in different sectors of the economy appeared to be useful. A brochure entitled "Official Statistics - Sources of data and major gaps" was brought out by the CSO in 1968 which takes stock of the currently available statistical material in the country and identifies the major gaps in each subject field.

### SOCIAL STATISTICS

#### Housing statistics

58. The scheme for collecting current housing and building statistics which envisages the setting up of statistical cells in the Department of Public Works and Local Self-Government and coordinating cells in the SSBs\* made headway during the period. This has been included as a priority scheme for implementation in the States during the Fourth Five Year Plan(1969-74). Although a housing census as such has not been undertaken in the country, the operation of house numbering and listing was conducted during February-May 1970 as a preliminary to the 1971 population census and this provided information on the type of house, age of construction, predominant material of roof, walls and floor, purpose for which the house is used and whether rented or owned.

#### Health statistics

59. An integrated programme for development of health statistics during the Fourth Plan has been initiated. The programme aims at the strengthening of the statistical set-up at the State level, creation of a manpower research cell at the Centre and opening of a few more centres for training in vital and health statistics. A scheme for the medical certification for the cause-of-death statistics in keeping with international standards has been initiated to start with in the public hospitals in a few States. A national seminar on health records and reports was held in 1969 and in pursuance of its recommendations the proformae prescribed for the collection and compilation of health statistics were rationalised. Orientation-cum-training courses were organised for the statistical personnel of the Central/State Health Departments and the medical records offices.

#### Family planning statistics

60. To collect family planning statistics, statistical cells were set up during 1965-66 at the State, District and block(Primary Health Centre) levels. To ensure uniform

\*State Statistical Bureaus.

collection of data a manual of family planning records and returns, prescribing returns from the district to the State level, was brought out in 1969. Demographic and evaluation cells have also been set up in some of the State Family Planning Bureaus to carry out concurrent evaluation of the family planning programme. The cells undertake surveys on the knowledge, attitudes and practice of family planning (KAP studies), and fertility and follow-up studies. The Central Family Planning Institute was set up in 1965 to provide appropriate guidelines and to conduct and coordinate research work done at the nine demographic and research centres and four communication action research centres. A Standard Fertility manual was brought out for the guidance of research workers.

#### Educational statistics

61. In pursuance of the recommendations of the Fourth National Seminar on educational statistics organised in 1968, the statistical machinery at the Centre and the States has been strengthened. The expanded unit at the Centre will conduct sampling studies in order to fill up gaps in the availability of data. Studies regarding wastage and stagnation at the elementary level and enrolment projections, have been undertaken. As from 1969-70 the work of compilation and processing of educational data relating to universities is being done by the University Grants Commission.

A draft manual on 'measurement of scientific research and development' giving definitions, concepts, classification etc. was prepared by the CSO in 1969.

#### NATIONAL SAMPLE SURVEY

62. The National Sample Survey (NSS) was set up for meeting the needs for reliable and objective data in regard to production, consumption, distribution and other socio-economic characteristics of the population. When the field organisation came into existence in October, 1950, it had about 300 Investigators and a small contingent of supervisory staff with a budget estimate of Rs.2.5 million per annum for field work. Since then, NSS field organisation has grown steadily into a closely knit, well trained and experienced field organisation with a strength of about 1,900 members and with a budget provision of Rs.11 million per annum.

63. NSS has been collecting, on a continuing basis, comprehensive data relating to the socio-economic and demographic characteristics of the population since 1950. During the period under review four annual rounds (21st to 24th) were completed, and the 25th round has started in July 1970. Besides the regular collection of data on land utilisation, crop cutting experiments, demographic

particulars, economic activities of the household and retail prices of selected commodities, the NSS also collected data on an ad-hoc basis on a number of items such as farm practices, knowledge and practice of family planning methods, small scale manufacture in the household and non-household sector, household non-registered distributive trade, and number of handicapped persons. Normally data are collected from a sample of about 8400 villages in the rural areas and of about 4600 blocks in the urban areas.

64. Pilot studies for improving methodology and standardisation of concepts and definitions are an integral part of the programme of the NSS. During the period pilot studies were conducted, among others, on (i) building construction, (ii) questionnaire form of enquiry on population, births and deaths and (iii) employment and unemployment.

65. The National Sample Survey Organisation is being reorganised by bringing its entire range of operations under a unified control for achieving efficient programming and better coordination among the functional divisions. The reorganisation is expected to cut down delays in processing and publication of the results. Provision for economic analysis and interpretation of the results is a special feature of the new set up.

#### DATA PROCESSING

66. The first general-purpose digital computer was installed in India in 1956 at the Indian Statistical Institute, Calcutta. Between then and now, the total number of computer installations in the country has risen to about 125. Out of these, approximately 70 per cent are used mainly for business applications and the rest for scientific, statistical and educational purposes. With the exception of two, all the computers fall in the small and medium categories.

67. The first significant measure to develop computer applications in Government was taken in 1966 when Government of India acquired 10 Honeywell computers to meet its data processing requirements. A Computer Centre was set up in 1967 in the Department of Statistics, New Delhi with three of these computers and the remaining seven were deployed among other organisations in the major cities of the country. The Computer Centre functions as a service bureau and helps a number of Government organisations and Public Undertakings in their data processing jobs. The Centre provides support in systems design, programming and data preparation and also accepts responsibility for developing applications on a 'closed shop' basis. The applications developed by the Centre include construction of consumer price indices, tabulation of the results of National Sample Survey, tabulation of income tax

and Central excise statistics, industrial statistics (small-scale sector) and maintenance of personnel records of Government employees. Over 50 Government organisations are availing of the facilities of the Centre.

68. The applications so far put on the Computer are primarily concerned with direct conversion of existing manual/mechanical systems of data processing to a computer based system. The initial emphasis is to secure timely and comprehensive statistical information required by the Government and to create adequate data base for more meaningful analysis. An attempt is simultaneously being made to develop integrated information systems dealing, for instance, with foreign trade, industrial development, personnel management, audit and accounts operations. Under these systems, it will be possible to coordinate the activities of several organisations which have inter-related programmes of data collection and use.

69. It has been recognised from the beginning that training of personnel in computer programming, systems design and analysis should receive the highest priority to promote computer capabilities in the Government. Right from its inception, therefore, the Centre devoted much time and effort in organising training courses for programmers. These courses, which form a part of the regular activities of the Centre, extend over a period of 12-weeks each. Nearly 400 programmers have received training at the Centre in the last 3 years. A few other organisations, such as the Indian Statistical Institute, Calcutta, Indian Institute of Technology, Kanpur, Tata Institute of Fundamental Research, Bombay, also offer training courses in computer programming.

#### TRAINING

70. Over the last decade considerable expansion of teaching facilities in statistics in Indian Universities has taken place. At present 28 Universities have departments of statistics for postgraduate teaching and research, and 36 Universities have provision for teaching statistics up to the first degree level. The Indian Statistical Institute is continuing to do pioneering work in research and training of statisticians. A number of other institutes like Demographic Training and Research Centre, Institute of Agricultural Research Statistics, Forest Research Institute, etc., offer specialised courses and research facilities in their respective field of interest. During the period under review the CSO continued to organise regular training programmes for Government and public sector personnel.

71. A separate training unit was set up in the Central Statistical Organisation to organise training programmes for the personnel of the Indian Statistical Service, a cadre of professional statisticians, constituted in 1964. The first two-year training course for direct recruits to Grade IV, selected in a nation-wide competitive examination, was completed. The training of the second batch of direct recruits is in progress. A six months' training programme for departmental promotees to Grade IV of the Service was also organised.

## Review of Statistical Activities

1. This note deals in summary form with some of the important activities of the Central Statistics Office from 1966 to date. A noticeable feature has been the steady increase in the demand for more statistics, better statistics and fresher statistics. This demand has come from those directly concerned with economic management and physical planning, from research institutes, and from organisations representative of business, management and labour. A Committee on Statistical Requirements and Priorities has been set up

- (a) To examine the present national statistical system in the light of requirements for administration, policy formulation and planning at national and regional level, for relevant research activities and for the needs of other users, and to assess the extent to which the system should be strengthened (a) by improving or modifying existing statistical services and by introducing new series; (b) by improving or modifying existing methods of collection and processing of statistics.
- (b) To advise on the order of priorities in which recommended developments should be undertaken having regard to existing resources and any likely expansion thereof.

## Census of Population

2. The most recent Census was taken on 17 April 1966, while the next Census will be taken on 18 April 1971. A government decision has recently been obtained that, in future, Population Censuses will be at quinquennial intervals. It has been found that bench-mark data are needed with this frequency if annual estimates of population, emigration, labour force etc. at national and regional level are to be provided within acceptable levels of accuracy. In fact since 1946 a Census has been held every five years, but the scope has varied substantially. With a total population of approximately three million persons sample censuses will not provide acceptable estimates at the required geographical sub-divisions and all Censuses have been on a 100% basis.

3. Seven Volumes have been published on the 1966 Census, as follows

- I - Population by geographical areas, towns etc.
  - II - Ages and Conjugal Condition
  - III - Industries
  - IV - Occupations
  - V - Industries and Occupations classified by ages and Conjugal Condition
  - VI - Housing and households
  - VII - Education
- } Classified by geographical areas and employment status

Where printing delays occurred, summaries of the results at the national level were issued in the Quarterly Statistical Bulletin.

4. Education was covered for the first time in the 1966 Census. The approach used was to ask (a) the age at which full-time education had ceased and (b) the type of full-time education received, giving the respondent the opportunity to indicate one or more of four categories primary; secondary; vocational or technical; university. Information on those still receiving full-time education was, of course, obtained from the Occupational Analysis. The information sought was as simple as possible and did not cover the number of years in each category or the qualifications held. It is proposed to repeat these questions without alteration in the 1971 Census.

5. In addition to including almost all the questions asked in 1966 for each person, the 1971 Census form will also cover

- usual residence
  - usual residence one year earlier
  - place of birth
  - religion
  - ability to speak Irish
  - date of marriage
  - number of children born alive
  - place of work
- And for each household
- form of tenure
  - rent (for rented dwelling)
  - number of rooms (also asked in 1966)
  - sanitary facilities
  - number of motor cars
  - aggregate area and valuation of agricultural holdings owned by normal residents



6. The population is always taken on a "de facto" basis and persons are recorded in the household in which they were on Census night. To enable the full migration pattern over the preceding year to be derived, however, usual residence is being included.

7. The principal pre-Census field activity is concerned with determining town boundaries for Census purposes. Where there are legal boundaries, suburbs or environs outside these, which form part of the population centre, must be identified. In other cases boundaries have to be drawn. For the first time in the Census work use is being made of aerial photographs and any enumerator whose area covers all or part of a town will be given such a photograph with the Census boundary delineated.

#### Census of Distribution and Retail Sales Index

8. As in 1951 and 1956, a register of retail, wholesale and certain services establishments was compiled by the Enumerators when distributing and collecting the 1966 Census of Population questionnaires. After editing, this was used early in 1967 as a mailing list for the 1966 Distribution Census. For the first time data on sales by commodity groups were sought, for establishments with annual sales over £10,000. Apart from the direct value of this information it enabled more precise definitions to be adopted for classification by type of business. Other information collected for the first time related to selling space, self-service activity, membership of retailer's buying group or wholesaler sponsored voluntary chains, hire purchase sales, advertising and transport payments and numbers of motor vehicles owned. In the analyses principal shopping centres of the main towns are being shown.

9. The monthly retail sales index based on a sample inquiry, was updated using the results of the Census. A new sample was drawn, stratified by size of turnover, description of business and geographical region. Respondents now number 3,000 compared with 1,000 in the previous index. The new index is compiled to base 1968. So far sub-division by commodity groups in the index has been confined to department stores.

10. It is proposed to compile a register of distribution outlets in conjunction with the 1971 Population Census and to take a Census of Distribution in respect of that year. The content of the questionnaire has not yet been determined.

#### Census of Agriculture

11. A full Census of Agriculture is being taken in June 1970. This does not involve a special inquiry as there is an annual June enumeration which, however, in recent years has had a coverage of approximately 60 per cent of the basic enumeration areas, of which there are about 3,000. The main problem arising in the extension to 100 per cent coverage is the availability of suitable enumerators.

12. Unlike most large scale inquiries, the compilation of the results has not yet been transferred to a computer system or to a punched-card tabulator installation. The enumerators record data for each agricultural holding in their enumeration district in the same book. All the particulars for one holding are entered on one line which extends to several pages. Holdings in different size classes are entered in different parts of the book. This permits the derivation of subtotals by size classes without transcription.

13. For analyses dependant on individual records, (e.g. frequency distribution of holdings by livestock number), a stratified sample is selected and the data are transferred to a computer system. Grossing up is by area size group and by geographical region (county). In the most recent analysis of this kind, carried out on the last full Agricultural Census in 1965, a set of standard man-day coefficients was applied to the various livestock and crop categories. These were used to express total activity on each holding in the common unit of man-days, yielding a classification of holdings by size of activity. In addition the man-day profile for a holding was used as a basis for determining the pattern of farming, yielding a classification of holdings by pattern of farming. Similar analyses will be carried out on a sample basis in the 1970 Agricultural Census compilations.

#### Household Budget Survey and Consumer Price Index

14. In August 1969 the full report on the 1965/66 Household Budget Inquiry was published. The Inquiry, relating to urban households, yielded information on average household composition, number of rooms, weekly income by type and a detailed profile of expenditure, classified by

- i) Calendar quarter
- ii) Geographical location
- iii) Town size
- iv) Household tenure
- v) Social group of head of household
- vi) Household size
- vii) Gross household income
- viii) Household composition

With a number of cross-classifications

15. Each household return covered a period of two consecutive weeks, and in most instances participating households completed two returns with an interval of six months between them. In all 4,759 completed household returns were used in the derivation of the results. The sample was

selected in two stages. A stratified sample of towns, with variable sampling fractions for different town sizes, was followed by selection of households within selected towns with appropriate sampling fractions to give each private urban household in the state an equal chance of selection.

16. About two-thirds of the households approached co-operated in the Inquiry. Differential non-response and sampling anomalies were modified by weighting. Returns were post-stratified by household size and social group. Taken with size of town this gave 96 cells for which the weighting pattern was available from the 1961 Census of Population. The standard error of average household expenditure was 1%.

17. A special analysis was made of income redistribution resulting from direct and indirect taxation and transfer payments. The study classified households by income and by household composition.

18. One of the primary reasons for carrying out the Household Budget Survey was to provide an up-to-date weighting pattern for the Consumer Price Index which had remained unchanged for fifteen years. A new series of index numbers base November 1968 = 100 has been introduced using the 1965/66 Household Budget weights, adjusted for price changes up to November 1968.

19. The list of items priced and the outlets from which price quotations are collected was also revised in November 1968. For continuity purposes it was necessary to complete the old and new pricing procedures during that month. The last collection of prices for the old series was completed on 11 November 1968. A gap of fifteen days was allowed between the two pricing operations so that the price collectors could be instructed in the new procedures: to do so before the conclusion of the final price collection under the old system could have caused confusion with resulting lack of comparability with previous quarters. A careful account was taken of any price changes which occurred in the intervening period and appropriate adjustments were made to ensure that complete continuity was maintained.

#### Input - Output

20. In January 1970 the first official input-output publication appeared. It related to the year 1964. Three different levels of aggregation of productive sectors were used, 17 sectors, 33 sectors, and 92 sectors but in the initial preparation economic activities were classified into more than 150 types. For each level the basic transactions table, the matrix of direct input coefficients and the customary matrix inverse were given. Primary input aggregates and Final Demand aggregates are in concordance with the National Accounts totals - procedure which creates difficulties in achieving complete reconciliation between the data used from many additional sources to complete the Transactions Matrix. Similar imports have been incorporated with the output of domestic sectors and are therefore included in the inter-industry quadrant.

21. Previous Input-Output studies were made for the years 1956 and 1960, but because of lack of detailed information, were not considered sufficiently reliable to justify official publication (although they were published in a scientific journal). Apart from the use of more detailed basic information for 1964 and the adoption of more satisfactory methods of compilation, a number of the concepts and definitions involved differ from those used on the previous occasions. Consequently, the economic flows and derived coefficients for 1964 are not, in general, comparable with those for 1956 and 1960.

22. It is proposed to prepare a report for the year 1969 on similar lines to the 1964 Input-Output study. Meanwhile work is proceeding on updating the 1964 Tables using various techniques.

#### National Accounts

23. An analysis of expenditure by public authorities, classified by purpose categories has been carried out within the framework of the National Accounts. Results covering the period 1963/64 to 1968/69 have been published within the past year. The main categories are general services, social and community services, economic services, and public debt, with appropriate sub-divisions. As in the National Accounts, Central Government and Local Authorities are shown separately and in addition a consolidated picture for all public authorities is given. A cross-classification by economic category (e.g. wages and salaries, subsidies, etc.) forms part of the analysis.

24. A series of estimates of gross national product by sector of origin, at constant prices has been compiled to supplement the long-standing series on constituents of expenditure on gross national product at constant prices. Over the period 1958-1968 as a whole the results are in very close agreement (increases of 50.4% and 49.9% respectively) but some individual years show growth rates differing by  $\frac{1}{2}$  - 1½%.

#### Building and Construction

25. An experimental series based on planning permissions has been compiled commencing with January 1968. This involves a combination of data from (a) administrative procedures which yield

numbers, categories and where appropriate, floor area and (b) a special voluntary statistical inquiry relating to value. It is hoped that when available for a sufficiently long time period, the series will prove to be a reliable indicator of impending constructional activity. However, for the present the series is not being published.

26. Three new series connected with the private building sector have been inaugurated. A monthly index of employment, a quarterly series on earnings and a quarterly series on work done. Difficulty is still being experienced in getting sufficient returns in the work done series and no publication plans are being made. The two other series, however, are likely to come through the experimental period successfully.

#### Population Projections

27. A considerable amount of work on population projection has been carried out [see paper on item 14(b)]. The computer programme is being designed with a view to regional as well as national projections.

STATISTICAL ACTIVITIES SINCE THE SIXTH CONFERENCE

I. STRUCTURE AND ORGANIZATION

A. General

1. The Department of Statistics in Jamaica is the Central data collecting agency of the nation. All the important statistical series are either prepared by the department, or from data collected by it.
2. A number of Ministries maintain Statistical Units, in particular those dealing with Health, Housing, Agriculture and Education. The Department of Statistics works closely with these units and usually collaborates and advises on statistical programmes in which they are involved.
3. Appropriate powers are provided under the Statistics Law, under which the department operates for the institution and maintenance of a National Statistical System, for the setting of standards in statistical work, and for the carrying out of all censuses and surveys relating to any aspect of the social and economic life of Jamaica.

B. Staff and Staff Training

4. The department maintains a regular staff of about 192 persons made up as follows:

Professional Staff	21	(including the Director)
Technical Staff	58	
Executive Staff	26	
Field Staff	87	(including 50 full time not on permanent establishment).

Not all of these posts were filled at all times during the four years under revision. Like most other countries Jamaica suffered extensively from the lack of professional statisticians and economists, and at the time of writing seven posts out of ten in the department at the recruitment level for professionals were not being operated.

5. During the review period however, two new streams of officers were introduced.

- (a) Statistical Officers who were given inservice training courses in elementary economics and statistical methods.
- (b) Statistical Enumerators and Supervisors who were specially selected, trained and permanently appointed to do field work.

In addition to the specialised in-service courses in elementary Statistics and economics, graduate degree courses in economics with statistics as the special subject tenable at the University of the West Indies were offered in increasing numbers, by the Government of Jamaica.

- 6. Finally a number of overseas training courses were utilized for specialised training in demography and population census procedures.

### C. Structural Changes

- 7. During the review period a permanent Census Division was added to the Central Statistical Agency of Jamaica. This was an important addition since it enabled the department to attract personnel from outside for census work and to reduce the dependence of censuses on its already limited resources of expertise and experience.
- 8. During this period a permanent survey taking capacity was also introduced by the creation of a special unit organized to carry out Household Surveys.
- 9. While computer facilities have regretablely not been allocated entirely to the department, access has been established to the Central Data Processing Agency of Government, and a number of projects notably Trade Statistics, Labour Force Statistics and the Census of Agriculture have been put on the system.
- 10. Jamaica participated in successive conferences of Caribbean Commonwealth Government Statisticians which are held annually in different islands of the Caribbean. Four conferences have so far been held, the fourth of which was hosted by Jamaica.

This fourth conference recommended to the Heads of Government of Commonwealth Caribbean Countries that a permanent Statistics Coordinating and Advisory Committee (S.C.O.A.C.) be set up for the region, to deal with common statistical problems.

The proposal was accepted in March of this year. S.C.O.A.C. will operate under the administrative umbrella of the Commonwealth Caribbean Regional Secretariat, and will determine the scope and quality of its operations, based on the expressed statistical needs of the co-operating Governments.

While S.C.O.A.C. will meet annually (or more frequently if necessary) the larger Conference will now meet only every two or three years.

## II. CENSUS OF POPULATION

### A. Census of Population 1960.

11. Two volumes of reports concerning information collected in this census were published during the review period. These are :-

- (a) Volume II Part A - The Administrative Report.
- (b) Volume II Part A - Book 2 - Fertility
- (c) Volume II Part D - Classifiable Labour Force and Wage Earners.

This brings to seventeen the number of reports published on this census. It is unlikely that any further general reports will be prepared although research may still be organised with the use of the data.

### B. Census of Population 1970.

12. At the time of writing the field enumeration of this census is still in progress. As in the case of the 1960 census the Commonwealth Caribbean Governments have agreed that the 1970 census should be carried out as a regional operation.

Consequently a central committee financed by the Governments of the Area and consisting of the Census Officers of each country was set up under the chairmanship of the Professor of Demography at the University of the West Indies, to plan and advise on all matters pertaining to the carrying out of the census programme.

13. The committee organized the use of a common questionnaire and essentially a common set of concepts and procedures. The technique of "mark-sensing" which was used successfully in Jamaica in 1960 was adopted for the whole region. Minor differences in the questionnaire related only to the names of major and minor administrative divisions and to religions. All questions were located at the same position on the schedule.

It is hoped that this approach will ensure a high degree of comparability throughout the region, and thus save on administrative and processing costs.

Plans to centralise processing, tabulations and printing have been completed, and Canadian Technical Assistance has generously provided an I.B.M. 360 Model 30 Computer, to be located at the University of the West Indies, Mona, Jamaica, as the base of the central facilities.

14. Eight areas of information are catered for in the 1970 population census. These are :-

- (a) Demographic Characteristics (all persons)

- (c) Education (all persons)
- (d) Vocational Training (persons 10 years and over)
- (e) Economic Activity (persons 10 years and over)
- (f) Fertility (female 14 years and over)
- (g) Housing (head of household only)
- (h) Income from employment (persons 10 years and over)

The tabulation plan will essentially be determined by this structural lay-out.

### III - CENSUS OF AGRICULTURE

#### A. Background

15. In response to the F.A.O. request for member countries to participate in the World Agriculture Census Programme, Jamaica decided to carry out a census one year prior to 1970.

From conferences beginning in 1965, decisions concerning the scope of the census and method of obtaining gravely needed data were evolved.

It was decided -

- (a) To confine the Census of Agriculture largely to data on structural characteristics e.g. on land tenure and utilization, farm population, holders mean of livelihood, and number of years in farming, holder's purpose of farming (for sale or otherwise) and main sources of farm income, type of farm management, farm equipment, cropping patterns, irrigation, fertilizer practices and communication patterns.
- (b) To carry out a number of sample surveys soon after the census based on bench mark data derived from the census with the accent on current agricultural statistics, e.g. crop acreage, number of trees and production, farm costs and prices, and livestock numbers.
- (c) Subsequently to launch a number of diagnostic studies in areas like the effects of types of tenure on land use, farm household expenditure, and the sociological and demographic implications of improving farming techniques in Jamaica.

Technical Assistance was provided by the F.A.O. on a request from the Government of Jamaica, and an expert was assigned to assist in planning for the project and in training national personnel accordingly.

16. The final shape of the census project was based largely on the results of a pilot census carried out by the expert in the latter

part of 1967. Definitions and concepts were derived so that comparisons could be obtained with results of previous work. Thus :-

- (a) A farm was defined as all that area operated for agricultural purposes within a parish under a single management (the parish being the major administrative division of Jamaica).
- (b) A Second concept was however added, where the holding embraced all land operated for agricultural purposes under a single management wherever it was located.

Linkage by means of numeric codes, and two sets of tabulations are planned.

#### Progress

17. The census was carried out during the period 1st December 1968 and 31st August 1969. Reference date for the main questions was 1st December 1968.

All the material was put on punch cards which have now been read into the Central Computer System. So far several edit runs have been carried out and corrections are being made to the data. The first set of tabulations are expected to be available in August of 1970, and two reports concerning land use and land tenure are due for release within one year from the date when the tabulations are received.

18. In the meantime a preliminary report based on the listing records and showing the number and acreage of farms by size group distribution and by major geographical divisions has been prepared for general release in June of 1970.

#### IV CENSUS OF HOUSING

19. No Census of Housing has been planned or was carried out since 1966. However a number of questions was included in the population census questionnaire for 1970. These relate to

- (a) Type of dwelling unit
- (b) Type of Tenure
- (c) Water supply
- (d) Toilet facilities
- (e) Age of dwelling unit
- (f) Material of Outer walls
- (g) Number of rooms
- (h) Lighting and cooking facilities



20. While these do not run the whole gamut of questions appropriate to a census of housing, they will provide enough information for a comprehensive picture of the conditions of housing under which the population lives, and for relevant policy decisions to be taken.

#### V. OTHER CENSUSES

21. No other censuses were planned or carried out during the review period.

#### VI. LABOUR FORCE SURVEY 1966

##### A. Description

22. Early in 1966, the Government of Jamaica took a decision that a labour force survey should be carried out in that area. At the time, plans to set up a permanent survey organization were being organized but the government felt that a special "crash" project should be implemented to carry out the survey immediately while the programme was being developed.
23. Accordingly, the survey was planned having as its main objective a comprehensive study of the employment and unemployment situation of those members of the population who are 14 or 15 years of age and over.
24. The concepts and definitions relating to the Labour Force, Employment, and Unemployment were based on those adopted at the Eighth and Ninth International Conference of Labour Statisticians.

##### B. Results

25. Unfortunately the results of that Survey were not as useful as had been planned. While the area, age, and sex distribution of the population came out fairly close to what was expected, the size of the labour force and participation rates for both male and female were all somewhat low. Further the proportion of the labour force that was unemployed seemed so high that it was decided to withhold publication of the results. (Subsequent Surveys have shown that the unemployment rate demonstrated by the 1966 Survey was well within the realm of credibility).
26. The experience gained on this project was essentially one that reinforced the original thinking of the department. This is that labour force surveys are very difficult to plan and execute successfully and are best undertaken by a permanent

organization, carefully trained, supervised and developed over time

#### VII. CONTINUOUS SOCIAL AND DEMOGRAPHIC SURVEY

27. The Jamaican continuing series of household surveys came into operation in the latter part of 1967. Previously, a number of ad hoc surveys had been carried out with varying degrees of success. Those surveys designed to present data on basic structure, such as surveys of household expenditure, have proved very valuable to government planners, other government ministries and agencies, as well as to business and academic interests. In other surveys where the emphasis has been on trend movements, such as surveys of the labour force, the results have not been as satisfactory. Variations in sampling methods, form design, survey organization and field enumeration techniques have raised doubts as to the reliability of estimates derived from these surveys. Further the less to the survey taking organization of trained, experienced field staff at the end of each ad hoc survey increases significantly the financial cost as well as the administrative and technical burden of each new survey.
28. The permanent survey taking organization has been established within the Department of Statistics for the purpose of developing the capacity to undertake a wide range of social and demographic surveys and to make information available on a continuing short-term basis. This Unit, called the Continuous Social and Demographic Survey Unit (CSDS), "aims at providing information to bridge the data gap that now exists in social and demographic statistics, and is conceived in the concept of scarce resources". It posits the careful development of a permanent survey taking capacity. Finally, and most important, it is flexible enough to undertake eventually the demanding task of carrying out a wide range of enquiries, including surveys of the labour force, housing conditions, nutrition, households' economic situation, education and cultural levels, fertility, natality, and other special enquiries of a similar character. The topics enumerated above do not of course exhaust the areas which may be investigated by the CSDS. In addition, the sample has been designed with flexibility such as to permit more or less intensive types and degrees of investigation as the organization develops and the need for more specialized information emerges.

B. Sample Design

29. The sample for the C.S.D.S. is based on a master frame designed to permit selection of samples for any purpose where a sample of dwellings, or persons associated with dwellings, is required. The design employs a two-stage sampling plan the first stage representing selection on a geographic basis; the second, selection from a list of dwellings. The geographic frame is comprised of enumeration districts, the household or dwelling from from a listing of all dwellings in the selected enumeration districts. In compiling the frame for the area sample, enumeration districts are grouped together to comprise Sampling Regions. There are fourteen parishes and fifty three constituencies in Jamaica, and constituencies are created within parishes such that the boundaries fall within or coincide with the boundaries of a parish.
30. For statistical purposes, the parish and constituency boundaries are recognized. The statistical units of division, the enumeration districts, are sub-divisions of parishes and, in general, of constituencies. Sampling regions, already referred to as comprising a number of whole enumeration districts, are created within parishes and constituencies. Enumeration districts vary in size. Thus, in order to control variation in size within each sampling region, the sample of enumeration districts is selected with probability proportionate to size, the probability of selection being proportionate to the number of dwellings within. After selection of areas, the sub-sample of dwellings is made such that the sample is self-weighting. The selection of enumeration districts is carried out independently within each sampling region. In each sample, a given number of enumeration districts is selected. The number of enumeration districts having been decided on, the expected number of sample dwelling per selected enumeration district is determined by the formula:-

$$d = \frac{1}{R} \times \frac{N}{X}$$

where  $d$  = the density, that is, the expected number of dwellings;

$\frac{1}{R}$  = the overall sampling ratio;

$N$  = the total number of dwelling in the enumeration district; and

$X$  = the number of enumeration districts to be selected in each sampling region.

The sample of dwellings is selected by applying the region sampling ratio within the selected enumeration district by the method of systematic sampling. The size of the first or second stage sample is thus controlled by  $R$  and  $X$ .

C. Projects undertaken by the Unit31. Listing

In order to obtain the frame for the second stage, a sample listing of all households in the selected enumeration districts was carried out. Information collected at the listing referred to:-

- (a) Number of dwellings;
- (b) State of occupancy of dwellings, that is, whether vacant or occupied;
- (c) Type of dwelling, that is, whether private or non-private. If non-Private, by institutional type;
- (d) Address of dwelling;
- (e) Diagrammatic and written description of dwelling;
- (f) Name of head of household;
- (g) Number of persons in household, by sex;
- (h) Number of persons 14 years and over, by sex.

32. Field Enumeration

Three types of surveys were undertaken during the period under review. These were survey of the labour force, of housing conditions and of worker attitudes.

Labour Force Survey

33. The sample for the labour force survey represents a one percent sample of private dwellings selected from the sampled enumeration districts. The final selection represents dwellings in three of each six listed enumeration districts within the sampling region. The chosen sample is divided into three sub-samples, by random selection. The period of enumeration allocated to each sub-sample is two weeks, the first or survey week for intensive enumeration, the second devoted to call-backs. The labour force data generally relate to the week, and the period of reference is the week previous to Survey Week. The results of the three sub-samples are compounded to provide the final estimates.
34. Mark sensing questionnaires are used in the field and these later read by an IBM 1232 Card Reader. The punched cards are then passed to the Central Data Processing Unit for tabulation on an IBM 360 Model 20 Computer. The main topics included in the labour force survey are:

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- (a) Demographic Characteristics
- (b) Education and Training
- (c) Economic Activity, week's and year's
- (d) Occupational classification
- (e) Industrial classification
- (f) Employment Status
- (g) Income.

#### Survey of Housing Conditions

35. Two surveys of housing conditions have been conducted by the Unit. These surveys are, in fact, partial censuses in that they cover all of a defined area. Thus the sample design described above is not applied to them. In these surveys, conventional type questionnaires are used. The results are then coded and punched, and then tabulated on an IBM 420 Tabulator. The topics covered in these surveys are:

- (a) Demographic and social characteristics of the head of the household.
- (b) Composition of the Household
- (c) Type of dwelling, age and tenure
- (d) Structural characteristics of dwelling
- (e) Facilities - lighting, cooking water, bathroom facilities
- (f) Financing, present and potential.

#### Survey of Worker Attitudes

36. An enquiry into attitudes of workers in selected manufacturing and service industries to conditions of work has been carried out by the Unit at the request of the Ministry of Labour and National Insurance. Selected firms were requested to supply a register of workers from which a sample was randomly selected. The Management of these firms also supplied the home addresses of the workers, The selected persons were interviewed at their homes or in other places, selected by them, outside of their working environment. The questionnaire used in this enquiry had the following main heading.

- Section A. - Identification
- Section B - Background Information
- Section C - Conditions of Employment
- Section D - Relationship with Fellow Workers
- Section E - Job Interest
- Section F - Job Security
- Section G - Productivity Interest
- Section H - Skill Development
- Section I - Wage Interest
- Section J - Trade Union Affiliation

Section K	-	Sense of Participation
Section L	-	Management Attitudes and Relations
Section M	-	Self Advancement
Section N	-	Family Interest
Section O	-	Self Expression
Section P	-	Absenteeism
Section Q	-	General Comments
Section R	-	Interviewer's Comments

Tabulation of the results are yet incomplete.

D. Future Plans

37. The Unit will not be undertaking any further field surveys until late this year. The public reaction to the 1970 Population Census has been such as to render it impolitic to attempt another survey until the general mood which now prevails has changed.
38. Accordingly, the following is the list of surveys which will be undertaken by the Unit over the period 1970-1973.
- (a) Surveys of the labour force, subject to decision concerning the policy to be followed in respect of publishing the results.
  - (b) Survey of Household Expenditure
  - (c) Survey of Health Conditions
  - (d) Surveys of Housing Conditions
  - (e) Nutrition Surveys
  - (f) In depth studies of the Unemployed
  - (g) Other enquiries as may be demanded by government or other interests.
39. The Unit will also be engaged in updating the sampling frame, making use of the information obtained from the 1970 Population Census Visitation Record. Lists of private dwelling distinguishing apartment buildings, and non-private dwelling will have to be compiled and updated by the Unit. The sample design will also be examined with view to assessing its suitability, in the light of experience gained. The division into small sampling regions may have to be reviewed in the context of the difficulties encountered at the tabulation stage, as well as the effect of errors due to small samples.

### VIII. SURVEY OF INDUSTRIAL COSTS AND OUTPUT

#### A. Background

40. The Costs and Output Surveys were conceived as a result of a critical examination of the existing sources of data for the purposes of calculating the estimates of National Income and Product. There was need to investigate new sources of data and to improve on existing ones, particularly in respect of obtaining reliable figures of inputs and outputs at a fine level of detail. Much of the information previously utilized was based on Income Tax Records which were either incomplete or were not suitable for national accounting purposes.
41. The last major survey of industry was carried out in 1960 and new benchmarks were required for many of the statistical series that used physical volume and output value as their main ingredients.
- Finally a new five year development plan was being procured based on a revised econometric model of the Jamaica economy. There was therefore need for detailed information on industrial input and output to be fed into the model.
42. A United Nations Operational Expert who had been secured to review the basis and other relevant criteria of the Constant Price estimate of National Income, was put in charge of the project.

#### B. Field Work

43. A listing survey designed to supplement existing records of establishments which together would then form the Sampling frame for the detailed Survey was put in the field in January of 1966. All towns with a population of over 8,000 persons (including the capital city of Kingston) were completely enumerated. In addition 6 other smaller towns randomly selected and 5% of the rest of the country (approximately 150 census enumeration districts) were covered. It was expected that with the various administrative lists from the Department of Statistics, the National Insurance Agency, the Industrial Development Agency, and the Registrar General, the listing would produce the necessary additional firms to form a suitable frame.
44. The Sectors covered were:
- (a) Large Agricultural Establishments (i.e. farms of 100 acres and over)
  - (b) Mining, Quarrying and Refining

50. The other survey is similar to the first in general design and structure. It related solely to non-corporate establishments and was carried out by the unit set up for the industrial cost and output survey project.

Tables on this Sector have recently been completed and are being prepared for publication.

#### X. A SURVEY OF TRANSPORT COSTS

51. Conceived as a means of securing data to improve calculations of the net output of the transportation sector, a survey of public and personal transport costs was carried out.

Forms were sent to a number of establishments and persons (mainly government servants) selected purposively. Very little follow-up was exercised and the returns were thus expectedly lower than was planned.

#### XI. NATIONAL INCOME AND PRODUCT STATISTICS

52. Over the past few years Jamaica has succeeded in preparing annually estimates of the main components of National Income and Product for presentation to the Legislature, simultaneously with the presentation of the Budget. This arrangement greatly assists the annual review of the progress of the total economy.

However, the lag in the preparation of the detailed final current and constant price estimates is normally a year; thus in June 1970 the Department published the final estimates for 1968 and the preliminary data for 1969.

53. Present indications are that a great deal of attention will be paid in the immediate future to the following:
- (a) Reviewing the estimation techniques and the structure of presentation of accounts and tables so as to bring out more appropriately the changing structure of the Jamaican economy.
  - (b) Re-working many of the component estimates using new benchmark and other data.
  - (c) Revising deflators used in the Constant Price series.
  - (d) Starting basic work on the preparation of quarterly estimates.



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## XII. TRADE STATISTICS

54. Only two minor developments to have taken place in Trade Statistics over the past few years-
- (a) A draft of a new Tariff (B.T.N.) and Statistical (S.I.T.C. Revised) classification was prepared and is under study. Import and export entries are to be designed so that trade transactions can be tabulated both on the B.T.N. basis for tariff and fiscal policy, and on the S.I.T.C. basis for economic analysis.
  - (b) The department has commenced a programme of gradual computerization of trade statistics.  
Both projects have some way yet to go before full implementation is possible.

## XIII. INDUSTRIAL PRODUCTION STATISTICS

55. The collection of quarterly data on industrial production in selected industries (mainly those subject to excise taxes or to close administrative supervision) continued without significant change.
- Development of this area of statistics awaits the reaction of the Parliament to a proposal for establishing a Current Survey of Establishments.

## XIV. EMPLOYMENT STATISTICS

56. The compilation of statistics of employment, wages, and hours worked was suspended in 1968 through lack of Staff. Resuscitation and development of these series depend on Government reaction to a proposal for establishing the Current Survey of Establishments mentioned above.

## XV. VITAL STATISTICS

57. Statistical Series relating to vital events in Jamaica have been prepared by the Registrar General for many years. Some data (e.g. births, deaths, infant mortality) are available early, although final comprehensive reports are four to five years late!
58. The Cabinet recently took a decision that this work should be transferred to this Statistical Department. Implementation of this proposal awaits the working out of appropriate transfer procedures and the provision of the necessary resources within the department.

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## XVI MIGRATION STATISTICS

59. It has not yet been possible to organize workable programme of operations in migration statistics although this is a very important area of work. Data on external movers are collected from the various foreign embassies and are reported on quarterly.
- No details in demographic and occupational characteristics of migrant are available.
60. Jamaica operates and Aliens' Work Permit Law, and while the number of applicants are usually known, no further details are collected.
61. No work on the measurement of current internal migration has been attempted.

## XVII. FINANCIAL STATISTICS

62. The department continued to maintain its series of financial statistics during the reviewed period. In addition to a detailed reporting on the operation of the monetary authority and the banking system, a significant amount of information is published quarterly on:
- (a) Post Office Banking
  - (b) Insurance Companies (Life and General)
  - (c) Building Societies
  - (d) Credit Unions
  - (e) Hire Purchase Credit
  - (f) Agricultural Credit
  - (g) Government Revenue and Expenditure
  - (h) Interest Rates and Credit
  - (i) Money Supply
63. Future expansion is indicated along the lines of linking this data with flow-of-funds studies that are currently being developed.

## XVIII BUILDING AND CONSTRUCTION STATISTICS

64. Since 1966, two reports have been completed and published covering the period 1961 through 1968 on building and construction in selected areas.

The data are collected from the Local Government Agencies and the Ministry of Housing and relate to both government and private building activity in areas for which regulatory provisions are exercised under building and zoning laws.

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These are limited essentially to urban and special development areas.

The information relates particularly to the number and area (in square feet) of new buildings, classified by type unit cost of different types of building, materials used, etc.

The series is a new one and has found ready acceptance both in the Government and Private Sectors.

#### XIX. ADMINISTRATIVE STATISTICS

65. Over the past eighteen months some effort has been made to establish closer contacts with those government ministries departments and local government agencies which have demonstrated an interest in providing for the publishing of statistical data which can easily be derived from their normal administrative procedures.

The activity is part of an exercise to begin the preparation of a comprehensive Yearbook of Jamaica which will include a great deal more information than is recently published especially on Local Government activities.

#### XX. CONSUMER PRICE INDICES

66. In August of 1968 a new series of monthly Consumer Price Indices were released to the public for the first time. The series were based on prices in effect in January of 1967 and replaced the old Retail Price Indices which were based on the prices of December 1955.
67. Weights for the new indices were derived from household budget surveys carried out between 1963 and 1965. However, signs of strain and change are already appearing in the indices and another household budget survey which was originally scheduled to begin in summer of this year is planned for 1971.

#### XXI. INDICES OF EXTERNAL TRADE.

68. In June 1969, a new series of indices of external trade was released. The base year was updated to 1965 compared to the old series for which the base year was 1964.

Separate indices are for the first time calculated for the main commodity groups based on the classification of commodities as set out in the S.I.T.C. (Unrevised), and weighted according to proportion of value in 1965.

XXII. RESEARCH

69. The Jamaican Department of Statistics does not now have a section devoted to specialised research. However during the review period, some demographic research was carried out by an expert provided under the U.N. Technical Assistance Scheme for one year during 1967.

Three reports were prepared by the experts:

- (a) "Fertility in Jamaica" (published)
- (b) "Internal Migration in Jamaica" (published)
- (c) "The Population of Jamaica 1844-1964" (being edited for publication)

Plans are under way however to expand this area of work as reorganization proceeds.

XXIII . OTHER WORK

70. During the past four years various attempts have been made to formalise the operational procedures of some aspects of statistical work in the department.

In addition to the manuals prepared for the C.S.D.S. programme (numbering 12 so far), the Agricultural Census Manuals, and the Population Census Manuals, books of instruction have been prepared for statistical clerks in the Trade Statistics Unit, for the collection and calculation of the Consumer Price Indices, and to a lesser extent for National Income calculations.

This has greatly enhanced the capacity of junior staff and field staff alike through teaching seminars, and more importantly has given to them a greater sense of appreciation of the work they do.

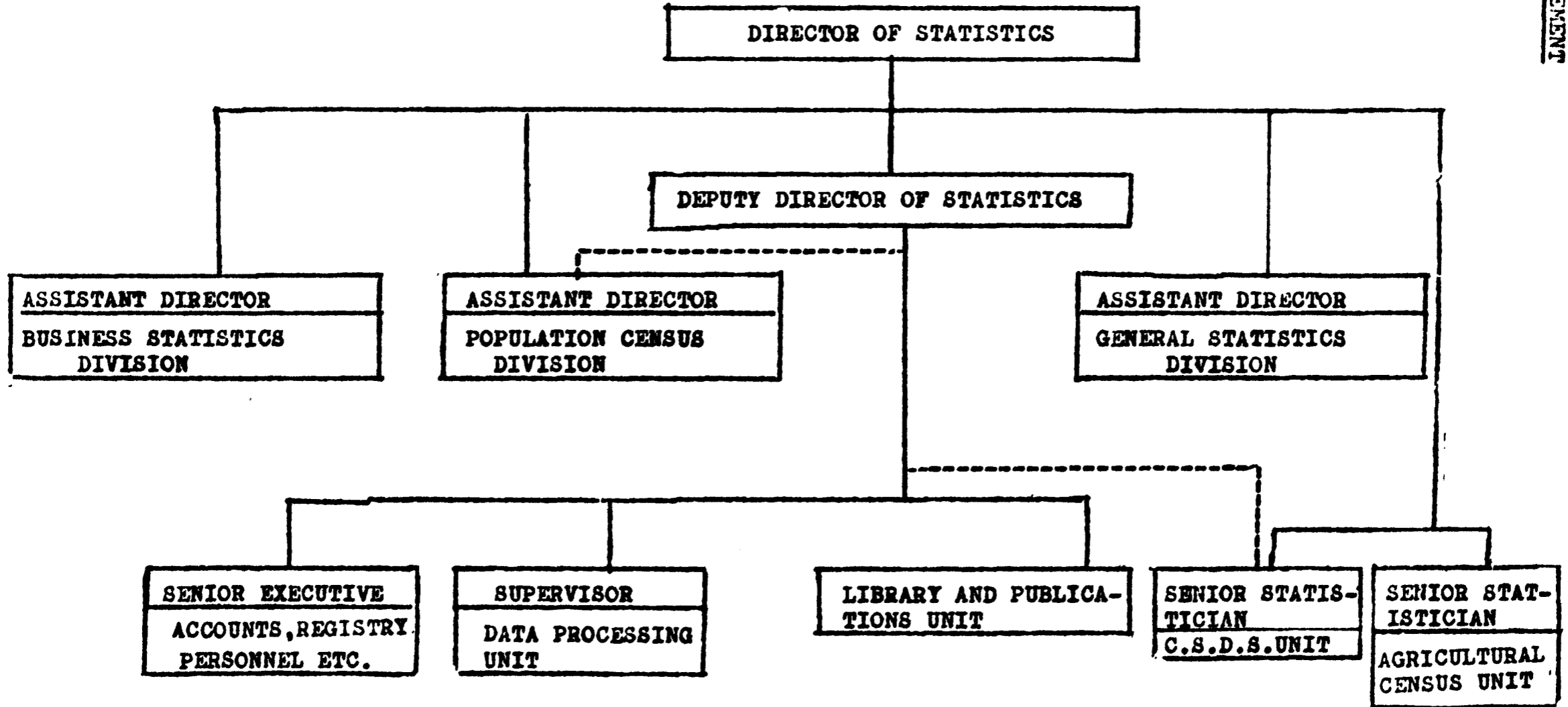
71. New classifications of industry and occupation have been prepared for use in the Jamaican Statistical Office.

Both are based on the latest international systems, (I.L.O., I.S.I.C.,) although a serious attempt has been made to re-orientiate the classifications to Jamaican requirements. These two coding schemes have been used in the recent Labour Force and Housing Surveys, but are now being reviewed. It is hoped to secure Cabinet directive in the near future for other Ministries and departments to use these codes and no other as a matter of course.

XXIV. FUTURE PLANS

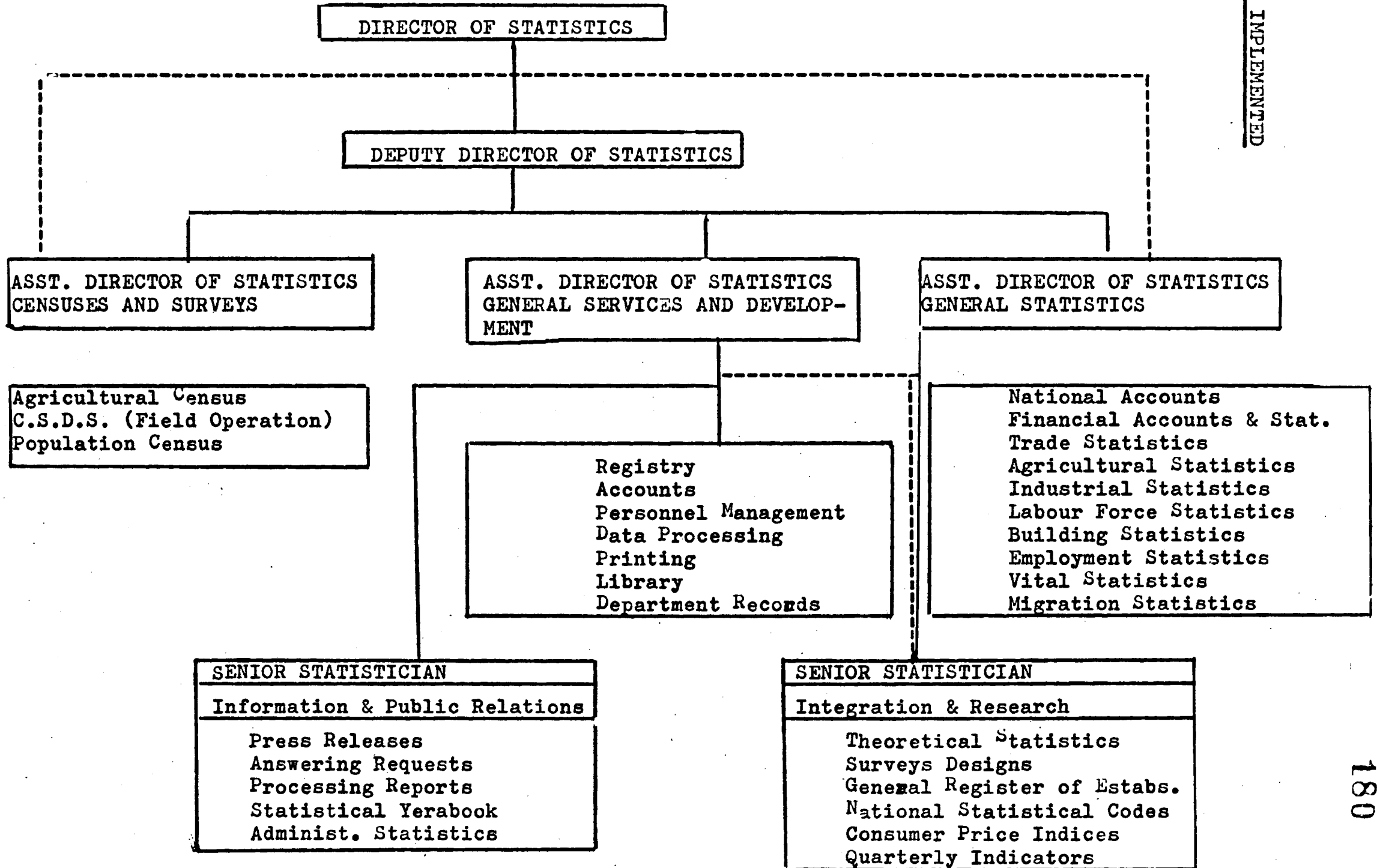
72. It is expected during the next four years to stabilise and expand the Census Division since cycles of censuses are planned as follows:
- (a) Business (Industry and Commerce) in Years ending in "3"
  - (b) Agriculture in years ending in "7"
  - (c) Population and Housing in Years ending in "0"
73. New divisions that have to be developed will be an "Information and Public Relations" Division and a Planning and Development Division.
- The former will deal with all requests for information, press releases, preparation of all reports, the development of the Yearbook and public relations, while the latter will deal with forward planning for programmes and projects, training and liaison with the Central Planning Agency.
74. The Statistical Office will attempt to establish a Central Register of all business establishments, with the emphasis on use for the Current Business Survey which it is hoped will be established in the near future.
75. All of these future developments depend on the extent to which the Statistical Office convinces the Parliament that adequate resources are necessary to develop and implement them. A great deal also depends on the degree to which the organizational structure can be revised and streamlined (See Appendices I - III).
- This is perhaps the most important goal for the next four years.

DEPARTMENT OF STATISTICS - JAMAICA

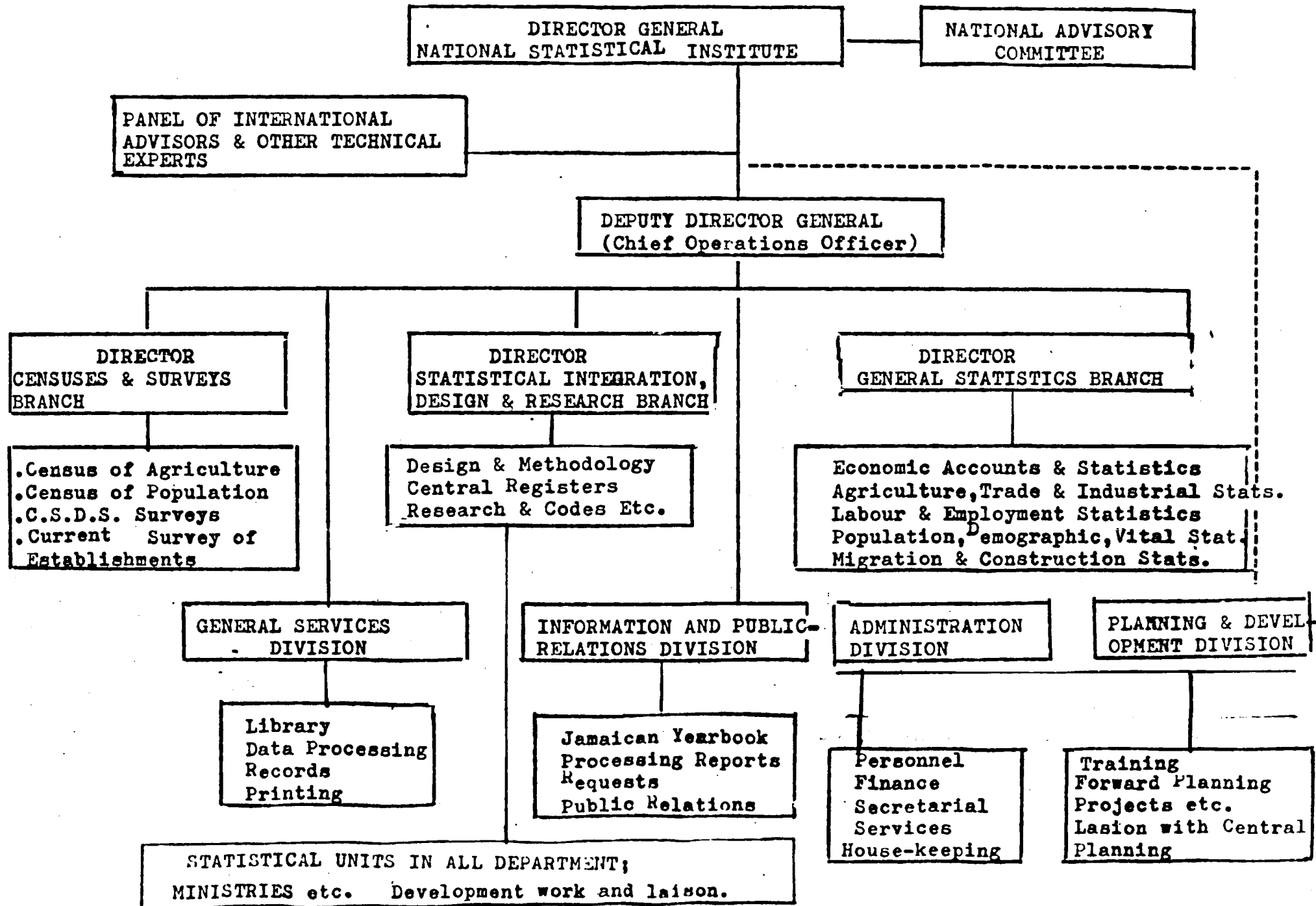


DEPARTMENT OF STATISTICS - JAMAICA

INDEX II  
BE SHORTLY IMPLEMENTED



THE NATIONAL STATISTICAL SYSTEM





REVIEW OF STATISTICAL ACTIVITIES SINCE THE  
SIXTH CONFERENCE

1982

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Structure and Organization

1. As far as structure and organization are concerned there have been two significant changes during the last few years. The first of these relates to field data collection activity. Until 1966 agricultural survey work was centered in a sub-office maintained about a hundred miles from the capital. In that year, however, the role and functions of this office were transferred to headquarters and a beginning was made to set up a new data collection service. As a result, there is now a statistical office in every provincial headquarters responsible for all data collection activities in the province. The responsibilities of the provincial offices do not however extend beyond data collection and the surveys are devised, controlled and processed centrally at headquarters.

2. Another organizational change was the setting up of a data processing unit with its own manager. He is responsible for all advice and executive functions relating to data processing. The latter include control of a key punch installation, liaison with the Computer Division of the Government (which serves all Government Ministries) and supervision of computer programmers. It has become apparent that because of the heavy load on the government computer and because a good many statistical exercises do not really require a computer a small conventional data processing section would make an important contribution to efficiency in the data processing field. This would supplement the computer facilities available.

Staff and Training

3. Although almost all of the professional establishment is full, the recruitment position for professional staff remains difficult and some non-nationals continue to be required. However, domestic training facilities for professional staff have now been established in conjunction with the University of Nairobi. A notable development affecting professional statisticians was the setting up in 1968 of a scheme of service for economists, "economists" being defined to include statisticians, demographers, market research specialists and economists. Under this scheme specific terms of service for those affected are laid down. Compared with those of other similar personnel in Government, these are somewhat better and there is the additional advantage that all members of the scheme are eligible for appointment to all economic/statistical posts in the civil service.

4. Training facilities are also available for middle and lower level statistical staff at a training centre operated by the United Nations and located in Tanzania.

#### Statistical Development

5. The last few years have been a period of rapid growth in statistical work and expansion as well as consolidation continues. Development of work has been guided, in the main, by requirements of data for planning purposes, improvement of product accounts, the need to secure greater knowledge of the peasant sector and the importance of developing a more comprehensive picture of employment.

6. Before considering specifically the major fields of activity in which development has taken place, mention should be made of the register of firms which has been built up. Of course, a register was maintained for a long time. However, it was a cumbersome card index and had become out of date. It was therefore decided in 1967 to re-examine it thoroughly for up-dating, expansion and improvement and also to computerize it. Following completion of this major undertaking, a functioning computerized register of all enterprises in the modern sector (i.e., including small scale rural activities) is now available and includes, for each establishment, name and address, location, economic activity, legal status and employment. Efforts are being made to link this computer file with the computer records of the National Social Security Fund. Currently, the file has about 25,000 names and addresses. It is hoped to publish the register.

#### (i) National Accounts

A paper prepared under item 10 (a) of the agenda shows in some detail the work undertaken in this field and reference can be made to that paper.

#### (ii) Input/Output Analysis

Work has been initiated on an input/output table of the economy for 1967. The exercise grew out of a large amount of work which had already been completed on end-uses of imports. It is expected that an input/output table will be available next year. Apart from its other uses, it will also serve as a check on the consistency of existing production accounts. In fact, the need for some amendments to these is already apparent from work done on the input/output exercise.

An exercise on domestic use of production has just been initiated.

(iii) Household Budget Survey

Until last year, there was a gap of several years since any significant work was undertaken in this field. A new round of survey was therefore initiated, first to cover the main towns and, subsequently, the rural areas. Enumeration in the main towns has been completed and the first phase of work in the rural areas is proceeding. Apart from enabling the cost of living data to be revised and new consumer demand projections made, the surveys are also intended to contribute to the further development of national accounts in the consumption and income distribution fields. In addition to detailed income and expenditure accounts, the information gathered includes data on demographic factors, the availability of various services and housing as well.

(iv) Financial Statistics

Economic and financial analysis of Central Government accounts had been undertaken for many years but no such work was done on Local Authority accounts. This gap has now been closed and it is intended in future to undertake this analysis regularly for Local Authorities as well.

(v) Agricultural Statistics

Although agricultural work absorbs the bulk of statistical funds, it remains perhaps the weakest area of statistical efforts because the requirements of even rudimentary coverage are enormous. However, significant advances have been made during the last three or four years. A basic agricultural statistics sample survey now extends to all arable areas and is an annual exercise. This level of frequency has created problems on the processing side and a backlog of data has built up. Added to the results of the established annual census of large scale farms, the data obtained in the sample survey should enable a fairly complete annual picture of agriculture to be built up.

An interesting innovation for Kenya was the start two years ago of aerial surveys of livestock in the arid areas. By the end of the year, all but a small part of the pastoral areas in the country will have been surveyed in this manner.

A serious gap in agricultural statistics is the field measurement of crop production - the survey mentioned above does not include estimation

of production. As far as marketed crops are concerned fairly good data are available from the statutory marketing bodies which handle most crops. But very little is known about subsistence consumption of the major food crops. Information from the consumption end will be obtained from the Rural Household Budget surveys. But it is felt that estimation from the production end is also desirable, at least for the basic food crops. But because of lack of the manpower and financial resources required to do such work systematically, it has not so far been possible to initiate crop production surveys.

Apart from the collection of basic agricultural statistics, farm economic surveys are also a part of the responsibilities of the Statistics Division. For several years the bulk of the resources for work were concentrated in a study of land settlement schemes. Since 1967, effort has been switched to a more general whole farm sample survey with emphasis on production details of particular enterprises.

A bi-annual census of sugar farms was initiated two years ago. This arose out of the need to make reliable projections of sugarcane deliveries up to two years ahead to the sugar factories which include a large element of public investment.

The data collection work for agricultural statistics constitutes the major responsibility of the data collection unit mentioned above. However, the extension of agricultural surveys and other new responsibilities has placed considerable strain on the supervisory and transport resources of this unit.

#### (vi) Population

A population census of Kenya was undertaken in August last year. It is intended to publish the first volume of basic data before the end of the year. Further analysis of census data will continue to occupy for some time the resources available for demographic work. However, it is hoped, if resources can be found, to initiate a more continuous programme of demographic work which will incorporate sample surveys of fertility and other demographic characteristics, checks on vital registration as well as on family planning.

#### (viii) Distribution and Services

Major surveys to cover each of these sectors were undertaken in 1966. More limited ones were repeated in 1969 (for the reference year 1968). Some rudimentary information was also obtained by

## 2 - Kenya

sample survey for 1967 and 1969 of rural distribution and services enterprises (as part of a survey the major objective of which was the gathering of employment data).

New aspects of survey work in the distribution sector have been suggested by the requirements of further development of national accounts, particularly of margins on capital goods.

(viii) Industrial Production

A census of industrial production of all firms employing five or more persons was carried out for 1967. The previous census had been done in 1963. Since then, between intercensal years, annual surveys of the larger firms have become a regular exercise. These larger firms account for about eighty per cent of all industrial production. A directory of manufacturers is being prepared on the basis of information gathered in industrial surveys.

A completely revised quantity index of manufacturing production has just been completed.

(ix) Tourism

This sector is one of the fastest growing in the Kenya economy and is now a major source of foreign exchange. Over the last few years, a growing amount of statistical resources has been invested in tourism. Hotel occupancy statistics are obtained monthly. Alterations have been made and more are proposed to the collection of migration data with a view to improving information on tourism. A sample survey of tourists has been in operation for about three years at the major airport of the country. This has recently undergone a complete review and it is also hoped to extend it to some of the border points with neighbouring countries. More general information on tourism is also obtained from the surveys such as those on transport, services, etc.

(x) Transport

Three somewhat limited and ad hoc road transport surveys have been undertaken in the last three years, mainly with a view to obtaining information for national accounts purposes. However, it is felt that more serious studies of the transport sector are required. As a beginning, a complete computer master file of all vehicles registered

in the country is now reaching the final stages. Once this has been completed, additional information will be added to it on vehicles licensed for freight and passenger transport. This will enable production of data to show all licensed capacity for freight and passengers on each route.

(xi) Employment

An annual survey of employment in the "modern sector" has been undertaken for many years. However, in order to complete the employment picture for the country as a whole, it has been necessary to undertake surveys outside the modern sector. For peasant agriculture, employment data have been obtained as part of the basic agricultural statistics survey. For rural and non-agricultural activities additional sample surveys have been carried out. As a result, there is now available a fairly complete picture of the employment situation in the country. However, further work is necessary to refine it and to determine the significance of such factors as seasonality, multiple occupations, etc.

(xii) Manpower

The Statistics Division has had no direct responsibilities in this field in the past. However, it has now been asked to undertake the next manpower survey - two earlier ones were carried out directly by the planners. This will be a major exercise which will require additional resources of professional and other manpower.

(xiii) Social Statistics

This is another area in which significant gaps are apparent. The only regular series is on education. This is now quite comprehensive and data are derived from an annual census of all educational institutions.

STATISTICAL ACTIVITIES SINCE THE SIXTH CONFERENCE

Population and Vital Statistics

1. Machine processing of the 1966 population census was concluded in the latter half of 1967. The first volume of the report, comprising Parts I and II - methodology and tables respectively - was published in 1969. In 1968 Mr. J.G.C. Blacker of E.C.A. was requested to advise on various aspects of the analysis of the census and plans for future demographic studies. On the strength of this advice a demographic survey was conducted at the close of another survey conducted in the rural areas. More will be said on these under "surveys". The statistician in charge of demography left for a study course in London in 1968 and work in this area has necessarily been slowed down. There is as yet no legal instrument compelling Basotho to register births and deaths. It is hoped that this will soon be introduced. In the last conference it was stated that attempts were being made to have such an act passed. At the time of writing this report there has as yet been no success.

Agriculture

2. Preparations for the 1970 round of the agricultural census started in 1967. Plans for the exercise were drawn up in early 1968 and were approved by Cabinet. The Bureau of Statistics was responsible for the technical aspects of the exercise and the Ministry of Agriculture provided most of the field staff from their Extension Agents. Because of the scarcity of resources the census is conducted on a sample basis.
3. Since agricultural operations are carried out by individual households on fragmented holdings, and there are no large farms or contiguous holdings, it was decided to take a farming household as the unit of enumeration. In April 1968 the first pilot study was conducted in one district, covering the summer crops. From August 1968 to July 1969 the second pilot study was conducted over three (3) districts, covering the whole crop calendar. This second pilot study included the district covered by the first. Thus, for summer crops, this district has been covered for three successive seasons, including the actual census. It is hoped that in the absence of current yield, production and crop acreage data, information for this district will be useful in indicating trends and patterns. It will also indicate how practicable it is for Extension Agents to combine their routine work with objective measurements of these variables on a current basis. The main census started in August 1969 and is scheduled to end in July 1970. On the basis of the two pilot surveys final questionnaires were drafted by mid 1969 and training of field staff started end of July.
4. Whilst it is recognised that agriculture will for a long time to come remain the mainstay of Lesotho's economy, collection of current agricultural statistics has been neglected. It is proposed to use the results of the census as bench-mark data and thereafter to collect as much current data on agriculture as possible. The only information collected at the moment is on marketing of crops, livestock and livestock products. Even in this area information not always available or, if available, inaccurate.

10. Farming households constituted the second stage units, the necessary frame being constructed in selected EAs at the beginning of each of the three surveys (two pilots and main census), and random selection of these households made without replacement. All fields of selected households were measured for estimation of areas, while crop-cutting experiments for yield estimates were undertaken on a sample of five fields of each crop from a totality of fields put to a given crop at the rate of one crop-cutting plot of 33' x 33' per field. Eight households were selected per E.A. per selection.

#### Consumption and Expenditure Survey

11. The design and preparations for this survey were reported in the last conference in detail. The purpose of this paper, therefore, is only to fill in the gaps.

12. The survey covered the entire country, excluding the capital and its periphery. The country was arbitrarily divided into three areas which were independently covered over a period of about two years, one year in each area. Financial constraints did not permit simultaneous canvassing. The selected first stage units (E.As) were completely enumerated for households, recording information on individual members such as name, sex, age and source of income. For each household information was recorded on sales of crops, livestock and livestock products in the past year. This information was used for stratifying households by income groups. Three income strata were thus constructed. Non-farming households were left out of the sample.

13. Cost and communications determined the number of primary units to be covered in each of the three areas. A constant overall sampling fraction was maintained for determining the number of second stage units within each area. After the stage 1 enumeration of E.A.'s sales values for each stratum were totalled up and summed over the area. Allocation of households to strata was made proportional to the contribution of individual strata to the overall recorded income from sales for the area. The strata sampling fractions were then calculated and applied to individual E.A.'s to determine the number of households to be selected from those available for selection in each stratum within each E.A. In all 1,827 households were included in the sample.

14. For the sake of completeness the list of items covered by the survey is here included. Information was recorded four times each month on receipts and payments for selected households. Receipts consisted of (a) farm income and (b) non-farm income. Farm income covered sales of crops, livestock and livestock products, domestic consumption of own produce, seed replanted and labour payment in kind. Payments covered items like (a) enterprise operating costs, (b) domestic expenditure, (c) domestic consumption of own produce, (d) capital outlay and (e) other payments.

#### Demographic Survey

15. In the first paragraph of this paper a reference was made to the demographic survey that was conducted at the close of the consumption and expenditure survey in each of the three areas mentioned in paragraph 12. The purpose of this survey was to determine the necessary demographic parameters for population estimates and analysis. Information was collected of all households in the selected E.A.'s on number of births and deaths over the past twelve months; number of children ever born of all females aged 12+; number born alive and how many of these were still alive; date of last birth.



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Selection procedures for the E.A's have been described under Consumption and Expenditure Survey.

## Activities of the National Statistical Office from 1967

### 1. Structural modifications

In early 1967 the office structure was reorganised along the lines of three subject groups - economic statistics, agricultural statistics, and demographic statistics and special surveys - and three common services groups - data processing, field and geography, and general administration.

The economic statistics section is responsible for foreign trade, balance of payments, national accounts, prices, labour and industrial statistics. Agricultural statistics covers agricultural survey work. The demographic and special surveys section deals with field survey work other than in agriculture (e.g. household expenditure, retail trade, and population change surveys) and with all sampling problems. The common services section field and geography handles mapping for survey work and is responsible for organising and controlling all non-technical aspects of field surveys. The data processing centre provides processing services for all 3 subject groups as well as for other Government Departments.

### 2. Numbers of staff by main categories

The 1970 approved establishment for the office is as follows:-

#### Statistical

Professional	14	
Sub-professional		
Supervisory staff	14	
Clerical, and enumeration	55	(Includes 22 temporary field enumerators)

#### Data Processing

Professionals	1
Programming and system	4
Operations and card punch	26

#### General Service

21

TOTAL 135

### 3. Demographic and Social Statistics

A Population Census was undertaken in August of 1966 and final results published in June of 1969. This covered sex, age, race, languages, education, and type of income.

A survey for the four major urban areas in Malawi was conducted in March-June 1967. This covered housing, income, and occupation. At the same time a questionnaire on radio listening habits was also completed. Results have been published.

A population change survey planned to run about three years was launched in February of 1970. This will measure births, deaths and migrations in a sample of 7,400 households in Rural and Urban areas.

#### 4. Labour Statistics

At the beginning of 1967 a quarterly employment enquiry was initiated. For 1967 questionnaires were mailed only to private firms employing 20 persons or more. Data were collected on numbers employed. From the beginning of 1968 the coverage was expanded to include government agencies and data on earnings were also collected.

For 1969 a "shuttle form" has been introduced. Data for all 4 quarters will be collected on the same form which will be "shuttled" between respondents and the NSO. This is expected to reduce reporting error, and to simplify editing and reviewing procedures. Additional questions have been added on man-days, and on total sales in the quarter. This latter item has been added as a cheap means of collecting quarterly sales data for the various industry groups.

Results of the enquiry are published in special quarterly editions of the "Monthly Bulletin of Key Economic Indicators", with more detailed tables published in a special "Reported Employment and Earnings, Quarterly Report".

#### 5. Household Budget and Consumption Surveys

A Consumer Expenditure Survey was conducted between January 1968 and January 1969 on a sample basis and covered all Malawi except the rural sector although information was collected for a sample of the agricultural estates. Each enumeration area contained segments of ten households and a sample of these segments was taken. The sampling fraction was 1 in 60 for Blantyre, 1 in 10 for Zomba and Lilongwe, the small urban areas and the estates and 1 in 5 for Mzuzu.

The survey was carried out on an interview basis and the interviewers were required to revisit households if the credits and debits differed by more than 10%. The quality of interviewing was generally good and the response was excellent. Information was collected on household make-up, housing, income and occupation and in great detail on expenditure plus loans, savings, etc. Food and fuel expenditure was collected for one week while for all other items the respondents were asked to recall their expenditure over the last year. An exception was made for households whose income exceeded £500 where a recall period of one month seemed more sensible.

All information was coded, punched and processed by UNIVAC 1004. Tabulations were done by quarter both to observe seasonal variation and to make checking easier; most of the data will be tabulated by receipts group. Results for the first quarter are now available and it is hoped to bring out a report with all basic data by the end of 1969 with a supplementary report containing elasticities etc. to follow.

#### 6. National Accounts

In mid-1967 basic national accounts tables were prepared for the years 1964 and 1965. These were, however, regarded as provisional pending

the establishment of reliable series relating to employment and earnings, industrial and estate production, the output of the traditional rural sector and consumer expenditure. By the end of 1969 sufficient data were available for the preparation of reliable tables for the industrial origin of G.D.P. for the years 1964-1968 inclusive.

Since 1969 efforts have been concentrated on revising subsistence sector estimates using results of a national food consumption survey, improving the techniques for commodity-flow estimates of gross fixed capital formation, and preparing estimates of consumer expenditures.

During 1967 responsibility for economic and functional analyses of the government accounts was turned over to the Ministry of Finance.

### 7. Balance of Payment Statistics

The present series was established by an I.M.F. advisor to the Reserve Bank of Malawi. As from the beginning of 1967 responsibility for the Balance of Payments statistics has resided with the N.S.O. Reports have been published for 1964-1969 inclusive.

### 8. Price Statistics

Two consumer price indices, one for the low income group, and another for the high income group are calculated for the town of Blantyre and Limbe. The former is monthly and the latter quarterly and was resumed in early 1967 from an earlier series constructed by the Central Statistical Office, Salisbury. Both the indices may be revised later this year when data from the Consumer expenditure Survey becomes available.

In the latter part of 1968, work started on the construction of a wholesale price index for government purchases. The foreign trade export indices (quanta and unit values) were revised in early 1968 and import indices were started for the first time. For both series 1967 was taken as the base year.

### 9. Industrial Statistics

The Annual Survey of Economic Activities Report 1967 was published in May 1969. For the first time the report included information on estate agriculture, mining and quarrying, construction, distribution and transport as well as manufacturing and utilities. This wider coverage was maintained for the 1968 Survey, mailed out in July 1969, and the final results of the survey were published in March 1970.

The survey covers all private firms with 20 or more persons engaged, statutory bodies and government manufacturing enterprises. It deals with output, purchases of goods and services, fixed assets, stocks, employment, earnings and, in 1968, short term monetary assets.

There was a 94% response to the survey in 1968 and it is proposed to maintain the questionnaire in much the same form as at present.

The Quarterly Building Enquiry is now well established and response has been excellent. The survey collects information on the value and type of work done and the quantities of main materials used. The questionnaire is sent to all the building firms covered by the Quarterly Employment Enquiry.

## 10. Agricultural Statistics

Early in 1967, it was decided that a National Sample Survey of Agriculture should be taken to obtain information on acreage of land under principal crops and yield data for maize and groundnuts in the traditional agricultural sector of Malawi. Previous surveys had obtained information on acreage and other information for small selected rural areas, but there had been no comprehensive systematic survey relating to the whole country and data on yield had not been included in the selected area surveys.

A plan for the survey was presented to the British Government as a development project to be financed mainly from the U.K. Development Loan. It was originally proposed that the National Sample Survey be undertaken for the 1967-68 crop year, but because of the substantial amount of preparatory work required and the size of the full-scale survey, it was decided that a pilot survey should be taken for the 1967-68 crop year with the full scale survey to cover the 1968-69 crop year. This approach would allow testing of procedures before the full-scale survey and also provide some summary data for two consecutive crop years.

The pilot survey was completed successfully and besides providing the required data on acreages and yield, provided information on sample design, questionnaire design, field procedures and response error. The necessary changes were introduced for the large-scale survey which at the time of writing, is underway. The report for this survey is expected to come out early July, 1970.

## 11. Trade Statistics

A simple computer (UNIVAC 1004) was installed at the N.S.O. in December 1966. The use of this machine has resulted in considerable improvement in both the quality of the trade statistics and in the release data for monthly tabulations. By the end of 1968 the monthly trade statistics were available for release about 8 weeks after the month to which they referred. Previously the delay was 3-5 months.

The publication date of the Annual Trade Statement has also been improved. Photo-offset reproduction of machine sheets is now used for this publication, whereas previously the annual tables had to be typed.

## 12. Data Processing

A 1004 UNIVAC processor was installed at the N.S.O. in December 1966.

Systems and programming work for the 1966 Population Census was completed by July 1967. Punching continued through March 1968 and processing was completed in September 1968. Foreign trade statistics were fully computerised by June 1967. Data processing support was furnished for various NSO surveys including Radio Malawi Listenership Survey, Manpower Survey, Housing and Income Survey, Consumer Expenditure Survey, and various Agricultural Surveys.

Data processing work formerly done by the Accountant General was taken over by the NSO computer installation in February 1967. This included the Government payroll and monthly expenditure accounts. Other work done for government agencies includes standardised test-scoring and

selection system for primary school leavers, annual income tax listings, and an employment service scheme organised by the Ministry of Labour.

### 13. Survey of Retail Trade

The survey covers shops with less than 20 employees in the 4 main urban areas. All the shops with over £1000 sales/month have been included in the survey; while of the shops with under £1000 sales/month a sample has been taken of 1 shop in 5.

The survey is now well established and results of sales, employment, earnings are available, though not yet published, for all 4 quarters of 1969.

### 14. Departing Visitors Report

This was initiated mid-1969. Cards are distributed by Immigration Officers to departing visitors at various exit points. The first report came out in November of 1969. Since January 1970 there has been a monthly report.

### 15. Miscellaneous

As can be seen from the above, Statistical Activities have had high priority in Malawi since independence in 1964. There has been considerable assistance from the U.K. and the U.S.A. Loans from the U.K. financed a large part of the Population Census and the National Agricultural Survey, and a large part of the professional staff of the office have been U.K. officers recruited by O.D.M. U.S.A.I.D. has provided data processing and other equipment and advisory personnel, and has detailed professional officers to the N.S.O. U.S.A.I.D. has also provided training for about 20 Malawian Statistical personnel.

U.K. officers will continue to constitute a significant part of N.S.O. professional staff until a sufficient number of qualified Malawians are available. U.S.A.I.D. is providing technical assistance in data processing only after June 1970. U.N. has provided an OPEX officer with experience in economic statistics.

### 16. Publications

The following publications have been released since the beginning of 1969.

a) Monthly Bulletin of Key Economic Indicators.

The Bulletin contains monthly figures on trade, electricity, agriculture, transport, construction, money and banking. In addition a quarterly supplement contains more detailed trade statistics as well as trade and price indexes, construction and vehicle statistics and occasional items of interest stemming from the work in the N.S.O.

b) Balance of Payments Report: 1968

c) National Accounts Report 1964-1968 (with provisional 1969 data)

d) Annual Trade Statement 1968

e) Quarterly Report on Employment and Earnings

Quarterly data on employment and earnings for Government and larger enterprises.

f) Annual Survey of Economic Activities 1967 and 1968

Embodying the results obtained from the Annual Economic Survey of larger establishments.

g) Population Census 1966 Final Report

The final tabulations of 1966 Census. Containing detailed information on the structure of Malawi's population term of age, education, region and economic status.

h) Rural Radio Listenership Survey, 1968

Details of the radio listening habits of the rural population from a survey undertaken for the Malawi Broadcasting Corporation.

Review of Statistical Activities ~~since the~~ 6th Conference, including  
Population and Agriculture Census Plans

INTRODUCTION

The past four to five years witnessed significant progress in the level of statistical activity in Malaysia. A number of new surveys as well as improvements and extensions to existing collections were effected. With a view to developing statistical series on a Pan-Malaysian basis, several new lines of statistical activity were initiated in the East Malaysian States of Sabah and Sarawak.

The Department began to play a leading role in the development planning machinery of the Government in not only providing a vastly expanded range of statistical data but also by being actively associating itself with the various governmental committees determining targets and formulating alternative strategies for use in the five-year plans. The Chief Statistician and head of the national statistical organization is a member of the National Development Planning Committee, the highest economic policy making body in Government. In cognizance of the vital role, the Department of Statistics has to play in the planning process in the country and in view of the urgent need for building up the Department's capabilities in generating the requisite information, the Government made a bid for United Nations Special Fund assistance in the field of statistics. This project has since been approved by the U.N. and is being implemented. The data processing facilities of the Department were modernised with the installation of an electronic computer, an ICL 1904A model. The foregoing developments are elaborated in subsequent sections of this review.

A. POPULATION

(i) 1970 Population and Housing Census Malaysia

Preparatory work in connection with the Population and Housing Census began in early 1968. The services of an adviser, Colombo Plan (Australia) were made available in 1968 for an initial period of 2 years. This has now been extended for another year. Subsequently, more Australian Colombo Plan aid on evaluating and purchasing a computer and in helping set up a Quality Control System for the Census was made available.

The decision has now been taken to have the above Census in August 1970, Census Date being 25th August. It will be a Malaysian wide Census with a common Census Date.



A 2 stage enumeration system will be used. A total of 5 forms are to be canvassed viz:

Form 1 or The House-Listing Book

Form 2 or The Housing Census Form

Form 3 or The Agricultural Census Form

Form 4 or The Household Record Form

Form 5 or The Persons Form

Form 3 attempts to collect some data on the agricultural activities to build up a frame for the Agricultural Census scheduled for 1971. Small variations in Form 3 and Form 5 have been made for East Malaysia. A separate set of Forms 3 and 5 will be used for East Malaysia. Forms 1, 2 and 3 will be canvassed in the first stage, that is, about 1 week before Census Date. Canvassing of Forms 4 and 5, the second stage, will start on Census Day and continue for about 14 days. The House-Listing Book will be used in the second stage as well. The District administrative machinery will be used to canvass these forms.

For both the Population and Housing enquires the U.N. recommendations have been modified to include a number of topics which are of special interest to Malaysia. Given the multi-language situation self-enumeration is not possible. Hence enumerators will be specially recruited and trained for the canvassing of the forms. All items on the schedules will be canvassed on a 100% basis.

With the exception of Form I and the East Malaysia version of Form 3 all the forms are designed for input to an optical scanner. An optical reader, on line to the computer, will directly read the data off the forms on to magnetic tape. The bulk of the answers are precoded. A mark is made against the applicable answer. Office coding and marking will be done on age, previous place of residence, occupation, industry, educational qualifications and family status. It is planned to complete the transfer of all data on to magnetic tape within a year from Census Date. Form I is non-optical. Being a listing book it only provides field count summaries and serves as a control for the other forms. The East Malaysian version of Form 3 is non-optical as it is to be priority processed on conventional punch card equipment. This, as mentioned earlier is for Agricultural Census purposes.

## 2 - MALAYSIA

Tabulation will be in 3 phases: filed count summaries, basic tabulations, composite tabulations. Field count summaries will be made available within weeks after Census Date. Basic tabulations will be made available over the year that data is being transferred on to magnetic tape. Work on Composite tabulations will start after all data is on magnetic tape.

A Post Enumeration Survey is planned for West Malaysia only. This survey will check the quality of the enumeration block boundaries and the dwellings and persons coverage. Some persons characteristics may be checked. The dwellings coverage check will use a 1% sample and the persons coverage check a ½ % sample.

To facilitate field work Malaysia has been divided into approximately 23,000 enumeration blocks. Each enumeration block averages 80-100 households. Allowances have been made for accessibility and terrain, the guiding principle being an identifiable area of work which an enumerator can completely canvass in 14 days. Each enumerator will be provided with a map of his block and a description of the boundaries. Enumeration block maps by Census Districts and by Administrative Districts will eventually be made available to users.

For each of the State capitals of West Malaysia urban conurbation maps will be made available. A combination of population density and land use criteria is being used to identify these conurbations. Work on this aspect will continue during the inter censal period.

Preparatory work has started in organising an annual population survey to be conducted in the inter censal period. This will be along the same lines as the Current Population Series Surveys in the United States.

(ii) Malayan Family Survey 1966-1967

A Family Survey was conducted from July 1966 to July 1967. This project was sponsored by the Ford Foundation. An adviser and 2 research assistants were made available from the University of Michigan for the duration of the survey.

The purpose of the survey was to measure the knowledge, attitudes and practice of family planning in West Malaysia. The primary user of the data would be the National Family Planning Board.

Altogether 7,697 household interviews, and 5,457 intensive fertility survey interviews were conducted. The processing and writing of the report was done at the University of Michigan. The survey data are available on magnetic tape in the Department of Statistics.

(iii) Vital Statistics

The birth and death certificate continue to be the source document for all vital statistics published by the Statistics Department.

A small point to note was that in 1966 births and deaths were classified by both place of residence as well as by place of occurrence. Previously, only place of occurrence was shown.

(iv) Tourist Statistics

Disembarkation Cards are sent to this department by the Immigration Department. These cards are coded and punched for processing. Tabulations are published in "Tourist Statistics, West Malaysia". The coverage is limited in that it only covers arrivals by air and sea into West Malaysia.

B. AGRICULTURE

(i) Agriculture Census 1971

In accordance with the programme of the Food and Agricultural Organisation of the United Nations, this Department proposes to carry out the next Agriculture Census in 1971. The Census will be carried out with the collaboration of the Ministry of Agriculture and Co-operatives and the Rubber Research Institute.

Some data on agricultural households will be collected in the 1970 Population Census which is scheduled for August, 1970. The data would be very useful in assisting in the building up of a frame and to make certain decisions in the sample design. Besides, basic data on livestock and poultry will also be collected by the Population Census. It will therefore not be necessary to go into the field again to collect livestock and poultry statistics for non-agricultural households unless the results from the Population Census prove that livestock and poultry are of major importance in non-agricultural households. This will save considerable expenditure and resources without losing much information.

A Policy Committee and a Users' Committee for the Census will be established in the near future.

The Census would be on a nation-wide basis. Two regional Census Offices will be set up in East Malaysia, one in Sabah and one in Sarawak. The Census will cover approximately 900,000 agricultural holdings.

Agricultural holdings will be divided into four sectors:-  
(1) smallholdings; (2) estates; (3) government farms and (4) group settlement scheme farms. The last three will be enumerated through a questionnaire sent by post with field follow-up for non-response cases. Field enumeration of smallholdings will be carried out by field agencies of the Rubber Research Institute and the Department of Agriculture, supplemented by the Department's field resources.

The Census will cover most of the items in FAO's short list. Some items in the expanded list applicable to Malaysian conditions will also be covered. In addition, some items not found in the FAO's recommended list but peculiar to Malaysia will be included. The following main subjects are proposed in the scope of the Census:-

- (a) Land utilisation;
- (b) crops;
- (c) Livestock and poultry;
- (d) employment in agriculture;
- (e) farm population;
- (f) agricultural power and machinery and general transport facilities;
- (g) irrigation and drainage;
- (h) fertilisers and soil dressings;
- (i) fishery products;
- (j) association of agricultural holdings with other industries.

For rural areas, it is proposed to have a sample census for holdings below 15 acres in size and a complete enumeration for those above 15 acres. The stratification and sample design of those holdings to be sampled would be determined after results

from the Population Census have been obtained. By having a sample of the smaller holdings, more resources will be available to concentrate on the bigger holdings. A listing of households in rural areas will be undertaken before enumeration.

In the case of urban areas, the list of households obtained from the Population Census will be used. A separate listing will not be done as the benefits derived would not be commensurate with the resources expended as densely built areas do not have many agricultural households. The stratification and sample design of those households to be sampled would also be determined after studying the results of the Population Census.

Data processing will be undertaken by the Department's electronic computer. The input media would be punch-cards.

#### Current Agricultural Statistics

##### (ii) National Crop Survey

The main objective of the National Crop Survey has been to build a sample survey system so as to give fairly reliable annual estimates on area under principal crops for each State. The survey is specially oriented to give estimates for "smallholdings". The survey also envisaged, in the course of time, to be integrated with the Crop Cutting Survey, which is designed for the estimation of yield rates of padi, and the proposed Coconut Survey.

The idea of carrying out a survey to obtain reliable estimates of acreages of principal crops annually in West Malaysia for the "smallholdings" was mooted by the Ministry of Agriculture immediately after the results of the 1960 Agriculture Census were available. This project was awaiting the services of an U.N. Sampling Expert who joined the Department in March, 1964 and submitted a paper in July, 1964 underlining the details on how the project might be carried out. This paper was a result of the preliminary work done by the Department of Statistics in consultation with the Ministry of Agriculture as well as the Survey Department and it indicated the possibilities of adopting the sample survey approach for building up annual estimates for the "smallholdings" sector by utilizing the services of the State Agriculture Departments and Rubber Research Institute for field operations.

Exploratory field studies were carried out in 1965 and they brought out numerous problems regarding location of selected lots, area measurement, recording of parcel areas, etc. This experience provided useful background for the design of the schedules and writing of instructions for the pilot survey.

Four areas were selected for the pilot survey which was carried out during the Agricultural Year, 1966/67. The pilot survey brought out the following conclusions:-

- (a) The Pilot Study undoubtedly established the feasibility of carrying out the full fledged survey by utilizing the services of the existing agencies of Department of Agriculture and the Rubber Research Institute by dividing the entire work into a number of independent interpenetrating network of sub-samples. The Department of Statistics was able to train a corps of field workers who could be utilized not only for assisting the departmental agencies such as Agriculture and Rubber Research Institute for carrying out the work assigned to them, but also for undertaking independent field work for some of the States.
- (b) The sample design adopted has been found to be satisfactory. However, the need for certain modifications, both of an operational nature as well as in terms of design, were recognised.
- (c) In most of the important padi growing States it was found that it would be possible to integrate the design and to some extent the operations for the conduct of the Crop Cutting Survey on Padi with that of the National Crop Survey.
- (d) Finally, the Pilot Study has also helped in standardizing field procedures such as the optimum size of the field survey team, the standard equipment required, the average time involved in completing the work and other related matters.

The first full-fledged survey was conducted in 1967/68. For this survey, two separate sample designs were adopted, one for permanent titles and one for temporary titles.

Five separate schedules were to be canvassed for the survey:-

Schedule 1.0 - Listing and selection of lots

Schedule 2.0 - Identification Particulars of Selected Lots

- Schedule 3.0 - Area Measurement and Tree Count for Crop  
Parcels in the Selected Lot - First Visit
- Schedule 4.0 - Area Measurement and Tree Count for Crop  
Parcels in the Selected Lot - Second Visit
- Schedule 5.0 - Enumeration of Unaccounted Lots of 100 acres  
and above

Field work began in late 1967 and was completed by August, 1968.

The data collected were edited, coded and transferred on to punch-cards for electronic data processing. About 40% of the final tabulations have so far been finalised.

For the 1969/70 Survey, it was decided that only one sub-sample would be canvassed by the Department of Statistics. The sample design and selection procedure of lots for permanent titles remained the same and the AAUs and lots were selected from the same "frame". Sample III (for temporary titles) would not be canvassed.

(iii) Padi Crop Cutting Survey

In 1964, the Ministry of Agriculture and the Department of Statistics decided to adopt a standardised procedure of obtaining padi yields on a scientific basis.

A pilot survey was undertaken during the Agricultural Year, 1964/65. Prior to this, the State Agricultural Departments were responsible for providing data on yield rates in their own States. The method of collection and the procedure of obtaining yield rates varied from State to State.

Since the pilot survey, the Padi Crop Cutting Survey has been conducted on an annual basis. The Survey is confined to wet padi under main season. At present, about 40 padi growing districts (each district with a planted acreage of 5,000 and above) in all the eleven states of West Malaysia are covered. In addition, about 5 minor padi growing districts have been incorporated with the larger padi growing districts to give combined district estimates. About 92% of the total area under main season wet padi is covered in the Survey. During the 1969 off-season, crop cutting tests on double crop padi areas were conducted in three States for the first time.

The Department of Statistics is responsible for the planning of the survey, sample design, updating of the sampling frame, selection of units, preparation of schedules and instructions, training of field agencies, randomized field supervision, data processing and presentation of results.

The State Agricultural Departments are responsible for the field work. The field agency consists of Junior Agricultural Assistants, most of whom are permanent staff and have undergone training in agriculture. At the district level, the Agricultural Assistant supervises the work of the Junior Agricultural Assistants.

Initially, the object of the Survey was to obtain State estimates of padi yield with a fair degree of precision. With an improved sample frame and sample design, it was found possible to give district estimates of important padi growing districts within 4-5% standard error. For the important padi growing States, the estimation of yield rates was within 1-4% standard error.

The Padi Crop Cutting Survey was extended to the two States of East Malaysia in 1966/67.

(iv) Rubber Statistics

There has been no change in the method of collecting rubber statistics during the last five years. Estate rubber statistics have been collected on a full coverage basis, both monthly and annually. During the last five years additional questions have been included to provide data by district, planted acreage by type of planting material and on production cost. Smallholding output is indirectly estimated through a survey of all licensed rubber dealers.

(v) Oil Palm, Tea and Coconut Estates

The first comprehensive census on Oil Palm, Tea and Coconut Estates was conducted in 1964 for the reference year 1963. Since then annual censuses are undertaken in this field. Prior to 1969 only basic information on production and acreage of oil palm estates were collected. Since 1969, data on production of palm oil and kernels by different varieties and acreage by planting material are collected. As regards to coconut and tea estates, only production statistics and data on acreage are collected. Employment and wage data are also collected.

INDUSTRIAL STATISTICS

(i) Manufacturing

Monthly and annual surveys and a census once in every five years are carried out to collect manufacturing statistics. During the last five years about 17 selected industries consisting of about 1,000 establishments were covered monthly to provide indicative information on the more important manufacturing industries. There was complete coverage within the selected industries. In 1970, however, the coverage of the monthly surveys were changed to



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include a wider range of industries (about 70) by using an employment cut-off size. With the growing need in the country for statistics on the manufacturing sector as a result of the Government's drive towards industrialisation, it was found necessary to make this change in 1970. New questions on employment by racial breakdown and sales were included in the questionnaires in 1970.

In the annual surveys of manufacturing industries about 75 selected industries containing about 4,000 establishments are covered. These 75 industries have been estimated to account for about 85% of the total output of the manufacturing sector. A census of manufacturing industries was undertaken in 1969 for the reference year, 1968. About 200 industries consisting of about 10,000 establishments were covered. Results of the census are expected to be published in the middle of 1970. New questions on stock of capital, other business expenses and overtime were added in the census questionnaire.

The above refer only to West Malaysia. For East Malaysia annual surveys for Sabah and Sarawak have been undertaken since 1966.

(ii) Construction

The first statistical enquiry on construction industries was undertaken for 1963 and since then annual surveys have been undertaken. The frame for the construction survey is compiled from the records of the following administrative bodies:

- (a) Public Works Department;
- (b) Drainage and Irrigation Department;
- (c) Registrar of Businesses;
- (d) Registrar of Companies;
- (e) National Electricity Board;
- (f) Developers and Enterprises.

The following were omitted from the Survey:-

Small itinerant contractors who do work directly for project owners and who are not registered with any body. However, the contribution of this category of contractors is insignificant.

Own-account construction;  
Own-account construction in West Malaysia is assumed to be very small.

Construction activity undertaken by Public Works Department and Drainage and Irrigation Department using their own labour force is excluded. Response from these bodies were very slow or non-existent.

Prior to the 1966 Survey there was a complete coverage of all establishments in the frame and every effort was made to obtain reliable statistics from each and every one of the establishments. A size "cut-off" was introduced in the 1966 survey. This meant that only the returns submitted by contractors and sub-contractors whose total value of work done for 1966 exceeded \$10,000 would be edited and the figures tabulated. The resources released as a result of the size "cut-off" were employed in improving the quality of the data.

From results obtained from the annual surveys it was found that establishments reporting \$100,000 or over of total value of work done during a year accounted for about 85% of the total value of work done in the construction sector. Therefore, as from 1968, it was decided to allot more editing and field work time to those establishments reporting value of work done of over \$100,000 per annum. Since 1966, information requested on the questionnaires has been increased annually. More detailed information on materials used, purchases and sales of fixed assets and employment, by racial breakdown were included in the questionnaires.

The amount of information collected from the construction surveys has been found to be insufficient to meet the demands of the Government and private sector; for example, information is not available in respect of different types of buildings, e.g. schools, shop-houses, hotels, etc. erected during a year, or over a number of years. To overcome this shortcoming, this Department proposes in 1971 to undertake a Building Survey which will be conducted through the help of the Board of Architects. All architects will be covered in this survey and will be required to submit information on the number of buildings completed by types and the commencement and completion values of such projects.

(iii) Mining

An annual census of mining industries is undertaken in respect of all mining activities, e.g. tin mining, iron mining, gold mining, etc. There has been no change in the coverage during the last five years. However, as in other surveys, the number of questions included in the questionnaires have increased.

(iv) Distributive Trades

Prior to 1966, almost complete absence of data on distribution posed a great handicap to the Government policy-makers and businessmen. In order to remove such a handicap, a Census of Distributive Trades for the reference year, 1966 was carried out in late 1967. The census was conducted in two parts - a completely enumerated sector and a sampled sector. Six metropolitan towns and forty-two other towns with a population of 10,000 or more were completely enumerated. Urbo-rural areas (those with a smaller population but having urban characteristics) and rural areas were covered on an area sample basis; i.e. certain localities were selected randomly and all businesses situated within the selected localities were listed and enumerated. From data for the selected localities, estimates were calculated for the urbo-rural and rural sectors as a whole. Regional and national statistics were therefore made up of a completely enumerated element and a sampled element.

D. EMPLOYMENT AND UNEMPLOYMENT SURVEY

The first nation-wide survey on Employment and Unemployment was carried out in 2 rounds in April and September, 1962. It was a household sample survey covering all residents between the ages 15-70 in the Federation of Malaya (now West Malaysia). Both institutional and non-institutional households of the civilian population only were covered.

Subsequent surveys were carried out in 1964, 1965 and 1966 in the 5 Metropolitan towns only since it was found that the rate of unemployment was highest in these towns.

E. SAMPLE SURVEY OF HOUSEHOLDS

In 1967/68 the Malaysia Socio-Economic Sample Survey of Households which is a multi-subject household sample survey was launched. The Employment and Unemployment Survey was incorporated in this new survey. A national household sampling frame was first constructed for the purpose of evolving a new sampling design for the MSSH. A stratified multi-stage sampling design was used covering a sample of 30,000 households. A system of inter-penetrating (network) of sub-samples was used; the first sub-sample was supervised by the Department of Statistics and the second sub-sample by the respective State Commissioners of Labour. The survey was carried out in 3 sub-rounds of 4 months each (June 1967 - May 1968).

The MSSH covered only non-institutional civilian households. Furthermore, only those between the ages 15-65 were requested to give particulars about employment and unemployment. Being a multi-subject survey, the MSSH had 3 different schedules; the first schedule referred to demographic particulars, the second schedule on employment and unemployment and the third schedule on household amenities and conveniences.

The MSSH has been established as a continuing survey of recurrent rounds where the type of data collected is reviewed from round to round. As such, for the fourth rounds i.e. July - December 1963, the schedule on household amenities and conveniences was dropped. The 5th, 6th and 7th rounds were from the period January - December 1969.

At the time of writing, the 8th round January - June 1970 is in progress.

#### F. MANPOWER SURVEY 1965

The above survey was conducted in February 1965 and was confined only to West Malaysia. It was essentially an establishment survey on a sample basis covering both the private and the public sectors. A total of 8,304 establishments, schools and Government Departments were covered in the sample and the response rate was 92%. The survey was carried out by the Department of Statistics in collaboration with the Ministries of Labour and Education. It was designed to provide data on available manpower in terms of industry - occupation matrix, technical skills, extent of shortage of trained personnel in key occupations, extent of employment of expatriates and foreign technicians, and employers' foreseeable manpower requirements that could be expected within the next 2 years for the public and private sectors and also at the end of the First Malaysian Plan for the public sector. Plans exist for repeating this in the next few years.

#### G. PRICE STATISTICS

The Retail Price Index is an indicator used to measure the changing cost, over time, of a fixed basket of goods and services. The Index is computed using Laspeyres' formula as a weighted arithmetic average with a fixed base. The base period is 1959.

The weights and selected items were derived from a Household Budget Survey conducted during 1957/58. A sample of 2,760 Malay, Chinese and Indian households throughout West Malaysia were interviewed. The Index is confined to all non-European families whose total monthly income is M\$300 or less.

Data on prices are collected monthly by officers of the Labour Department in 49 urban and rural centres from approximately 1,780 retail outlets. The Index is also computed monthly.

#### H. TRADE STATISTICS

Three important events dominated the development of trade statistics over the last five years. They are:-

- (a) The formation of Malaysia in 1963;

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- (b) The change-over from mechanical to electronic data processing;
- (c) The change-over to the Brussels Tariff Nomenclature.

The formation of Malaysia in 1963 led to a demand for statistics on a regional basis (i.e. West Malaysia, Sabah and Sarawak) as well as for Malaysia as a whole. Therefore, after 1963, the trade statistics underwent a period of consolidation to cater for this demand.

In 1967, the Statistics Department changed over from mechanical to electronic data processing. The use of electronic data processing made possible further development of trade statistics to cater for the demand for trade statistics on a Malaysian basis. The first trade publication for Malaysia entitled, "Malaysia, Annual Statistics of External Trade 1967" was made available in 1968. In 1969 the pamphlet series entitled, "Malaysia, Preliminary Figures of External Trade" was introduced on a quarterly basis.

In 1968, the Department changed over to the Brussels Tariff Nomenclature System of classification for tariff purposes. This change-over was greatly facilitated by the use of the computer. However, to ensure continuity and comparability, the trade statistics continue to be published according to the Revised S.I.T.C.

In 1969, the Department initiated the computation of a set of import and export quantum and unit value indices for West Malaysia, Sabah and Sarawak. This is an ambitious project which may require some time to bring it fruition.

## I. NATIONAL ACCOUNTS

The major developments in the field of national accounts since the last conference is characterized by (a) the revision of the series for West Malaysia, (b) the derivation of constant price measures and (c) the commencement of a systematic and sustained approach to the measurement of national income and product for East Malaysia.

In West Malaysia, refinements in methodology have been effected in the light of the availability of better and an expanded range of statistical data. For instance, the Census of Distributive Trade 1966 has provided invaluable information on trade margins to be utilised in the construction of a new input-output table for 1967 as well as in the measurement of the relevant components of the national accounts. The results of this Census make a singular contribution to the improvement in quality of the estimates when, it is considered that hitherto the measurement of the contribution of the wholesale and retail sector was

based on markups calculated from a variety of sources e.g. import prices, produce and prices, and retail prices whilst in some instances we had to rely on 'informed guessess' rendered by people connected with the different industries and in many instances using an arbitrary markup. Further as an integrated approach to the derivation of the real accounts and the construction of input-output tables, conceptual refinements were also incorporated as for example in the differentiation between competitive and complementary imports.

Another area of national accounting in which extensions were made was the compilation of 'real' product, both, by expenditure categories as well as by branches of economic activity. The former was computed at market prices whilst the latter evaluated at factor cost. This exercise proved to be one of invaluable experience in that it brought to the fore several problems from the standpoint of trying to obtain an alignment between the measures of 'real' product derived from two alternative approaches. One thing that became patently clear was that the estimation technique had to be undertaken at a considerable degree of detail and that short cut methods were simply inappropriate. The two methods yielded in rates of growth of 6.3 and 6.1 per cent over a selected time period although the deviations in the year to year changes were observed to be slightly higher. This discrepancy in the two series occurred despite our attempts at carrying out the calculations in considerable detail and was primarily due to the influence of indirect taxes which in the Malaysian setting account for about 20% of G.D.P. As regards the influence of indirect taxes on the outcome it should be noted that G.D.P. figures in constant prices could be expected to be identical only if both value added and final expenditures were calculated at current market prices and then appropriately deflated by market prices or else, were both calculated at current factor cost and appropriately deflated by prices from which all indirect taxes had first been removed. (A formidable undertaking).

Work was also initiated on a systematic and continuous basis in the estimation of gross national product series for the East Malaysian states of Sarawak and Sabah with a view to establishing an integrated system of national accounts for the whole of Malaysia. A slightly simpler approach had to be adopted given the current stage of statistical development in East Malaysia. The possibility of applying the methodology underlying the compilation in West Malaysia on an overall Malaysian basis seems likely only in a few years' time just as the fuller and articulated system of social accounts.

#### J. BALANCE OF PAYMENTS STATISTICS

To develop and to improve the Malaysia Balance of Payments Estimates, several surveys were launched during the last five years to provide the necessary data for the various accounts in the Balance of Payments.

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- (a) The Financial Survey was launched with the object of obtaining information of private capital inflow and outflow and investment income payments and receipts. The survey also seek to obtain information for the National Accounts Estimates.
- (b) The Ticket System seeks to identify all foreigner - resident transactions which takes place through the banking system. However, the usefulness of this survey was limited by the fact that transactions in Singapore dollars, which form a substantial portion of total transactions, could not be identified and allotted to each type of transaction. Another limitation is that the information obtained from the Ticket System is incomplete in the sense that we do not know the size of the whole pie but we know only a small part of it.
- (c) Survey of film rentals, insurance companies, shipping, airline companies and nominee companies. These surveys aimed at getting information for the other transportation account, and other services account of the balance of payments.

#### K. DATA PROCESSING

The Data Processing Division of the Department of Statistics was first created in 1952 with the installation of Power Samas Equipment for the specific purpose of processing Trade and Demographic data collected through Customs and Registrar General respectively. The initial strength of the staff was 1 supervisor and 20 operators.

With the expansion of workload and the added commitment to produce the Electoral for the Malaysian Election, the Department in 1961 found that the existing equipment were inadequate to cope with the new demands and decided to acquire new pieces of equipments which were both flexible and suitable for the jobs at hand. During this brief period from 1961-63, several machines of Hollerith type were installed. The total staff grew from 21 to 66.

From 1963-67, the Data Processing Division was again loaded with new tasks as a result of new statistical series being developed by the Department of Statistics in addition to new requests for data processing facilities from various Departments of Government. It was obvious that Hollerith machines (except for data preparation equipment) of the types acquired prior to 1967 were unsuitable for the growing needs of the Department and that more flexible and powerful equipment need to be purchased to satisfy the requirements of users. It was then decided that the Department should purchase an

ICL 1902 computer with its complement of peripherals. Since this was the first time that electronic data processing was introduced into Government, recruitment of staff at all levels at the early stages was difficult. The Department survived through the teething problems and is gradually building up its own corp of system analysts and programmers to service the new installation. The initial strength of the Division was 1 Computer Manager, 2 system analysts and 4 programmers, 4 console operators, 7 supervisors and 92 machine operators. This was subsequently increased to a larger number in 1969 with the acquisition of new equipment. The new computer equipment was adequately suited to the expansion needs of the Department within the resources allowed, but was totally inadequate for the processing requirements of Population Census and the Agricultural Census which were scheduled to be held in 1970 and 1971 respectively. It was therefore found necessary to further expand the existing configuration to one that is able to meet the load of the two censuses plus the normal routine increases of the Department for several years to come. The Department decided on a ICL 1904A Computer with new facilities of random access in 1969. The staffing position was also considerably increased to provide a good balance between staff and equipment. The total strength of Division at time of writing was 146, including 1 Computer Manager, 7 System Analysts, 16 programmers, 12 supervisors, 8 console operators and 92 machine operators.

#### Involvement in Planning

In recent years the Department has begun to be actively associated with the Government's efforts at planning for the economic and social development of the country. This involvement has just not meant the provision of statistical data on a broad front but also the participation in the work on economic projections and forecasting thereby making an effective all round contribution to the decision-making process at the official level. As mentioned earlier the Chief Statistician is a full-time member of the National Development Planning Committee, composed of the heads of the important Ministries and agencies concerned with development planning.

Since the inception of the First Malaysia Plan there has been almost daily contact between the Department and planning officials over a wide range of statistical and economic questions. A considerable volume of the Department's work is now taken up with the requirements of the planning bodies. The Department provides continuous statistical support not support not only to the various planning bodies, but also to major related agencies as the Central Bank, Treasury and Ministries of Labour, Agriculture and Commerce and Industry. The Department is also relied upon to provide essential factual information for the periodic visits of the IMF and World Bank teams. Apart from representation in the NDPC, the Department, as the government's central statistical agency, is represented in the Tax Committee, the National Family Planning Board, the Tariff Policy Advisory and Negotiating Committee, etc. and has advisory responsibilities to various Ministries.



Special Fund Project

The Department of Statistics has during the last few years relied on some form of technical assistance from outside the country. The reasons for the Department's reliance on foreign advisers have been twofold: (1) the acute shortage of trained statistical personnel in Malaysia and (2) the pressure on the Department for rapid expansion of its services. These reasons will continue to hold true in the foreseeable future. The presence of statistical advisers has helped to give form and momentum to statistical organization, but at the same time, the ad hoc nature of most of this assistance has led to a somewhat uneven development of statistics. The number of foreign advisers attached to the Department at any one time has also varied widely (and unpredictably). The growing and insistent demands of the various planning bodies and in particular of the Economic Planning Unit on the Department, coupled with the shortage of high-level experienced staff in those areas of statistics requiring rapid expansion and improvement, was posing a crisis for the Department. It was becoming increasingly clear that stop-gap arrangements under which technical assistance was provided were wholly inadequate to cope with the situation. Accordingly, the Government realising that only a co-ordinated programme of technical assistance with assured continuity can reduce the gap between the Government's statistical needs for planning and the Department's capacity to fill these needs, submitted an application for a U.N. Special Fund Project in the field of statistics. This project which has now been approved and have begun to be operative envisages expert assistance over a four-year period in such specialized fields as national accounts, financial statistics, agriculture statistics, demographic and social statistics, labour statistics, price statistics, statistical sampling, data processing, industrial and distribution statistics. The project costing about a million dollars (U.S.) envisages the provision of 31-man years of assistance in addition to fellowships.

The Department also has close relations with and is an increasingly important supplier of essential data to most of the special bodies and authorities that have been established for furthering specific plan objectives. These bodies include the Federal Industrial Development Authority (FIDA), charged with responsibility for promoting industrial development; the Tariff Advisory Board, which considers requests for tariff protection and is charged with creating a common customs area between East and West Malaysia; the Majlis Amanah Raayat (MARA), which has very broad responsibilities for the economic advancement of the indigenuous population; the Malayan Industrial Development Finance Company (MIDF), a public limited company which finances industrial ventures, conducts feasibility studies, and the like, and the Federal Agricultural Marketing Authority (FAMA), concerned with marketing schemes.

## Statistical Activities Since The Sixth Conference

### Introduction

This report gives only a broad outline of the main developments which have taken place in the statistical field in Mauritius since the 6th Conference of Commonwealth Statisticians. Normal routine developments will not be included in the summary.

### Administration

2. The last 4 years have been in Mauritius years of austerity during which, on account of financial difficulties, Government enforced strict economy measures to compress public expenditure to the utmost. For a fairly long period it was even difficult to get authorization to fill staff vacancies created in the Public Service by retirement, resignation or promotion.
3. Now that conditions are back to normal, the Central Statistical Office is experiencing difficulties to fill vacant posts by qualified Statisticians
4. At the time of writing this report three of the four senior posts are not being occupied by substantive officers. Hence the office has worked with a greatly depleted staff during these last few years which have been a period of fight for survival instead of expansion of activities.
5. This report will consequently be very brief, as there is not much to be reported in the way of development.

### Organizational Changes

6. An organizational change of particular interest, departing from the usual practice of centralization, has been the creation of a statistical section inside two ministries: Agriculture and Education. It is thought that both Ministries will thus derive more benefit from the physical proximity of the sections dealing with their statistics, whilst the statistical staff will still retain the advantage of looking for guidance, supervision and promotion in the Central Statistical Office.
7. The Central Statistical Office which was under the Prime Minister's Office has been transferred to the Ministry of Economic Planning and Development on the creation of this ministry in late 1969.
8. The Central Statistical Office is thus in the same ministry as the Economic Planning Unit with which it works in close collaboration.

Population

9. The next population census is to be taken in June 1972 and planning is scheduled to start in July next.
10. It is hoped that a full-time demographer will soon be appointed on the staff of the Central Statistical Office to help with the planning of the census.
11. The census will be followed by various demographic studies and by the computation of life tables.

Agriculture

12. The Nuffield Foundation sponsored a Survey of Cowkeepers which was taken in 1966/67. The Central Statistical Office provided technical advice in the field of sampling, and organised the field work of this study which provides information on the economic and social conditions under which milk is produced in the country.
13. Mauritius has agreed to participate in the 1970 round of the World Agricultural Census, and the census was to be carried out in 1970. However, as no funds are available for this purpose, it has been decided to postpone the operations to 1973, when use could be made of information gathered in the 1972 Population Census to reduce costs.

Labour

14. Since 1966 the Central Statistical Office carries out a bi-annual survey of employment and earnings in large establishments. For the purpose of this survey large establishments are defined as:
- (i) Sugar cane plantations where 25 acres or more are harvested;
  - (ii) Tea plantations of 5 arpents or more;
  - (iii) All "flue-cured" tobacco establishments, irrespective of acreage;
  - (iv) Non-agricultural establishments employing at least 10 persons;
  - (v) All Central and Local Government departments.
15. The main purpose of these surveys is to provide a continuous series of comparable data to show seasonal changes in employment in the various sectors of the economy.
16. When financial and human resources will permit, the scope of the survey will be broadened to include all establishments irrespective of size, but data for small concerns will be obtained on a sample basis.

## 2 - MAURITIUS

17. In 1967 a survey of apprentices in industrial establishments was carried out. For this purpose all establishments likely to employ apprentices were contacted by the Central Statistical Office. The survey established that apprenticeship was in no way organized in Mauritius, and that no proper training scheme in industry, no uniformity of payment and no code of rights and obligations existed for apprentices.

18. The survey results led to the passing of the Apprentice Act in 1968 which regulated apprenticeship in certain trades, and to the establishment of a central apprenticeship committee to deal with all matters concerning apprentices. It also helped to establish priorities for the Industrial Trade Training Centre which started to run courses in late 1967.

Production

19. The second Census of Industrial Production was taken in 1968-69 and covered the production during 1967-68, of all establishments, irrespective of size, engaged in mining and quarrying, manufacturing or repairs and electricity production and distribution (major groups 11 to 51 of ISIC).

20. The census was a combined postal and field enquiry. Firms employing 10 or more persons were contacted by post, whereas an interviewer called on smaller establishments. The response rate was 93% for the postal survey and 100% for the field survey. The results were published in January 1970.

21. In future all large establishments (i.e. those employing 10 or more persons) will be surveyed annually and all small establishments every 3 years.

Trade

22. Up to the end of 1969 the Trade Statistics of Mauritius were compiled and published in Standard International Trade Classification (SITC) and consisted of 713 items. However, to meet more adequately international requirements as well as the requirements of the trading and industrial community of the country, the Brussels Trade Nomenclature has been adopted as from the 1st January, 1970.

23. The Central Statistical Office will henceforward prepare two sets of trade figures, one according to the Brussels Trade Nomenclature and the other according to SITC-revised.

24. The compilation and publication under SITC-revised has been extended to cover 1310 items.

International Organization

25. Since it achieved independence in 1968, Mauritius has obtained membership of the following international organizations: The United Nations Organization and its specialized agencies - I.L.O., F.A.O., W.H.O., and

U.N.E.S.C.O. - the International Monetary Fund, the International Bank for Reconstruction and Development and its agencies, the Organization for African Unity and the Organization Commune Africaine et Malgache.

26. This office is being called upon to reply to numerous and extensive questionnaires from these organizations dealing with a wide range of topics.

### Data Processing

27. The work load on the Punched Card Data Processing machines of the Central Statistical Office has increased so much that it has been necessary to envisage the installation of a Computer.

28. By the end of 1970, a small ICL computer of the 1900 family will be installed to cater for the needs of all government services. The Central Statistical Office will however lose in autonomy as it will have to share the equipment with other departments.

### Future Developments

#### Major plans for the immediate future

29. In view of the growing importance of national accounts as a basic tool for economic planning and policy making, special attention will be given to refining the methods employed and improving the coverage. A complete revision of national accounts and capital formation estimates is envisaged, using the new S.N.A. if feasible. This will necessitate the carrying out of various enquiries and ad hoc sample surveys, inter alia, to determine wholesale and retail trade margins, building costs, etc.

30. A Census of Distribution is to be taken as soon as financial and human resources are available.

31. A Family Budget Enquiry is to be undertaken principally to obtain data for revising the consumer price indices.

32. A Survey of Industrial Production covering establishments employing 10 or more employees will be carried out annually, and an exhaustive survey of all establishments every 3 years.

33. The scope and coverage in many fields will be improved, e.g.

Labour statistics	-	Employment and wages
Education	-	Study of costs per pupil in secondary schools
		Analysis of examination results in primary schools
		Study of 'drop outs' to determine causes
Agriculture	-	Statistics of yield of various crops

STATISTICAL ACTIVITIES SINCE THE  
SIXTH CONFERENCE

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New Zealand Statistical Organisation

1. In the latter half of 1969 New Zealand's statistical needs were intensively investigated by a Technical Committee on Statistics reporting to the National Development Council (N.D.C.). For much of 1970 planning and negotiation has been taking place to establish the necessary increase of resources and the nature of the statistical reorganisation required to meet the recommendations of the Technical Committee as accepted by the National Development Council and the Government.

2. A programme of expansion of statistical services has been agreed upon, as has a scheme for the reorganisation, enlargement, and upgrading of the Department of Statistics. Moreover a review of the division of statistical work between the national statistical organisation (the Department of Statistics) and other Government departments has been commenced. This will result in the assimilation by the Department of Statistics of such of the activities in question as are considered to be better centrally administered. The State Services Commission with the Government Statistician has now in hand measures for the appointment and training of the additional staff.

3. For the benefit of the conference it is felt that the continuing current activity of this reorganisation should be emphasised in this paper.

National Development Statistics and the Technical Committee  
on Statistics

4. The 1969 National Development Conference concluded that if indicative planning were to be done in a rational way, a comprehensive framework of official economic statistics would be required. The Targets Committee of the Conference had stated "Only when the current and projected future performance and structure of the economy is quantified, can the formulation of growth targets and the setting of optimum policies to achieve the targets be carried out effectively".
5. In like vein, the Monetary and Economic Council had earlier stated "Unless we have an accurate picture of the structure and working of the economy we cannot know which measures for the promotion of growth with stability are really appropriate in the New Zealand setting, nor can we critically assess the effects of past measures as a basis for subsequent policy decisions".
6. Central statistical offices in many countries have increasingly been placed under heavy pressure to produce an ever-widening range of material basic to development planning.
7. The difficulties which faced the Targets Committee of the National Development Conference were among the reasons leading to the appointment of the Technical Committee on Statistics, which set out in its report the statistical requirements of the developing New Zealand economy.
8. The main conclusions of the Committee, as set out in its report published on 5 November 1969, were:
9. Major extensions to New Zealand's official statistical services are necessary to meet national development planning needs. These extensions are parts of an integral whole which will fully repay the commitment of the substantial resources required.
10. A modernised and extended system of national accounts and inter-industry studies is the key to the statistical requirements of indicative planning.
11. A quarterly summary of national accounts is necessary as a tool for short-term economic management.
12. Periodic surveys of household incomes, expenditures, and savings will provide valuable information for national accounting and social purposes.
13. A variety of new or extended statistical services is recommended: a statistical information centre using computer resources; the development of liaison arrangements between the Department of Statistics, National Development Sector Councils; and users and providers of statistics; and further development of statistical projections by the Department of Statistics.

14. There is a need for improved regional statistics. The coverage and usefulness of regional statistics will be increased by the introduction of the fine-mesh block system which is recommended.
15. The implementation of its recommendations is seen by the Committee as taking place in two stages, the first before and the second after the end of 1971.
16. The State Services Commission, the Government Statistician and the other departments concerned should investigate the scope for the further centralisation, better co-ordination, and more economical conduct of statistical work.
17. Statistics presently collected should, in collaboration with users and suppliers, be periodically reviewed and, where indicated, discontinued or adapted.
18. The Committee's recommendations made in October 1969 were promptly accepted in principle by the National Development Council and in turn by the Government. Intensive consequential investigating and planning work has since been proceeding at departmental and Government levels.
19. In effect the report of the Committee is a comprehensive review of the whole field of New Zealand Official Statistics. The keystone of the Technical Committee's work was the proposal that a revised and more detailed system of New Zealand national accounts be introduced in the near future, based on the United Nations System of National Accounts 1968, to serve as a framework within which, as far as possible, all economic statistics would be integrated.
20. The Committee's report contained several other major proposals. The Department of Statistics was recommended to try to overcome the problems in regional, social, and economic studies resulting from a multitude of regional definitions, by introducing a common location-referencing system, and a standard classification of larger areas to meet the needs of most users.
21. Household surveys of family expenditure and other social, demographic, and economic data were another important topic considered and in view of the value of the statistics provided by such surveys for national accounting purposes and other purposes, the Committee concluded that a household budget survey should be undertaken by the Department of Statistics with high priority.



22. The Committee also recommended the establishment of a computerised statistical information centre; development of demographic and economic projections to serve indicative planning needs, and supported the principle of a standard statistical reference year but felt that more study was needed of the administrative problems that would arise if such a standard was adopted.

23. Besides these major proposals, the Technical Committee gave consideration to the detailed statistical needs of particular N.D.C. development councils and also the changes in other fields such as population and financial statistics. Close attention was paid to the need for better liaison between statistical agencies and the users and producers of statistics, and the need to reduce as far as possible the burden on respondents to statistical surveys.

#### New System of National Accounts

24. The S.N.A. (System of National Accounts) 1968 has been examined in detail with a view to its suitability for adoption in New Zealand. It is a consistent system which provides most of the statistics necessary for economic planning. The general framework of S.N.A. 1968 is adequate for New Zealand needs, but there are some parts of the system where it will be necessary to make changes in concepts, definitions, and classifications to suit particular New Zealand circumstances. These include the classification of industries to meet N.D.C. and general statistical requirements. The amount of change necessary is small and it will not disturb the internal logic of the system.

25. The S.N.A. will be discussed more fully under Item No.10.

#### Central Register of Enterprises

26. Completely new demands are currently being made for information covering a wide spectrum of economic data of business firms, capable of aggregation and disaggregation.

27. Historically many statistical series have developed independently due to their nature and the purposes for which they were designed. In general, there is an absence of unifying concepts as between various series. Therefore, in too many cases these series cannot be satisfactorily aggregated to yield meaningful economic data.

28. Today the intra and inter-firm relationships can be most complex. Consequently, the availability of economic data on a consistent basis differs greatly as between

individual firms and groups of firms. Until now each survey branch of the department has prepared its own index of establishments to be surveyed and these do not precisely mesh with other indexes where firms have complex organisations.

29. All countries have essentially similar problems in this regard and these are being overcome to a large extent by a similar approach. This involves the construction of a single index of enterprises which records the hierarchic relationships between units at one level of organisation and units at other levels. These statistical units can be systematically defined and recorded so that they are treated consistently in all economic censuses and surveys. Such consistency of treatment will extend not only to the delineation of the jurisdictional limits of the units but also to their various quite numerous characteristics.

30. With such an index it is possible to carry out surveys so that any firm engaging in a number of separate activities will report on each individual activity in such a way that all its parts will sum up without omissions or duplications. This will also enable firms to check the figures against their own records.

31. The register, at present being prepared, will contain, when fully developed, an up-to-date list of all enterprises and their establishments, incorporated in a centralised address system covering the whole of New Zealand and capable of providing the name, address, form of proprietorship, establishments, and local units classified by industry and location. This listing will become a single source of coverage replacing the individual survey lists which are at present kept separately and updated by various unco-ordinated means. Additionally non-farming enterprises will be included with farming enterprises considered for inclusion at a later date.

32. The establishment of the register should also materially assist sampling procedures by authoritatively providing survey fields from which respondents may be selected.

### Inter-Industry Studies

33. There is a requirement by the new National Development Council to produce aggregations of both 1959-60 and 1965-66 transactions at a level of 21 industry groups with, as far as possible, the same specifications and methodology in each year. This will be done on the basis of the methodology and definitions used for the 1959-60 workings. In addition the full tables of 110-120 industries for 1965-66 will be prepared with concepts and definitions aligned to those laid down in the U.N. System of National Accounts 1968. Some improvements in methodology will also be incorporated as the result of experience gained in the previous inter-industry study.

34. The choice of a year for the next study has not yet been made but it is intended that it shall be the first of a three yearly series in which the input-output tables are reconciled with New Zealand's revised national accounts following the principles and definitions set out in the United Nations System of National Accounts 1968. This series will start when the staffing situation for this type of work allows. A series with this order of frequency is a requirement for analyses and projections to be made as a part of the indicative planning by New Zealand's National Development Council.

### Electronic Data Processing

35. Early in 1970 the Government decided to establish a Government Computer Centre to ensure the best planned and most economical extension of Government electronic data processing services. Already several Government departments, including the Department of Statistics, had been operating their own computer installations for varying periods. Some were pressing to expand their E.D.P. work and to obtain more modern, more powerful, and more expensive equipment to enable this. They were being joined by a number of other Government departments seeking for the first time to embark upon more or less considerable E.D.P. programmes.

36. The decision to establish the Government Computer Centre - the day-to-day administration of which is to become a responsibility of a division of the Internal Affairs Department - is expected to ensure the orderly extension of the Government's E.D.P. work and at the same time both the most efficient use of scarce E.D.P. staff and the best and most economical use of costly E.D.P. plant and equipment.

37. A Computer Centre Co-ordinating Committee has been set up with the full powers to plan, regulate, and oversee the work of the centre. This Committee, of which the Government Statistician is a member, has already taken a number of significant decisions affecting the rate and pattern of expansion of facilities, as well as the day-to-day use of machine capacities.

38. Computer methods of checking the accuracy of unaggregated detail prior to processing statistics from surveys, formerly all done clerically, are still being developed and may eventually lead to the elimination of most routine clerical checking at this stage of survey processing. The use of computer methods for handling the addressing of statistical questionnaires, recording of survey response, the preparation of copy for publication, and the centralized storage of unaggregated and aggregated statistics in an organised form to permit vastly easier location and accessing of statistics for users, are among the extensions that have been proposed and are in the process of implementation or development. This trend towards automation of the routine aspects of departmental operations, besides giving rise to greater efficiency, also assists in overcoming staffing shortages.

39. The additional statistics made possible by the development of new computer systems over the last four years include the complex 110-sector input-output study of the New Zealand economy undertaken by the department. Once the basic analysis of the pattern of inter-related sector inputs and outputs had been determined by economic investigating staff, computer sections, using special methods developed for the purpose, were able to carry out the equivalent of tens of man-years of computational work within weeks needed to produce the derived data which quantify the structural relationships existing in our economy.

#### New Statutory Responsibilities of the Government Statistician

40. During the past year three additional statutory responsibilities were entrusted to the Government Statistician. The first of these was under the Superannuation Amendment Act 1969. Under this Act the Government Statistician is required to certify increases in the level of prices, as measured by the Consumers' Price Index. Superannuation payments from the Government Superannuation Fund are altered in accordance with these certified changes.

41. The second additional responsibility results from the State Services Remuneration and Conditions of Employment Act 1969. Here, the Government Statistician reports on movements in average ordinary time earnings in the private sector, as shown by the Department of Labour's half-yearly survey, making adjustments for the effect of changing proportions of part-time workers and females in the labour force. The percentage movements shown are then applied to State Service wages and salaries.

42. Thirdly and also pursuant to the State Services Remuneration and Conditions of Employment Act there is to be established as a division of the Department of Statistics a Pay Research Unit which will have the responsibility for developing comparisons of job contents and emoluments obtaining in industry and with the State Services. Planning work on this initiative is already under way.

#### Planning of 1971 Census of Population and Dwellings

43. Planning and development work for the 1971 census has been intensive during the year. Planning work for this already done includes:

- (a) Additional to the non-administrative areas, statistical divisions are to be created from the 1971 census; there are seven of these divisions, the basic criterion being a population of at least 75,000 in a central nucleus and its environs.

- (b) Developments of standard census location small-area groups (about 900 area units are envisaged) for which statistical data will become available progressively as 1971 census processing takes place.
- (c) Re-design of the personal and dwelling schedules. To facilitate reading and completion by respondents the size of both schedules has been increased for 1971 and the effects on printing, processing, etc. have been studied. Following on a study of National Development Conference and other user requirements, proposed new questions cover internal migration, fertility of married females, place of employment, mode of transport to work, and ownership of motor cars and pleasure boats.
- (d) Revised standard New Zealand industry and occupation codes shortly to be issued are being adapted for census use.
- (e) A feasibility study and investigation into incorporating basic geographic reference location (census district, sub-district, and mesh block) into basic E.D.P. input media.
- (f) An analysis of results from the pilot survey into mark sensing processing methods, leading to a rejection of this method of processing for 1971 census.

#### External Trade Statistics

44. Up to 30 June 1967 New Zealand operated, for import statistics, a combined Customs Tariff and Statistical Classification. At its inception (1/7/62) this document covered 4,160 items at seven digit level based on the Standard International Trade Classification (S.I.T.C.).

45. As from 1 July 1967 the Customs Department brought in a completely new Customs Tariff for purely customs purposes based on the Brussels Tariff Nomenclature (B.T.N.). When launched this new classification covered 4,242 items at six digit level. Thus all customs import entries were classified in this six digit code and it became necessary for this department to operate a dual-purpose system - basic documents in six digit B.T.N. language and a published output in seven digit S.I.T.C. for economic purposes and to maintain comparability both over time and internationally.

46. With the 1962-67 combined tariff and statistical document becoming obsolete this department had to set up a link between the new B.T.N. type tariff and future published statistics in S.I.T.C. This was done by establishing a

completely new Statistical Classification of Imports covering initially 3,879 items in a seven digit S.I.T.C. listing. This involved quite an amount of intricate work linking both classifications and maintaining a "one for one" relationship.

47. There is a continuing necessity to keep abreast of subsequent Customs Tariff changes to preserve this relationship and to see that amendments are able to be incorporated under the existing E.D.P. arrangements, by adequate maintenance of machine keys and other supporting documents, and the statistics finally published by the Department of Statistics.

48. Some idea of the effect and the volume of both clerical and machine work involved in operating in two languages (B.T.N. input/S.I.T.C. output) can be gained from the following E.D.P. summary card outputs at Country Summary level:

1966-67 ("Old" Tariff last of S.I.T.C. solely) - 333,679 summary cards.

1967-68 ("New" Tariff on B.T.N. basis plus conversion of B.T.N. to S.I.T.C.) - 534,634 summary cards.

(It should be noted that this increased card handling occurred at a time when total imports dropped sharply from \$752m. in 1966-67 to \$623m. in 1967-68).

### Summary of Other Selected Statistical Surveys

#### Household Electricity Consumption

49. The department is conducting a nation-wide survey of patterns of household electricity consumption in collaboration with the New Zealand Electricity Department and the Electrical Supply Authorities Association.

The survey will help authorities assess the pattern of demand and what future investment needs will have to be met.

There is a lack of knowledge of the factors lying behind trends in electricity consumption. Although information is available on non-household consumers, little is available on household consumption.

#### Projection of Housing Requirements

50. A new set of housing projections has been completed covering the period 1970-1980 (March years). As well as projecting future housing requirements, losses through

demolition, conversion, and fire are also projected, thus leading to projections of new dwelling requirements. The projections have been based primarily on demographic factors, allowance being made for the differing housing requirements of the various age and marital status groups in the future population. Alternative assumptions regarding housing standards have been incorporated. The first assumption was that housing standards will remain at the level obtained in 1968 while the alternative assumption was that housing standards (as measured by occupancy rates) will continue to improve at the rate experienced over the period 1961-68. The data on housing standards were obtained from the 1966 census of dwellings and adjusted to allow for experience up to 31 December 1968.

Housing projections provide an essential framework for the planning of future building activity in the field of private dwellings. The usefulness of the projections for forecasting purposes depends on how closely the assumptions used actually match future experience.

#### Private Superannuation Funds

51. The first survey of these funds in New Zealand was completed for the year ended 31 March 1968, and the results were published as a supplement to the August 1969 Monthly Abstract of Statistics. The results of the survey showed that whereas, in the past, only the very largest enterprises in the banking, insurance, and industrial fields had schemes for their employees, a large number of smaller concerns were operating schemes and practically all types of industries in addition to trading and financial institutions were represented. It does appear that considerable development of private superannuation schemes can be expected and it is the intention of the department to institute a further and more wide survey of these funds in the near future.

#### Non-Bank Deposit Accepting Intermediaries

52. The major statistical development over recent years in the Reserve Bank has been the effort to extend the range of information collected from financial institutions, in particular the non-bank deposit accepting intermediaries. The move was stimulated some time ago by a recognition of the growing absolute and relative importance of institutions outside the normal banking sphere and the need for Government to be better informed on the overall structure of the financial system. Hence the Bank has added to its statistics on trading and savings banks detailed collections from official money market dealers, insurance companies and, more recently, finance companies, stock and station agents and building societies.

Revised Nominal Weekly Wage Rates Index (Adult Males)

53. A new nominal weekly wage rates index for adult males was introduced in 1968 with 31 December 1965 as base. Former indexes were in the main measures of changes in minimum rates for manual occupations but the new index covers wage and salary rates for all adult male employees in the labour force whose minimum or mandatory rates of pay are determined by some statutory authority. Major sub-indexes are calculated for (mainly) minimum rates fixed by or within the jurisdiction of the Court of Arbitration and for (mainly) mandatory rates determined by other statutory authorities. Further analyses give indexes for both industry and occupation groups.

Previously some 220 odd individual rates were used in the calculation of the index. Now some 600 individual rates are covered. The selection of these is no longer made by reference to a fixed list but must be determined by an examination in detail of all Awards and Agreements.

Additional Data from 1966 Census

54. The use of electronic data processing on the 1966 census data meant that not only were results available earlier than at previous censuses, but that a great many additional cross-classifications of the census data were possible. New tables were included in almost all the census volumes, and the Households and Dwellings volume was published in two parts to allow for the inclusion of a mass of data of considerable sociological interest on the composition of New Zealand households and families. This data was derived by programming the computer to produce a household card by analysing the data on each dwelling card and its associated personal cards. As a result, statistics on types of households, family occupancy, and characteristics of the head and spouse (such as age, sex, marital status, income, etc.) became available for the first time. Information on institutions and group living quarters such as hotels, motels, hospitals, old people's homes, etc. was similarly compiled.

55. A question on education was included on the census schedule in 1966 for the first time since 1921, and this enabled statistics to be compiled on the level of schooling and educational qualifications of the total population aged 15 years and above. Cross-classifications with industries, occupations, incomes, ages, and so on were also processed.

Census of Distribution

56. The five-yearly Census of Distribution was taken in 1968 and the full results published earlier this year. This latest census was the fourth of its kind in New Zealand.



Three main categories of domestic trade were surveyed - retail trade; wholesale trade; and services. The census showed the level of purchases, stocks, and sales by broad categories; the geographical distribution of establishments, and other information useful in evaluating developments in domestic trade. Among its other uses, information from the census provided a base for the regular quarterly surveys of retail and wholesale trade.

#### Air Freight of Exports and Imports

57. Special six-monthly tabulations of air exports and imports are now being produced to measure the growth in value of goods transported by air. Summarised statistics showing groupings of commodities and countries of origin/destination are published as a supplement to the Monthly Abstract of Statistics.

#### Urban House Property Price Index

58. As an indicator of changes over time in the level of prices paid for urban house properties, an index of urban house property prices is published at six-monthly intervals. This index was developed during the last revision of the Consumers' Price Index.

59. The index is so designed that variations from period to period in the characteristics of the house properties transferred - age, size, standard of construction, site, etc. - have no influence on the index, that is, the index measures solely the price element in the changing level of urban house-property values.

#### Quarterly Balance of Payments

60. Commencing with September quarter 1967, a summary of the current account of the balance of payments has been published on a three-monthly basis. The figures are provisional and are subject to revision when the annual accounts are prepared.

## Review Of Statistical Activities Since The Sixth Conference

### Introduction

Since the last conference of Commonwealth Statisticians in September 1966, Nigeria has been in the grips of a crisis culminating in a civil war, the details of which are already probably well known to participants at the present conference. But suffice it to say that its effects were all-permeating and that the Federal Office of Statistics has had its adequate share.

2. These effects were two-fold. Firstly, owing to movement of persons from the rest of Nigeria to the former Eastern Region (now the three Eastern States) of the Federal Office of Statistics lost several of its staff particularly in the middle and lower cadres. Secondly, the "three Eastern States" have been unavoidably excluded from all our major surveys like the National Income Survey, the Rural Economic Survey, Urban Consumer Survey and Industrial Survey and the Capital Formation Survey. All our surveys therefore since 1967 have been "partial". This becomes significant when one realises that the three Eastern States constitute 8% of Nigeria's land area, 25% of its population and account for between 17% and 20% of its Gross Domestic Product. The war has now fortunately come to an end. With the return to normal prewar conditions coupled with the problems of rehabilitation and reconstruction of the economy, greater demands are being made on the Federal Office of Statistics for statistics relating to various facets of the national economy.

3. Our review over the past four years is in three parts. The first part deals with the recent changes in the organisational structure of the Federal Office of Statistics, the second gives an account of the further progress made in our regular areas of statistical activity while the third part describes new fields of activities contemplated/planned or currently being undertaken.

### Reorganisation of the office

4. In order to be able to cope with its expanding activities, the Federal Office of Statistics has further modified its structure. Basically the office is now divided into three divisions viz

- (a) An Economic Statistics Division comprising National Accounts, Capital Formation, Public and Business Financial Statistics, Industrial Survey, External Trade and Balance of Payments and Research and Development.
- (b) Surveys and Demographic Division comprising Population, Vital Statistics, Labour Statistics, Agricultural Surveys, Urban and Rural Consumption Surveys.
- (c) A common Services Division comprising Data Processing, Publications, Staff Training, Field Surveys, Administration.

5. Two branches are worthy of special mention. The Research and Development exists to effect improvements in methodology and concepts with particular reference to the Rural Economic Survey and the National Accounts. Within two years of its establishment the Statistical Standards has done

considerable work on the Rural Economic Survey where it has been looking into ways of reducing sampling errors, and improving data on acreage and yields of principal farm crops. The office attaches great importance to estimates of agriculture as this constitutes over  $\frac{1}{2}$  of the Gross Domestic Product of Nigeria.

6. The Field Survey Organisation Unit has grown out of the need to separate the field survey staff in the field from the analysis staff. This will considerably improve the quality of our surveys as the training of staff; the design of survey forms and the actual conduct of the surveys both rural and urban have now been centralised. This leaves the analysis staff free from any administrative schedules.

7. Following the division of the country into twelve states in March 1967, the office has further expanded. Consequently there are now twelve state offices as against the four prior to 1967.

### The Regular Surveys

National Income Survey: In 1968 the Federal Office of Statistics published "The Gross Domestic Product of Nigeria 1958/59 - 1966/67". The notes accompanying the estimates describe the latest methods used for the various items and sectors.

The Rural Economic Survey: The annual survey has continued as usual. As mentioned earlier, the survey over the past three years has excluded the three Eastern States owing to the civil disturbances. The latest year for which estimates are available is 1967/68 but the results of the 1968/69 survey will be ready shortly.

Household Surveys: Cost of living indices for lower income groups (i.e. incomes below £500) have been issued regularly for the large urban centres like Lagos, Kaduna, Ibadan, and Benin. There is also a cost of living index for the middle income group for Lagos.

8. Currently a rent enquiry is being undertaken in Lagos, Ibadan, Port Harcourt and Calabar the result of which will be used to revise the accommodation component of the urban consumer price indices of the towns concerned. The weights used at present were obtained from enquiries conducted over a decade ago. There is little doubt that conditions have significantly changed since then.

Industrial Survey: The results of the yearly survey of the manufacturing sector covering establishments employing 10 or more persons for 1967 are available in draft. These will be published before the conference meets in November.

9. The response rate continues to be encouraging, although there was a drop from 96% in 1966 to 93% in 1967.

Future Developments: Late last year the Federal Office of Statistics prepared "A Programme of Censuses and Surveys 1970-75" which sets out in great detail its future statistical activities over the next five years. The document has been formally submitted to the government for approval.

10. In this connection mention should be made of the National Advisory Committee on Statistics set up early in 1970. It consists of personnel from

the Federal Ministry of Economic Development, the Universities, Chamber of Commerce, the Central Bank with the Federal Chief Statistician as its chairman. It is to advise the Federal Office of Statistics on ways of improving the Statistical System in the country. It has already held two meetings the earlier one of which discussed the "programme" mentioned above.

11. The most important censuses and surveys included in the programme are

- (a) The Demarcation of Enumeration Areas 1970-71
- (b) The Population Census 1973
- (c) The Census of Agriculture 1974
- (d) The Distribution Survey 1970
- (e) The Labour Force Survey 1974

The Demarcation of Enumeration Areas: This is an operation which is a necessary prelude to all other surveys and censuses. It is proposed to demarcate the entire country into enumeration areas or blocks each containing about 500 persons.

12. The operation will consist of three stages - mapping, the listing of localities and the actual demarcation. Preparatory work is already well in hand and the demarcation is expected to be completed in early 1971.

Population Census 1973: A population Census is being planned for 1973. The demarcation exercise already referred to will be useful for the various demographic surveys connected with the census.

Census of Agriculture 1974: A census of agriculture is being planned for 1974 as part of the world programme.

The Distribution Survey: The survey on distribution is to cover both large scale and small establishments. The large scale establishments will be covered by a census while the small will be covered by a sample. The U.N. expert to organise the survey arrived in February and the survey is expected to commence in July.

The Labour Force Survey: Two types of surveys are proposed - a quarterly survey and a more infrequent one every five years. It is to provide data on composition of Labour Force, the volume of employment and the geographic, industrial and occupational distribution of employment and unemployment. The quarterly survey is to be based on a sample and limited to the urban sector where the problem of unemployment is really serious.

13. It is expected that by the time the next conference meets most of these surveys will have been completed.

Review of Statistical Activities since the Sixth Conference,  
including Population and Agriculture Census Plans

After the 6th Conference of Commonwealth Statisticians, Tanzania's Bureau of Statistics has been divided into nine sections whose responsibilities are as follows:-

1. **Population Statistics Section:** At the moment, this section is mainly engaged in the analysis of the 1967 Population Census. Already three preliminary reports have been published, namely "Preliminary Results of the 1967 Population Census" giving a sex distribution of the population both at regional and district levels. "Population Changes: 1948-1969" giving a historical presentation of the population changes during the last two decades, "Provisional Estimates of Fertility, Mortality and Population Growth Rates". It is envisaged to produce five volumes out of the census data, namely Volume I - "Population Distribution by Enumeration Areas", Volume II - "Urban Statistics from the 1967 Population Census", Volume III - "Demographic Factors," Volume IV - "Economic Factors" and Volume V - "The Methodology of the 1967 Population Census." Of these, Volume I is out, Volume V is being printed and Volume II is ready for printing. Information for Volume III is now being run through the computer.
2. **Household Budget Survey Section:** A nationwide and yearlong survey on incomes, expenditures and savings of households was launched in December 1968 and the field work was closed around the end of the first quarter this year. The purpose of the survey has been to provide data for (a) measurement of levels and standards of living of people in Tanzania Mainland (b) to enable a direct derivation of private consumption expenditure (which is up till now being obtained as a residual calculation) for national accounts (c) to provide a basis for the construction of national cost of living indices (d) to provide data for demand elasticity studies. The tabulation plan for the survey has been completed and circulated to interested users for comments. Coding work is in progress.
3. **Industrial Statistics Section:** This is responsible for carrying out annual surveys on industries and analysing monthly returns of industrial production from a few selected major industries. The annual surveys cover establishments employing at least 10 persons engaged in manufacturing, mining, production and generation of electricity. It is intended to expand the scope of these surveys to include the construction sector as well within the Second Five Year Plan period (July, 1969-June, 1974). Also an index of industrial production and mining will be attempted. An expert has already been recruited from India to undertake these functions.
4. **Agricultural Statistics Section:** With regard to current agricultural statistics this section deals with the analysis of data on crop husbandry including prices paid to growers, animal husbandry, forestry and fisheries from the Ministry of Agriculture, Food and Co-operatives. It also deals with periodical sample surveys on crop yields and acreages such as one conducted on the cotton growing regions round Lake Victoria in 1966. However, the Bureau is now committed to conducting a national agricultural census in the period: October, 1971-September, 1972. It is hoped that the census will provide benchmark data essential for planning

and following up the development of the agricultural sector. Preparatory work has already started with the aid of an FAO Statistician and a pilot survey is expected to be launched in some five regions shortly.

5. National Accounts Section: This deals with compilation and analysis of statistics on national income, trade and public finance. A U.N. Expert in this field has already produced three reports, namely "Revised National Accounts of Tanzania Mainland for the period 1966-1968", "Accounts of Central Government Authorities for the period: 1965/66 - 1967/68" and "Accounts of Parastatals: 1966 - 1967". Trade statistics have also been analyzed by end-use up to 1968. Accounts of Parastatals for 1968 have just been completed and a provisional national income series for 1969 is also available. Work is now in progress to analyse the accounts of Local Government Authorities and parastatals for 1969.
6. Labour and Price Statistics Section: As the title implies, this section deals with annual surveys on employment and earnings and analysis of price data for certain selected consumer goods. Three cost of living indices are being compiled, namely "Dar es Salaam Wage Earners Price Index" calculated bi-monthly, "Dar es Salaam Middle Grade Civil Servants Cost of Living Index" calculated quarterly and "Dar es Salaam High Income Cost of Living Index" calculated twice a year. In mid-1968 work on price collection in respect of selected commodities in regional capitals was initiated. It is hoped that, when the results of the Household Budget Survey become available, this information will form a basis for the construction of a national consumer index.
7. Migration and Tourism Statistics Section: This is dealing with the analysis of migration data contained in migration cards from the Immigration Department and reports on the statistics thereof quarterly. Monthly analyses of visits to National Parks and hotels are undertaken including compilation of data on aviation statistics collected from local airports.
8. Data Processing Section: This is responsible for punching, coding and writing programmes for analysing data emanating from large-scale statistical investigations. At the moment, it is occupied with writing programmes for analysing the remaining material in respect of the 1967 Population Census. Work on programming for the Household Budget Survey data will be undertaken shortly.
9. Statistical Information and Documentation Section: This operates as a data bank for the Bureau of Statistics. It is responsible for the maintenance of library and distribution of available statistical reports.

REVIEW OF STATISTICAL ACTIVITIESPopulation and Vital Statistics

1. The department publishes a statistical report which provides detailed analyses under the four main headings of (i) population, (ii) births, (iii) deaths, (iv) marriages and divorces.

The source of data for births are the confidential statistical returns sent in by the District Registrars to the C.S.O. each month. The source of data for deaths are the legal certificates furnished by medical officers; duplicate copies of such certificates are sent to the C.S.O. Figures for marriages are also obtained from the Registrar General while those for divorces are obtained from the Registrar of the Supreme Courts of Port of Spain and San Fernando.

(a) Population estimates

Annual intercensal population estimates and projections by age groups and region have been prepared and published. The sources of data are Vital Statistics based on returns from the District Registrars, 1960 Census and estimates of internal migration derived from the Continuous Sample Survey of Population.

(b) Movement of Persons

Estimates of Internal Migration in the intercensal period have been prepared from information collected by means of the Continuous Sample Survey of Population. Estimates for the years 1966-1968 were published for restricted use.

(c) International Migration and Passenger Movements

Monthly Travel Reports are published each month giving simple cross classifications of category of passengers by Sex, Country of Normal Residence, Country of Embarkation and Country of Dis-Embarkation. The sources of data are E/D cards obtained from the Immigration Department.

Annual Travel Statistics are published each year and give much more detailed analyses than those appearing in the monthly reports. These Travel Statistics provide useful information on Tourism and are used in the compilation of Balance of Payments estimates.

(d) Manpower

The Continuous Sample Survey of Population supplies information every six months on the Labour Force by age, educational attainment, occupation, industry etc. Through the survey, the Central Statistical Office was able to publish a special Manpower Study of the fifteen plus population on "Highest Level of Skill Attained and Special Training". Crude Projections of Manpower requirements for the period 1969-1973 was prepared by the department in collaboration with the Ministry of Planning using data collected from the survey.

The Central Statistical Office is actively collaborating with the staff of the recently formed Manpower Unit at the Ministry of Planning in both the collection and preparation of data for a national manpower plan.

### Agricultural Statistics

2. After the first results of the 1963 Agricultural Census were prepared a new programme of intercensal agricultural statistics was planned.
3. A comprehensive review of the necessary statistics was prepared under the guidance of a Canadian Technical Adviser, Mr. H.R. Manery (Department of Agriculture, Ottawa). The main features of his report were:-
  - (a) To establish all the needs for agricultural statistics according to economic planning proposals.
  - (b) To propose a programme of surveys to be built up over about five years.
  - (c) To begin the programme with the most urgent and practical aspect i.e. commodity surveys especially in the field of Livestock.
4. In practice the shortage of suitably trained professional staff and of funds generally has meant that the programme has only been partially implemented.
5. The structure of Farming in Trinidad and Tobago is such that general surveys are necessarily costly and complex. The range of the size of holdings is vast and virtually every "Farm" has several enterprises or crops, plus the problems that the majority of farmers do not keep sufficient records to supply data. With a few of the newer commodities, however, the establishments are more specialised and the size distribution enables effective economies to be made by sampling - once the frame is established. Thus we have been able to start a series of monthly commodity surveys to estimate the production and sales of broilers, eggs and milk.
6. Another significant development in the field is that, not only has the 1970 Population Census made provision for recording a frame of all "Farmers" but that the development of the Central Marketing Agency under the Ministry of Agriculture has started a complete registration of Farmers. These two sources will permit more efficient sampling for a whole range of surveys of agricultural production and other features of agriculture.
7. Basic series on production and exports of major crops and products are collected regularly and published in our Quarterly Economic Report and Annual Digest of Statistics. Appropriate series on forestry and fishing are published, using data collected by the Ministry of Agriculture.
8. Preliminary work has been done to assist the agricultural department to obtain costs and farm management type data, which is also required for our national accounts work. That department also provides some price data to supplement the retail price series collected by the Central Statistical Office.



Manufacturing, Mining and Quarrying

9. The department maintains a quarterly series of domestic production of a number of major commodities such as Petroleum (Mined and Refined), Fertilizers, Sugar, Citrus, Cement, Cigarettes, Alcoholic Beverages, Matches, and Edible Oils and Fats. A pilot survey is currently in the field with the intention of extending the coverage of domestic production to include a number of the newer commodities now being produced locally such as footwear, assembled household appliances, radios, T.Vs, motor-cars etc.

10. In addition to the quarterly series of domestic production, the department has published a number of bulletins and a graphical supplement containing the results of the 1966 Continuous Sample Survey of Establishments (C.S.S.E.). The bulletins provided detailed information on cost structures, capital formation, average earnings, and hours of work for the following sectors of Manufacturing - Petroleum, Food, Drink and Tobacco, Wearing Apparel and Textiles, and Other Manufacturing. Similar data for 1967 and 1968 are also available but not yet formally published.

Construction and Energy

11. The Quarterly Economic Report provides data on Building plans approved and electric energy production. Cost structures of the Construction industry is published in the C.S.S.E. Bulletin.

Transport and Communication

12. Cost structures of local industries are available from the Continuous Sample Survey of Establishments. Information on Passenger movements, Registrations and Licensing of Motor Vehicles, Telephone installations, Toll calls, Cargo handled, etc. are published quarterly. A Monthly and Annual Travel Report supply detailed analyses on all passenger movements by Air and Sea. The latter two reports have been very useful for data on Tourism and Balance of Payments estimates.

Internal Trade

13. The major data available have been obtained from the Continuous Sample Survey of Establishments. This survey provides basic information on cost structures and receipts from sales.

14. A Retail Sales Index has been prepared from 1968. This index is being released for restricted circulation in view of the interim nature of the series.

External Trade

15. Trinidad and Tobago continues to use the basic S.I.T.C. classification as adapted locally in a Combined Trade Classification for Customs and Statistical purposes. It has been possible to prepare the monthly as well as the Annual reports in greater detail with the use of a computer so that detailed and timely reports are available.

16. Since external trade forms a substantial part of our country's economic activity the trade statistics are of the greatest importance in any economic analysis. It is noticeable that many private business organizations also depend on this data for at least a first appraisal of markets, especially where other data are less readily available.

17. Consideration is being given to changing the classification system at least to the U.N. S.I.T.C. Revised - which would then allow for convertibility to the alternative world system of the B.T.N. Discussions are proceeding with government statisticians in our region (the Commonwealth Caribbean) so as to provide for greater comparability of data in the area. This is a part of the efforts towards economic integration for the countries in the Commonwealth Caribbean.

#### Wages and Prices

18. An index of Minimum Wages (1956 base) for manual workers on "time rates" is prepared twice yearly, May and November of each year. A Pilot Survey has been completed with a view to reconstructing this index.

19. There is also an Index of Retail Prices (1960 base) published on a monthly basis. It is intended to reconstruct this index after the establishment of a proposed Continuous Budgetary Survey.

#### National Income and Balance of Payments

20. Provisional data on National Income for the years 1963-1968 have been made. A comprehensive presentation of the Accounts and Supporting Tables are still to be completed. Balance of Payments Statistics for the years 1956-1965, and preliminary data up to 1967 have been published. In collaboration with the Ministry of Planning, projections of the National Income to 1973 were made.

21. The entire system of National Income and Balance of Payments are currently being revised in the light of the U.N. Revised S.M.A. and with a view of making the system of economic statistics internally consistent and relevant to the peculiarities of the economy.

#### Financial Statistics

22. The first Financial Statistics report (1966) was published in April 1967. This report was followed by the second in November 1969. The next issue in the series is due to be published in August 1970. The report is designed to provide information concerning the financial operations of the Central Government and other public organizations, as well as commercial banks and other private and public financial institutions and intermediaries. The coverage and scope of the series is at present under review with a view to providing a more complete picture of the operations of the financial system to integrating Financial Statistics in the system of National Accounts with special reference to the Capital Finance Accounts.

Social Statistics

23. Statistics on Justice and Crime, and Health have been maintained and published in the Annual Statistical Digest.

Housing

24. The department published a report of twelve tables on the Condition of Housing in 1966. This report was used by the department to provide crude estimates of Housing needs and projections.

Education Statistics

25. Modest developments have taken place in the range of Education Statistics published to provide additional information on technical and higher Education as well as more detailed analyses of pupils by form and subjects and teachers by qualification.

Field SurveysContinuous Sample Survey of Population

26. The Continuous Sample Survey of Population has been progressing satisfactorily and is the major source of information with respect to intercensal information on Manpower supply, Housing, Internal Migration and Income.

Continuous Sample Survey of Establishments

27. One of the major achievements since the last conference in 1966 was the launching of the Continuous Sample Survey of Business Establishments in 1967. The economic data collected in the 1967 survey were in respect of 1966. The survey which was in the first instance devoted to firms employing ten and over employees is now expected to embrace the "under ten". The sampling scheme at the "over ten" level is divided into two stages - a census of firms responsible for 70% of total employment in a given economic sector and a sample of the remaining 30%. The survey is now in its fourth year and to date response has been very encouraging.

28. The Continuous Sample Survey of Business Establishments replaced the former system of "ad hoc" Business Surveys to collect data for purposes of National Income and Balance of Payments estimates. Over the last few years, a permanent unit in the Central Statistical Office has been set up under the supervision of a statistician to process and evaluate data collected by this survey. Enriched by experiences gained from the last three surveys, the organization of the survey is being reviewed so as to extend and improve the range of economic statistics now being collected taking into account the needs of the economy and the Revised U.N. S.N.A. To illustrate, it is hoped that data from the survey could be used to provide data for Input/Output Matrices and an extensive range of Financial Statistics. The register of firms in the survey has recently been updated using the listing records of the C.S.S.P. (Continuous Sample Survey of Population) and other available records. The listing records of the 1970 Census will further be used to provide a complete sampling frame.

Population CensusRegional Approach

29. The 1970 Population Census of Trinidad and Tobago was taken in April 1970, as part of the Caribbean Commonwealth Census Programme in which the following countries participated: Jamaica, Cayman Islands, Barbados, Guyana, St. Lucia, St. Vincent, Grenada, Dominica, Montserrat, British Honduras, St. Kitts-Nevis, Turks and Cacos, British Virgin Islands. This regional approach to the 1970 Census in the Commonwealth Caribbean meant that the major concepts and definitions for the Census were the same throughout the area and the method of approach to census taking was the same, in that the direct interview method was employed as compared with the mail approach in the more developed countries. The uniformity in approach was secured through the establishment of a Census Co-ordinating Committee comprising the Census Officers of the participating countries with the Professor in Demography of the U.W.I. in Jamaica as Chairman. (Each member-country contributes to the expenses involved in the operation of this Committee.)

30. The Committee was responsible for finalising a uniform census questionnaire and an enumerator's training manual in concepts and methods and enumeration procedures for use in all member-countries. Census day throughout the area was 7th April 1970; and all the countries (except Jamaica) started preliminary enumeration approximately 3 weeks before, with a final count on Census day. Jamaica, carried out its detailed enumeration after its Census day count of 7th April.

31. The country is divided for ordinary administrative purposes into 12 major administrative areas. Of these twelve areas, 3 are municipalities, including the capital city of Port of Spain. These twelve major divisions are further sub-divided into Wards (or Parishes) also for administrative purposes; the number of such sub-divisions is 36. For Census purposes each of these sub-divisions and major areas (which were not previously sub-divided) were further sub-divided into Enumeration Districts of a size convenient for an enumerator to enumerate within the time allotted. There were approximately 1,500 such E.D's in the 1960 Census. These were maintained for the 1970 Census but with sub-divisions where necessary to represent a reasonable workload for an enumerator. In addition, new districts were established in new development areas. The number of sub-divisions and new districts could represent an increase in the total number of Districts of approximately 300 over the 1960 figures making a total of about 1,800 E.D's for the 1970 Census.

Enumeration Procedure

32. In Trinidad and Tobago, nearly 2,000 enumerators were employed to go from house to house and interview the head of household and obtain data for all members of the household. These enumerators were supervised by a team of approximately 300 Supervisors; on the average a supervisor was in charge of approximately 6 enumerators.

### Enumeration Districts

33. An enumerator was responsible for an enumeration district of approximately 100 to 150 households in a rural area and about 150 to 200 households in an urban area. As indicated earlier the enumerator visited every household in his area during the 3-4 weeks prior to Census Day and made a final visit on Census Day to check whether there was any change in the composition of the household. The boundaries of the enumeration districts (E.D's) of the previous Census (1960) were maintained but in areas where the population had grown to the extent that the workload of an enumerator was increased considerably, the area was sub-divided to provide workloads for more than one enumerator. In addition, new E.D's were established in areas which were previously uninhabited at the time of the 1960 Census. The boundaries of E.D's of the 1960 Census were maintained particularly to ensure easy comparability with the 1970 Census results.

### Maps

34. The maps used for the enumeration were sketch maps of the E.D. previously drawn by permanent field staff of the C.S.O. and brought up to date for the 1970 Census. A map for an E.D. would indicate the boundaries of the E.D. and indications of the roads, streets, traces etc. and buildings in the E.D., as well as the start and stop point of the enumerator's assignment and the route he should follow.

### Administration

35. The expansion in needs of users of statistics has not been adequately met mainly as a result of deficiencies in staff at the professional and sub-professional level. The statistics in the table below indicate that the staff position remained virtually unchanged between 1966 and 1970. There was some improvement beginning in 1968 with an increase in the number of statisticians by two, followed by the creation of three additional posts in 1970. Supplementary posts at the sub-professional level have not been increased.

Year	Posts											
	Director of Statistics	Senior Statistician	Senior Economist	Statistician III	Statistician II	Statistician I	Statistician I/II	Principal Statistical Officer	Statistical Officer III	Field Staff		
										Census and Surveys Supervisor	Stats. Surveys Officer	Stats. Off. III
1966	1	1	1	-	4	-	-	2	5	1	2	1
1967	1	1	1	-	4	-	-	2	5	1	2	1
1968	1	1	1	-	4	2	-	2	4	1	2	1
1969	1	2	-	1	4	2	3 <sup>1</sup>	2	4	1	2	1
1970	1	2	-	1	4	2	6 <sup>2</sup>	2	4	1	2	1

<sup>1</sup> Temporary Posts.

<sup>2</sup> Three of which are temporary posts.

### Training Schemes

36. Training Courses for Statistical Officers were organized in 1967 and 1968 respectively. The courses were attended by Statistical Officers from other countries in the region as part of Trinidad and Tobago's contribution to inter-regional co-operation. Such training courses have been an annual feature since 1963, but no course was held in 1969. A course is being planned for the Summer Months of 1970, with assistance from the O.A.S.

37. As a considerable amount of the work of the C.S.O. culminates in the Reports published, Appendix I provides a list of the current reports indicating the date of the latest report issued.

## CENTRAL STATISTICAL OFFICE

## PUBLICATIONS

## MONTHLY PUBLICATIONS

Monthly Overseas Trade

Sets out provisional data on monthly overseas trade. Published since 1951. From 1965 onwards the report gives a comprehensive analysis, item by item, of an expanded list based on the United Nations Standard International Trade Classification. Also provides a summary of items by Divisions and Sections and contains a direction of trade table classified according to the major Economic Trading groups. Only principal sources of imports and destination of exports for each item are, however, provided.

\*March (February data) 1970.

Monthly Travel

Provides preliminary monthly data on passenger movement by category of passenger and country of embarkation or disembarkation and country of normal residence. Current series published since April 1965. Old series published since October 1955 and terminated with the January 1963 issue.

\*February 1970.

## QUARTERLY PUBLICATIONS

Quarterly Economic Report

Contains up-to-date information on Overseas Trade, Prices, Agriculture and Fishing, Industrial Production, Employment, Transport and Communication, Finance and Banking, Population and Vital Statistics, Tobago Trade. First issued 2nd Quarter 1950.

\*October-December 1969.

## ANNUAL PUBLICATIONS

Annual Overseas Trade

Gives a detailed analysis of imports and exports by item and country. First issued 1951. From 1963 this report came in two parts. Part B combines a review with summary tables. Part A gives a detailed analysis of the year's trade by country of origin/destination.

\*Part A - 1968, Part B - 1967.

\*Latest Issue.

Annual Statistical Digest

A comprehensive annual designed to include the most important tables and summaries from all other specialised reports and also to contain several tables not appearing in the other reports of this Office. Contains data on Labour and Employment, Justice and Crime, Social Conditions, Transport and Communication, Industrial Production, Agriculture, Mining and Refining, National Income and Expenditure, Overseas Trade, Prices and Banking. First issued in 1952 showing data from 1935 to 1951.

\*1968.

Population and Vital Statistics

Presents the population and vital statistics of the country - births, deaths, marriages. Provides; in addition, a historical appendix of vital statistics from the year 1882. First issued 1953.

\*1967.

International Travel Report

Contains detailed data on international travel, tourist expenditure, transportation, shipping movements and cargo. First published 1955.

\*1966/67.

Education Digest

Contains data on Primary, Intermediate and Secondary Schools; main highlights are: schools conducted by denominational boards; geographical distribution of schools; enrolment by sex, age and class and teacher qualifications. First published 1958 showing figures for 1950-1956.

\*1967/68.

National Income of Trinidad and Tobago

The report contains the National Accounts. The tables cover such subjects as the Domestic Product Account, National Income, Capital Account, Government Account and External Transactions. First published 1954 showing figures for 1951-1954.

\*1952-1962.

Balance of Payments

A systematic record of all economic transactions between residents of Trinidad and Tobago and the rest of the world. First published 1959 with data for 1951-1959.

\*1967<sup>P</sup>.

Financial Statistics

Report designed to provide a summary of the financial operations of Central and other Government organisations, as well as commercial banks and other private and public institutions. First published 1966.

\*1967/68.

\*Latest Issue.



## PERIODICAL SERIES

Report on the Continuous Sample Survey of Population

These reports give a description of the labour force in Trinidad and Tobago since 1963. It is published in the Series of Labour Force - Size and Structure; and Income.

(a) Labour Force

Two series - L.F 1-1 tables showing employed and unemployed classified by Age, Industry, Occupation and Type of Worker, and L.F 2-1 which includes similar tables by Administrative Area, Educational Attainment etc.

\*L.F 1-7 No.14 (June '68 data)

L.F 2-3 No.13 (June '68 data)

(b) Income

Tables showing paid employees by Sex, Type of Employer and Income Group etc.

Housing

Preliminary report of a Housing Census taken in 1957, showing the condition of housing, overcrowding in houses etc.

Index of Wage Rates - (Statistical Studies and Papers No. 4).

Report shows the Index of Wage Rates, also the movement of the Index for "All Industries" and for individual industry groups. Issued May 1957.

Index of Average Earnings - (Statistical Studies and Papers No. 6).

Report discusses the methods used in computing the Index of Average Earnings. Issued June 1959.

Index of Retail Prices - (Statistical Studies and Papers No. 7).

The report introduces the New Index of Retail Prices. Published in 1960. The first report which was published in 1952 is now out of print.

Land Utilization - Agricultural Production

Analysis of the results of two agricultural enquiries conducted by the Central Statistical Office. Published in 1956 and 1957. Out of Print.

Structure and Output of Industry

Results of a Survey of Industrial Establishments carried out in 1953 of establishments engaged in mining, quarrying, manufacturing, building etc.

Out of Print.

\*Latest Issue.

Industry 1957

Results of a Survey of Industrial Establishments carried out in 1957. This report is a follow-up of the above report. It is published in two parts - Vol. I and Vol. II.

Vol. I - Tables.

Vol. II - Analytical Report.

Out of Print.

Distributive Trades and Other Services - Survey of DistributionTransport and Other Services

Report of a Survey of Establishments engaged in distributive trades and other services in 1957. Published in two volumes.

Vol. I - Tables.

Vol. II - Analytical Report.

Out of Print.

Survey of New Buildings - (Statistical Studies and Papers No. 3)

Report of a Survey of New Buildings in Trinidad and Tobago for 1948-1952.

Out of Print.

Survey of the Rice Industry - (Statistical Studies and Papers No. 2)

Results from Survey carried out in 1951 into the Rice Industry of the country.

Out of Print.

Pioneer Manufacturers - (Statistical Studies and Papers No. 8)

Report of survey to find out the amount and source of capital invested in manufacturing establishments set up with assistance granted under the Aid to Pioneer Industry. Report covers the period 1958-1959.

Out of Print.

The Size and Structure of the Labour Force

Report incorporates a full discussion of the country's labour force and provides a number of statistical tables for further study. Published in 1955 and 1956.

Out of Print.

Central Statistical Office Research Papers

Series of articles of qualified public servants and special advisers to Government in relation to the country's economic and social problems.

Number 1 contains two papers prepared by members of the Central Statistical Office, one on employment, and the other on the economic structure of the country.

Out of Print.

Number 2 contains three papers, one on the labour force 1946-1964; the other two were written by non-civil servants - a method of deriving post-censal estimates of West Indian populations and a note on inter-industry relations in the economy of Trinidad and Tobago 1962.

Number 3 contains three papers, one on estimates of internal migration and of current population distribution in Trinidad and Tobago. The second is on the state of crime in Trinidad and Tobago. The last paper is on variances and correlations of three characteristics observed in rounds 2 and 3 of the Continuous Sample Survey of Population by H. Fairfield Smith.

Number 4 consists, for the most part of a collection of articles on the population of Trinidad and Tobago, which have been previously published in various journals. It included as well, two articles, also previously published, dealing more generally with the world population situation, and one article not formerly published, which describes the population situation in Trinidad and Tobago on the basis of the most recent available data.

Number 5 contains four papers one on exports, employment and wages; problems of measuring balance of payments transactions in the area; and the prospects of constructing useful capital and financial accounts in the area. Life tables for Trinidad and Tobago 1900-1903 and 1945-1947.

Number 6 contains six papers, employment in the British Virgin Islands; current labour force statistics, labour force for the society in transition tradition versus function in labour force statistics; a note on educational development; and 1965-80 student, labour force and old age pensioner estimates.

#### SURVEY OF ESTABLISHMENTS

- |  |   |   |
|--|---|---|
| Survey of Establishments, Bulletin No. 1 | - | Manufacturing industries 1966                                 |
| Survey of Establishments, Bulletin No. 2 | - | Construction, Transport Services establishments 1966          |
| Survey of Establishments, Bulletin No. 3 | - | Petroleum and Asphalt, Wholesale & Retail establishments 1966 |
| Survey of Establishments                 | - | A graphic summary   |

## 1960 POPULATION CENSUS OF TRINIDAD AND TOBAGO

Volume I Part A

Gives a description of the entire census, of the approaches and concepts adopted and of the methods used in tabulating the data.

Volume I - Supplement

Report shows the Boundaries of Enumeration Districts.

Volume I - Maps

Shows the maps of each Enumeration District in Trinidad and Tobago.

Volume II Part A

Detailed tables on household and family, age and race, religion, migration, education, marital status, fertility and union status.

Volume II Part B

Detailed tables on the Labour Force.

Volume III Part A

Gives a detailed cross-classification of population by type of household, type of institution, internal migration, and foreign born population by place of birth, period of movement, educational attainment, ethnic origin.

Volume III Part B

Gives a detailed cross-classification of marital status by age, educational attainment; union status of women by age, educational attainment, main activity, marital status.

Volume III Part D

Detailed cross-classification of population by age group, ethnic origin, educational attainment, union status, marital status.

Volume III Part E

Detailed cross-classification of household and family by age and head of household, education of head, marital status of head, occupation of head, household composition, family composition.

Volume III Part G

Detailed cross-classification of labour force and working population by industry, occupation, type of worker, educational attainment, place of birth.

## AGRICULTURAL CENSUS 1963

Volume II Part A

Report of the Census of Agriculture taken in 1963. This report consists of the basic tables on the Holder and his Holding, showing the number and acreage of holdings according to various characteristics. Explanatory notes on the Census Design and concepts and notes to the tables are contained in this volume.

Volume II Part B

This report contains tables on land utilization by county, holding size, tenure, status, agricultural size and management.

Volume II Part C

Production and sales of crops 10 acres and over by county, holding size, production size and tenure.

## MISCELLANEOUS

Trinidad and Tobago Today

A graphic presentation of the social and economic problems and opportunities facing Trinidad and Tobago today.

CENTRAL STATISTICAL OFFICEResearch Reports(Available on Request.)1. Internal Migration 1963-67

A study of internal migration in Trinidad and Tobago from the Continuous Sample Survey of Population data.

March 1969.

2. Condition of Housing in Trinidad & Tobago 1966 and Projections to 1980

An analysis of the 1966 Housing Survey (C.S.S.P. HO.1) conducted by C.S.O., showing condition of housing and estimated housing needs with projections to 1980.

May 1969.

3. Labour Force: Occupation by Industry 1960 Census

A special study providing a cross-classification of Occupation and Industry of the Labour Force as collected in the 1960 Census.

August 1969.

4. Agricultural Census 1963, No.6

Summary of Results, preliminary results for Holdings 1 acre and over excluding Government; provides estimates of crop acreages, live-stock, production and cultivation practices, not yet available in final form.

September 1969.

5. Manpower Report on Special Training and Skills Attained

A special analysis of data from the Continuous Sample Survey of Population (Labour Force) as at March 1967 showing the level of skills and training of the Labour Force against their occupation, work status and experience.

August 1969.

6. "Brain Drain" 1962-1968

A special study of emigration of trained professional and skilled workers, sponsored by the United Nations Institute of Training and Research in 1969.

January 1970.

## Item 2 - United Kingdom

REVIEW OF STATISTICAL ACTIVITIES SINCE THE SIXTH CONFERENCE,  
INCLUDING POPULATION AND AGRICULTURE CENSUS PLANS

## INTRODUCTION

1. In the United Kingdom (UK) there is a decentralised system of statistical activities and the most far-reaching changes which have taken place since the Sixth Conference of Commonwealth Statisticians have been in the re-organisation of this system to achieve a greater degree of co-ordination and central management. The Estimates Committee\*, which reviewed the Government Statistical Service in 1966, argued for a greater degree of centralisation and it asked the Treasury to "review the position of the Central Statistical Office (CSO) in the Government machine with the object of enhancing the co-ordinating role of the CSO". This review was undertaken and the CSO was asked to prepare detailed proposals about changing the role of the CSO to make it the centre of the Government Statistical Service with appropriately increased responsibilities. This paper explains the rationale of the proposals that were made and the stage reached in their implementation. The paper also gives a summary of major statistical activities since 1966 with an emphasis on changes and improvements, and looks at plans for the future with particular reference to the population and agriculture censuses.

CENTRAL CO-ORDINATION AND MANAGEMENT OF STATISTICAL  
ACTIVITIES

2. In this section the reasons for seeking greater co-ordination and central management are outlined, then the advantages of a decentralised system, such as exists in the United Kingdom, are given. This is followed by an assessment of the benefits of a completely centralised system and the hopes we have for the success of the compromise we have chosen for the United Kingdom to try and combine the advantages of centralised and decentralised systems i.e. with statistical sections in each department and a strong co-ordinating central office.

3. The needs for stronger co-ordination and central management are fairly obvious. There is the need to avoid duplication in data-collection, and to ensure that definitions and classifications are, wherever possible, uniform. There is the importance of ensuring that enquiries to firms and individuals are put out in a carefully phased and streamlined manner, so as to minimise the trouble for respondents. Above all, there is the need to look at the government's statistical activities, and its priorities, as a coherent programme. The statistical services must serve the needs of government as a whole, not only of individual departments; and the more a government proceeds in terms of overall planning and management, both

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\*A committee of the House of Commons composed of members drawn from all political parties, but excluding any members holding office in the Government which reviews selected parts of the estimates of expenditure submitted to Parliament each year.

social and economic, the more important it is that the information system underpinning its policies should be planned as a whole. This means a continuous process of assessing the adequacy of current statistics, models, explanatory theories to changing policy needs; of reviewing the balance of effort over the whole statistical field; of studying the changing needs for statistics, inside and outside government, in relation to national, regional and sub-regional data; and of assessing whether, in the short and the long term, the statistical machine is geared to these needs. This applies to all the stages of the statistical process—collection, analysis, interpretation and dissemination. Moreover, the increase in the volume, detail and speed of statistics sought by government, and the outside world, coupled with the continuing shortage of staff and other resources, makes this general oversight every day more important.

4. In the United Kingdom we have a decentralised system with a statistical division in each government department and this has a number of advantages. Firstly, that such statistical information is collected as a by-product of administrative processes, which lie in departments rather than at the centre. Secondly, that individual departments have close links with the suppliers of information, and that this would be less well achieved by a central organisation; and, thirdly, that a centralised system removes statisticians from contact with policy levels in the departments, which has had effects on policies, on the statistical work and on the interest of statisticians. Senior statisticians learn from contact with their colleagues and Ministers how policy is forming and what statistical advice is required. This results in better statistical analysis and briefing. A Central Office would undermine these advantages, and detract from the status, influence and utility of departmental statisticians.

5. We could move from this situation of decentralisation to a single statistical organisation which would have considerable advantages. A single office offers the best hope of keeping up with the increase in demand for statistics from all parts of government and it offers the best way of taking an unbiased view of priorities. It is the surest way of achieving co-ordination of data collection, preventing duplication and poor phrasing of enquiries, of developing and keeping to uniform standards, definitions, classifications; all of which is particularly important where related items of information are sought from the same units, eg firms. A single organisation is best able to handle the massive problems of computer services, of data storage and access which face modern statistics, the more so as the emphasis on micro-analysis, and on relating different items of information, grows. Statistical systems are moving increasingly towards regular data-collecting processes (eg current population surveys, mini-censuses etc) which are "multi-user", and these are best handled by a central organisation. Many organisational services (eg research sections and computing pools) are general to all statistical activities, and a single organisation makes for greater efficiency, and more economical use of scarce skilled resources. A "neutral" central office has a better chance of securing the full trust of individuals and firms providing data than does a policy department.

6. The balance of advantage thus seemed to lie with a single organisation. Starting from our highly decentralised system it was an enormous and daunting task to endeavour to create a single statistical office; the Swedes had attempted this task and it had taken them six years to achieve. However, this was not the main reason for not embarking on



the transformation; we hoped that we might be able to get the best of both worlds. To do this we decided to build up at and under the CSO an organisation with powers to achieve the essential aims of central management already outlined above, whilst maintaining in the individual departments the statistical divisions with their invaluable policy links.

7. A number of ways have been developed to give substantially more central CSO control. Firstly, four CSO units have been set up to take responsibility for key aspects of the Statistical Service, working in close association with other government departments. The Computer and Data Systems Unit (CDSU) has the general responsibility, in conjunction with our Civil Service Department, for planning computer developments for government statistics and in particular to ensure that the computers used are compatible. One of the Unit's major tasks has been to advise on the computer configuration for the new Business Statistics Office, which will be explained later in the paper, and to provide programming and analytical assistance. The Unit is also concerned with providing CSO statisticians with ready access to computer facilities and with satisfying a growing demand from within and outside government for a data bank of macro-economic series.

8. The Survey Control Unit was established to maintain a critical watch on all official demands for statistical information. Sponsors of new enquiries are asked to inform the Unit of their plans, and existing enquiries are being carefully examined. In this way it is hoped to avoid unnecessary duplication between enquiries; to improve the phrasing of enquiries from the point of view of both users and suppliers of information; to merge enquiries where appropriate and to assess the scale of enquiries, and the subject matter covered by them, in relation to policy and user needs and to the burdens imposed on suppliers of information. The Unit is initially dealing with enquiries to industry. It has no powers other than persuasion, though more formal powers may need to be instituted if this fails.

9. A Statistical Standards and Classifications Unit is working on producing the maximum possible uniformity in definitions, concepts and classifications used in official statistics. There can never be complete uniformity because departmental needs will dictate some variations, but regular oversight is necessary to keep these to a minimum. The Unit's main job will be with classification systems; it will do the basic groundwork of constructing these systems; ensure that they fit in as far as possible with the recommendations of the international agencies; and deal with enquiries about their use, from outside as well as inside government. The Unit was concerned with the final stages of the revision of the Standard Industrial Classification and is now assisting in the development, for the first time in the United Kingdom, of a standard classification of occupations.

10. The Statistical Programme Development Unit was the last of the new Units to be established, although it is the one with the most far-reaching responsibilities. In close association with the statistical divisions of government departments the Unit is attempting to achieve a more integrated approach to the development of the government's statistical programme and the priorities within it. As a first step towards this the Unit has made an assessment of the current statistical work of departments and plans for the next five years in terms of money, manpower and computers.

11. These four Units are concerned with co-ordinating a number of statistical functions and the second development deals with a different kind of centralisation, that is, of collection, storage and access of statistical data. Two new agencies have been set up for this purpose, the Business Statistics Office to deal with industrial statistics and the Office of Population Censuses and Surveys to deal with statistics of individuals, families and households. The CSO has an important role in the management of these two offices.

12. The Business Statistics Office has been evolved out of the Board of Trade Census Office and is responsible for the collection of all main data on industrial statistics, for the maintenance of a common register of establishments and firms, and for developing a data bank to store statistics and provide access to them. The day-to-day administration of the office is in the hands of the Board of Trade and thus the important policy links are secured. However, as part of the increased central management of statistics, the policy of the Office and the priorities within its work are decided by an Interdepartmental Management Committee under the Chairmanship of the Director of the CSO.

13. The Office of Population Censuses and Surveys has been formed by combining the General Register Office, responsible for censuses of population, for register of births, deaths and marriages, and for medical and population statistics, with the Government Social Survey, responsible for conducting most social surveys on behalf of other government departments. The CSO will have a great influence in estimating priorities and allocating resources for censuses and surveys of the population which are fundamental sources of data for economic and social planning and need to be integrated with other statistical operations. Since censuses and surveys are essentially complementary ways of obtaining information about households and individuals there will be considerable administrative and technical advantages in having the two methods more closely integrated.

14. A third area where co-ordination has been introduced is in research and a small Research and Special Studies Division has been established in the CSO. It deals with research tasks flowing from central policy issues and with technical problems affecting the work of many departments. So far the Division has been particularly concerned with methods of seasonal adjustment, and more details of this and other work of that Division are given in the United Kingdom paper for item 4 on the agenda.

15. The fourth way in which the CSO exercises its strengthened central management role is through the recruitment and deployment of members of the Statistician Class.

#### A NEW SYSTEM OF INDUSTRIAL STATISTICS

16. The first essential step in improving the collection and analysis of industrial statistics was to create a common register of business establishments, and other reporting and accounting units such as companies, business units, and enterprises. This was the initial task undertaken by the Business Statistics Office and it will be used for all industrial statistics and will enable results from different enquiries to be related and to form an integrated system of information. The register will basically be a list carried on magnetic tape of the names and addresses of business units, coded by size, location, industry and by company of ownership and so on. The register will have an important use in preventing duplication in the

collection of information which is sometimes unavoidable when enquiries are not directed to commonly agreed and defined industrial fields.

17. Most enquiries to industry will in future be undertaken by the Business Statistics Office using the Common Register and a major scheme for which they are responsible is the new system of industrial statistics based on current reporting of industrial output. This reporting will generally be on a quarterly basis though some monthly enquiries will also be made for industries which wish to maintain the benefit of monthly reporting or where the Government needs monthly indicators. These enquiries will be supplemented by annual and less frequent enquiries on other information previously collected in censuses of production. A major feature of this scheme which is currently being implemented is the quarterly enquiries primarily about sales by value of the products of each industry. Sales were chosen rather than production because sales data is usually more readily available, and in value terms in order to achieve comprehensive coverage of activity. Some figures in physical terms will be collected where appropriate, and in industries which are interested in production or "total make" figures the traditional enquiries on these topics will be retained and integrated into the new framework. Extensive consultations are being held with suppliers and users in industry, in particular to decide on the level of detail of the list of products for which information is to be collected. These negotiations have been conducted by the appropriate sponsoring Department largely with the trade associations representing the industry. Where there is an Economic Development Committee for the industry, this is also brought into the discussions, to which individual firms often contribute, especially on matters like the definitions and suitability of product headings. The re-organisation programme is a very substantial one and the new enquiries are being introduced gradually over a period of months and years.

## SOCIAL STATISTICS

18. Social statistics, which have in the past had somewhat less emphasis placed on them than economic statistics, have recently come into the forefront of statistical activity. Both nationally and internationally there has been an increasing demand for social policy to be monitored and a consequent increase in demand for facts. In the United Kingdom a number of steps have been and are being taken to satisfy this need.

19. In order to make all currently available data on social conditions easily available to policy makers, politicians, and journalists a new publication "Social Trends" has been prepared. This draws together data on a large number of social conditions into one publication which is lavishly illustrated with charts.

20. This is only a first step and a further phase is to find out more about the inter-relationships between the social characteristics of individuals, families and households. In order to do this a new continuous multi-purpose household survey has been instituted this year and is conducted by the Office of Population Censuses and Surveys. The questionnaire is concerned in part with households and in part with individuals and covers a wide range of topics such as past and current employment, housing, education, health, demographic information and mobility. The survey will basically be analysed quarterly, though some topics may be analysed less frequently and others may only be included in the questionnaire at intervals or on an ad hoc basis.

21. The most ambitious step in this programme of work on social statistics is one on which we have only just started and is concerned with the construction of a system of social and demographic statistics. This system like the system of national accounts will be comprehensive and inter-linked and based on common classifications and definitions. The system will cover all the social aspects of life: demographic factors such as population size, age and sex structure, births, deaths and migration, also social structure, social mobility and composition of the labour force; and social conditions, its economic components (income, wealth and consumption), and health, education, housing, social care, law and order, leisure and environment. Work on this new system will draw attention to gaps in social statistics and the need for improvements. It will obviously involve the collection of further statistics and must be viewed as a long-term project, gradually completing and refining various sections of it as has been done over the years with the system of national accounts.

#### Specific improvements

22. Apart from these general, overall improvements in and plans for social statistics a number of changes have been made in specific areas such as health, education and crime, and also a number of innovations have been made in the techniques being used for the 1971 Census of Population. One particularly important technical change has been in the system of students statistics in further and higher education. This is being changed so that students can be studied as they move through the educational system. In the past colleges and institutions have provided aggregated data on the number of students classified by subject of course, age and so on. Now an "individualised data" system will be held on a centrally maintained magnetic tape and will yield data on flows of students from one educational 'state' to another. To introduce this new system a 1 to 30 sample of students in 'full-time' further education was surveyed in November 1967 and this has been extended year by year. A scheme of individualised data for university staff and students is to be introduced and university applications are being used as a starting point for records of undergraduates. It is hoped that in due course these records can be linked to employment undertaken on leaving the educational system.

#### 1971 Census of Population

23. In the Census of Population to be conducted next year, all questions are to be asked of the whole population. Selection of a 10 per cent sample for the processing of data on "expensive-to-code" topics will be carried out in the office; but tabulations on "easy-to-code" topics will be produced on a 100 per cent basis, and the full enumeration will make it possible to produce 100 per cent analysis relating to certain sections of the population of those data which are to be processed only on a 10 per cent basis for the population as a whole.

24. A number of new questions are to be asked. These are concerned with such topics as immigration, job-mobility, family-spacing and school-leaving certificates.

25. Two major pre-tests and some smaller tests have been carried out. The main tests have revealed the need for (among other things) greater supervision of the "field force", simplification of definitions which enumerators were expected to apply and a reduction in the range of questions which

were being tried out. They have also helped to demonstrate that certain questions would be unsuitable for the census or more suitable for voluntary sample surveys and have led to the improvement or abandonment of certain enumeration procedures.

26. As a result of tests carried out in the marking of documents for direct input to the computer, it is planned that enumerators shall mark certain items of information on to those documents from the completed census forms to make it possible to produce early tabulations on these subjects. There is also to be a set of 1 per cent "advance sample" tables on all topics; this sample is to be selected within a few weeks of census day so that it can also be used for a voluntary follow-up survey on incomes.

27. To make it possible to produce tabulations for areas which cannot be identified in terms of enumeration district boundaries, and to meet the need for statistics relating to units of areas which are of uniform size and which will not be subject to change over time, systems of map-referencing to co-ordinates on the national grid were tried out in the pre-tests, starting with a small scale test in 1967. As a result of the tests, it is proposed that all addresses in areas for which maps are available on the 25" or 50" scale, should be referenced to 100 metre squares on national grid. In addition, in a few selected areas of concentrated population, addresses will also be referenced to unique co-ordinates (1 metre).

#### OTHER IMPROVEMENTS IN DATA COLLECTION

28. So far this paper has laid a good deal of emphasis on improvements in data collection and there are further improvements, one in tending the Family Expenditure Survey and the other in introducing an earnings survey which should be mentioned, as well as changes in conducting the agricultural census.

29. The Family Expenditure Survey has been a basic source of data on household income and expenditure for fourteen years. In January 1967 the sample was doubled from five to ten thousand and was redesigned by the Government Social Survey in order to produce more tabulations relating to regions and to quarterly analysis than was possible in the past. The new design has helped to reduce sampling errors and other improvements in the questionnaire and analyses have led to new and more useful data becoming available.

30. In September 1967 a new type of earnings enquiry was piloted. The full-scale survey, covering a random sample of 100,000 employees, was launched in September 1968. The sample covered full-time and part-time employees in all industries, occupations, areas and age groups and details of the earnings in a particular pay period and other information relating to the individuals were sought from their employers. The survey has yielded many new types of analyses of earnings, for example, the make-up of total pay and terms of basic pay, overtime and bonuses etc; reasons for loss of pay or low pay; distribution of hourly earnings and the general relationship between earnings and hours worked. The second full-scale survey was undertaken in April this year and will now be conducted annually.

Agriculture census plans

31. The introduction of automatic data processing at the end of the nineteen-fifties has paved the way for a new concept of agricultural activity defined in terms of type and size of enterprise, and using standard labour requirements as the common measure of cropping and stocking. This had made possible a number of developments relating to the structure of the industry and the scope and coverage of the agricultural census.
32. The use of electronic equipment to process the results of the census has made available a mass of data in addition to the basic products of the census - numbers of livestock, workers, machines etc and acres of crops - which has given a new series of statistics on the structure of farming based on a 'type of farming' classification. In the past it has only been possible to relate changes in the distribution of crops and livestock to farms of different acreage size.
33. With the adoption of standard labour requirements as the measure of agricultural activity the cropping and stocking value of the holding measured in standard man-days has become the criterion for inclusion in the census and it has been possible to exclude 50,000 holdings from the census. However steps are being taken to include holdings of one acre or less which have a significant volume of agricultural output because some form of intensive farming is being used.
34. The new classification by 'type of farming' has made it possible to sample holding by type - dairying, livestock, pigs and poultry, horticulture and mixed - and the size of farm measured in standard man-days. This has again, combined with the reduction in size of the March, September and December sample censuses (June being a full census) reduced the burden of form-filling on the occupiers at the lower end of the size scale but has inevitably led, with the increasing demand for statistics, to more frequent returns from those at the top.
35. Side by side with these efforts to rationalise the coverage of the census and reduce form-filling go measures designed to fill gaps in present statistical knowledge or to collect data on subjects assuming increasing prominence in the light of modern developments. These fall into four categories, horticulture, total area of holding, tenure and the agricultural labour force.

## CONCLUSION

36. This paper has dealt with a small number of major improvements and changes in government statistics in the United Kingdom. It must be remembered however that the scope of statistical work in departments is extremely diverse and small but significant improvements in the scope, timing and accuracy of statistics have been made in many areas whilst the load of day to day work has continued. The papers contributed by the United Kingdom for other items of the agenda will illuminate some of these other areas.

"REVIEW OF STATISTICAL ACTIVITIES SINCE THE SIXTH CONFERENCE,  
INCLUDING POPULATION AND AGRICULTURE CENSUS PLANS".

1. Since this is the first time that Zambia is represented at the Conference of Commonwealth Statistics it is necessary to give briefly the history of statistical organisation of Zambia.
2. The co-operation in statistical matters between Rhodesia, then Southern Rhodesia, and Zambia, then Northern Rhodesia, started as far back as 1940. At that time and at the request of Zambia the then Southern Rhodesian Government undertook a European family expenditure survey and compiled a monthly cost of living index.
3. As far back as 1911 a census of Non-Africans was carried out through the administrative channels. The Southern Rhodesian Department of Statistics later extended its work for Zambia to include censuses of Non-Africans, census of manufacturing, demographic sample survey of Africans which was carried out in 1950, pilot studies of African Agriculture, annual external trade statistics, national income and balance of payments which were started in 1948, family expenditure and savings studies for urban Africans and annual census of Non-African Agriculture.
4. During the Federation of Rhodesia and Nyasaland the statistical services were still carried out in Salisbury formerly Southern Rhodesia capital. It was wholly centralised although statistical unit was maintained in Zambia. During the Federation the scope of statistical activities was increased to include such data as sales of agricultural produce, mineral production, electricity production and data on traffic banking and government finance. Some data was collected directly through the appropriate Ministries and institutions and others by mailed questionnaires.
5. Some of the main recurrent statistical publications issued by the Central Statistical Office, Salisbury were as follows:-
  - Monthly Digest of Statistics
  - Quarterly Bulletin of Financial Statistics
  - Quarterly External Trade Statistics
  - Annual External Trade Statistics
  - The Census of Production of the Federation
  - Migration Report
  - Balance of Payments
  - National Accounts
  - Company Accounts
  - Changes in the level of Activity in the Construction Industry
  - The Input - Output Accounts for European Agriculture
6. Most of the above publications contained not only information for the Federation as a whole but also data for individual member countries. There were also other publications of specialised nature which were issued for each country.
7. After the breakup of the Federation of Rhodesia and Nyasaland in 1963 a statistical office was established in Zambia at the end of the year by a professional officer who was transferred from the previous Federal Office. Almost at the same time the Zambian Government appointed a team of experts under Professor Seers to advise the Government on economic and other related matters which included among other things the setting up of the Zambia Statistical Office. The team's recommend-

## 2-ZAMBIA

ations appeared under Appendix J "The Statistical Needs" of its report. Almost the recommended priorities for statistical programmes have been implemented with some variations depending on the country's requirements, staff position and statistical advances. The statistical activities carried out by the Federal Government were continued and in addition new inquiries were carried out.

8. In 1965 another team of experts from the United Nations was appointed to advise the Government on statistical programmes. The team made recommendations which formed the guidelines of action for the statistical office. The team recommended that the statistical service be organised as centralised statistical system in order to

- i) obtain a co-ordinated statistical programme
- ii) ensure consistency throughout the whole system of national statistics
- iii) to alleviate the acute shortage of professional and non professional staff
- iv) enable making right decisions on the priorities to be given to different types of statistics to meet the country's national planning requirements
- v) utilize to the fullest field services and other general service facilities.

#### Statistical Legislation

9. The Central Statistical Office operates under the Census and Statistics Act 1955 which describes the functions and responsibilities of the Central Statistical Office. There is a provision in the Act which stipulates that no statistics shall be collected "until regulations have been made specifying the particulars and information to be furnished." Consequently there are a number of statistical regulations for specific statistical inquiries. Those which are not covered by the regulations are collected on voluntary basis. Restrictions on disclosures of statistical information collected are also included in the Act. An officer joining the Office has to sign the Oath of Secrecy in accordance with the Act.

#### Organisation

10. The Department is headed by a Director. Below the Director is the Assistant Director and under him are the Senior Statisticians. Each Senior Statistician supervises a number of statisticians who in turn organise the work of a number of non-professional officers.

### STATISTICAL ACTIVITIES

#### Census of Population

11. Censuses of population for Non-Africans used to be carried out



every five years from 1911 until 1961. No attempt was made with regard to the African population. It was not until 1950 when a sample survey of Africans was carried out and in 1963 a complete count of the African population only was taken. The census had some shortcomings. After the establishment of the Central Statistical Office for Zambia it was found necessary that a census of population would have to be taken in the near future. In preparation for the second National Development plan, the Zambia Government decided to take a census of population in 1969. A census committee was approved by the Cabinet in December 1967 to organise the administrative and technical operations of the census. The head of the Central Statistical Department was the Secretary of the Committee. A working committee was formed to decide on the type of questions to be canvassed - this was in accordance with the advice given by an expert from the United Nations who came to advise the Government on the taking of the census.

12. A pilot census was taken in July of 1968 and on the basis of the results of this pilot census, a final questionnaire was drawn. The pilot census forms, were used in carrying out tests in London in the use of an optical reader. It was decided that the best method of getting the census data processed within a short time was by use of the optical reader. Further details of the optical reader will be explained under data processing. The country was divided into supervisor's areas roughly from 2,000 to 3,000 persons. These areas were mapped on the basis of the 1968 polling districts demarkations. The supervisor's areas were further subdivided into four to eight enumerations areas and each enumerator was to count approximately five hundred persons. Despite instructions regarding the mapping of the enumeration areas the reports from the supervisors were so unreliable that the idea of getting maps for enumeration areas was dropped. A comprehensive training was held for eighty senior supervisors, one thousand six hundred supervisors and eight thousand enumerators. The census was carried out from the 22nd August to the 30th August, 1969. This was a much better achievement as compared to the 1963 census which took approximately two months to complete. It is hoped that the next census will take one day.

13. Two types of questionnaires were canvassed a shorter one contained only basic questions and a longer one which contained questions on economic characteristics, fertility, deaths and housing. All questions in the shorter one were contained in the longer schedule. The longer one was canvassed in all the urban areas and rural counties and fourteen to fifteen per cent of the rural areas and the shorter one in the remaining rural areas.

14. For administrative purposes an officer at the level of Assistant Secretary was seconded by the Establishments Division to the Central Statistics Office for a period of approximately nine months. Despite considerable difficulties of various types which had to be overcome the entire census operation went quite satisfactorily and the census was completed successfully.

15. A flow chart based on the project reporting system had been prepared in order to be able to control the various stages of the census operation. Monthly progress on these were made available to the Central Statistical Office by the Data Centre using the computer. These reports

were extremely helpful for the completion of the Census.

16. Preliminary results of the population by district and provinces were issued in October 1969. The coding of the census information was started in October and it continued throughout the rest of the year. It was expected that it would be over by April 1970 and that the various tabulations would be available by the middle of 1970. The first report was issued at the end of June 1970 as planned. The population of Zambia was found to be 4,056,995 as against 3,490,540 in 1963; this indicates a rate of natural growth of 2.5 per year.

17. The crude birth rate was found to be 42 per 1,000 population and the crude death rate was 17 per 1,000. An estimated infant mortality of 16%, a life expectancy of 47 years. Among the developing countries Zambia ranks high in this regard. The male family ratio varies from one district to the other. The number of men per thousand women was 960. Children aged 0-14 form 45.8% of the total population. Average sizes of households was 4.6, there were 43,390 Europeans and 10,789 Asians in the country. Further analysis of the census results is still being carried out and the rates mentioned above may be liable to alteration.

18. Information on Economic Characteristics, housing conditions and various other demographic characteristics are contained in the first report.

#### Migration Statistics

19. Migration statistics have been collected over the years. Annual publications are issued at the end of each year and most of the data is published in the Monthly Digest. With regard to internal migration an attempt was made during the census and it was found that about 26% of the population were in a different place twelve months prior to the census. Further details are still being worked out.

#### Agricultural Census

20. No comprehensive Agricultural Census had been taken before in Zambia. Data on agriculture used to be collected through the Annual Census of Agriculture and Pastoral Production of the Commercial Farmers every year and a report was issued. Those farmers who sold to the Grain Marketing Board up to the value of K12,000 were all covered. Those below K12,000 were included on a sample basis. The Census used to be conducted through sending questionnaires.

21. Following a recommendation of the United Nations F.A.O. to carry out a world wide census of 1970 and in order to meet the country's planning requirements, the Government appointed an Agricultural Census Committee in 1967. Plans for the operation of the census were worked out with the help of the F.A.O. Advisers. It was decided to carry out the census on a sample basis. Fortunately the population census of 1969 provided a very good frame. The office in conjunction with the Ministry of Rural Development, Agricultural Development started the census in October 1970; A number of enumeration areas were selected and a staff of 700 was organised. The census is to be carried out in four phases, the first phase is aimed at obtaining Agricultural Inventory the second measuring fields, the third harvesting and the fourth obtaining data on sales and retentions. The first phase is now in full swing and it is hoped the last phase will be completed at the end of September 1971.

### Other Agricultural Statistics

22. Statistics on fisheries from various lakes and rivers are collected and a report is issued annually. A number of Agricultural Surveys were carried out from 1965 to 1969. These formed a very good preparatory work for the census for Agriculture.

### National Accounts - Input and Output Matrix

23. The office has been compiling data on National Accounts using the old system of National Accounts. An attempt is being made to adopt the new system. The first input - output matrix for Zambia was produced in 1961, the second in 1964 and since this we have had yearly input - output matrix.

### Industrial Production Statistics

24. The department conducts an annual survey of industrial production for mining, manufacturing and construction sectors. All companies employing more than ten people are covered on a complete basis. Those below ten are taken on a sample basis. A lot of the data collected through the industrial production census is used in the compilation of the input-output matrix.

25. An index of industrial production with base year 1961 is produced monthly. Systems and programmes work for the computerisation of a new index of industrial production has been completed.

26. An established register was set up in 1967 and the register is now satisfactorily computerised and is being maintained continuously. Along with the census of population data was collected relating to establishments in all parts of the country. It is expected that this data will enable the department to get a more complete picture of all the establishments particularly those in the rural areas. This data is still to be analysed.

### Labour Statistics

27. Data on the number of employees, annual wages and salaries are collected from every company, institution or organisation. The figures are published quarterly. A comprehensive publication showing the trend in employment and their earnings in various sectors is issued annually. The processing for 1969 data was based on the new international standards of Industrial Classification. It became necessary, for comparable purposes to revise the previous figures up to 1966.

### Consumer Price Index

28. There are two types of index numbers issued, one for the high income group and the other for the lower income group. The index numbers for the higher income group have base period January 1962. The Department, from information collected from various households during the budget surveys intends to devise a new set of index numbers. The data is collected from the main ten towns. The consumer price index numbers for the lower income group has been revised in the light of the information collected during the 1966/1968 series of household budget surveys with base year 1969. Apart from the ten towns, information is

also collected in some few rural centres for the compilation of the index. A combined consumer price index numbers will be devised when the higher group price index numbers are completed. A survey was carried out to provide information for the construction of index numbers of wholesale prices and these were issued with base year 1966. They are produced in two forms, by industrial activity and by end use. The department produces other various types of index numbers.

#### Financial Statistics for Public Corporations

29. Information is collected annually from various public corporations showing their various economic transactions, and publications are issued annually.

#### Government Accounts

30. An economic and functional analysis of Government Accounts is produced annually. The data includes accounts of both the Central Government and Local Authorities.

#### External Trade

31. Information on external trade is collected directly from Customs documents and reports on shipments. From January 1970 a new customs tariff classification based on the Brussels Nomenclature was introduced. The classification is considered better than the old one for it is possible to get one to one correspondence between the B.T.N. and the statistical classification.

#### Budget Surveys

32. A series of household budget surveys were undertaken from 1966 to 1968 in three cities, four towns, and two rural centres. In the cities samples were taken every month for each city for a period of twelve months and each household selected was visited by the enumerator every day for thirty days. In the other towns and the rural centres the surveys took between three to six months. Analysis of the data collected is still being carried out. Preliminary basis tabulations were produced in 1969.

#### Data Processing

33. Until August 1969 most of the statistical data was processed by the use of an I.C.L. computer which was installed in the Ministry of Finance. In August however, an I.B.M. machine was hired for the Planning Office and the Central Statistical Office. Now most of the data is processed by this machine although one or two types of statistics are still being carried out by the I.C.L. The new computer installed in the Data Centre eased the situation regarding the processing of data relating to the proportion of various enquiries.

34. An optical character reader was installed. This device reads figures written according to certain specifications. The department uses the optical reader to put data on tape and avoids completely key punching. It reads characters very fast. The machine was used in processing the census data and the character rejection was less than 1%.

The use of the optical reader enabled this department to complete the census on schedule. The machine proved a great success.

Development of Manpower Statistics with Particular Reference to  
Manpower Forecasting and Manpower Targets.

1. The employment problem in the Commonwealth Caribbean, with the exception of the Bahamas, and more recently the very small British Virgin Islands, has been seen by analysts as one of massive unemployment of unskilled labour. For this reason, policy makers and planners have been particularly concerned with seeking to provide more jobs through development, public works and the like. Interest has therefore been particularly for statistics of the labour force type, indicating the level of unemployment and the characteristics of the unemployed.
2. A number of surveys have been carried out in the past decade to obtain measures of unemployment, defined somewhat more broadly (though not uniformly) than the usual concept of persons without jobs who are seeking work, since it is realised that a significant number of persons who want work would not be seeking work regularly because of the chronic unemployment situation. These surveys have indicated unemployment rates of 15-20% of the labour force in most of the larger countries.
3. It has been found, however, that efforts so far have had little if any effect on unemployment. There are a number of reasons for this, among them being that there is also considerable under-employment in terms of low-income jobs, so that when new industries begin to operate, or Government public works schemes are extended, there is a large scale shift from low-income employment to these new jobs with little effect on total unemployment. Another is that in Government 'relief work' schemes, employment is provided for unskilled labourers in road construction and the like, while the hard core of the unemployed are young persons 15-24 years old, with good elementary education or with incomplete secondary education, who are unwilling to accept jobs of this type. This in part also explains the phenomenon of a scarcity of agricultural workers, and the need even to import workers to cut sugar cane in some countries with a very large unemployment and under-employment problem.
4. But the Commonwealth Caribbean is at the same time suffering from a scarcity of professional personnel in many fields (e.g. medicine, engineering, teaching, nursing), as well as workers with adequate training and skill for occupations in the building industry, in the assembling and repair of motor vehicles and related occupations, and even in some 'clerical' occupations such as stenography and occupations in the tourist industry (waiters, chefs, hotel managerial staff and so on). This has been aggravated by the "brain drain" to the developed countries.
5. Many of the countries of the region, either singly or in collaboration with each other, have therefore been paying increasing attention to the provision of training facilities to increase the supply and quality of these workers in short supply, and it is in this context that some attention is now being given to manpower forecasting, manpower targets and related problems of the optimum utilization of the human resources of the region.
6. So far, ad hoc surveys have been carried out in most of the larger countries of the region. These have sought, for the most part, to obtain information from establishments about existing vacancies, and the qualifica-

tions required to fill these vacancies, the probable reason why vacancies in various occupations have remained unfilled for a longer period (say 3 months or more), the additional staff, by occupation, which establishments believe they would require during the next one, five or ten years, the existence and need for opportunities for vocational training and so forth. 1

7. In addition, increasing use is being made of labour-force type data obtained from Censuses of Population and sample surveys of households, both to forecast manpower supply, and, through analyses of the existing and potential industry-occupation structure, to forecast the demand for manpower according to level of education, professional and vocational training and occupation. 2

8. But despite the growing interest and concern, both the manpower statistics and the manpower analysis in the region have, with few exceptions as regards the collection of labour-force type statistics, been ad hoc and crude by comparison with what is being done in many other regions, and in view of the magnitude and potential explosiveness of the employment problem in the region.

9. Very recently, however, the Government of Trinidad and Tobago has obtained the services of a demographer-manpower analyst of considerable experience, on a technical assistance scheme, to organize a manpower analysis unit in the Government, and to train a team of young civil servants to carry out a continuing programme of manpower analysis for advising the planners and policy makers. There has been a Manpower Unit in the Ministry of Labour in Jamaica since 1960 but its studies and reports have not been published.

10. Another important step has been the decision of the Institute of Social and Economic Research of the University of the West Indies to hold a Human Resources Seminar at the University's campus in Jamaica in August of this year. The purpose of this seminar is to provide an opportunity for top-level Government officials, social scientists and others who have been involved in serious work in the fields of economic, education and related planning and who have therefore been involved with the problems of human resources in the region, to discuss the problems which they have been facing both as regards finding solutions to the problems on the one hand, and obtaining suitable statistics and meaningful analyses on the other. A number of eminent persons in the field from outside of the region have also been invited. The hope has been that the Seminar would give some directions to future work in the region in the development of manpower statistics, manpower forecasting, manpower targets and other aspects of the optimum utilization of the region's human resources, and that this in turn would provide the basis for a series of Manpower Workshops, aimed at training government officials and social scientists who would be involved in the various aspects of this work.

11. By the time the Seventh Conference of Commonwealth Statisticians is held, the above seminar would have taken place and it may be possible to make some brief statement on the outcome of the Seminar.

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1. See list of studies and reports attached as Appendix.

2. See list of studies and reports attached as Appendix.

APPENDIX

List of Studies and Reports on Human Resources  
in the Commonwealth Caribbean.

1. Report on the Manpower Situation in Trinidad and Tobago; No. 1 (March 1959), No. 2 (July 1959) and No. 3 (May 1961). Ministry of Labour, with the assistance of Mr. F.W. Mahler, I.L.O. Manpower Adviser.
2. Report on a Survey of Manpower Requirements and the Labour Force, British Guiana; Preliminary Report and Volumes I-V. Ministry of Labour and Social Security, with Mr. O.J.C. Francis as U.N. Technical Assistance Consultant.
3. Manpower Assessment Report, British Honduras; Reports for 1964 to 1967. Labour Department (in collaboration with Mr. Osmond W. Francis, I.L.O. Manpower Expert for the more comprehensive and first report of 1964).
4. "Human Resources and Manpower Planning", Chapter IX in Third Five-Year Plan 1969-73 of the Government of Trinidad & Tobago.
5. Reports on the Labour Force, 1963 onwards, and on Income for 1965 of Trinidad and Tobago, based on the Continuous Sample Survey of Population, Publications 1-14, and continuing.
6. A set of Manpower Surveys for the Windward and Leeward islands by Alice W. Shurcliff and John F. Wellemeier, published by the University of the West Indies - Institute of Social and Economic Research (Eastern Caribbean) - in 1967-68 in the series Economic Development in the Eastern Caribbean Islands.



DEVELOPMENT OF MANPOWER STATISTICS WITH PARTICULAR REFERENCE  
TO MANPOWER FORECASTING AND MANPOWER TARGETS

1. As a background to the examination of the development of manpower statistics in the Canadian context, it is necessary to review briefly the economic circumstances of recent years since statistical developments are strongly influenced by policy needs, which in turn are based on the state of the economy.
2. During the past decade the Canadian labour force has experienced an annual growth rate of about 2.5 per cent, rising from about 6.5 million in 1960 to 8.2 million in 1969. This compares with an annual growth rate of about 2 per cent in the previous decade.
3. Underlying the overall growth of labour force over the past decade are substantial variations in the experience of different sectors of the economy. Employment in agriculture declined from almost 700,000 in 1960 to just over 500,000 in 1969. Conversely, employment in manufacturing rose from about 1.4 million to over 1.8 million in the same period. As a further indication of the growing maturity of the Canadian economy, employment in the service sector, including government service, increased from about 1.5 million in 1960 to almost 2.4 million in 1969.
4. At the beginning of the 1960's, the rate of employment was at the lowest level since World War II. This situation gradually improved, as shown in Table 1 below, but the goal of an employment rate of 97 per cent as suggested by the first report of the Economic Council of Canada(1) was never achieved and in only two years, 1965 and 1966, did the rate rise above 96 per cent. Unemployment rates, adjusted to conform in definition and coverage, have consistently been higher than those of most industrialized nations including the United Kingdom, though they differ but little from the American.

TABLE I

Annual Average Employment Rates, Canada, 1960-1969 inclusive

1960 - 93.0	1965 - 96.1
1961 - 92.9	1966 - 96.4
1962 - 94.1	1967 - 95.9
1963 - 94.5	1968 - 95.2
1964 - 95.3	1969 - 95.3

Within Canada, the upward movement of employment was felt in all parts of the country, yet unemployment rates have remained above the national average in certain region and for certain classes of workers (youth, older men, unskilled etc.). At the same time, as employment expanded there emerged serious problems of occupational and locality shortages.

5. The major policy response dates from 1966 with the establishment of the Department of Manpower and Immigration, which marks a full commitment to

(1) Economic Council of Canada, First Annual Review, Dec. 1964, p. 38

selective manpower policies as necessary complements to main policy levers operating on the demand side. The approach is not wholly new, the federal government having undertaken to assist the matching of workers and jobs through the National Employment Service as long ago as 1941. But it is much more comprehensive. In addition to offering an employment exchange, the new department embodies the key concept of promoting the mobility of labour - occupationally, industrially, geographically - to conform with changing labour market requirements. A co-ordinated program is offered, embracing counselling and placement services; training, retraining and educational upgrading; and financial assistance to workers moving from one place to another.

6. The total cost of federal programs affecting labour supply and the operation of the labour market is close to 10 per cent of total budget expenditures.

7. The brief experience with selective manpower policies serves to indicate both their importance and their limitations. On the one hand, with a downturn in employment growth but continued rapid growth in labour force size, it seems likely that high rates of youth unemployment would have been even higher in the absence of training and counselling directed to skills and trades in high demand. At the same time, the slackening in total employment growth is not amenable to action on the supply side; such policies also seem to be relatively ineffective in combatting the tendency for rising unemployment to concentrate in regions where unemployment and underemployment traditionally exceed the national average.

8. Regional income disparities in Canada reflect very different patterns in manpower utilization - differences which have persisted over many years. Illustration may be drawn from a recent study(2) which, having established a measure of "potential employment", calculated that over the last decade the Atlantic provinces lost 4 to 8 per cent of this potential through unemployment and a consistent 12 per cent through non-participation in the labour force.

9. Federal programs aimed at increasing employment in lagging regions predate the new manpower services by several years and have been given added emphasis with the still more recent establishment of the Department of Regional Economic Expansion. The proposed program is strongly oriented to the development of secondary industry, using locational assistance and investment in supporting services - transportation, education, etc. - as the major means. A very close co-ordination with the manpower services is expected. In areas where industry is to be fostered, developmental programs are likely to provide for training of the local labour force; elsewhere, lacking the necessary potential for industry growth, adjustment may be sought through assistance for relocation of workers.

#### New Data Developments

10. The statistical requirements of full-employment policies are largely met by regular and frequent information on changes in population, labour force employment and unemployment. The Monthly Labour Force Survey of households which supplies these indicators has long been an important source of policy-oriented manpower statistics in Canada. But selective manpower policies require much more detailed knowledge both of workers and of the labour market,

(2) DBS, Special Labour Force Studies, No. 8, Underutilization of Manpower in Canada.

hence their adoption has required extensive efforts to improve and extend the statistical system.

11. The most serious deficiency was encountered on the demand side, there being a wide range of data on labour supply. In addition to leading indicators, the Monthly Labour Force Survey supplies a number of labour force characteristics, useful in the analysis of trends; there is also a system of establishment surveys which adds importantly to the industrial detail available for employment data, as well as supplying hours of work and earnings. But the urgent need confronting on-going programs was for specifics on labour demand: to guide the placement services, to determine the occupations for which the unemployed and the new entrants should be trained, for formulating an immigration policy appropriate to the needs of the economy.

12. From the operational standpoint, the most urgent need was for detailed and specific measures of job vacancies. Existing measures (orders placed by employers with the public employment service) were plainly insufficient because many employers did not use the facilities, particularly for locating skilled workers. Thus, administrative statistics were not representative of either the total of unfilled demand or the occupational mix. To fill this gap, a comprehensive, national survey of occupational job vacancies was initiated; this survey has just recently reached the operational stage.

13. Among the first attempts in any country to collect information on vacancies in any systematic way, the development process extends back to the first step of defining a vacancy. Prior developments in supply measures were taken as a broad guide to establishing a demand definition; thus, the vacancy must be available for filling at the present time, and the employer must be actively seeking workers to fill the vacancy. To ensure reflection of impact on the labour market, only those vacancies are counted for which the employer is seeking workers outside the firm. For precision in measurement, vacancies must be in existence for a specific period - a full day.

14. Conceptually similar to job vacancy measures being developed in the United States, the Canadian survey provides much more complete coverage of the economy (all industries except agriculture) and uses more intensive techniques of collection. In addition to the initial mail survey the Canadian program also makes provision for an interview phase covering a substantial proportion of the surveyed universe each month. The interview is primarily intended to reveal, through indirect questioning, the accuracy of the information obtained in the mail survey and to provide a basis for adjustment for non-response.

15. The survey will provide vacancy data by occupation and industry, with considerable occupational detail at the national level and, on a more aggregative basis, for regions and the more important labour market areas.

16. The growing importance of occupational data also launched a major reexamination of the several classification systems used in Canada with the intent of developing a standard system which could meet the needs of all users. This has been a very large undertaking, requiring the analysis of many thousands of jobs, specifying such attributes as materials worked with, tools used, education and training required and physical demands of the job. The end product - The Canadian Classification and Dictionary of Occupations - is now virtually complete and because it was developed by the principal sponsors of other classifications (Census, Manpower Services and the Immigration service) working in collaboration, there are good reasons to believe that the objective of supplying a single system has been met.

Manpower Forecasting Models

17. As reported in another paper(3), the feasibility of building a medium-term simulation model which would include a manpower requirements feature is being intensively studied with D.B.S., the Economic Council and the Department of Manpower and Immigration sharing in this work. The latter's policy interests are evident; in particular, the planning of training programs and of immigration policy would be greatly strengthened by the ability to forecast the manpower requirements of the economy. The Economic Council, which has responsibility for producing analysis of economic trends and assessing policy alternatives, also has a vital interest in the project. The decision is being taken to proceed with the first stage of the model. Primary reliance will be placed on the co-ordination of projects already in existence that are directly related to the model building activity.

18. As conceived at present, the manpower requirements would emerge as a function of the levels of industrial activity. The models would accommodate a variety of levels, reflecting the effect of policies in terms of manpower requirements. In the first stage model, the estimates of manpower requirements will probably not be used to modify or refine other components but at a later time the formal reconciliation of demand and supply could be attempted.

19. The intention is to provide, eventually, cross-classification by occupation as well as by industry; whether educational qualifications could also be accommodated is more doubtful though certainly this additional dimension is desired. Data limitations will be fairly severe. Of necessity, primary reliance for labour force information will be placed on the 1961 Census, with some help from current data series for updating. The possibilities offered by all current survey data will be thoroughly explored.

Capabilities under Exploration

20. Employment by occupation: Although operations of the Manpower services will be greatly assisted by job vacancy statistics, the latter's development adds greatly to the pressure for current statistics on total occupational demand (employed plus vacancies). It is this total, not merely the fraction which shows up as vacancies, that must underlie program planning, and it is only with good data on employment by occupation that there will be a universe for the calculation of job vacancy rates. Without the rates, various problems in interpreting the vacancy data could arise.

21. At the present time the decennial census is the only comprehensive and detailed source of information on the occupations of the Canadian labour force(4) and, with rapid change in technology, product demand and other factors which alter occupational structure, the ten year interval is simply too long. The question of developing current data series is now under active exploration. It is hoped that either singly or in combination certain administrative data and extended utilization of the Job Vacancy Survey machinery to cover a sample of establishments could yield the desired capability but the investigations are still at a preliminary stage.

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(3) See 4 - Canada.

(4) The monthly Labour Force Survey supplies only ten occupation groups, hence is of very limited usefulness in this respect.

22. Added regional dimension: The second serious gap in Canadian manpower statistics is at the local and regional level. The Monthly Labour Force Survey, which is an approximately 1% sample, reports only at the provincial level and with smaller provinces combined.(5) For sub-provincial information, between censuses, the principal source has been the monthly survey collecting employment hours and earnings data from all establishments (more than 40,000) with twenty or more employees. While this yields employment counts for most of the larger urban centres, the omission of employment in the small firm sector imposes some limits on usefulness. The absence of data for counties and census divisions (the main sub-provincial areal system employed by the Census) has also been a problem. However, the utility of establishment statistics will be greatly enhanced in the near future as the result of the decision to code all data, including data from small firm surveys, to the county unit.

23. Local area information on unemployment is regrettably weak. While rough measures are obtainable from the records of unplaced applicants registered at Canada Manpower Centres, since participation is voluntary the statistics reflect only those who choose to avail themselves of the service. Records of persons drawing unemployment insurance benefits are limited by partial coverage of the scheme. Considerable interest, therefore, attaches to an experimental investigation launched by the Econometric Research Staff in DBS to determine the feasibility of estimating unemployment by the application of multiple regression methods to data from the Labour Force Survey and the Department of Manpower. The former is so designed that sample estimates of unemployment can be tabulated for some 60 sub-provincial regions, although the estimates are judged unusable due to sampling variability and have not been produced in the past. The new plan involves using the Labour Force Survey data for all areas combined, in conjunction with the data on registrants at Canada Manpower Centres, to derive a regression equation which will provide a better estimate for a given area than the original sample figure.

24. Initial results appeared promising. However, difficulties were subsequently encountered in connection with inconsistencies in the reporting practices of regional offices and certain variables required by the equations ceased to be collected. These difficulties have not as yet been entirely removed. Until such time as the statistical reporting can be stabilized, further work on the estimates is in abeyance.

25. For some years the 1961 Census has been inadequate as a source of diagnostic information to assist the operations of the Manpower services and also as a basis for designating areas to which special federal programs would apply. Now, under the new Department of Regional Economic Expansion, comprehensive economic planning is to be an integral part of the designation program, hence a new urgency attends the development of local area statistics, including labour force.

26. The regional statistics program established within D.B.S. took an important step forward in developing the capability to supply annual estimates of population for some 300 counties and census divisions. The method rests on the application of "symptomatic" data series - administrative data which are available annually and which bear some close relationship to total population or a specific age group. By extension of the same or similar methodology, breakdowns by age and sex will be available in the near future. However, the

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(5) Provinces may obtain figures for individual provinces and for the larger Metropolitan areas on a confidential basis, but the data are subject to sampling variability.

estimation of labour force for small areas appears more problematical due to the margin of error in the population estimates (particularly in smaller counties) and to the absence of data which could reflect a change in participation rates.

27. The weakness of the data base which affects most small area estimates stems from the small size and limited functions of most administrative units within provinces. Statistics, in other words, are typically generated as a by-product of programs. A further difficulty arises with the areal system established for the manpower program, with administrative boundaries drawn to define or approximate local labour market areas. It is on this locality basis that administrative statistics are generated and for which additional labour force information would be most useful to the Department of Manpower and Immigration. On the other hand, data collected by D.B.S. which might be utilized in producing small area estimates has been coded for counties and census divisions (the Job Vacancy Survey is the one notable exception). While a new start can be made within the 1971 Census which will supply labour force information both for Canada Manpower Centre areas and for the county system, methods for converting current data series will still be needed after the Census. It is hoped that a system of geo-coding now being developed will supply the solution.

DEVELOPMENT OF MANPOWER STATISTICS WITH PARTICULAR  
REFERENCE TO MANPOWER FORECASTING AND MANPOWER TARGETS

1. The first specialised study of the labour force in Guyana was carried out in 1956 in collaboration with the ILO. This study was based on a sample of the population and was designed to measure the size and other demographic and occupational characteristics of the labour force, with particular reference to the level of employment, unemployment, and underemployment. The results of the studies were published in a report entitled - "A Report on the Employment, Unemployment and Underemployment in British Guiana", which was issued jointly by the ILO and the Government of Guyana (then British Guiana).
2. A second specialised study, again based on a sample of the Population, was conducted in respect of the labour force in 1965. This latter study was however designed to yield information not only in respect of the numbers that were unemployed, underemployed, and employed, but also with respect to the level of qualification, occupational training and skill, possessed by persons who were in the labour force. In addition the study provided data in respect of the unsatisfied demand for labour, that is vacancies in productive enterprises, and pointed to areas in which training was likely to be critical in view of the existing supply of skill, and potential demand for them.
3. The Censuses of Population taken in 1946, 1960 and recently in 1970, provided further opportunities for measuring important elements of the manpower situation in Guyana. There is therefore basic information on the labour force - its employment status, and levels of training and of qualification - on the basis of which it is possible to make forecasts of the supply of manpower.
4. In Guyana, future work in manpower would be the joint responsibility of the Bureau of Statistics and the Manpower Research Unit of the Ministry of Labour. Unlike some territories in the Caribbean Guyana does not have a Continuous Sample Survey of Population on the basis of which it could make current estimates of, and observe changes in, the occupational characteristics of the labour force. It is proposed however to design and conduct on an Annual basis a survey which would yield various manpower statistics relevant to the needs of economic and educational planning in Guyana. A measure of size and information on the demographic characteristics of the labour force, together with the provision of data on the educational levels and occupational training attained by persons within the labour force would constitute important objectives of the Survey. Attempts would also be made to measure the incidence and nature of unemployment from time to time, with attention being given to the underemployment problem which in Guyana poses special problems because so much of the work force is engaged in agricultural employment both paid and own-account.
5. This survey would at least provide measures of the changing supply of manpower. The Ministry of Labour which has recently carried out an establishment survey to measure the changing levels of employment in various occupations and industries would on the basis of present thinking increase the frequency of its survey in order to capture data not only on the level of employment by occupation, but also on the number and duration of

Vacancies. For instance, long term vacancies, that is vacancies existing for more than six months, may be a good indication of shortages in the particular occupation. This employment data would therefore form a valuable indicator of the impact of development on employment, and unemployment.

6. The information referred to in the foregoing paragraphs represents the kind of manpower statistics that is necessary to make available to the economic planners. They represent essential pieces of manpower information if reasonable assessments are to be made of the performance of the economy in so far as the provision of jobs is concerned.

7. There is however another important aspect of manpower statistics which requires attention. This refers to the forecasting of available human resources as well as the demand for, and therefore the capacity of the economy over a time, effectively to employ and utilise its human resources. Most development plans in developing countries have stated either implicitly or explicitly the reduction of unemployment as a major objective of development planning.

8. In the Guyana case a Ten Year Perspective Development Plan is in course of preparation. The major objective of the plan is the achievement of full employment in about fifteen years. The requirements of the plan have entailed work on two fronts so far as manpower statistics are concerned:-

- (i) the assessment of the unemployment problems based on the most recent information;
- (ii) a projection of the labour force over the next ten years (1970-1980);
- (iii) an estimation of the demand for manpower (or skills) over the same period.

Work on (i) is in progress, and involves an analysis of the 1970 Population Census data relating to the Economic Activity of a Sample of persons enumerated in the Census. At the end of this stage of the exercise it is expected that usable information will be derived with respect to the nature of the human resources in Guyana, in terms of the age, sex, education, training, occupation, worker status, and the geographic location of persons between the ages of fourteen and sixty-four, who are both in and outside of the labour force. It is also expected that adequate information would be secured on the labour force status of the economically active, that is whether, and the extent to which, the labour force is employed, under-employed and unemployed. This information together with comparable data in the 1946 and the 1960 Censuses should provide the basic framework for planning considerations, as well as the base material for the stage (ii) of the exercise; that is, the projection of some of the manpower aggregates, over the next ten years. In this second stage of the analysis projections would be made by the application of a growth curve equation to the available labour force data derived from the 1946, 1960 and the 1970 Population Censuses.

9. It is recognised that any aggregate derived in this way, tacitly assumes that development in the period over which the projection extends



would follow the path of development in the period between 1946 and 1960 and from 1960 to 1970. There will be underlying imperfections in such an assumption, but it is probable that the projections would give the minimum manpower supply position. However population growth, migration and any change in the participation rates of persons in the population, particularly of women, would tend to change the path of actual growth curve.

10. Even where a workable projection of the manpower supply is produced, there still would remain the even more complex task of projecting the demand for skills in various occupations. The intention is to start with an inventory of skills in the existing work force. Since work in this area has recently been done by the Ministry of Labour; business establishments would be canvassed for their development plans over say the next three to five years. It is possible that some of these firms would have actually worked out the manpower requirements of their projected expansion. In that case the business enterprise would probably be able to make reasonable assessments of their manpower requirements. The same would probably apply to the Central Government which would need to work out or determine the demands for human resources that would be created by the projects it wishes to include in the Plan. The combined manpower requirements of the Public and the Private Sectors would constitute an estimate of the effective demand for certain skills - manual, technical and professional.

11. However certain serious difficulties would arise in this approach. In the first instance some may not be willing to make, while others may not be capable of making an assessment of their manpower requirements much more than two years ahead. To ask for longer periods may well invite imprecise and therefore valueless information. Secondly even the Public Sector would be hard put at the time of formulating a Plan to assess in detail its requirements in terms of all forms of manpower.

12. It is possible however that in terms of certain professions - e.g. Doctors, Nurses, School Teachers, - rough ratios to total population could be worked out, on the basis of which requirements could be assessed over time based on projections of the total population.

13. Another aspect of manpower statistics that would be of interest for compilation and study relates to the inflow and outflow of skilled or trained personnel. This phenomenon in many countries, usually the developing countries, is commonly referred to as the brain-drain. It is therefore extremely useful that an accurate count is kept of residents who emigrate permanently, and that these are analysed with respect to their ages, sex, occupational training received and educational standard attained. These represent wastages in the training effort of educational and vocational training institutions. Similar analyses also need to be done with respect to arrivals of permanent immigrants, as these add to the labour force and may compete with and even displace nationals for scarce jobs.

DEVELOPMENT OF MANPOWER STATISTICS  
WITH PARTICULAR REFERENCE TO MANPOWER  
FORECASTING AND MANPOWER TARGETS

INTRODUCTION

1. In India studies on forecasting of manpower and manpower targets relate to certain categories of technical personnel such as scientists, engineers, teachers, doctors, nurses and other para-medical personnel. In this paper the main sources of manpower statistics and the techniques adopted in estimating the demand and supply of manpower in the selected categories are discussed briefly.

MANPOWER STATISTICS

The decennial census

2. The 1961 census conducted by the Registrar General of India provided the following distribution of the urban and rural population at the State and district levels:

- (i) Industrial Classification (by divisions, major and minor groups) of workers separately for each sex;
- (ii) occupational distribution of the workers according to sex and broad industry divisions;
- (iii) educational levels of the workers by sex and industry divisions;
- (iv) occupational divisions of persons at work other than cultivation, classified by sex, broad age-groups and educational levels in urban areas only;
- (v) persons unemployed aged 15 and above by sex, broad age-groups and educational levels in urban areas;
- (vi) persons unemployed aged 15 and above by sex and educational levels in rural areas.

The occupational distribution is available at the three digit level for all those engaged in non-farm work. Another significant contribution of the 1961 census to the development of manpower statistics was the special census of scientific and technical personnel conducted with the help of the Council of

Scientific and Industrial Research (CSIR) along with the census operations.

#### National Sample Survey

3. The National Sample Survey (NSS) in the various rounds furnishes, apart from the estimates of employment and unemployment, information on (i) the distribution of labour force by educational levels, (ii) the distribution of gainfully employed persons by industry and occupation separately, (iii) distribution of the unemployed by sex and broad age-groups, (iv) a two way distribution of the unemployed in urban India by type of work sought and broad level of training or education and (v) an industry-occupational distribution of workers at one digit level.

#### Employment Market Information

4. The Employment Market Information programme (EMI) was started by the Directorate General of Employment and Training (DGET) in 1959 for the collection of comprehensive employment data on a continuing basis from all public sector establishments and from non-agricultural establishments in the private sector employing 25 or more workers under the Employment Exchange (Compulsory Notification of Vacancies) Act, 1959. The data are being collected from public and private sectors respectively in alternate years. Information is collected from establishments on employment, vacancy, shortages and occupational distribution through statutory returns. Since April, 1966, smaller non-agricultural establishments in the private sector employing 10 to 24 workers are also being covered on a voluntary basis. In addition, the DGET have been conducting biennially a survey of non-agricultural establishments in the private sector employing five to nine workers on a voluntary basis. However, the frame on which this information is based is considered incomplete. The EMI data have limitations owing to non-coverage of employment in agriculture (except plantations) and of self-employed persons and inadequate coverage of establishments in the private sector and of employment in construction. In terms of the total labour force in the country, the EMI returns represent not more than ten per cent. However, the organised sector covered under the programme accounts for a fairly high percentage of high level manpower except doctors about half of whom are self-employed.

5. On the basis of data supplied by the establishments in regard to the occupational patterns of employees working in them, the DGET prepares reports on the occupational pattern of workers in the private and public sectors in alternate years. From 1965 occupational data which was previously presented at the three-digit level has been extended to the

five-digit level. The reports also provide industry-occupation matrices for establishments in the public and private sectors separately, the industry codes being at the three-digit level and occupational codes at the two-digit level. The DGET has recently published an occupation-educational level matrix after obtaining on a voluntary basis additional data for 1966 on educational levels for certain selected categories of employees in the public sector establishments such as professional and technical, administrative and managerial, craftsmen and production process workers. (1) In the private sector similar information was collected for all skilled occupational categories on a sample basis for the year 1967 and arrangements have also been made for presenting such matrices according to the size of establishments.

#### Employment exchange registers

6. The DGET maintains a list of job seekers at the various employment exchanges numbering 423 currently. In spite of the limitations of live register statistics owing to various factors like voluntary nature of registration, plural registration by the same applicant at different places and for different jobs, registration by employed persons for better jobs, etc., the live register data are the only source of information that provide statistics of job seekers by occupational categories at the district level. An educational as well as occupational distribution of candidates on the live register is brought out by DGET as on 30th June and 31st December each year.

#### National Register for scientific and technical personnel

7. For obtaining information on the utilisation of trained manpower the Council of Scientific and Industrial Research (CSIR) started a National Register in 1948 for persons holding at least a degree in science or medicine or a diploma in engineering and technology, particulars of each individual being collected voluntarily and kept in the form of a filled-in-card. In 1957 an 'Indian Abroad' section was started in the National Register for maintaining particulars of persons trained abroad. Despite all efforts it has not been possible to secure information for all persons eligible for registration. Other limitations of the CSIR data are (i) the information contained in the cards does not relate to any particular reference year and (ii) the data pertain to all those who choose to register themselves irrespective of their being or not being in the labour force. Despite the limitations, the information contained in the register is being usefully analysed for studying the various characteristics of these technical personnel. (2) This analysis provides a number of useful cross tabulations such as (i) average salary of

personnel possessing different levels of education and engaged in different types of activities in the public and private sectors, (ii) activity preferred by personnel having different educational levels, (iii) distribution of personnel in different sectors according to length of experience and (iv) distribution of personnel according to the country of training.

#### Statistics of teaching personnel

8. The Ministry of Education and Youth Services compiles and publishes comprehensive statistics on school as well as higher education. Statistics of sanctioned strength, annual intake and outturn of engineering colleges and polytechnics are available annually. The University Grants Commission(UGC) also brings out annually educational statistics relating to different faculties including data on teachers. Education Ministry covers teachers in all educational institutions which are officially recognised while the UGC confines itself only to teachers in universities and affiliated colleges. The Ministry of Education also collects data on the educational qualifications of teachers at the school level which enables it to provide a break-up of teachers trained and untrained according to broad levels of education.

#### Registers of medical personnel

9. The Medical Council of India(MCI) with its regional councils in the States maintains a register of allopathic medical personnel with a degree or licentiate diploma. This suffers from limitations on account of omissions, duplications, outdated entries, etc. The register also does not provide information on occupation, industry and sector of employment(public or private) of the medical personnel.

10. The Dental Council of India maintains manpower data regarding dental colleges and dentists. Similarly, the Pharmacy Council of India maintains registration data on pharmacists. These data suffer from the same defects as noted for medical personnel. The Indian Nursing Council maintains a register for (a) nurses, (b) midwives, (c) health visitors and (d) auxiliary nurse-midwives who have completed the prescribed course of education and training. The recent recommendation of the Indian Nursing Council that the registrants should renew their registration after every five years is expected to make the data more upto date.

#### MANPOWER FORECASTING AND MANPOWER TARGETS

11. The first attempt to forecast the technical manpower requirements was made by the Scientific Manpower Committee (1949) which, for the sake of convenience, classified all national activity requiring scientific and technical manpower

under two principal groups viz., (i) Industries and (ii) Government and Government sponsored departments (including agriculture, transport, medical and public health, etc.). The Committee estimated the requirements of the scientific and technical personnel on the basis of 'production to personnel' ratio in the various industries. Where the use of this ratio was not possible, the estimates were attempted on the basis of other factors such as (i) possible size of the industry, (ii) technical operations involved, and (iii) conditions obtaining in similar industry in other countries. The estimates were provided for a period of five years in over 20 principal industries. (3)

#### Demand for engineering personnel

12. The estimates of engineering personnel required in the principal fields of material development such as building and road construction, railways, industrial development in the public and private sectors, mining, irrigation and power, etc. prepared by the Engineering Personnel Committee set up by the Planning Commission in 1955, were mostly based on the 'Cost to Personnel' ratio. Where the 'Cost to Personnel' ratio was not applicable the estimate was based on 'Production to Personnel' ratio. (4)

13. The estimates of engineers in the manufacturing sector provided by the Perspective Planning Division (PPD) of the Planning Commission for the Second Plan (1956-61) were based on the assumption that the demand for the engineering personnel would, on the average, increase in direct proportion to the increase in industrial output. The estimated number of engineers in different industries in 1954 was assumed to indicate the minimum number of engineers required at the beginning of the Second Plan period. On the basis of the anticipated rate of development for each industry during the Second Five Year Plan rough indices of physical production in respect of each of the nine major groups of industries taking 1955-56 level of production as 100, were worked out. The percentage increase in production in each major industry group multiplied by the number of engineers employed in the base year provided an estimate of the additional engineers required. On the basis of the relative proportion of different types of engineers in the base year estimates were also made of different specialities. (5)

14. The Working Group on Technical Education and Vocational Training (1960) provided estimates of requirements of engineering personnel for the periods 1961-66 (Third Plan) and 1966-71, on the basis of (i) increase in the national income and (ii) additional employment potential. The investment outlay corresponding to an expected increase in national income during 1961-66 was allocated among important industries and the corresponding targets of production in these industries were estimated. On the basis of assumed output-engineer ratios in

different industries, additional requirements of engineers were estimated. A ratio 1:2 was assumed for the allocation of total engineering personnel between graduate engineers and diploma holders. In the second approach, it was assumed that a net investment of Rs.100,000 million in the Third Plan would generate additional non-agricultural employment for 10.1 million persons, and that additional requirement for engineering personnel would form about 1 per cent of the additional total employment. The estimates for the next five year period (1966-71) were prepared directly on the assumption that an average annual investment of Rs.20,000 million per year would entail a demand for about 24,000 engineers annually. Estimates for this period were also worked out on the basis of additional employment potential approach.

15. An alternative approach was also adopted by relating total employment of engineering personnel to total employment in the non-agricultural sector (as distinct from additional employment considered in the earlier approach). It was found that the percentage of engineers to total non-agricultural employment has risen from 0.12 in 1950-51 to 0.16 in 1955-56, to 0.24 in 1960-61 and to 0.41 in 1965-66. On the assumption that this ratio would be about 0.55 in 1970-71, the total number of engineers required at the end of the year 1970-71 was estimated. In addition to this global estimate, segmental approach was also adopted by working out the requirements for engineers for each Ministry/industry on the basis of targets of production/capacity envisaged in the Third Plan period.<sup>(6)</sup>

16. The foregoing methods of forecasting technical manpower were based on the global approach, i.e., they lump together all the sectors of the economy without making any distinction between them. Further these studies, excepting the one by the Working Group on Technical Education and Vocational Training, have related engineering manpower requirements to estimates of mainly one factor, viz., output or investment, rather than considering the three factors viz., output, investment and work-force. The Institute of Applied Manpower Research (IAMR) made an exploratory study to examine the practicability of sectorwise approach based on the three factors viz., output, investment and work-force to provide three independent estimates.<sup>(7)</sup> A comparison of the results obtained from sectoral as well as global approach brought to light the relative strength and weakness of the two approaches, indicating the need for checking the findings of the one with the help of the other. Conceptually, the superiority of the sectoral approach over the global one is unquestionable, since the various sectors of the economy have widely different characteristics as far as engineering manpower employment and related factors are concerned. Not only do important ratios like output-engineer, investment-engineer and engineer-workforce, differ significantly from sector to sector, but the rates of growth of various sectors over time are also quite different. However, the statistical problems in the

sectoral approach are more difficult than those encountered in the global approach, mainly because the global data of engineering manpower employment are available for a larger number of years than sectorwise figures. In regard to factors on which engineering manpower requirements could be based, it was considered that instead of using any one factor for all the sectors, the most suitable factor for the different sectors could be identified and used. For example, an estimate for demand of engineering teachers could best be made on the basis of projected enrolment of students and pupil-teacher ratios in engineering educational institutions. Similarly while investment may be the most suitable basis for 'construction', the engineering manpower needs of maintenance should be related to the total capital stock built up over time.

17. The IAMR has also attempted a long-term forecasting of demand for engineers adopting global approach. The global approach was adopted because sectorwise data for Fifth Plan were not available. The study was based on certain assumptions in regard to the growth of the economy in the Fourth Plan (1969-74) and the Fifth Plan (1974-79) periods. Two approaches were adopted. In the first approach, linear regression of employment of engineers on total national income was fitted and on the basis of certain assumption in regard to growth of national income estimate of demand for engineering personnel was obtained. Two more alternative regression estimates were also worked out using national income from non-agricultural sector and income from engineering-intensive sectors as independent variables. In the second approach linear regression of engineering employment on investment was fitted. On this basis and on the assumption of certain rate of increase in investment in the future, demand estimates were worked out for engineers.<sup>(8)</sup>

18. When engineering manpower is classified by an occupational concept, it covers all those who perform engineering functions irrespective of their educational qualification. Hence, the term 'engineering personnel' covers not only graduate and diploma holders in engineering and technology but also the 'engineering practicals' who do not possess any of the above qualifications but perform functions appropriate to the profession, generally complementary to that of the engineering graduates and diploma holders. A Planning Commission study (1955) identified this category for the first time and estimated that they constitute slightly less than a quarter of the graduates and diploma holders. Another survey by IAMR (1964-65) showed that the relative strength of 'practicals' slightly increased since the Planning Commission study. The estimates of demand of the engineering personnel would include the 'engineering practicals' as well.



Supply of engineers

19. The first attempt to estimate the supply of technical personnel was made by the PPD of the Planning Commission when it made, during the Second Plan period (1956-61), a number of stock and distribution studies in respect of different categories of technical personnel.<sup>(9)</sup> The IAMR estimated the prospective growth of the supply of engineers during the Third Plan period (1961-66).<sup>(10)</sup> The stock of engineers for the period 1955-68 was estimated based on the number of pupils who passed out successfully in each year from the various institutions, the number for the base year 1955 having been estimated separately. The estimates of future outturn were worked out on certain assumptions regarding the number of admissions in the various institutions and the numbers who are expected to pass out successfully after completing the course, due regard being paid to the wastage due to failures and discontinuation of studies, etc. The IAMR also estimated the growth of engineering manpower supply for the Fourth (1969-74) and Fifth (1974-79) Plan periods on the basis of educational programmes and institutions already available assuming the future admissions to be maintained at the level of actual admissions made in 1968-69 and certain pass percentages for the degree and diploma courses. The losses due to retirement, deaths, migration, etc. were assumed at 2 per cent of the stock each year.<sup>(8)</sup>

Demand for doctors and nurses

20. The estimates of demand for doctors and other supporting para-medical personnel for the first three plans have generally been based on global doctor-population ratios considered feasible on the basis of availability of resources, stock of doctors, etc. The IAMR has attempted the estimates of demand for doctors for the Fourth (1969-74) and Fifth (1974-79) Plan periods by component method. The components are (i) employees in the public sector exclusive of medical teachers and doctors employed in family planning work (ii) medical teachers (iii) employees working on family planning programmes (iv) self-employed doctors engaged in private practice and (v) doctors employed by the private sector.<sup>(11)</sup> The demand for doctors in the public sector (other than those employed in family planning programmes and medical teachers) was estimated by the use of a regression equation relating the number of doctors to revenue expenditure (after adjusting for price changes) on health programme for the period 1956-68 and assuming the levels of Government revenue expenditure for the future years. The demand for doctor-teachers was based on certain assumptions on teacher-pupil ratio and the trends of admissions in medical colleges during 1968-78. The demand for doctors for the family planning programme has been worked out on the basis of organisational structure and staffing pattern for the various administrative and service units for the family

planning work at the State, District and Block level. The demand for doctors in the private sector consisting of two components, namely (i) self-employed doctors doing private practice and (ii) doctor employees of private employers, has been estimated by two approaches. The first approach is based upon the income elasticity of the expenditure on medical services used in conjunction with per capita income of household (medical service user approach) and the second approach relates to demand for doctors in the private sector to the national income. The results of both the approaches were found to be approximately of the same order. Having thus estimated the total of the two components of demand for doctors in the private sector, separate estimates in respect of the two components were obtained on the assumption that doctor employees of private employers constituted about 10 per cent of the total doctors in the private sector.

21. The IAMR adopted the component approach for estimating the demand for nurses for Fourth(1969-74) and Fifth(1974-79) Plan periods.<sup>(12)</sup> The components are (a) care of beds, (b) teaching, (c) administration and (d) family planning. The demand for nurses in respect of 'care of beds' was estimated on the basis of specified nurse-bed ratio. The method followed to assess the demand for nurses for family planning programme was more or less similar to the one adopted for projecting demand for doctors for the same programme. The demand for nurses for administrative purposes has been estimated on the basis of certain norms for medical administration. The method for estimating the demand for nurse-teachers was more or less similar to the one adopted for doctor-teachers.

#### Supply of doctors and nurses

22. Estimates of the stock of medical personnel in India are not available from any one single source and there are many sources each of which gives a partial picture of the available medical manpower. The IAMR brought together all the available information on the number and distribution of medical personnel and then arrived at an estimate of the stock of doctors, nurses and dentists.<sup>(13, 14, 15)</sup>

#### Demand for teachers

23. The estimation of demand for teachers for the years 1976 and 1986 made jointly by the Indian Statistical Institute (ISI), Perspective Planning Division(PPD) of the Planning Commission and the London School of Economic(LSE) is mainly based on assumed pattern of teachers' qualifications, the pupil-teacher ratios, targets of enrolments etc. considered feasible at different levels of education, the gradual substitution of untrained by trained teachers being an ancillary aim to improve the quality of education. As regards

pattern of teachers' qualifications, it was assumed that no non-matriculいたes were recruited after 1961 and that by natural wastage, the stock of non-matriculate teachers would be reduced by 3 per cent a year from 1961. The distribution of these estimated teachers by educational qualifications was worked out on the basis of certain assumptions in respect of percentage of graduate teachers in primary schools, middle schools, high and higher secondary schools, universities and colleges.<sup>(16)</sup> The Education Division of the Planning Commission in consultation with the Ministry of Education estimated the requirements of teachers for the different plan periods on the assumption of certain pupil-teacher ratios for different stages of education including the university education, due allowance having been made for replacement requirements. The targets of additional enrolment of pupils for different stages of education were set-out on varied considerations taking into account the future expected age-sex distribution of population.

#### Supply of teachers

24. The estimated demand for teachers (ISI/PPD/LSE) for the years 1976 and 1986 would provide the additional requirements for the periods 1961-76 and 1976-86. The total outturn required was obtained by adding replacement requirements to allow for wastage, etc. A wastage rate of 2.5 per cent a year was assumed for trained and untrained teachers with matriculation or higher qualifications. The total wastage for the two periods was estimated on the assumption that stocks of graduate and undergraduate teachers would grow at compound rate of growth between 1961 and 1976 and between 1976 and 1986. Having thus obtained the total outturn of school teachers required for the two periods, the annual outturn of teachers required was estimated on the assumption of a phased programme for the two periods.<sup>(16)</sup> The Education Division of the Planning Commission in consultation with the Ministry of Education estimated the supply of teachers on the basis of enrolments in teacher training institutions at various levels of education due allowance having been paid to the wastage due to failures, discontinuation of studies, etc.

#### Manpower and Educational Development

25. The Indian Statistical Institute, the PPD of the Planning Commission and the London School of Economics in a joint study estimated the requirements of workers at each educational level by two approaches - one for services (other than trade and transport) and the other for the other sectors of the economy. For estimating employment in all sectors except 'other services' (i.e. excluding trade and transport) it was assumed that the demand for educated manpower (matriculates and above) would increase at the same rate as net output in each sector of the economy. The targets of economic growth for the economy as a

whole and for each sector of it were those proposed by the PPD of the Planning Commission for the different sectors. The demand for educated manpower in public administration and defence was worked out on the basis of likely growth of non-developmental expenditure adjusted for likely increase in productivity. The demand for doctors and nurses in the medical services sector was worked out on the basis of certain ratios of these categories of technical personnel to population.

26. The total stock of educated personnel from which the required number of workers could be drawn was worked out on the assumption that the proportion of workers to the total stock of educated persons would be the same in future as it was in 1961, for men and women separately. Having thus estimated the requirements of the stock of educated personnel, the future growth of enrolments implied by the manpower needs both in the general education as well as education of specialists was estimated on the basis of certain trends.<sup>(16)</sup>

#### Manpower requirements by industry and occupational groups

27. Directorate General of Employment and Training (DGET) also attempted manpower projections according to main occupational and industrial groups for a period of ten years (1968-69 to 1978-79).<sup>(17)</sup> These projections were based on certain assumptions regarding the growth of national income, employment and labour productivity. The future occupational pattern of employment within each sector was obtained on the basis of the industry-occupation matrices of non-agricultural employment constructed on the basis of 1961 census working force data and the industry-occupation pattern of wage-paid employment for 1962-63 and 1964-65 based on the EMI data.

#### Concluding remarks

28. From the above survey, it will be seen that the methods of estimating demand and supply of manpower are still in the early stages of development. More sophisticated methodology for estimating demand could not be followed due to inadequacy of necessary data in respect of the changes in the industry-occupational matrices and the occupation-educational level matrices with the development of industry and production. The changes in the pattern and distribution of these matrices due to technical developments are yet to be studied in some depth. Information on levels of productivity and their impact on the occupational pattern in different industries needs careful investigation. Even the various ratios such as investment-manpower, cost-manpower, output-manpower etc. require to be studied in greater detail before they could be applied for the purposes of manpower forecasting. Majority of the manpower requirements were worked out at the macro-level. These estimates need to be cross-checked with more detailed micro-level estimates of specific sectors/industries/projects. Only on the basis of the above mentioned background knowledge, it

would be possible to adopt more sophisticated methods of manpower forecasting. As regards manpower supply only a few studies on the underlying methodology have been carried out. The difficulties were partly conceptual in the sense that on the one hand, all persons holding a diploma or degree were included in supply estimates irrespective of their labour force status and on the other hand, a fairly high percentage of skilled personnel like 'engineering practicals', who perform functions appropriate to engineering profession, despite their not having undergone any institutional training, were generally excluded from supply estimates. Inadequate information on rates of mortality, retirement and migration introduced errors in supply estimates. Further, mobility aspect had to be practically ignored due to lack of information, although it deserves very careful attention for purposes of maintaining manpower supply and demand at regional/industry levels.

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DEVELOPMENT OF MANPOWER STATISTICS WITH PARTICULAR  
REFERENCE TO MANPOWER FORECASTING AND MANPOWER TARGETS

1. The National Development Conference marked New Zealand's entry into the field of indicative planning, an important element of which is the planning of manpower resources. As a result, since the last Commonwealth Statisticians' Conference, this country has commenced the collection and compilation of data for manpower planning purposes.

2. Initially, the exercise was necessarily tied to the National Development Conference, and was concerned with forecasting manpower targets for each of the two planning periods ending 1972/73 and 1978/79. Because of the structure of the National Development Conference, manpower forecasts were calculated for 11 major sectors as follows:

- Farming (including Farm Contracting)
- Agricultural Processing
- Forestry and Related Industries
- Distribution
- Fishing and Fish Processing
- Building and Construction
- Manufacturing
- Hotels, Restaurants, etc.
- Transport
- Electricity, Coal, Gas, and Oil
- Other Industries (including Armed Forces)

3. As a basis for the forecasts, estimated manpower figures were compiled for each of the above sectors for the period April 1958 to April 1968 inclusive. The basic information was drawn mainly from Estimated Labour Force Statistics prepared by the Labour Department. Where necessary, this was supplemented by figures from the Industrial Production Statistics collected by Statistics Department. The resulting series has just been revised to bring it into line with the International Standard Industrial Classification.

4. The forecasts of manpower requirements, in the time laid down, necessitated the development of a number of ad hoc surveys and special studies of productivity in selected firms. These were tied in with the aforementioned Industrial Production Statistics, Input-Output Studies, and other information collected by the Department of Statistics.

5. On the supply side, the procedure was to obtain estimates of the supply of labour by individual age groups for the following ten years. It was assumed that participation rates would remain at their then current levels, and that there would be a net immigration gain of 5,000 per annum. The initial supply figure arrived at was, in effect, a control figure for demand.



6. On the demand side, production targets were obtained, and productivity trends were worked out based on information received from each sector, and in the light of expected future technological changes. From the foregoing, manpower requirements were calculated.

7. As the National Development Council is an exercise in indicative planning, the production targets will be revised from time to time, in the light of altered economic conditions. Any alteration in production targets will, of course, necessitate an alteration in labour forecasts.

8. In addition to manpower forecasts for each sector, forecasts were also calculated for twelve occupational groupings, viz.:

Higher Professional - qualified at University or Medical or Dental School, etc.

Other Professional - those generally regarded as professionally qualified, but for whom a University course is not necessary.

Teachers and Trainers - those not included in professional categories, and including all teachers except those who described themselves according to the subject they taught, e.g. Physicist, etc.

Technicians - all those regarded as Technicians by the Technicians Certification Authority, and including medical and dental technicians, computer programmers, etc.

Tradesmen - those who have undertaken an apprenticeship training.

Operatives - those who have been trained on the job, both skilled and semi-skilled.

Management - all types of managerial staff including administration officers, foremen and supervisors.

Clerks and Typists.

Sales Workers.

Own Account Workers and Working Proprietors.

Others - including fishermen, farm labourers, labourers not working with machines, etc.

Not classified by occupation, and Armed Forces.

9. All occupations contained in the New Zealand census were classified in accordance with the twelve groups. The classification was then applied to the labour force as at 1968. In the light of expected technological changes, an estimate was made of the likely skill mix in the future.
10. Eventually, it is intended to provide estimates of labour force requirements by occupations in the professional, technician and tradesman groups. In fact, this work has commenced, with the estimation of the supply of certain tradesmen in the Building and Construction industry for the period ending 1973.
11. The development of Manpower Statistics in New Zealand is still very much in the embryo stage. We hope that by the time of the next Commonwealth Statisticians Conference, we will have a solid statistical foundation on which to base our manpower forecasts.

Manpower Planning And Forecasting In Nigeria

Manpower Forecasting:

In manpower forecasting two prerequisite conditions should be satisfied. First, manpower statistics should be well developed and second, manpower planning should be integrated with economic planning. Once these conditions are satisfied, groping for assumptions in fixing manpower targets will become unnecessary. Unfortunately many developing countries have no reliable manpower statistics and this fact makes manpower forecasting hazardous.

2. A brief review of Nigeria's experience in this field will throw some light on the problem that developing countries face in attempting to make manpower forecasts. In 1960, Professor Harbison of Princeton University attempted to set the targets of high-level manpower requirements for Nigeria up to 1970, for the Senior and Intermediate categories. The only statistics available at this time were the Federal Ministry of Labour's Survey of Employment and Earnings. The data collected from this survey were not comprehensive and were otherwise somewhat unreliable.

3. However, Professor Harbison took 1958 figures as base and then proceeded to estimate employment figures for 1960. From his discussions and interviews with economic planners and other officials of both public and private sectors of the economy, he arrived at some expected growth rates for each sector. With these growth rates he estimated net increase in employment for the decade 1960-1970. He then estimated replacement needs and arrived at the targets for 1960-1970. In 1961, the results of the Ministry of Labour's Employment and Earnings Survey, showed that Professor Harbison's targets had been exceeded in the intermediate level as shown by the following table which underlines the danger of forecasting without adequate and reliable data.

	<u>Employment and Earnings Survey Figures</u>		<u>Professor Harbison's Figures</u>
	<u>1958</u>	<u>1961</u>	<u>1970 Target</u>
Senior Level .. .. .	11,670	22,342	28,875
Intermediate Level ..	8,731	50,139	37,275

4. The Manpower Secretariat decided in 1963 to review Professor Harbison's targets. Implementing this decision it conducted a survey of High-Level Manpower among establishments employing 10 or more persons both in the public and private sectors of the economy. The Secretariat set out the following procedures for forecasting manpower needs of the country:-

- (a) Estimate of employment level for the forecast year;
- (b) Determination of employment pattern;
- (c) Determination of proportions of employees in the high-level and skilled jobs and

(d) Break-down of these proportions by type of occupations.

5. Each of these steps involved several assumptions since relevant statistics were not available. Some of the assumptions were as follows:-

- (a) 1952-53 census was projected by assuming 2% growth rate per year;
- (b) Constant labour force participation rate and full employment in the current year were assumed;
- (c) That the proportion of active population engaged in production was 68% in 1968 (1952-53 census put this proportion at 77.5%).
- (d) Proportion in commerce was assumed to be 15% (1952-53 census put this at 12.3%) etc.

With these dubious assumptions, the targets worked out appeared too high. Consequently, the Manpower Board called an international seminar to discuss the country's manpower planning and forecasting and asked that the targets made be reviewed. The seminar reviewed these targets and noted the gaps and deficiencies in the statistical data employed. It then recommended the following steps to correct the forecasts:-

- (a) Future manpower needs to be based primarily on expected rate of growth of employment sector by sector and checked against future needs supplied by employers.
- (b) The annual rate of growth of technicians or intermediate category be taken as 3A%, senior category as 2A%, where A is annual % rate of growth of gross national product.
- (c) Recommended separate allowances for wastages at 3% per annum on existing employment and for replacement of expatriates.

6. On the above recommendations of the seminar, the Manpower Secretariat recalculated its targets based on the high-level manpower survey of 1963. Although these new targets were in fact no more than guidelines they nevertheless provided a good base for the development of manpower statistics for planning and forecasting.

7. From these early attempts, the Manpower Secretariat has since redoubled its endeavours to collect relevant statistics in order to improve the quality of its forecasts in the future. It has also accepted the principle of integrating economic and manpower planning and accordingly is currently striving to get the planning authorities to accept the idea.

8. The Manpower Secretariat has concentrated on the development of manpower statistics in the following areas:-

- (i) Statistics of Employment in its detailed break-down by industry and occupation.
- (ii) Register of high-level manpower in selected occupations,

giving areas of speciality, qualifications, experience etc;

- (iii) The Statistics of Labour Requirement - Apart from knowing the existing employment of the establishments by occupation, and vacancies, employers also answer questions on future programmes for expansion, modernization and manpower implications;
- (iv) Sectoral or type studies to locate and appreciate the particular needs of key industries in the country.

9. From the supply side, the following areas are being covered:-

- (i) Data on Education and Training schemes, industries and formal institutions are periodically collected and also statistics in respect of Nigerian students studying overseas.
- (ii) The first Labour Force Survey was launched in 1965 to give a picture of total manpower by age, sex, education and training, industry, occupation etc., and it is envisaged that this survey will be carried out periodically.

10. There are some areas not yet tackled and which are very important for manpower planning and forecasting. A good example is the Statistics of Wages, Income and Salary, which is an important instrument in the decision of labour to move towards various occupational categories. Also there is need to increase the frequency of the enquiries of establishment surveys which is at present, on an annual basis; if it is to be really useful in manpower projections, it should be on quarterly or monthly basis.

11. The problems facing the Manpower Secretariat are manifold and are attributable to the following factors:-

- (i) Lack of trend (due presumably to paucity of available data) in collected data which could be used for extrapolation.
- (ii) The reluctance of employers to give information promptly and correctly is also a serious set-back in statistical collection.
- (iii) Lack of records in indigenous establishments and suspicion of the use of the results of statistical enquiries.

12. For these various problems facing statistical agencies in the country, a quick solution is not easy to find. Although establishments can be forced under the Statistical Act of 1957 to supply information, opinion is divided as to the advisability of such a course. Hence the approach of the Manpower Board Secretariat has hitherto been to persuade employers to co-operate and supply the necessary information.

Development of manpower statistics with particular reference  
to manpower forecasting and manpower targets

1. Tanzania is committed to implementing a Fifteen-Year Plan taken at intervals of five years beginning from 1st June, 1964. The country has just started on the Second Five Year Plan (1st July, 1969 - 30th June, 1974). One of the targets of these five-year plans is to achieve by 1980 self-sufficiency in skilled manpower except highly specialized skills. With this point in view, availability of up-to-date and reliable statistics on manpower has become very important partly to assess the progress of the plan and partly to facilitate periodical forecasts to 1980.
2. As the staff of the Bureau of Statistics has not yet expanded sufficiently, manpower statistics are still handled by the Manpower Division of the Ministry of Economic Affairs and Development Planning. This Division has already undertaken two surveys in this respect-one at the beginning of the First Five-Year Plan in 1964 and the other in 1969 just at the eve of the current development plan. Both surveys have been carried out by personal visits to certain randomly selected firms.
3. The information sought relates to the following items: total employment, number of citizens, number of non-citizens, number of existing vacancies, number of output of formal in-plant training schemes and number of net increase in posts during the plan period. Apart from these quinquennial surveys, tables for the "Annual Economic Surveys" include one on localisation of senior and middle grade civil service. The source for this is the Central Establishment Division of the President's Office, a department which deals with the administration of the Civil Service.

The Development of Manpower Statistics with Particular  
Reference to Manpower Forecasting and Manpower Targets

Development of manpower statistics in the United Kingdom

1. The development of manpower statistics in the UK began with the Censuses of Population. From the year 1841 onwards the censuses have provided analyses of the "occupied population". The more recent censuses have provided analyses of the economically active population not only by occupation but also by industry, by area of work, by area of residence, by age and by marital status. Full censuses are held every 10 years, the last having been in 1961. There was also a sample census, covering 10 per cent of households, in 1966.
2. A second source of information about the employment of manpower came into existence with the National Insurance Act of 1911, which introduced a compulsory scheme of insurance against unemployment. From 1923 onwards the scheme provided statistics about most employees in the working population and the coverage became complete in 1948 when it became compulsory for every employee to be insured against the risk of industrial injury.
3. The procedure for paying contributions to the national insurance scheme involves the use of documents known as national insurance cards. Counts of these cards provide quarterly estimates of the total number of employees in the working population. This information is supplemented by statistics showing the numbers who are registered as unemployed, and also the number of unfilled vacancies which have been notified by employers of labour.
4. The differences between the statistics of employment obtained from the national insurance scheme, and those obtained from the Censuses of Population, are described in the UK paper on the item "The need for independent cross-checks of statistics from different sources".
5. By combining statistics of employees derived from the national insurance scheme, with estimates of the numbers of employers and self-employed persons derived from the Censuses of Population and with information about changes since the last census based on samples, estimates are obtained of the quarterly changes in the total stock of manpower in the working population. This is complemented by very detailed annual analyses of employment by industry and by area based on the counts of national insurance cards; and annual estimates of changes in the age composition of the working population.
6. The manpower statistics described above relate to the whole of the economy. These are supplemented by further statistics for particular sectors, of which the most notable are as follows:-
  - (a) Qualified scientists, engineers and technologists.
  - (b) Numbers of students in higher education and numbers of employees with higher educational qualifications.

304(c) Estimates of numbers of employees in particular occupations in the manufacturing industries, and in certain other industries for which information is collected by Industrial Training Boards.

The statistics for these sectors are described in more detail in the following paragraphs.

Scientific Manpower

7. Data about qualified scientists, engineers and technologists have been collected at three-yearly intervals since 1956. Information is obtained from a sample of industrial establishments and more comprehensive information from other sectors such as education; combined with information from the Censuses of Population. The surveys show the utilisation of qualified scientists, engineers and technologists (and recently also technicians) in industry, commerce and public Departments. They show information about the functions on which these persons are employed, distinguishing between "research and development" and "other work", and plans are in hand to extend this functional analysis to distinguish between general management, commerce, production, research and development and common services.

8. The employers included in the surveys are also asked questions on vacancies, and they are asked to forecast their likely demands for these types of qualified manpower for three years ahead. Experience of these forecasts since 1956 has shown that the employers' forecasts of their future demand have consistently exceeded the numbers who, three years later, are found to have been employed.

9. Studies of the flows of qualified scientists and engineers are made by the Ministry of Technology. This work involves an assessment of the increases in stock due to the acquisition of new qualifications, gains from immigration and losses from death and emigration.

10. Information about professional engineers and scientists has been augmented by sample surveys of members of professional institutions. In this way information has been obtained about remuneration and the variation of earnings with age in different industries in the private and public sectors, and in different functions (research and development, production, etc.).

Industrial Statistics

11. Estimates of the stock of manpower employed in selected occupations in the manufacturing industries has been collected since 1963 by sample surveys of establishments. The occupations concerned include skilled and semi-skilled manual occupations, as well as those in the administrative, technical and clerical group.

12. Work is at present in progress on compiling a list of those occupations which are of sufficient importance for various purposes, including manpower planning, to justify the collection of statistics on a national scale.

Statistics on Higher Education and the Stock of Qualified Manpower

13. In the 1961 Census of Population information about qualifications was sought only in respect of persons with degrees or equivalent awards in science, technology and engineering. The 1966 Sample Census provided the first



comprehensive account of the stock of highly qualified manpower in Great Britain. The 1971 Census will also cover certain qualifications at a slightly lower level.

14. Statistics on the flows into and out of the stock of qualified manpower are less complete. A good deal of information is now available about those emerging from the educational system, but little is known of the numbers obtaining qualifications through professional institutions outside science, technology and engineering. However, it is hoped to obtain regular returns from the professional institutions which in practice award substantial numbers of qualifications at degree level. As yet no information is available about the mortality of qualified persons and only the most tentative estimates of overseas migration can be obtained for qualified manpower. Obviously in this situation projections of the stock of qualified manpower over the next 10-15 years have to be presented with some reservations.

15. Little is known also about the industrial and occupational mobility of qualified persons, but the 1971 Census of Population will include a question on occupation one year ago, as well as current occupation. This will show the number of people who have changed their occupation during the year. A proposal is also being considered for a follow-up to a sample of qualified persons to collect data on earnings and employment over the last five or ten years.

#### Manpower Forecasting

16. Forecasts of the supply of labour, i.e. the future size of the working population including both employees (whether employed or unemployed) and self-employed persons - are made by the Department of Employment and Productivity, based on forecasts of the total population in each age group and forecasts of the numbers of persons who will be in full-time education and therefore not available for employment.

17. Corresponding forecasts of the total demand for labour, to match with these forecasts of supply, were made in the National Plan (1965) based on forecast rates of growth of output and productivity in individual industries. The 1965 forecasts showed an impending shortage of manpower, but in the event the growth targets in the national plan were not achieved and the threatened shortage did not develop. More recent forecasts assume that output will grow more or less in line with productive potential, which implies that the total numbers in employment will change more or less in line with the supply of labour.

#### Manpower Forecasts for Particular Occupations

18. Forecasts of the likely future number of doctors, dentists, nurses and other medical personnel are made by the Department of Health and Social Security. These forecasts are generally of future requirements but they are conditioned by likely available financial resources and take some account of likely supplies in the case of doctors, dentists and nurses.

19. Forecasts of the future demand for scientists, engineers and technologists are obtained from employers in sample surveys, as described in para. 8 above. These are studied by the Ministry of Technology who are developing forecasting models for 14 engineering and scientific disciplines. It is hoped to carry out studies in collaboration with the industries concerned

into the effect on salary bills of the growth of employment in various "mixes" (i.e. according to function, age and employment status) and variation in remuneration and salary bills.

20. As regards the industrial sector, in 1963 the Ministry of Labour (now the Department of Employment and Productivity) set up a Manpower Research Unit with the general aim of helping industry training boards with the technical aspects of their work. The MRU has undertaken manpower studies in particular industries or in spheres of employment of special interest. These studies have generally presented occupational demand forecasts for 5 or more years ahead or were undertaken to investigate the possibility of making longer-term manpower forecasts. Industry studies have been carried out in the fields of electronics, metal production, construction, food retailing and most recently in printing and publishing. Cross industry studies have been made of trends in occupations associated with computers and of the growth in clerical employment in offices. The MRU also studies the technical problems of manpower forecasting at the national and sectoral level.

21. Work on forecasting for particular occupations is also being carried out by some of the Industrial Training Boards.

#### Demand for Higher Education

22. Forecasts of the numbers of school leavers who will obtain the qualifications to obtain places in higher education are made by the Department of Education and Science. The first forecasts were based on the assumptions (i) that the trend in the proportion of each age and sex who were still at school was linear and (ii) that constant proportions of those who stay on to any given age will qualify for the various forms of higher education. In fact both the staying on trend has grown at a faster rate and the proportions qualifying have increased.

#### Computable model of the educational system

23. A computable model of the educational system is being developed jointly by the Department of Education and Science and the Unit for Economic and Statistical Studies on Higher Education at the London School of Economics. As developed so far the model concentrates on making projections of numbers of students and teachers in each sector and level of education in each future year, analysed by such factors as age, sex and qualification. It is intended later to introduce other aspects such as building and finance. The basic form of the model is an inflow-outflow matrix in which the row and column headings correspond to different educational and related activities. The row and column totals of this matrix are the numbers of pupils or teachers in each activity in two successive years, and the remaining cells the number of persons who moved from one activity to another during the year. These numbers are converted to coefficients representing the proportion moving from one activity to another. By observing changes in these coefficients over a series of years it is hoped to predict their future values and hence to estimate likely numbers in each branch of education. But as the outcomes in previous years result from the interaction of unknown supply and demand functions, it could be misleading to use them as indicators of how students would behave in the absence of any supply constraints. This difficulty has led to fairly detailed theoretical considerations of the impact of supply constraints.

24. A second phase of the work began in 1968. This aims at constructing a more empirical sub-model of the part of the educational system normally catering for pupils between the ages of 15 and 19. In this model secondary education is viewed as a series of decisions which result in progressive closing of options by more and more students until they leave the educational system or undertake a course in higher education. Each of these decisions and each of the outcomes is postulated to be influenced by a number of exogenous factors and certain feedback relationships in the model. Most important among the latter at present are the availability of specialist qualified teachers and the success rate of university applicants with various qualifications.

#### Rates of returns to education

25. A follow-up survey to the 1966 Census of Population was directed towards estimating the rates of return to expenditure on higher education. Some 15,000 of those who recorded higher educational qualifications were sent a postal enquiry inviting them to provide information about their incomes from employment in the financial year 1966/67. The same questions were addressed also to 5,000 persons without higher educational qualifications who were working on occupations which involved substantial proportions of the highly qualified.

#### The demand for and supply of teachers

26. The need for teachers is forecast on the basis of the likely growth in the school population, and the policy objective of reducing class sizes. This need was compared with future supply of active teachers likely to result from a recommended expansion of the numbers of places in universities and training colleges.

#### Company manpower planning

27. Company manpower planning has only emerged into prominence in the last decade. In the UK at least it is still only practised by a small number of generally large firms. But the theoretical problems have attracted a growing interest in university and other research bodies. A new independent unit, the Institute of Manpower Studies, has been set up to assist firms with the technical problems of company manpower planning.

28. On a larger scale, the Civil Service Department is extending its complete records, covering 500,000 government employees, to provide more information for manpower planning and personnel management. Research is in hand on problems of classification and the development of forecasting models.

#### Conclusion

29. There has been a very considerable development in manpower statistics in recent years. In the field of manpower forecasting, further progress will be dependent partly on the collection of additional statistics, partly on the passage of time until a longer run of statistics becomes available, and partly on the solution of problems on the methodology of forecasting. In some occupations it is possible to identify clearly the factors which determine the demand - for example, the demand for school teachers is related to the

number of children in schools. But there are many occupations in which the situation is much more complicated, and where there may be inter-actions between supply and demand, and substitutions between different groups and skills, which make simple methods of forecasting inapplicable. Our knowledge of the workings of the labour market is still imperfect. Other problems are the identification of the occupations for which forecasting will pay for its cost, and the development of an occupational classification in which the key occupations are defined sufficiently precisely to produce accurate statistics, but also sufficiently simply for practical use in large-scale data collection.

THE ANALYTICAL AND RESEARCH CONTENT OF PROGRAMMES  
OF STATISTICAL OFFICES

Introduction

The topic of the analytical and research content of the programmes of a statistical office could be approached in two ways. One way would be to concentrate on the analytical and research content of the output of the office. The other would be to concentrate on the analytical and research content of the processes of the office.

2. The analytical and research output is the kind of statistical information which is produced using analytical techniques (e.g. certain national accounts series, price indexes, econometric forecasts, etc. which are estimated by making use of the known relationships between available data series and the series to be estimated) as opposed to the direct data collection output of censuses and surveys and administrative by-product collections. Clearly some kinds of statistical offices are geared to produce more of this type of statistical output than others. Sometimes this depends on how their role is seen in relation to other government and private agencies.

3. The analytical and research processes can be distinguished from the basic statistical production process of a statistical office as the kind of efforts which are directed at evaluating what is being done. Thus a statistical office might be expected to be constantly evaluating:

- (a) the relevance of its statistical programmes,
- (b) the technical quality of its statistics and its statistical operations, and
- (c) arrangements for communicating and disseminating statistical information.

Here again different kinds of statistical office will deploy their analytical and research resources differently according to the importance they place on each of these aspects of their performance and according to how they see their role in the national information system. In considering the general philosophy and practice of Australia's official statistical service, this paper follows the latter approach while commenting in passing on the relative importance of analytically-produced output in its programmes. In doing so, it concentrates on matters of general attitude and approach and on the influences in Australia which have conditioned them. It does so self-critically, with a view to provoking discussion in a similar vein. A great deal could be said about particular lines of research which are undertaken continuously in respect of both established and new data collection fields and data processing systems. Accomplishments and plans are catalogued in the Australian paper for Agenda Item 2 and in other documents before the Conference.

Evaluating the Relevance of Statistical Programmes

4. This involves evaluating the uses being made of statistics, the needs of users, and the specifications for statistical programmes to meet these requirements. It also involves establishing statistical standards for ~~coverage and timing~~ and the definitions and classifications of the

data items to be collected and the statistical units for which the data are to be collected.

5. It should be noted that in Australia there are no formal national or regional planning goals or programmes comparable to those of many other Commonwealth countries. There is, therefore, not the same kind of demand for analytical extensions of the national accounting system, such as input-output studies, to form the framework of national policies. Government planning in Australia tends to be concentrated in Federal and State Government Departments and especially in Canberra. The statistical system is correspondingly highly centralised in the Bureau. While a centralised statistical system has many advantages, there are, of course, some disadvantages which need to be understood and overcome as far as possible by appropriate measures.

6. Communication with users has been restricted by the tradition that factual description and interpretative analysis should be kept separate - that the function of a statistical service is to supply information (statistical analyses and statements) from which users may draw inferences. Thus the Bureau has substantially avoided becoming involved in the interpretation of statistics beyond measures taken internally to ensure that its series will stand public examination. For these reasons, while the Bureau has been able to exercise control over standards of statistical quality, it has not been as well placed to observe the uses made of the statistics it produces and to respond readily to the needs of users in particular subject matter areas as, perhaps, some countries with more decentralised systems have been where government departments are both producers and users.

7. Although the Bureau is organisationally part of the Department of the Treasury, the process of assessing and deciding on statistical priorities has been mainly the prerogative of the Bureau. Channels of consultation with users include several relatively informal advisory committees like the two census-user advisory committees which were established in recent years, some interdepartmental statistical committees (e.g. on taxation, medical, and overseas trade statistics), and periodic consultations with representative non-government bodies, notably on their requirements for commodity data. But by and large, the Bureau has relied heavily on its own judgment as to requirements. Essentially the Bureau has depended on the ability of professional statisticians at Central Office and their counterparts in State Offices to maintain informal contact with users and to be expert in their own field.

8. The difficulty is to ensure that the system will adapt quickly to changing national requirements for statistical information and that priorities in the provision of statistics are allocated in an optimum way. In the comparative absence of articulate and representative advice from organised bodies of users, it is natural for analyses and research effort to focus on the evident shortcomings of existing programmes at the expense of programmes yet to be established. Certainly some major developments of existing fields, particularly the current programme to conduct integrated censuses of manufacturing, mining, retailing and wholesaling, while potentially of great value to a wide range of users, have required a concentrated analytical and research effort that has left little time to examine the possible claims of new fields. The Bureau's evaluation of user needs has generally been

soundly based on considerable experience but it has been a judgment which it has had to make with little organised external advice.

9. There seems to be a need for a better environment for consultation before users will make the contribution to the design of the statistical production system that it is felt they could and should make. One way to promote a greater understanding of the possible uses to which official statistics could be put would be to include more analytical matter in the Bureau's publications and to encourage more staff contributions to academic journals. Unfortunately, only a limited number of statisticians conversant with technical aspects of the Bureau's work are employed by users, which limits communication at a professional level. There is a tendency for users to regard the Bureau's statistics as given rather than to explore the possibility that the Bureau might undertake new or extended collections, and this has inhibited co-operative effort between these users and the Bureau to initiate and develop statistical programmes. A good deal of spade work would be necessary before interest and support could be evoked on the scale necessary for co-operative efforts like the New Haven census pre-test and small-area-data research study in the United States.

10. The Bureau has not made a great deal of use of outside consultants and contractors. However, a particularly successful partnership of this type with the Australian National University established new principles for the definition of urban boundaries based on extensive field studies. And there are a number of examples of inter-agency co-operation, one of which is the development of a national income forecasting model in co-operation with the Department of the Treasury and the Reserve Bank of Australia. Attendance by Bureau officers at professional conferences in Australia and overseas has been encouraged, particularly over the last decade, but other avenues of dialogue appear to be necessary. Although experienced statisticians move into university faculties or into policy areas in other departments, the necessary feedback in the way of better informed discussion of statistical services is not always as great as might be hoped. Measures which would be beneficial might include obtaining a return flow of officers with experience in using the Bureau's statistics, and short term exchanges of officers between the Bureau and other departments. A useful device already developed is the establishment of statistical units in other major policy departments, headed by Bureau officers temporarily on secondment.

11. Even with good communications between users of statistics and the Bureau, it seems unlikely that the relevance of statistical programmes can be adequately evaluated simply by comparing the supply against the expressed demand. It is the Bureau's experience that most users find it difficult to look beyond the needs of the moment and their comments tend to be made against the background of restricted interests and of experience limited to existing statistics. Better communication would tend to help in giving them a wider and more useful perspective; meanwhile it may be necessary for the Bureau to develop statistics in anticipation of demand and in a manner consistent with the rest of the statistical system. In Australia, as elsewhere, the national accounts have proved a useful framework for this kind of evaluation while the "demonstration effect" of international standards in this and other areas is helping to promote the development of statistics for which there is insufficient existing statistical material to give rise to an effectively

expressed demand.

12. The overall impression remains, however, that the statistical system has not gained as much as it could from involving users in a sufficiently systematic way in the process of ensuring that what is produced is what they most require.

#### Evaluating the Technical Quality of Statistics and Statistical Operations

13. The technical quality of statistics cannot be considered in isolation from consideration of the uses to which they are put, since the importance of accuracy in data is conditioned by the "accuracy" of the concepts employed as well as by "accuracy in use" - the latter might be said to be the extent to which decisions made on the basis of "perfect" statistical information are right.

14. There is often conflict between these concepts of accuracy. For example, while it might be desirable to have the business component of farm expenditure on motor vehicle operation, it may only be possible in a particular collection to limit reporting errors satisfactorily on total expenditure (i.e. business and personal). In theory, it is possible to examine the behaviour of errors at each stage of the information collection and decision-making procedures and thus minimise the total errors. In practice, this requires a great deal of research into each application - usually an impracticable amount - so that only selected information on accuracy and relevance is obtained and it becomes necessary to use judgment to make appropriate assumptions to fill the gaps.

15. In such a case, it is often necessary to decide that the extra costs involved outweigh the advantages and that it would be better to obtain information where it is more readily available. Subsequently, however, this procedure may result in a keen awareness of, and attention to, errors in the chosen data, with rather less attention to "accuracy" of concepts and to "accuracy in use". In these circumstances, the situation can arise where the statistics are irreproachable as to objectivity, but are not used because they do not meet specific needs and cannot be readily adapted to the needs by analytical techniques. A centralised statistical service may be more likely than a statistical service of an organisation with programme responsibilities to adopt the "information availability" approach in preference to the "information requirement" approach. In doing so, it would need to be sure that it was not taking the easy way out because its direct responsibility ends with publication.

16. In the case of the Bureau there is a countervailing influence where the statistics are used within the Bureau. The national accounts, extended recently by various forms of economic model-building activity in the Bureau, influence the statistics which provide the basic inputs.

17. Here the process has been one of initially adapting available data by analytical techniques until it has been possible to develop new or modified data collections. Thus the Bureau's farm cost estimates (required for the estimation of gross farm product and farm income) have been produced analytically using a variety of data sources and assumptions (e.g. applying



to acreage under crop a survey-based standard cost per acre for a particular item of cost). This has led to the establishment of a new comprehensive survey of farm expenditure which should enable much of the costs to be estimated directly. At the same time the new data resource should provide a basis for more extensive analytical studies of the farm sector for both national accounts and general publication.

18. Viewing a statistical service as a whole, another important aspect of quality is the internal consistency of the system. It might be expected that, with a minimum of institutional impediments to standardisation of concepts, classifications, etc., the Australian system would be highly cohesive. It may well be, in comparison with some countries. Nevertheless, the integration of statistical files does not occur automatically with the integration of statistical organisations. Reflecting their different historical origins, in Australia there have been inconsistencies between basic collections in the fields of population, labour, production censuses, trade and income taxation and so on which have made analytical extensions, such as national accounts, input-output and associated studies, extremely difficult.

19. The substantial integration of these fields over the past few years has been accomplished by a large amount of research and analysis being focused on the problem of consistency. This has led to redesign of the basic collection and classification systems in use. Major steps forward as a result of this research and development include:

- (a) establishment of a central directory of business units reflecting the hierarchic relationship between enterprise groups, enterprises and establishments, to ensure that their units are treated consistently in all economic statistics;
- (b) preparation of the preliminary edition of an Australian Standard Industrial Classification to be used to classify statistical units by industry in economic censuses and surveys, population censuses and surveys, and in other statistics (national accounts, etc.) derived from the basic statistics;
- (c) the conduct in respect of the financial year 1968-69 of the first set of Integrated Economic Censuses of all enterprises and establishments engaged in mining, manufacturing, electricity and gas production and distribution, wholesaling, retailing and certain other services, in such a way as to overcome gaps, duplications and inconsistencies in these fields and to provide the basis for the introduction of an integrated system of economic surveys.

20. These steps should in time increase the value of the information derived from the system. For example, it is planned to develop a system of economic surveys within this framework to replace a number of surveys which are at present difficult to relate one to another. Although much remains to be done, the way now seems open for the development of a more detailed and

useful system of national accounts on the lines proposed in the new United Nations System of National Accounts (SNA).

21. In the case of some of the less well developed fields not so clearly embraced by national accounts, such as small-area statistics for urban studies and social statistics, the way ahead can be seen. It has not been found possible, however, to provide resources for these needs while other large scale work of co-ordination and classification was proceeding. A good deal of research and analysis into user requirements and consideration of overseas innovations will, of course, be required.

22. The direction of research into the factors affecting the quality of statistics has also been conditioned by the availability of statistical resources. With a comparatively advanced economy, Australia's statistical needs are almost as great as occur anywhere, but with a small population trained statistical manpower is scarce. This has led to a particular emphasis on research devoted to economy of effort in statistical operations - that is, to research into the quality of the operations required to produce statistics rather than into the quality of the statistics themselves (i.e. their fitness for the purposes of users). Centralisation, possibly a reflection of the need to obtain economies of scale, reinforces this tendency, since economies from research are almost wholly realised within the organisation conducting the research.

23. Initially this research was mainly directed to saving staff at operative levels. A number of minor but effective innovations were made in various manual processing operations (these are now only of historical significance since the changeover to automatic data processing systems). Sampling techniques were applied to reduce sample numbers and acceptance sampling was applied to a number of large-scale checking operations. At the same time, automatic data processing methods were introduced in which a heavy investment in research and analysis in advance of the changeover from mechanical tabulation probably considerably reduced the usual "teething troubles". Specialist A.D.P. research units have subsequently concentrated on establishing and developing efficient operating standards in this area.

24. More recently, research aims have tended to be directed to meeting shortages of experienced and specialist professional staff. Developments in computer software (such as a table generator already in use, and a report generator and similar facilities on which work is proceeding) are directed to reducing programming effort, while laying the foundation for a general information retrieval system.

25. Quality control and administratively oriented error and speed analyses have been incorporated in acceptance sampling schemes, and have greatly assisted supervision of the operations subject to acceptance sampling checks. Sampling research is being directed more to obtaining sample design, sample selection and maintenance, and general survey estimation programmes rather than to improving individual applications. Although work is being done on post-censal evaluation, particularly in the population census field, greater emphasis has been given to incorporating evaluation studies in pilot test stages of new or altered operations; these pilot tests are part of an approach to new developments which draws more on testing of alternative

methods (such testing can be standardised to draw mainly on more junior staff) than on abstract consideration and assessment of methods, which necessarily involves more senior and experienced staff.

26. The shift in the direction of research has also involved a shift towards research with more general application; this should in the long term have the result of economising on research effort itself, though in the short term it adds to the complexity of the problems handled.

27. It is perhaps surprising that a research programme oriented towards economy has not resulted in more analytically produced statistics. Analytical methods are, of course, used in a number of fields where they are necessary or particularly appropriate: to national accounts and model-building, mentioned earlier, may be added demographic analyses, price and quantum indexes, seasonal adjustment, and estimation in a number of series of components which are small but troublesome to measure directly. There is an unsatisfied demand for this type of work, but it is believed that a much greater latent demand is only beginning to become evident. In anticipation of this, a limited research effort is now being directed in the Bureau to obtaining general analytical programmes, again with the main purpose of economising on skilled professional staff which might be needed to meet these emerging demands.

28. The relative concentration of research effort on economising measures has not precluded attention being devoted to the quality of statistics. Work in this area has, however, often been limited to subjective or qualitative assessments, or has been viewed as a by-product of more obviously productive research. Sample errors have usually been known, for example, but often as a result of work preparatory to sample design; in recent years errors on most sample surveys have been calculated with the regular estimates. There has not been as much effort devoted to the formal evaluation of non-sample errors, and much of the Bureau's knowledge of non-sample errors is obtained from the accumulated experience of internal and period to period consistency checks and as an incidental by-product of other research; pilot-tests and acceptance sampling operations have been fruitful in providing information on response and processing problems in particular surveys. Knowledge gained in this way is, of course, rather limited. Even so, it has been an important influence on the Bureau's views on the relative requirements for accuracy in different aspects of particular collections.

29. The Bureau's approach to many of these matters is changing. At present, however, it is a reasonable generalisation to say that while Australian statistics have a high standard of reliability, this standard has been preserved to some extent by restricting output to general purpose statistical collections which are regarded as basic collections by official statistical services. The Bureau has been inclined (and able) to resist pressures which might lead to a diffusion of its effort into a diversity of one-time or other programme-oriented collections which contribute little to a total general purpose system and for which world standards are not yet established. There are indications that the development of more powerful

attempts to develop a closer relationship with users of its statistics.

Evaluating Arrangements for Communicating and Disseminating Statistical Information

30. Research and analysis here is concerned with the "marketing" aspect of the Bureau's activity. It tries to provide answers to such questions as: "Do users know what is available?" "Are the presentations appropriate for different categories of ordinary or expert users?" "Are the statistics widely and appropriately used?" "Are the concepts adequately understood?" "Is access to information flexible and fast enough?" and "What facilities are available for ready provision of information required by users but not available in publications?"

31. The Bureau publishes a considerable number of both specialised and general publications (some 570 titles and 2,200 issues per year). Its approach to this aspect of its services stems from certain underlying aspects of the system:

- (a) the Bureau has traditionally taken the view that it should compile and publish objectively rather than analyse, comment or interpret; and
- (b) the Bureau was established as an independent organisation with a strong concern for protection from external pressure. Compared with many other statistical services it therefore tends naturally towards a "closed shop" relationship with the user. Its general stance, in contrast to the U.S. Bureau of the Census' data access, use studies and promotion programmes, has been that it is up to the user to find out what is available and to devise his own methods of applying the statistics to problems.

32. In general, the Bureau publishes most of what it compiles, although there are time lags in the case of certain detailed statistical publications. There is a growing feeling that detailed statistics might be made available in other ways. This is already the case with the Bureau's overseas trade statistics. "Special returns" are provided on a monthly basis to those who ask for them, showing particular items by country and by port of entry or exit according to individual specification.

33. The Bureau obtains a good press for its publications but it is not clear to what extent this informs the business community or the public about what is available. Approaches are made to trade associations and other bodies, and there are periodic efforts to publicise the Bureau's services. Nevertheless, it is surprising how little is known by some respondents (even very large ones are found) about the services the Bureau can offer. On the other hand, individuals and groups who take the trouble to approach the Bureau are frequently amazed at the amount of information available.

34. Distribution and dissemination is through the press and mailing lists which have been built up gradually over a long period of time as the

result of circularising informants and receiving requests for information.

35. Access to the Bureau's statistics is relatively straightforward given that all official statistics can be obtained directly from the one organisation and that the Bureau has offices in each State. The Bureau does educational and display work on request (e.g. distributing rural statistics at country agricultural shows, lecturing to visiting groups, attending conventions, seminars, etc.).

36. Not enough is known about the impact of the Bureau's publications. Some consideration has been given to conducting user surveys, both systematic and informal, but this work is still in its early stages. It would be fair to add, however, that attempts to get representative comment on what is needed have been less than successful perhaps because users have not been geared to give the time and effort needed.

37. The Bureau's publications are designed to meet a variety of needs. They can be divided into three broad groups:

- (a) general publications which contain a wide range of statistics (Year Books, Statistical Registers published by State Offices, 'Quarterly Summary of Australian Statistics', 'Monthly Review of Business Statistics', 'Digest of Current Economic Statistics', and 'Seasonally Adjusted Indicators'. The Review and Digest are published quickly, the others are more useful for general reference purposes;
- (b) annual special publications. These are the "permanent record" type of publication containing fine statistical detail; and
- (c) specialised mimeographs designed as vehicles for first release of statistics which are published promptly.

38. The specialised mimeographs were originally intended to contain only summary information, but there has been a tendency more recently to include additional information in them. In certain cases the mimeograph is virtually the final record - e.g. for balance of payments and education statistics.

39. The Bureau does not make extensive use of the press notice as a device to provide economic and financial journalists with a ready-made story, although a large number of mimeographed statements are released direct to the press. This is partly because of lack of time and partly because of the Bureau's policy of not delaying the release of information by undertaking analysis which others might be expected to do. Nevertheless, there is room for presenting the Bureau's statistics in a more attractive way for use in informative articles and for attempting to obtain wider press coverage.

40. So far the Bureau's service has been strongly oriented towards publications. Table and report generator programs have been developed to facilitate production of tables to meet ad hoc requests and experimental work is being undertaken on a time series (non-confidential aggregate) file system for internal use in the Bureau. Currently there is some interest in providing for the automatic and standardised geographical coding of data at

source, and in providing for flexible retrieval systems. The development of the Integrated Economic Censuses took into account the need to preserve the establishment as a statistical "building block" for producing the sort of geographical data required by users.

41. To date, the Bureau has restricted the dissemination of statistics almost exclusively to statistics which it is felt can stand on their own in general use. The influence of the Bureau's involvement in model building work is evidenced by the fact that certain data of a lower order of reliability has been released on representation by professional users for particular applications, for example, for use in econometric models.

#### Conclusions

42. The analytical and research content of the statistical programmes of the Bureau has tended to be concentrated mainly on the accepted fields of general purpose statistics rather than on special purpose collections for particular government programmes. The direction of this work in most fields reflects a concentration on the improvement of the production of statistics at the expense, perhaps, of using them, extending them by analytical methods and working with users in research on the actual or potential applications of statistics to ensure that what is provided is what is most required. Users therefore have a service which is perhaps outstanding in its cohesion and reliability and can be expected to improve as a result of a heavy investment in this aspect of the Bureau's work. Having largely put its system of basic statistics in order, the direction of the Bureau's research and analysis may tend to shift toward ways and means of opening up the system more to the influence of users. Now more positive philosophies and practices on the provision of statistical services are being sought.

THE RESEARCH AND ANALYSIS CONTENT OF STATISTICAL PROGRAMSIntroduction

1. It is by no means easy to define the terms "research" and "analysis" in a way as to distinguish unequivocally between them. It is also difficult to distinguish between these terms and certain regular activities of the statistical production process. We hope that the notions these terms are meant to convey in this paper, which is written from the point of view of experience in the Dominion Bureau of Statistics, will become evident as we proceed.

2. As a general guide, we consider research as an activity designed to bring forward new knowledge, usually involving considerable study, testing and experimentation. As applied to statistical programs, the activity is undertaken with a view to implementing a change for the better - in the character or composition of the statistical output; in the method of producing it; or in the manner and detail in which it is presented. The process of testing, evaluating and generalizing research findings necessarily involves a degree of analysis, but the word analysis is often applied to the statistical end-products. In addition to the evaluation of the statistical end-products (that is, the probing of the consistency and the validity of the data) analysis connotes their summarization in a way as to highlight the major features they convey, as well as their interpretation in the light of associated events. Such analysis frequently is indistinguishable from research. While the distinction between "research" and "analysis" is thus highly arbitrary, we shall employ the former in relation to the process of developing and producing statistics and the latter in relation to the resulting statistics.

3. The process of producing reliable and timely statistics involves many intellectually challenging activities which are akin to those conveyed by the terms "research" and "analysis". Major changes in the statistical process - whether they take the form of new statistical series, of significant improvements in existing data, or in the efficiency of producing them - are not a matter of routine. They are usually intricate and time-consuming; they involve much study, testing and experimentation. This arises from the complexity of the statistical production process or from the complexity of the events being measured, or both.

4. Thus the notion that a statistical office is nothing more than a "figure factory" is wrong. This notion is a factor (among others) which is responsible for the fact that many university graduates prefer work which involves using statistics rather than producing them. Yet, in order to achieve the objective of satisfying contemporary needs for statistical data, it is essential that the statistical office should be able to attract high caliber people who are often motivated by opportunities to do "research" and "analysis".

5. Thus we feel that it would be worthwhile on these grounds alone to review those activities of the statistical process which involve research and analysis, as this paper attempts to do. In addition, with increasing automation, the research and analysis components of the statistical activity are likely to become at once more necessary and more feasible. To make due allowance for this, in planning future resource allocation and training programs, management of statistical offices must be fully appreciative of the role of research and analysis in satisfying the changing and growing expectations of users.

6. The question is sometimes asked: what kind of research, how much research and what kind of analysis and how much analysis is it appropriate for a statistical office to do? It will be clear from the review that follows what kind of research and analysis we believe that a statistical office should strive to do. How much is actually done depends on circumstances, especially the caliber and number of professional personnel and the kind of specialized know-how acquired by them. Unless it is in the right hands, research is wasteful and analysis dangerous. A rule which we have insisted on is that the impartiality of the statistical office must be maintained: published commentary must be factually based and objective, with no value judgments in regard to policy.

#### Research and the development and production of statistics

7. There are many interrelated links in the chain of events which result, eventually, in the regular release of statistics. Typically, the developmental work of a new survey starts after the need for the data is established and typically, this involves some research. Having established the need, the first step is to translate abstract concepts into measurable definitions, frequently a difficult process. Many phenomena are difficult to measure because little is known about them initially or because the concepts underlying them are difficult to pin down in precise enough terms to provide meaningful statistics. This is particularly true when regular records of the phenomena being measured are not kept by the respondent. Where records are kept, problems can arise because they are often not in a form needed for statistical purposes. Thus considerable experimentation and field work is often involved. As more is discovered about the character of the events being measured, the various phases of the survey are adjusted. Through a series of successive approximations a system is finally created, yielding statistical results which can be endorsed as adequate in view of the purposes the data are designed to serve and the funds available. Thus, the development of meaningful statistics necessarily involves considerable work which is akin to that often conveyed by the word "research".

8. This is also true of established series. Statistics are designed to help people to adjust to a changing world and adjustments are, therefore, required in the statistics produced: e.g., revisions in the consumer price index to take account of the changing composition of purchases; periodic revisions in standard classification systems to reflect changes in the economic and social structure; revisions to various aggregates to assimilate new or better information. Revising data to make them reflect, more accurately, changing conditions in the real world is an important element of the statistical production process which usually involves a great deal of testing, experimentation and study. Incidentally, these occasions are frequently used to render concepts more up-to-date and improve definitions and methods, again involving research.

9. Because statistical series are usually used in conjunction with other statistics and seldom in isolation, they must be constructed as an integral part of a mutually consistent overall design. To accomplish this it is necessary to develop tools of integration, in particular, standard classification systems (industry, commodity, occupation, region, and so on) and conceptual frameworks such as the system of national accounts. The development or adaptation of such classification and conceptual frames and the organization and adjustment of data to fit them involve a great deal of research.

10. Contemporary demands are not only for more detailed and reliable



statistics but for more timely statistics. Production of timely statistics is to a large extent a management problem but also involves research. Earlier cutoff dates involve the development of proxies for missing data and the determination of the key respondents from whom information must be available for the estimates to be reliable. Early estimates, especially of aggregates such as national income and expenditure, may involve the construction of models to estimate partially missing components from the available data. Difficult trade-offs between timeliness and quality must be made requiring considerable experimentation and testing.

11. Similarly, the demands for more information by relatively small geographic areas have intensified the need for research in the statistical office. Small area information for intercensal years in particular requires piecing together of survey statistics with data from administrative records and the development, at times, of complex estimation and evaluation techniques.

12. Research is involved in developing new or more efficient methods for collecting, processing, retrieving or disseminating information. A major illustration is the development, adaptation or application of mathematical theories of sampling and of other survey methodology; these techniques have opened up new frontiers of statistical data collection, processing and error evaluation. Again, a great deal of testing and experimentation is involved when major surveys are automated. The various elements of the survey must be automated with due regard to the final overall outcome, rather than the impact of one or several steps. Considerable research is also involved in the development of general automated systems of survey processing, such as of data storage, retrieval, editing, sample selecting, and so on.

#### Research and projections

13. With the growing attention to planning in various sectors of the Canadian economy, there has been a growing demand for projections of population, labour force and school enrolment. Since projections are basically the arithmetic consequences of the assumptions underlying them, it is essential that the latter should be as realistic as possible. This involves extensive research into the individual components comprising the projections - mortality trends, fertility trends, immigration and emigration, and so on. Such research is ultimately intermingled with analysis, to which we now turn. Before doing so, the following illustrations of research activities in DBS are cited:

#### Illustrations of research activities in DBS

14. a) research leading to improved design of sample surveys and censuses;  
b) research in developing generalized survey processing systems;  
c) research in methods for developing or improving input-output accounts; income and expenditure accounts; national financial flows; real output indexes; balance sheets showing stocks of real capital and financial assets and liabilities;  
d) research into methods for compiling and/or inferring information on small regions;  
e) research into the measurement of flows through the educational systems;  
f) demographic research.

The analysis and publication of statistics

15. Analysis is involved in preparing reliable statistical data for publication, even when the results of the analysis, as such, are not published; it is difficult to distinguish between this aspect of the statistical process and the activities outlined above. At various stages of the statistical process, judgments must be made on whether the results up to that stage make sense, and this frequently involves systematic probing of the consistency of the data. Such probing becomes particularly critical at the final stages prior to publication and is especially vital in the preparation of estimates which are used as current economic indicators. Thus, prior to publication, the Canadian quarterly (and annual) income and expenditure and financial flow accounts are subjected to extensive exploration for internal consistency and consistency with an array of related statistics. Such exploration represents an activity frequently conveyed by the word "analysis".

16. In addition to this type of analysis (aiming to ensure that the data are as consistent and valid as possible) there is the type which consists of distilling the highlights of the statistical results and expressing them in literary form. Standard comparisons and interrelationships are presented. The process of producing and presenting statistics is often incomplete if it does not include this type of analysis. Numbers, even if reliable and valid, are not enough to convey information to the public. This type of analysis must be non-controversial and yet avoid blandness; it is a difficult combination of objectives to achieve, and requires high caliber skills.

17. Another type of analysis is employed to explain changes in movements and relationships of the data in the light of associated events, with the intent of interpreting their significance. Such analysis requires not only familiarity with the data but a more complete grasp of relevant theory and the general institutional and other factors at play. The process of writing up such analysis provides a discipline and stimulus for exploring more deeply the validity and significance of the statistical results. It is essential to ensure that such a narrative, especially if it is intended for publication, is prepared by qualified people who have the capacity for detecting and explaining significant trends and interrelationships in the face of detailed and, at times, conflicting data. In the case of DBS, commentary of this type is included in the published quarterly reports on income and expenditure, financial flows, and balance of payments, among others.

18. A similar but more general type of interpretive analysis involves a synthesis and sifting of large masses of data derived from censuses and surveys. This requires thorough familiarity with the characteristics of the data as well as competence to bring out and describe the underlying features from a massive amount of detail. Recent examples in Canada are a series of 1961 Census monographs (on fertility, income, labour force, migration, post-war immigrants, urban growth and merchandising), and a series of analytical reports, based on special questionnaires attached to the Canadian monthly Labour Force Survey, covering a broad range of topics (such as educational attainment, annual work patterns, geographic mobility, occupational distribution, female labour force participation, and so on). Such work has important benefits in that it helps to clarify difficult conceptual, methodological and presentational issues and provides a vital feedback for planning future statistical programs.

19. Increasingly, because of the long lead time involved in developing data, statistical agencies must exercise foresight about the lines of analysis which are likely to become important in future years. Moreover, with the

explosion in the possibilities for statistical analysis introduced by modern data processing techniques and the ensuing multiplication of analytical activities by governments, universities and businesses, the decisions on priorities made by the statistical office have a considerable and perhaps decisive influence on the shape of future analysis. In order to carry out these decisions in a perceptive and responsible way, it is necessary for the statistical office to be intimately familiar with the prevailing analytical developments. This is best achieved by being involved directly in analysis to some extent.

20. Statistical offices have a comparative advantage over other agencies in carrying out certain types of analysis. Often the same skills are required for the research discussed above and for related analysis. Once these skills are acquired, analysis becomes a natural extension of the research. This is particularly important where intimate knowledge of the data is a prerequisite for doing authoritative analysis or, as already intimated, where the analysis requires bringing together masses of data from various parts of the statistical system. Furthermore, triggered by basic needs but facilitated by the computer, an increasing proportion of analysis operates on highly disaggregated data. This also necessitates great familiarity with a massive amount of detail - a familiarity which evolves through working with the data in analysis. It is thus likely that considerations of effectiveness and economy will extend forward the production boundary of statistical offices. Another factor promoting such extension is the confidentiality provisions of the Statistics Act which render impossible certain types of detailed analysis outside the statistical office. These factors are thus conducive to creating an intellectually attractive environment which helps in recruiting high caliber people.

21. Finally, mention should be made of a variety of analytical tools, such as ratios, regressions, diffusion indexes, and other quantitative relationships. These should be keyed on the subsequent analysis which will be made by users. Computer technology has made it possible to construct such analytical tools in a vast amount of detail and to the extent that the needs of users can be satisfied by such quantitative relationships rather than by the raw data, this helps overcome some of the analytical restrictions on outside users which are imposed by the secrecy provisions of the Statistics Act.

22. The following summary of analytical activity in DBS is provided for illustration:

- a) monographs based on information collected during decennial censuses;
- b) special labour force studies exploring various characteristics of the labour force and their relationship with various economic and social factors;
- c) studies of consumer finance and income distribution;
- d) models of the economy based on input output tables;
- e) studies of industrial concentration;
- f) models for advance estimates of the quarterly income and expenditure accounts;
- g) models for population projections;
- h) analysis of balance of payments and non-resident investments;
- i) analysis of quarterly financial flows.

Research, analysis and model building

23. Recently, DBS has decided to participate with a number of other federal government departments in the construction of a medium term simulation model of the Canadian economy. While model building activity is not new to DBS, two features of this project make it stand out. One is the cooperation with policy oriented departments in constructing a tool specifically designed to assist in the preparation of policy decisions.

24. The second feature of this project is its scope. While final decisions have not been reached, tentative plans would include the following features: highly disaggregated production relationships; detailed functions describing the generation of incomes and expenditures; models of price change; and demographic factors. The model would also simulate manpower requirements and would, eventually, provide results on a regional basis.

25. This activity would have important consequences for the direction of many research and data development programs of the Bureau. Indeed this is a major argument for participating in the project: that many DBS statistical series would become more directly pertinent to, and would be brought together to investigate, particular classes of economic problems.

26. This rationale can perhaps be generalized. One of the services that statistical agencies could provide is to catalogue and organize the information they produce according to the classes of problems which that information can serve to analyze. Typically, a number of statistical series would bear on the same problem; when they are classified by class or type of problem, they can be brought together and, if necessary, modified for compatibility and consistency. Furthermore, obvious data gaps are brought to light in this process. Whether the statistical agency then proceeds to participate in analyzing the problem would depend on its comparative advantage over other potential analysts, bearing in mind that the statistical agency is primarily charged with producing statistics and has limited resources at its disposal. At any rate, a problem oriented catalogue of statistical series would in itself be an invaluable analytical contribution.

THE ANALYTICAL AND RESEARCH CONTENT OF PROGRAMS OF STATISTICAL  
OFFICES

Demography

1. In May 1969, the National Development Council set up the Technical Committee on Statistics and asked it to investigate the present range and future requirements for statistical services, particularly those required for planning. This Committee recommended that more detailed projections of population, labour force and households be made, including regional age-sex projections of population and labour force. Current and future research in the demographic field will be aimed at carrying out these recommendations.
2. To produce more sophisticated demographic projections it will be necessary to obtain comprehensive data on fertility, internal migration, the demand for housing, labour force participation and educational attainment. This data will be obtained by modifying basic administrative and statistical documents. To this end, the 1971 census of population will collect information on fertility and internal migration.
3. Research is being carried out on more complex demographic projection models. This research relies heavily on actuarial techniques, and an example is the use of nuptiality tables to project marriages and marital status in a population projection model. One of the requirements of more sophisticated and timely demographic projections is an up-to-date, accurate and sophisticated population base. As a result, research is being carried out to produce more accurate and timely intercensal estimates of the population classified by age, sex and marital status.
4. Regional demographic projections are very much in demand but pose considerable problems. Not only is it difficult to construct a suitable projection methodology, but it is difficult to obtain suitable data particularly on inter-regional migration.
5. Generally an aim of methodological research will be to relate demographic variables with economic and social variables. The demand for labour and housing, and demographic phenomena such as migration, fertility and nuptiality are functions of both economic and demographic variables. However, the complexity of the techniques required to analyse the effect of economic factors has prevented in the past the making of projections which take into account demographic, social and economic interactions.

Index-Number Design

6. Work in this area is expected to expand in the near future. Major projects will include the construction of a new

index measuring prices of farm inputs, a restructuring and extension of the wholesale prices index and revision of the exports price and volume indexes. In the course of revision close attention will be paid to the use of these indexes for indicative planning purposes, and also to their compatibility with the system of National Accounts recently produced by the United Nations. Other research projects will include reviews of the Consumers' Price Index and the Import Prices Index.

#### Social Statistics Development and Research

7. A research programme investigating New Zealand's social statistics, their current limitations and avenues for improvement, and their possible integration within a comprehensive socio-demographic framework has recently commenced.

#### Household Survey of Electricity Consumption

8. In New Zealand, household consumption of electricity exceeds 50 percent of total electricity consumption. However, little is known about the pattern of consumption by type of household, the effects of various climatic conditions on regional patterns, or the different uses within households. This lack of knowledge has been a handicap to planning future electricity generation requirements.

9. A survey of household electricity consumption is therefore being undertaken by the Department of Statistics in cooperation with the Electricity Department, and electricity supply authorities. Special meters have been installed in the sample of households to provide detailed records of electricity usage. The survey commenced this year with an initial personal interview to obtain information about the social and demographic characteristics of the households, and also on the number and types of electrical appliances. The survey will continue for at least a year and will provide much valuable information on domestic uses of electricity. Later the survey may be extended to investigate the use of other sources of energy.

10. A random selection of supply authorities throughout the country was first made. From within each selected supply authority's area a sample of households was then made by a two stage sampling process. In all 2000 households were selected representative of the varied pattern of climatic, urban/rural conditions and of differing levels of average household consumption.

#### Other Sample Surveys

##### 11. (a) Household Surveys

Investigating work on the appropriate survey home and sampling design for household surveys of expenditure and other economic and social variables has commenced, in preparation for large-scale surveys which are likely to be undertaken in the near future.

(b) Business Surveys

Currently most of the Department's regular 'business' surveys (retail trade, manufacturing, building activity) employ ratio estimation methods. The designs of these surveys, and estimation methods, are to be subject to a general review to establish any weaknesses in design, and also to find whether alternative estimation methods are preferable to those currently used.

Seasonal Analysis

12. The Department is currently expanding its published range of seasonally corrected time series, using a version of the Census II, X-11 programme produced by the United States Bureau of the Census. Considerable analysis of those time-series being corrected is required, and will continue to be required, as the series are regularly updated. In addition, the Department, resources permitting, may carry out research on alternative methods of seasonal correction.

Economic Projections

13. The Department already does some work in the field of economic projections and model-building for instance in projections of electricity generation requirements and short-term projections of payments for private imports. It is intended to expand research in the general field of economic projections and econometric analyses and model-building. This work will naturally be closely linked to the computerised statistical information centre which is to be set up with the Department.

THE ANALYTICAL AND RESEARCH CONTENT OF PROGRAMMES  
OF STATISTICAL OFFICES

This paper is presented in two parts - I, the role of the official statistician in analysing and interpreting his figures, and II, the research content of statistical programmes.

PART I. THE ROLE OF THE OFFICIAL STATISTICIAN IN  
ANALYSING AND INTERPRETING HIS FIGURES

Introduction

1. In 1842, just eight years after the formation of the Royal Statistical Society, James Orchard Halliwell published a book (1) containing these significant lines:

Rub-a-dub-dub  
Three men in a tub  
And who do you think they be?  
The butcher, the baker, the candlestick-maker  
Turn them out, knaves all three

2. The old world, in which simple men ending in "-er" could set up in business or in government, was passing away. Those knaves were to be turned out to make way for the new experts, all "-ists" and "-icians", who would study, analyse and interpret before advising what, if any, action should be taken. The pathologist, the chemist and, of course, the statistician were to displace the butcher, the baker and the candlestick-maker.

3. The subject is so serious and far-reaching that only a light-hearted introduction can do it justice. The official statistician's role in analysing and interpreting "his" figures depends on whether statistics is a technique or a subject. That is a general philosophical question which should be discussed first. But there are also specific practical questions the answers to which affect the official statistician's role in analysing and interpreting "his" statistics. These are: whether the government statistical service is organised in a centralised or a decentralised structure; how far the basic statistical series have been developed; how much of a constraint shortage of statisticians is; and what is the personal style of the particular official statistician and his immediate superiors.

4. This paper will discuss the general philosophical question and then the specific practical questions, but there are first a few points to be made about those inverted commas round "his" figures.

Whose Figures?

5. This business of the ownership of figures may seem rather trifling, because it is such an artificial idea and only becomes important as a result of someone's perverseness. But it can then have serious consequences for the subject of this paper.

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(1) The Nursery Rhymes of England



6. The situation in which the matter comes up is familiar. The Minister asks 'How much is farm output?' for example. The Director of Statistics may just say "£1,500 million" or whatever the figure is, but if he is a responsible Director of Statistics he may say "What exactly do you have in mind, Minister? You can measure farm output in many ways, depending on how much you include, what price basis you use, whether you are measuring gross or net output and so forth, and the answer you need depends on the context in which you are going to use it". So far so good, but the Minister may then reply "I want to show how much better off our farmers are than the Ruritians" and at that point the Director of Statistics is in trouble. He will be tempted to argue vehemently that you cannot use farm output - or even farm income - figures for such a purpose and to refuse to allow "his" figures to be so abused. It is not necessary to go into the detailed arguments of this particular problem, (there is, after all, an item on the agenda dealing with problems of measuring levels of living); it is mentioned only to illustrate the difficulties of the official statistician's attitude to the figures he produces. The only point of producing them is so that they should be used and he would be both obstructive and un-cost-effective if he regularly refused to countenance their use. But he must exercise enough supervision to be sure that they are not abused. Responsibility but not ownership is the right attitude.

#### Is Statistics a Technique or a Subject?

7. Put so baldly it isn't a very interesting question and the only answer is that it all depends on the individual statistician. But the matter of style will be discussed as one of the specific practical questions; somehow or other this section should deal with the general philosophical point. Most people are mixtures and sometimes think one thing, sometimes the contrary, but when people consider that statistics is a subject they mean that as far as they are concerned at that time it is worth studying and developing statistics for its own sake or at least without regard for the uses to which the development could be put. The contents of Series B of the Journal of the Royal Statistical Society illustrate the point:-

"Compound decisions and empirical Bayes

Linear compounds of normal linear regression coefficients

Two queues in parallel

etc. "

8. But when people consider that statistics is a technique they mean that as far as they are concerned at that time statistics is only useful if it helps them with whatever, in the rest of the world outside statistics, they are dealing with at the time. The contents of Series A can provide the illustration:-

"Statistical methods in psychiatric research

The inflation of National Health Service registers of patients and its effect on the remuneration of General Practitioners.

## A note on betting strategies in compound games

etc. "

9. It seems quite clear that the official statistician, most of the time, will be, or at least ought to be, in the second posture. His concern is with crime, or the national income, or health, and statistics is merely the tool which he uses in his work, alongside others who use the tools of criminology, economics or medicine and others, perhaps, who use administrative ability to reduce or increase the incidence of the thing they are all concerned with. This being so (and it is, surely, not open to dispute) the official statistician cannot limit his role to the development of statistical method either in the manipulation of data or, more probably, in the production of data; he must go beyond that and be active in manipulating data and interpreting the results of his manipulations.

10. This paper has introduced "the official statistician" as if there were only one in each department. Since there are several in most it becomes, at least in theory, possible to have a division of labour, and employ some statisticians who specialise in data collecting, others who specialise in data manipulating and perhaps others who specialise in interpretation. But there are two qualifications about that. The first is staff shortages, which are returned to amongst the specific practical questions, and the second is that specialisation means communication problems. Statisticians who specialise in collecting data are bound to be so aware of the nature of the data which they have collected (and validated) that they are at risk of losing patience with the statisticians who specialise in manipulating data and vice versa; great care is therefore needed by their director to keep them in close touch with each other, aware of each other's tasks and problems.

11. For the official statistician, then, statistics is a technique at the service of some other subject and the role of analysing and interpreting the figures must be carried out in close touch with the roles of collecting and validating figures and, perhaps, of developing the techniques of analysis.

### Specific Practical Questions

#### 12(a) Centralisation and decentralisation

This paper is not concerned to argue the case for or against centralised statistical systems; that should be decided on its merits, though they do depend on the official statistician's role in analysing and interpreting the figures. The point here is that the way in which the whole government statistical system is organised and managed has substantial implications for the way in which the role of analysis and interpretation should be organised and managed. The United Kingdom's statistical service is at present in a stage of transition from an almost wholly decentralised system towards one with sizeable centralised groups. The great advantage of a decentralised system, with the statisticians grouped in statistical divisions of the various departments of state, is precisely that the role of analysis and interpretation is carried out closely alongside the other specialists

in the business of the department and under the general direction of political and administrative chiefs concerned with that business. The disadvantage is that the work of collecting and validating the data cannot fully exploit such economies of scale as there are in the business. The changes that are in train in the United Kingdom statistical system - creating a Business Statistics Office to collect and validate all economic statistics and an Office of Population Censuses and Surveys to collect and validate all large scale social statistics - are intended to reap those economies of scale. It is important - and in the United Kingdom we are very aware of this - to minimise the extent to which the collectors and validators become separated from the analysts and interpreters. When the changes are complete there will still be statistical divisions in most departments, whose members will be in close touch with the other specialists and administrators developing policies in their department. Those statisticians must remain in intimate communication with the data collectors as well as with their departmental colleagues.

In the role of analysis and interpretation the problem of purity is perhaps more acute than it is in collecting and validating, though even there the temptations to lower standards of objectivity that beset the statistician are severe. The task of analysis and interpretation tends to be carried out to the specification of administrators and politicians who may be more concerned with expediency than with absolute truth. One of the arguments that may be deployed in favour of centralising the statistical service is that the statisticians are thereby shielded from the temptation to trim the results of their work to please their political masters. There is some force in this, (though not all politicians are rogues), but it is possible to value purity too highly. The unfruitfulness of virgins is as unsatisfactory as promiscuity; it is the way of the faithful wife that is right for the official statistician whether collecting and validating data or analysing and interpreting them.

(b) Providing basic statistical series

The obvious point here is that you cannot analyse and interpret unless you have the data. It follows equally obviously that the role of analysis and interpretation is not the whole of the official statistician's task. Collecting data, and, as has already been said several times validating them, are also necessary. The nature of the link between these two roles is not quite the same for the official statistician, however, as it is for people whose interest is the pursuit of knowledge. They follow an overlapping cycle of observing, hypothesising, deducing consequences from the hypothesis, designing further observation to test the truth of the consequences and so on. So indeed does, or should, the official statistician. The ordinary scientist is moved by curiosity; "...the art of creation is the same in the arts as it is in science; certainly 'having an idea' - the formulation of a hypothesis - resembles other forms of inspirational activity....."(1) But the official statistician is moved by his political masters, not by curiosity; and his concern is to change the world, not only to explain it; he is nearer to the engineer than to the scientist. It follows that the joint roles of on the one hand collecting and validating and on the other analysing and interpreting must be designed and carried out to provide guides to

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(1) 'Hypothesis and Imagination' in 'The Art of the Soluble'  
Sir Peter Medawar Methuen 1967

government action. Since some broad zones in which government action is acceptable are well known, given the nature of the particular society, it is possible to define certain broad zones in which basic statistical information will be needed. Censuses (of Population, Housing, Production, Agriculture), National Accounts, Balance of Payments, statistics of education, health, crime are all basic requirements of government.

In designing the precise form of these basic statistical series the official statistician has to bear in mind the analysis and interpretation the data will be called upon to bear in order to develop possible policies of his government. (He must also spare a look over his shoulder at the need for international comparability and therefore indirectly at the possible policies of other Governments).

The conclusion of this section is that although it is true that you cannot analyse and interpret data that you do not possess, it is a mistake to put the whole resources of the government statistical system to the task of building up the basic series with the intention, later, of analysing and interpreting them. Both must proceed simultaneously. It is true that from time to time the relative priorities will swing one way or the other as fresh problems arise in the world calling for new policies, new analyses, new data and as well-established statistical series either develop defects through old age or become less relevant to the changing world. But collection and analysis depend on each other and each is sterile without the other.

(c) Staff shortages and style

It is worth dealing with these two matters together as the desirable style of the official statistician depends to some extent on how short staff is. For this discussion it does not matter whether the staff shortage (there is bound to be one) arises from budgetary constraints or from a plain lack of statisticians to be recruited. Since most things, certainly including statisticians, can be bought at a price they come to the same thing in the end. The greater the shortage of staff, the more difficult it is to achieve a proper balance between the different parts of the official statistician's work. "Of course it would be right to carry out a quality check on the data but we simply haven't got the resources". "It would be wrong to put any of our small number of statisticians onto analytical work until we have got the basic statistics right". Both of these remarks, which must be painfully familiar, are misguided and dangerous. Scarceness of staff necessitates a more careful assessment of the relative priorities that the external situation calls for and a more determined effort to match the allocation of numbers and types of staff between the different kinds of work to those requirements. It does not justify any imbalance between collecting, validating and analysing. Since one sure thing is that circumstances will change and that five years from now you will require proportions of statisticians of the various styles different from what you require now it is clear that the official statistician needs to be flexible. And since another sure thing is that most of us are inflexible by nature it is clear that the official statistician should be moved about if necessary in order to give him opportunities to work sometimes at collecting, sometimes at validating and sometimes at analysing. In that way natural inflexibility may be cracked and softened.

Summary

13. The role of the official statistician in analysing and interpreting his figures is exactly as important as his role in collecting and validating them. He should be responsible but not restrictive about the use made of the figures. For him statistics is a technique at the service of the subject of the figures for which he is responsible; it is not a subject in its own right. Centralisation of the government statistical system tends to divorce the official statistician from the subject of his figures, and may weaken the role of analysis and interpretation; decentralisation tends to smaller scale collection and validation with possible loss of economy but strengthens the role of analysis and interpretation. The pressing need to build up basic statistical series does not justify abandoning analysis and interpretation. Nor do staff shortages justify an unbalanced effort. And finally the need for the official statistician to be flexible between collecting validating and analysing can only be met by an active career planning policy.

## PART II. RESEARCH CONTENT OF STATISTICAL PROGRAMMES

14. One of the points made in Part I is that statistics for official statisticians is most of the time a technique and not a subject. Nevertheless situations can arise in which the official statistician must conduct research. This does not mean that he undertakes the same kind of work as is done by academic statisticians in universities. The projects on which he works are of an applied nature and what he does must be tempered throughout with the realisation that an answer is required to meet a practical situation. If it is felt that the problem is so difficult that the support of academics in universities must be sought this can be achieved either by means of a contract with a university department or by appointing an academic consultant to the project. Whether or not such a relationship be established, the official statistician has to "spread" his interest from the collection and validation of the figures used in the investigation to the latest thinking in academic circles on the statistical topic with which the research is concerned.

15. More important however is the fact that if the research is to be successful opportunity must be given for the investigation to be pursued to an adequate depth. Generally it is necessary to free him sufficiently from his daily tasks to allow him to spend a good part of his time on the research. It is important that an occasional opportunity of this kind be provided for those official statisticians who have the urge and the ability to undertake research as part of their employment.

16. There is much to be said for centralised research, which enables a research team to be formed. Then corresponding to the economies of scale referred to in Part I, there is a 'meeting of minds' between the members of the team, which can do a great deal to stimulate successful research. Also officers can be given a tour of duty in the research team as part of their career management.

17. An experiment in centralised research has recently been undertaken in the Central Statistical Office where a Research and Special Studies Division was set up in 1968. This Division has several purposes:

- (a) to carry out research on topics flowing from the economic and social statistics for which the Central Statistical Office is directly responsible.

(b) to undertake technical investigations which affect the work of many Departments. Here of course it is essential to work in close co-operation with departmental statisticians.

(c) to establish and maintain close contact with universities drawing wherever desirable on the services of consultants. A related task is to help make available to departmental statisticians new methods developed in universities and research institutions.

18. The main work done so far by this newly formed Research Division has been concerned with a problem in seasonal adjustment and a problem in the use of regression relationships. Work is also in hand on the timeliness of statistics. Also a small research was done on the estimation of the number of coins in circulation in the United Kingdom, on which information was needed for planning the changeover to decimal currency.

19. Seasonal adjustment is a subject of concern to statisticians in many Departments. The particular problem tackled by the Research Division arose because in recent years the method being used for seasonal adjustment of unemployment series was not giving satisfactory results. It was realised that a considerable effort would be needed to unravel what had happened and the Research Division undertook the research, reporting periodically to an informal interdepartmental group. The model used for seasonal adjustment of this series, which is a mixed model containing both additive and multiplicative seasonal factors, had to be examined in some detail before the recent behaviour of the series could be understood. It was found that since 1967 the amplitude of the seasonal variation had fallen to about two-thirds of its previous value, whereas the seasonal pattern (considered apart from its amplitude) appeared to have remained sensibly constant.

20. In the course of the work methods for dealing with extreme values, for improving the estimation of the trend and for choosing an appropriate length of the series over which the seasonal factors were to be estimated were developed. Also, the fitting of the model to the observation was studied and some improvements were effected.

21. It was intended from the outset that the Research Division would undertake a general research on methods of seasonal adjustment and, with the conclusion of the work on the unemployment series, this research has now been started. Further to the point made earlier about the applied nature of research undertaken by official statisticians, it is worth mentioning that the experience gained in dealing with the unemployment series has contributed a great deal to the thinking about how to tackle this general research.

22. In their interpretative work, official statisticians often use regression relationships. Although it is commonly assumed that these relationships remain stable over time it was felt that departures from stability might occur with economic time series. A study was therefore made of methods of detecting whether or not regression relationships were constant over time. This was approached as a problem in data analysis and, although significance tests in the usual sense of the word were developed, these were regarded as "yardsticks" which, taken together with the changes in the regression coefficients over time, could be used to give information which would help in improving the regression model. This particular research had both a strong academic content and a strong practical usefulness. To help application of the method, a computer program was written.

23. Little can be said at this juncture about the important work in hand on the timeliness of economic time series. Here much work is being done by the statisticians concerned with the collection, validation and analysis of the series. For example, early estimates of consumers' expenditure are now provided, making use of several regression models for the components of the series. The aim of the Research division is to support this work and at the same time to see whether some of the more elaborate methods of investigation are likely to yield useful results. The work is continuing.

24. The resources of the Research Division are small and the general policy so far has been to limit the number of topics being investigated at any one time so as to enable an adequate effort to be mounted on each of them. But mention may be made of one area in which it is hoped to work in the future. This is the area of forecasting. The programme of work has not yet been worked out. However, it is felt that some of the recent work on trend estimation by exponential smoothing, on the analysis of residuals, on the treatment of multiple series which may have varying degrees of correlation or coherence, taken together with the more usual methods may lead to a useful contribution.

THE ROLE OF THE STATISTICAL AGENCY IN NATIONAL AND REGIONAL  
PLANNING AND ITS RELATIONSHIP WITH THE PLANNING AGENCIES

I. Introduction

1. The Dominion Bureau of Statistics is a centralized statistical agency with the function of producing an integrated system of statistical information which provide the basis for the understanding and planning of many aspects of social and economic life and institutions. The uses of DBS information cover a very wide range of applications in Canadian society. One of the main uses of statistics is to support the formulation of government policies and to measure the effect of these policies and the resulting programs at all levels of government: federal, provincial and municipal. In Canada the statistical office does not participate directly in the planning process of any agency but rather indirectly through the statistics it produces for planning among other applications. We, accordingly, review later in this paper some statistical programs designed for utilization for planning among other purposes.

2. Although in Canada we do not have centralized economic planning or comprehensive and formal planning of regional economic development as in France, for example, there is an evolving situation in both fields which has had and will have in the future a significant impact on statistical programs and operations of DBS. A brief review of these developments follows next.

II. National Economic Policy

3. Public expectations from the government in shaping social developments and economic growth have increased markedly over the last few decades. The government has responded by designing appropriate policies and programs which created an unprecedented demand for statistical services. This demand grew somewhat faster than the capacity of DBS to satisfy them, however significant the increase and improvement in the statistical information has been.

4. In addition to existing federal agencies dealing with national economic policies such as the Department of Finance, Department of Trade and Commerce, the Bank of Canada, etc., in the early 1960's the expansion of government policy into new areas resulted in the creation of a number of new agencies such as the Economic Council, the National Energy Board, the Department of Industry (since amalgamated with the Department of Trade and Commerce) and the Department of Manpower and Immigration. These bodies were research and program oriented and placed heavy demand on DBS for quantitative information. Occasional demands came also from a number of temporary bodies such as parliamentary committees, royal commissions and task forces.

5. In addition to the traditional government agencies, the creation of the Economic Council of Canada (ECC) is especially noteworthy from the point of view of Canadian progress in the formulation of medium-term national economic goals and design of policy instruments. The Annual Reviews of the Council examine the potentials and performance of the economy in perspective and submit proposals as regards economic objectives and programs (for example, the First Annual Review's topic was "Economic Goals for Canada to 1970", the Sixth Annual Review's theme is "Perspective 1975"). These reviews are based on a substantial number of in-depth staff studies, to which DBS contribution in terms of both statistical material and expert manpower has been very



significant. These staff studies (and also those prepared for the purposes of various royal commissions and task forces) often identified important areas of statistical development which needed expansion.

6. The Economic Council has been paying primary attention to a number of economic goals which have been central to the policy of the federal government. These are: full employment, high rate of economic growth, reasonable stability of prices, a viable balance of payments and an equitable distribution of rising incomes.

7. Policies designed to achieve balanced progress towards these goals are extremely complex and require frequent reviews and shift in emphasis as changing circumstances impede progress in certain sectors of the economy. This situation requires a flexible capacity in the statistical system to respond quickly to new statistical demands. Although some progress has been made, it will still take years to develop a more flexible capacity than DBS now has to meet the increasing demand.

### III. Regional Economic Policy

8. During most of the post-war period the performance of the Canadian economy has been at a relatively high level. Despite this fact the benefits of growth have not been shared equally by all regions and all segments of the population. High standards of national performance did not bring about an automatic narrowing of economic disparities among regions, nor did they eliminate sizeable pockets of chronic economic stagnation. In fact the disparities persisted after the especially vigorous national growth during most of the 1960's. Poverty has not been done away with among significant portions of the population, in fact it became more noticeable in the midst of growing wealth.

9. As a result of increasing concern among the public about these problems during the early 1960's, a number of federal and provincial agencies were created. These agencies are responsible for the promotion of balanced regional growth and social adjustment. Many of the programs are based on agreements between the federal and the provincial governments. With the creation of the federal Department of Regional Economic Expansion, economic planning has been given a new emphasis. Nearly all programs, at both the federal and provincial levels are being based on more or less substantial research that places a heavy and increasing demand on DBS for timely regional and small-area data.

10. The Department of Regional Economic Expansion is not the only federal agency that concerns itself with regional growth. The Department of Manpower and Immigration, the Department of Finance and the Economic Council also have added a regional dimension to their programs. DBS has to have close liaison with all these and other agencies at the federal level and with provincial governments to develop and carry out a regional statistics program with the right order of priorities.

11. The increasing severity of urban problems (urban poverty, lagging economic performance of cities, inferior housing, rising costs of public services, hap-hazard urban development, inadequate transportation, etc.) have stimulated activity in urban and regional planning. There has been an increasing interest in urban studies. Quantitative models developed in urban research and planning gave rise to new socio-economic data requirements. In order to overcome difficult data problems, ideas emerged to develop urban and regional information systems among metropolitan governments, social scientists,

etc. These were to make use of both official statistics as well as the information contents of data files derived from the administrative process of public programs.

#### IV. Influence of National and Regional Policies on DBS Statistical Programs

12. The impact of these policies can be recognized in the form of demands for more timely and more detailed information on a greater variety of topics which, however, cannot be distinguished from the impact of other demands. DBS has modified and developed its programs in light of all these demands within the constraints of available resources.

13. A number of high priority programs have been designed to accelerate DBS capacity for meeting contemporary demands for information with more speed and flexibility. These involve broadly the development of new and more detailed data on subject matter and geographical detail, the augmentation of survey-taking capability, the integration of related subject-matter series wherever possible, more complete research and analysis of data collected, automation of statistical production and the improvement of timeliness.

14. A brief review of those features of these programs that are especially important for planning purposes both at the national and regional level will be attempted next.

15. As regards the extension of existing statistical series important work is underway on prices statistics. Data on prices, together with information from the national surveys of family expenditures and incomes and with other data, are essential in assessing inflationary pressures, international competitiveness and income maintenance policies. Since these surveys also yield regional information it is possible to use them for analysing regional income and living cost differentials. Analyses of this type are important for income maintenance, welfare and regional development programs.

16. Planning for regional development is frequently focussed on the service industries which is the fastest growing sector of the Canadian economy. It is also a sector in which DBS has lagged behind the demand for statistics. A program is being developed to extend the coverage of the service industries substantially during the next few years and where possible, develop regional details. Significant improvements are also planned in the construction statistics.

17. Substantial extension of the coverage and other improvements are planned in educational and labour statistics. A major effort has been spent on the development of the new job vacancy statistics. Further work is planned on developing occupational and related characteristics of the labour force. This information is essential for the efficient planning of the government's manpower programs designed to upgrade the manpower resources of the country and improve the allocation of manpower among industries, occupations and regions.

18. Responding to strong demands, the number of questions in the 1971 census of population, housing and agriculture has been considerably extended. A rapid computer retrieval system is also being developed for the forthcoming census which will facilitate the economic production of complex tabulations especially for small areas.

19. Both at the federal and provincial levels, interest in timely, small-area data has greatly increased. In response to these demands DBS has adopted a regional statistics program which is to develop intercensal small-area data estimates, initially, on population, employment, unemployment and money incomes. A centrally located staff has been established to coordinate throughout the Bureau the development of regional information (including small-areas). The Regional Staff may also undertake the development of regional statistical series if resources are not available in subject matter divisions. A systematic development of regional statistics will greatly help the formulation of regional development programs and the evaluation of their effects.

20. In the effort to satisfy demands for more statistics, especially on a regional basis, without great increases in costs and in burden on the respondent an important element is to utilize as much as possible the information content of records generated in the administration of various government programs (income tax, unemployment insurance, medical and hospital insurance, family allowances, etc.). DBS has done some work on the statistical utilization of administrative records. The general experience has been that while the coverage of these files are usually satisfactory, the conceptual and data retrieval problems are in many instances difficult. In some cases, the retrieval problem alone may render the statistical usefulness of the file impractical especially for small-areas (e.g. family allowance records which are not in machine readable form).

21. Work on the system of National Accounts (including input-output, financial flows, real output and productivity measures) as an integrated framework has acquired a new importance for measuring the performance of the economy and designing plans to remedial action where needed (for example, the Economic Council, the Department of Finance, etc., rely heavily on these national aggregates in their work). A major milestone in this field was the recent publication of the national input-output table for 1961. Input-output techniques have important applications in regional economic planning as well and DBS has provided assistance in constructing input-output tables to interested provinces and agencies. Extensive work is being done on the historical revision of the national accounts.

22. A "Geographically Referenced Data Storage and Retrieval System" ("Geocoding") is in an advanced stage of development. It is essentially a geographical data bank which will represent an unparalleled flexibility to retrieve 1971 census (and other) data. To every statistical return in major urban areas the computer will assign the geographic coordinates (latitude and longitude) which indicate the approximate location of each household. This approximation in these areas will be made within a city block face, in the rest of the country within the census Enumeration Areas. The latter will represent a somewhat less precise approximation of the geographic location of the household. This system coupled with the generalized data retrieval system makes it possible for the user to specify on the map any area for which he wants tabulations without regard to boundaries of political area units. The tabulations - with very close geographical approximations - can be produced rapidly and economically (subject to confidentiality restrictions). The geocoding system will provide the regional planner with an indispensable tool for designing plans and evaluating the effects of regional economic policies.

#### V. Relationship with Planning Agencies

23. As a general approach DBS has been making a continuous effort to

develop and maintain close relationships with users of statistics in planning agencies at the federal, provincial and, in some instances, at the local level. The main objectives are to detect new needs and changes in demand for statistics; to consider concepts, coverage and reporting problems; and to determine priorities for statistical development.

24. It is also important to note that some users - including some of the government agencies that are involved in program planning - are also suppliers of data. An effective, two-way communication is particularly important with those agencies which have administrative records that have potentials for statistical utilization. In some cases it is possible to suggest to these agencies to introduce marginal changes as regards the content and procedural handling of the records (e.g. phrasing of a particular question on the record, coding, etc.) that could make the record file more useful for statistical utilization without adding to the cost of administration. In fact these changes could contribute to the more efficient administration of the program itself in the form of better data supply (e.g. improved sampling, more flexible coding, etc.). These objectives cannot be achieved without the full and voluntary cooperation of the agency involved.

25. Although DBS has been making efforts to establish and maintain relationships with government agencies through the usual channels (committees, working groups, task forces, personal communications, etc.) especially when new statistical programs are planned, some problems still exist. These range from indifference to exaggerated demands; from failure to appreciate problems of data development to differences in objectives. Similarly, when the government initiates new social or economic programs, DBS tries to follow these developments closely and establish communication with the agency that is responsible for the program in question. Again, difficulties are encountered. The main problem is that usually there is a significant time lag between the enunciation of the new program and the ability to interpret what it means in terms of new demand for statistics from DBS. Statements regarding the new program initially tend to be too general to know what will be required from DBS. By the time the requirements are clear, the need is immediate. These problems are compounded by the usually long lead time necessary for new data development. As a result DBS can rarely "catch up" with demand quickly.

26. At the federal level one can cite examples of good cooperation and also cases when things do not work out quite well. The cooperation has been, for example, very good with the Department of Manpower and Immigration regarding the development of job vacancy statistics. A further example is the joint project on a system of medium-term economic projection models with the participation of the Department of Manpower and Immigration and the Economic Council. (Other federal agencies also expressed their interest in participating in this work.) It also happened, however, that the cooperation with a department is satisfactory regarding a particular project but not very much so regarding another. For example, with the Department of Manpower and Immigration cited above DBS has had difficulties in obtaining administrative data on the registered unemployed useful for estimating small-area unemployment required most vocally by the same Department for their manpower development programs. Even after agreements were reached regarding their data collection, for administrative reasons and without consultations with DBS the collection procedures were changed that affected seriously the usefulness of the data for statistical purposes. Further delays in the completion of an important statistical project were the results.

27. Relationship of DBS with provincial government departments and

agencies also has its strengths and weaknesses. The relationship with provincial bodies is a particularly important element to formulate objectives of statistical programs and the most feasible ways to carry them out because they represent users, suppliers and - in some cases - producers of statistics. The various federal-provincial conferences and their associated committees and other usual forms of communication have been the instruments for contact. Despite successes in many areas, such as joint surveys with some provinces, fruitful consultations on problems of various statistical series (labour statistics, population census, prices, interprovincial trade) and so on, difficulties remain in some other respects. These stem from a variety of circumstances. One of these is the fact that provinces are very different in size, socio-economic structure, potentials and stages of development. This fact is reflected in differences among provinces as regards statistical needs, demands on DBS services and capabilities to carry out statistical work. No simple approach can be formulated to meet the statistical problems of all the provinces. A few provinces have their own more or less centralized statistical offices that serve as focal points of contacts with DBS. Others are represented by a number of provincial departments among which the coordination is not always satisfactory. In these provinces the continuity of representation in statistical matters and contacts with DBS are additional problems. Even in those provinces where a statistical office exists other departments or agencies also have statistical interests. Disharmony between these interests within a province is a further complicating factor. Some of the problems that exist with the provinces have a constitutional connotation: it is not always clear to everyone what is provincial and what is federal responsibility. Another category of the difficulties comes from the fact that provincial (and other) expectations grew somewhat faster than DBS capacity to satisfy them. Major programs such as automation, improvements in timeliness, data retrieval systems, etc. take longer to implement than some people in the provinces or sometimes DBS people themselves think for a variety of reasons: inadequate material resources, scarcity of experienced personnel or the sheer complexity of the task in question. These are not always appreciated by everyone and some provincial representatives display impatience with DBS at federal - provincial meetings.

28. In order to improve communications with the provinces a few years ago the Provincial Liaison and Consultative Services Staff was created. Particular attention is given to making known the services that DBS can offer to provincial agencies, many of them involved in one way or another in economic and social program planning. DBS regional offices are being equipped with some professional personnel to strengthen regional liaison and detect and interpret local statistical needs to headquarters.

29. DBS communications with municipal governments and urban and regional planning bodies - in the field of financial statistics, for example - are being maintained through the provincial departments of municipal affairs. Although in some instances direct contacts also exist, for example in developing the geocoding system for a number of metropolitan areas, in a general sense these contacts are not extensive or frequent. One of the main reasons for this situation is again constitutional, i.e. municipalities being the creations of provinces, therefore the contact is usually considered appropriate only with the provinces or through the provinces.

30. Informal arrangements for communication are also important. Personal visits, correspondence between DBS personnel and those of policy and planning agencies have been very helpful in establishing and maintaining effective and mutually fruitful relationships. There has been an attempt by DBS management

to leave sufficient time to the professional workers to develop needed contacts and give advice and consultation when requested. The problem in this respect, however, is that experienced professionals whose consultations are the most valuable are scarce and there is already a heavy demand on their time for on-going statistical work.

31. In summary, it seems fair to say that although DBS has been making efforts to develop and maintain effective relationships with policy and planning bodies at the various levels of government, certain problems still exist. In order to overcome at least some of the outstanding difficulties the central statistical agency might apply different means and approaches, the central theme, however, of all these should be - it appears - to aim at better communication and mutual understanding. Mutual understanding of problems is an essential element in satisfying user needs to the extent that resources permit and in planning the most relevant future statistical programs.

## ROLE OF STATISTICAL AGENCY IN

## NATIONAL AND REGIONAL PLANNING

1. The availability of reliable statistics to provide a sound factual basis for formulating development programmes, keeping track of their progress, evaluating their achievements and taking policy decisions is crucial in the context of developmental planning in this country. Ever since the First Five Year Plan was launched in 1951 there has been a continuing effort for improving the range and quality of socio-economic data so that they might serve the needs of planned development more satisfactorily. Significant developments have taken place in the field of statistics needed for planning. Integration of statistical work performed at various levels, collection of data on a nation-wide scale, strengthening of various concerned organisations in the States as well as at the Centre, are some of the significant improvements achieved during the last two decades. Our current Plan is deeply involved in improving the situation in the areas where statistics needed for planning are still inadequate. Greater attention is being given to facilities for training and research in statistics with a view to improving the overall statistical system.

2. The planning structure in India is suited to the federal Constitution of the country and the policy of mixed economy to which the country is committed. For achieving the objective of systematic and scientific planning for balanced growth of the country's economy, the Government of India set up in 1950 the Planning Commission which has a pivotal role to play in formulating Plans, assessing their progress and evaluating the overall achievements. Close liaison is maintained between the Planning Commission, Ministries of the Central Government and the State Governments in developing and implementing Plans.

3. At all important stages of planning, whether it be for allocation of resources, determination of targets, or assessment and evaluation of progress, the role of statistical agencies both at the Centre and in the States has been recognised. At the Centre, the CSO, which is the technical wing of the Department of Statistics, is responsible for laying down standards and for coordinating the development of the national statistical system for meeting the requirements of data for planning. The Planning and State Statistics Division of the CSO also functions as the Statistics and Surveys Division of the Planning Commission. This Division works in close collaboration with the various Divisions of the CSO, Statistical Units of the Central Ministries and the State Statistical Bureaus. Screening of various statistical schemes proposed for inclusion in the Annual and Five Year Plans, and providing necessary guidelines

for various statistical schemes to all statistical agencies are some of the regular activities of the Division. The work of some of the other Divisions in the Planning Commission such as Perspective Planning Division(PPD), Economic, Finance and Resources Division, involves statistical studies for examination of the status of the economy, the perspective of development in the next 10 to 20 years, a feasible rate of growth of national income, estimates of internal and external resources, size and pattern of investment etc. The Programme Evaluation Organisation(PEO) undertakes studies for evaluation of rural development programmes at the national level, coordinates evaluation work in the States and organises training in evaluation methodology. The Committee on Plan Projects(COPP) conducts studies on the application of fundamentals and techniques of management information system to government operations, project control and industrial management.

4. The Statistical Units in the various Ministries meet the day to day requirements of planning and in addition feed information for wider uses. Working in close collaboration with the policy making agencies they provide basic statistical framework for development programmes in their respective sectors.

5. At the State level, Statistical Bureaus play an important role in the formulation, implementation and evaluation of plans. The Bureaus participate in various technical working groups, supply statistical data for formulation of plans, conduct surveys for data collection and undertake progress reporting and evaluation.

6. The statistical agencies at the national and State levels have been servicing the planning process at various stages. Some of the basic methodological and statistical work performed by various agencies, both statistical and economic, very much facilitated planning at successive stages. In this connection mention may be made of the following.

7. A sound statistical framework could not be provided for the First Five Year Plan owing to non-availability of adequate statistical material. The four sector model developed by Prof. Mahalanobis was utilised as statistical framework for the Second Five Year Plan. Later the Indian Statistical Institute(ISI) carried out detailed studies on inter-industry models based on input-output studies. The Perspective Planning Division(PPD) of the Planning Commission worked out projections for the period 1961-76 with a view to providing a general perspective within which the Fourth Plan could be undertaken. The ISI and the PP Division worked out in collaboration a 77 sector inter-industry model as technical



supplement to the draft outline of the Fourth Five Year Plan with a view to projecting mutually consistent levels of output to be achieved in various sectors for realising the targets of income, investment and consumption fixed under certain constraints at the macro-level. This has been recently expanded to a 144 sector inter-industry table. The PP Division also brought out a number of valuable publications relating to quantitative aspects of the development of the Indian economy.

8. Mention should be made of the following developments in the field of statistics in relation to planning. A number of working groups on statistics were formed to take an integrated view of the development of statistics for planning. They assessed the type of data required for the formulation of the Fourth Plan as well as the perspective plan, and for evaluating the progress and implementation of the Plan. An Expert Committee on Population Projections set up by the Planning Commission has worked out growth rates of population for use in the formulation of plans. The data collected by the National Sample Survey (NSS) in various rounds, relating to (a) consumer expenditure, (b) saving potential, and (c) other subjects, are used in studies in planning at the national and State levels. To ensure rapid processing and systematic analysis of the socio-economic data, all aspects of work relating to NSS are being brought under a unified control. The organisation will be responsible for designing, field work and tabulation of the data as also their economic analysis and interpretation of the results. The Electronic Data Processing (EDP) established in the Planning Commission has greatly facilitated the compilation of input-output tables and processing of other data. At the same time, the EDP Centre of the ISI, the Computer Centre of the Department of Statistics, and the Computers installed in the Reserve Bank of India and other Government agencies have helped in computerisation of data needed for planning. As measurement of State/regional income is fraught with conceptual and practical difficulties, indicators of resource-endowments and resource-utilisation which broadly determine the relative prosperity or backwardness of a region have to be devised. On the basis of the examination of the problem by a study group, a set of 15 indicators of regional development has been evolved to identify backward areas so that necessary steps could be taken for the accelerated development of these regions with a view to ensuring balanced regional development of the various parts of the country.

9. With the growth of our economy the problems of planning, and along with them those of statistical requirements of planning are becoming more complex. Improvements have been registered in the coverage and quality of statistics required for planning in a number of areas. Among the significant improvements achieved are: (i) Revision of national income estimates on the basis of better data and more refined methods of estimation; (ii) progress towards compiling

comparable estimates of income originating in different States for the commodity-producing sectors; (iii) refinements in the construction of index numbers of industrial production and consumer price index numbers; (iv) extension of the coverage of crop statistics to more crops and larger areas; (v) introduction of a system of rationalised supervision of collection of area statistics.

10. Despite the improvements in coverage and quality of data brought about during the last decade, there remain areas where the information is inadequate. Even in areas covered by the existing statistical system, there is scope for improvement in both the quality and timeliness of availability of the information. It would be the endeavour of the statistical agencies at the Centre and in the States to improve the situation in the course of the next few years.

11. A Committee on data improvement has been set up to review the existing machinery for the collection of data in different Ministries/Departments. Besides spelling out in an integrated framework the requirements of data for short-term forecasting and annual budgeting/planning, the existing data will be reviewed to identify gaps, suggest measures for avoiding duplication and arrange for speedy processing. Planning Commission has also made detailed suggestions to the States regarding collection and analysis of data relevant to sectoral planning at the district level.

12. Important steps are being taken for improving the reliability and timeliness of crop statistics. A scheme for timely reporting of crop areas based on complete plot-to-plot enumeration in sample villages is in operation in some States for building up advance estimates. The NSS collection of land utilisation statistics and crop surveys will be properly integrated with the State crop surveys to provide a single series with greater reliability. A number of significant steps have been introduced in the programme of the 1971 population census. Some of these are, enlargement of the scope of house-listing to secure information on cultivating and non-cultivating households, listing of various characteristics of manufacturing, trading and other establishments, data on age at marriage and children born in the previous one year to secure information on current fertility, data on place of last residence and duration of residence and improved data for classification of population into workers and non-workers.

13. The formulation of statistical projects in successive plans has been guided by the considerations of (i) maintaining continuity in the implementation of important statistical programmes already initiated, (ii) extending statistical development to new areas of enquiry essential for planning and evaluation, and (iii) undertaking projects

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basis of international statistical programmes. Gaps in statistics have been listed and, in order to ensure that resources available are not distributed thinly over many statistical projects, a few select schemes called 'priority schemes' have been initiated on a priority basis to cover some of the major gaps in plan statistics. Statistics on contributive trade, transport of goods by road, estimation of income, training of statistical personnel in the field for field work and processing of data, housing statistics, are some of the priority projects. With the intensification of statistical work relating to planning we expect statistical agencies to play a more significant role in our planning process.

The Role Of The Statistical Agency In National Planning,  
And Its Relationship To The Planning Office.

1. As there is as yet no regional planning in Lesotho, reference in this paper will be made only to national planning. Statistical activities in this country were born long before any organised economic or development planning was thought of. As a result statisticians always had to plan their collection of data without any guidance from prospective consumers of their product as to their needs. Fortunately the Bureau always attempted to collect such information as was thought relevant to economic and development planning, subject to availability of resources. Whilst the Bureau is not necessarily included in the national planning machinery, statistics produced have been found very useful by the planners. This is especially true of population data and national accounts.
2. There is close co-operation between the Bureau and the Planning Office. In a few key ministries a joint effort has been made to establish combined planning and statistics units. The reason behind this move is that collectors of statistics will realise the needs of the planners, and the planners will realise just how much statistics may be produced with available resources. The programme of collection of statistics is usually discussed with the planners before it is launched to make sure their needs will be accommodated. However, they are continually reminded that, while their needs may be given priority, the Bureau is there to serve more than just planning requirements. The two departments are, nevertheless, working in close co-operation to find ways and means of ensuring that basic statistics for planning are provided.

THE ROLE OF THE STATISTICAL AGENCY IN NATIONAL  
AND REGIONAL PLANNING AND ITS RELATIONSHIP  
TO THE PLANNING OFFICE

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The Emergence of Community-wide Indicative Planning in New  
Zealand and the role of the Department of Statistics

Introduction

1. Since the last Conference in 1966 significant developments in the political machinery for planning in the economic area and, to a lesser extent, in the social area, have taken place in New Zealand. A process of "indicative" planning, whereby planning targets are formulated after an extensive process of consultation and study by all interested groups in the community has been carried through, has gained wide acceptance. This has led to a fuller understanding of the explicit information services role of the national statistical office (the Department of Statistics) and an increased demand for a more comprehensive range of statistical services.

Nature of Indicative Planning

2. Indicative planning arose out of a decision by Government to convene a National Development Conference in 1968 with representation (in an individual, not official capacity) of management in the various industrial sectors, of trade unions, central government and other organisations playing a role in economic and social affairs. The conference was organised on both a plenary and sector basis and adopted specific economic growth targets for the coming decade. The conference also made an extensive set of recommendations on economic and social matters having a direct or indirect relationship to the achievement of the planning targets.

3. The targets adopted were in no sense intended as mandatory in regulating economic decision-making but the community-wide representation at the National Development Conference and the consensus reached resulted in widespread acceptance of the targets. Central government, while retaining the right to make final decisions on economic and social policy, has, because of its association and involvement in the setting of the indicative planning targets, used the targets and the associated conference recommendations as a basis for much of its economic decision-making. A permanent machinery comprising a central National Development Council and over twelve supporting sector councils, has been established to review progress in achieving the adopted community targets and to carry out studies designed to formulate policies to be recommended to government as desirable for planning purposes. Indicative planning, therefore, as it has emerged in New Zealand is a process of formulating acceptable, feasible, national economic growth targets and the setting of optimum policies for their achievement.

General Role of the Central Statistical Office

4. Indicative planning, if it is to be carried out in a rational and effective way, requires a comprehensive quantitative information system, with statistical information services playing a vital role in this system. This does not overlook the social and cultural elements in the full realization of the community's planning aims, but is an expression of the need to approach indicative planning in a managerially scientific way.

5. Before consideration can be given to economic and social targets it is essential to have available a comprehensive statistical description of the current state of the economy, at both the macro-economic and micro-economic levels, and the projected future state of the economy over the proposed planning period. Such a statistical analysis needs to be in terms of an integrated set of statistics relating to the major economic aggregates, such as the total volume and value of the production of goods and services, the level of aggregate consumption of such goods and services, capital formation and the volume and net balance of trading with other countries.

6. This indicates the central importance of national accounts statistics which provide the required statistical description. An analysis of the economy's current and unplanned future situation in terms of national accounting concepts, when assessed in terms of normative aspirations of the community for an acceptable rate of sound economic growth provides a basis for the quantification of possible planning targets.

7. Before these targets can be adopted as feasible, however, the implications of the macro targets, relating to gross national product, consumption, balance of external payments, and other economic variables, need to be explored to see whether their achievement is possible, taking into account the economic and technological structural relationships existing within the economy which act as a restraint on possible re-direction of economic effort. These more detailed and sophisticated studies, again, have to be done in quantitative statistical terms. However, for these studies to be effective, a further extension of national accounting statistics is required by way of input-output tables. These analyse the structural relationships between industries and institutional sectors in the economy.

8. Once the tentative targets are confirmed by means of an inter-industry input-output study as being feasible in terms of the requirements for imports, full utilization of the available labour force, and so on, they can be firmly adopted as rational, acceptable targets.

9. Exploratory investigation into optimum economic policies to assist industry in reaching the production levels involved in the achievement of the targets is not solely a quantitative process, but statistically-based studies involving a wide range of national accounting and other statistics are necessary.

10. The final stage of the indicative planning process is the measurement of the actual performance of the economy under the various policies and decisions taken. Again, this has to be mainly in quantitative statistical terms, and the continuing national accounts statistics, when related to the targets formulated in the same concepts, make this possible. This continuing statistical comparison of aspiration and economic performance then indicates whether planning policy and strategy is proving effective or is in need of modification.

#### Statistics for Planning Purposes

11. If indicative planning is to be carried out effectively there is an obvious need for a comprehensive, integrated set of national accounts, including input-output tables, and other economic and social statistics. While significant extensions to official statistics have been made by the Department of Statistics and other agencies over the last twenty years, the resources allocated in the past have been insufficient to meet the more sophisticated needs of indicative planning.

12. There is a community-wide nature to indicative planning. It involves all sections of the community, with decision-making responsibilities at all levels: central government, trade and labour organisations, managements of firms, and members of households. All need an adequate information system, in its widest sense, if indicative planning decision-making is to be well-directed. Statistics are a vital part of this information system. The statistical element needs to be relevant to the area of responsibility of the decision-maker and in many cases will therefore comprise detailed micro statistics not within the national accounting field. Planning thus involves all facets of official economic and social statistics, as well as the key national accounting statistics. If well-informed planning policies are formulated by the National Development Council, but decisions at a lower decentralized level are made on the basis of inadequate information, then the central policies could be nullified. The further development of statistics outside the national accounting field is therefore vital to the successful use of the improved national accounting statistics for indicative planning.

#### Review of Adequacy of New Zealand's Official Statistical System

13. As a result of the increased awareness of the demanding requirements for indicative planning purposes and the inability of the existing official system, both in terms of available resources and the range and nature of statistics available, to fully meet these requirements the National Development Conference recommended that a review be carried out to determine explicitly the changes in statistical services needed. Accordingly the Minister in Charge of the Department of Statistics appointed the Technical Committee on Statistics in May 1969 with the following terms of reference:

In order to provide adequate statistics for the indicative planning proposals of the National Development Conference, the Technical Committee on Statistics be required to:

- (a) Assess the statistical requirements resulting from the continuation of indicative planning work after the National Development Conference;
- (b) Examine the statistics which are at present available and consider what changes are needed;
- (c) Indicate -
  - (i) How such changes would be implemented;
  - (ii) The desirable allocation of work; and
  - (iii) The resources required;
- (d) Report on the foregoing matters to the National Development Council.

The Technical Committee comprised nine members, including the Government Statistician who was Chairman, and was serviced by a number of specialist sub-committees on national accounting, classifications, capital formation and systems of regional statistics.

14. The committee issued its report in November 1969. Seventy-one recommendations were made covering all aspects of a much improved official statistical system that was proposed. The main features of the report recommendations were as follows:

- (1) A modernised and extended system of national accounts and inter-industry studies be introduced, patterned on the United Nations System of National Accounts, as the key to the statistical requirements of indicative planning.
- (2) Quarterly summaries of the national accounts are necessary as a tool for short-term economic management.
- (3) Periodic surveys of household incomes, expenditures and savings be conducted for national accounting and social policy formation purposes.
- (4) A variety of new or extended statistical services be introduced, including the establishment of a central computerized file of both aggregated and unaggregated statistical data suitably classified so as to permit cross survey linkage; the development of formal liaison machinery between the Department of Statistics, the permanent National Development Council and the suppliers and users of statistics; and the further development of statistical projections.
- (5) In view of the need for improved regional statistics, that a fine mesh-block system be introduced as a basis for common regional referencing of statistical data in all subject areas.
- (6) That the various recommendations be implemented in two stages, the first before and the second after the end of 1971.



- (7) An investigation by the central government personnel authority (State Services Commission), the Government Statistician and other departments concerned should be carried out to determine the scope for the further centralization, better coordination, and more economical conduct of official statistical work.
- (8) Statistics currently prepared should, in collaboration with users and suppliers, be periodically reviewed and, where indicated, discontinued or modified.

#### Implementation of the Technical Committee's Recommendations

15. The Technical Committee's report was without a doubt the most significant document in the history of official statistics in New Zealand and has been accorded wide acceptance. After adoption in principle by the National Development Council it was referred to Government for its consideration. With Government approval being given to the implementation of the Technical Committee recommendations, negotiations have proceeded concerning the allocation of the required additional resources.

16. Recently, final approval to an 18 percent increase in the staff establishment of the Department of Statistics was given, together with an improved salary structure for statistical staff. It is anticipated that next year a second increase of about the same size will be approved to implement the second priority recommendations of the Technical Committee on Statistics.

#### Liaison Machinery with the National Development Councils

17. Great importance attaches to the institution of adequate liaison arrangements with the formal planning bodies if full advantage is to be gained from improved statistical services. The general functions outlined earlier require the independence of the statistical system from the planning machinery if statisticians are not to become committed to planning targets to some extent and therefore compromise their role as providers of objective data on which planning must rest and on which assessment of the success or failure of planning exercises depends.

18. In New Zealand the liaison machinery which has been developed avoids direct statistical representation on the main National Development Council or supporting sector development councils. The Government Statistician however is available to provide statistical assistance at this level when required. Both the central and sector development councils have supporting targets advisory and/or statistics committees on which the Department of Statistics is represented. Objective statistical data is made available at the more detailed working level of planning studies and reviews under this arrangement. While no limits are placed on the extent to which statistical analytical and interpretive services by departmental liaison representatives can extend, the formal liaison arrangements expressly prohibit the Department of Statistics representatives advocating views of a normative character either on desirable targets or planning strategy.

The Role of the Federal Office of Statistics in  
National and Regional Planning

I INTRODUCTION

It is generally agreed that the primary aim of economic development is social development and that the former is only a means of achieving the latter. It follows that if those who live within an economy are to have more per head of those material things that enhance their welfare the size of the product to be shared must first be increased and the rate of increase of the product must be higher than that of the population. The basic aim of any economic development effort is, therefore, to improve the efficiency or productivity of the factors of production available to the economy - its land, and other natural resources, its labour (including its management and entrepreneurship) and its capital.

2. On the other hand, apart from an increase in the product and in the share per head a basic aim of social development is the reduction of inequalities in the levels of incomes and - consequently - of living.

3. Therefore, before a reliable assessment of economic and social progress can be made it is necessary to have periodic quantitative information on the stock and flow of the population and its production and on how the output is shared. Such information coupled with inventory data on other capital resources decisions regarding the size of the product and of its individual components forms the basis for determining what are to be produced and in what quantities during a development period. Finally, from the flow of goods and services becoming available from time to time an assessment can be made of progress under a development plan or programme.

4. Thus, the statistical requirements of the different stages of planning can be summarized as follows:-

5. Planning Stage

Basic statistics are required:

- (i) to provide information on the community's needs
- (ii) for forecasting purposes and
- (iii) for making choices.

In a nutshell, statistics are needed at the planning stage for fixing targets and, consequently, for constructing econometric models.

6. Implementation Stage

Basic statistics are needed:

- (i) for assessing performance through data on such variables as production, capital formation, consumption, international trade and payments
- (ii) for assessing the social effects of a plan from data on income distribution, standard of living of the population

and on other socio-economic characteristics which are regarded as conditioned by planning.

The approach followed in this paper is to consider separately the kind of statistical information required for planning and measuring: -

- (a) economic development and
- (b) social development.

Because in some cases more or less the same series are necessary under each head, some repetition is inevitable.

## II THE SERIES NEEDED

7. In this section, we consider first, the series needed for planning and measuring global economic growth and - in connection with the former - the series necessary on the factors of production as well. The discussion is then followed by a consideration of the series needed for assessing social development. But before enumerating the different series it must be stressed that it is not for the statistician to tell the planner what information he requires or should ask for in connection with his work. On the contrary, it is the duty of the planner to articulate his needs as fully and clearly as possible and as early as possible so that he could be advised well in advance of need as to what information is already available, its scope, coverage, and limitations; what information is derivable, what other information is obtainable and when obtainable. The broad categories of data mentioned below are, therefore, those that appear from first principles to be the most important or relevant ones. They are mentioned more for the benefit of fellow statisticians who must often anticipate requests for information from planners if they are to be able to meet them without undue delays.

### Statistical series needed for planning and measuring global economic growth

8. Strictly speaking, the series needed for measuring economic growth consists of an inventory of national wealth at different points of time and the per capita value of that aggregate. But information on national wealth is lacking in most countries and not easy to obtain in any. However, fairly reliable estimates of economic growth are not impossible on this account. This is because interest usually turns on the total of the flow of goods and services available to a community and, for this reason, flow data such as the national product during a period (usually a year) is in general more useful for measuring economic and social progress than inventory information.

### National Accounts Statistics

9. The three different approaches to national income estimation yield information useful for assessing the increase in the national output and income, for seeing how the income is shared among the different factors of production and for showing how much of the output is consumed by individuals and the state and how much is set aside for increasing the nation's future productive capacity. From this it can be seen that the national accounts statistics furnish information for assessing both economic and social development on a global basis. We shall consider first the usefulness of national accounts - in this case the industrial

breakdown of the Gross Domestic Product - for purposes of assessing economic growth and defer consideration of the Gross National Income and Expenditure until we come to social development.

10. It has been said that, basically, the technical aspect of planning is the "establishment of a comprehensive quantitative account of the essential features of an economy in such a way as it is possible to examine the relationships between the various economic aggregates and make projections to show the over-all effect of a change in any of these aggregates or its components". And since the Gross Domestic Product provides a comprehensive economic picture of the essential features of a country's output it is a useful tool for planning. It is more useful still when it is broken down into its industrial origins for it then shows the relative importance of the various branches of productive activity. Furthermore, the individual tables from which the industrial breakdown is prepared provide the means whereby the sectors of the economy could be studied in depth. Finally, the work of compiling the G.D.P. reveals the various gaps in information and these provide an indication of those branches of statistics which most urgently require development.

#### Statistical series on the factors of production:

##### Labour:

11. Human resources are an essential part of a country's wealth and labour a major factor of production. Moreover, the population as a whole is the principal consumer and human welfare is the main objective of development efforts. Detailed statistics of human resources are, therefore, of vital importance in all questions of national development.

##### Land and other natural resources:

12. Stock and flow data on these are required. Information on land tenure is also useful.

##### Fixed Assets:

13. Information is needed on the stock and flow of dwellings, non-residential buildings and civil engineering construction; transport equipment, plant, machinery and equipment; breeding stock, dairy cattle and draught animals; land improvement and plantation development.

##### Financial assets:

14. Information is required on the sources of funds for domestic investment and on international capital movements.

##### Entrepreneurship

15. Information on the supply of entrepreneurship should be gathered as part of manpower statistics.

##### Other essential statistics

##### External Trade statistics:

16. In view of the importance of external trade in economic development

and as a component of national income, data are required on international trade and payments and terms of trade.

### Price statistics:

17. Good price statistics are essential for all stages of economic planning; for cost/benefit analysis; for national income calculations, for measuring changes e.g. in real incomes and in the cost of living; for calculating terms of trade; for estimating some items in a statement of the balance of payments, etc.

### Social development

18. Some of the categories of statistical data required for assessing social development have already been mentioned in connection with economic development. However, to use them for estimating social progress different series on the same subjects are required. Thus, for example, from population statistics life tables should be constructed in order to show how expectation of life is being affected by economic development. However, in addition to demographic data what is required is general social statistics. Chief among these may be mentioned: national income estimates based on the Income and Expenditure Approaches; medical and health statistics; nutrition surveys; statistical indicators of the levels of living such as consumption, household's wealth and cost of living indices; educational statistics (including data on out-of-school education); statistics of income distribution, employment, unemployment and under-employment and conditions of work and crime statistics.

19. From the foregoing it is clear that the statistical information at present available is inadequate in many respects. It is equally clear that although their roles are different the activities of planning bureaus and statistical organisations are mutually beneficial as far as economic and social development is concerned. The former play an important role in the development of the latter by pointing up which series should be improved and which ones started and developed while better statistics in turn enable the former's work to rest on a firmer factual foundation.

## III FILLING THE GAPS IN INFORMATION

20. One of the main aims of a comprehensive statistical programme is to enable the statistical organisation to fill in the gaps in the information it provides. The difficulties of fulfilling this aim effectively and satisfactorily in a developing country are formidable. They arise from three main causes - inadequate resources both in terms of funds and manpower, the low level of literacy among suppliers of information and the usual respondent - resistance. These difficulties are made no easier to overcome by the fact that the statistical organisation has to devote part of its resources to the provision of an information service for commercial and other firms, for the public and for international organisations and others overseas.

21. The difficulties point to the necessity for a developing national statistical organisation to set limits to its responsibility for providing information. Thus, in general, it must concentrate on providing economic and social information required for global and sectoral analysis and this does not normally include data for project analysis.

22. But while (in the opinion of the U.N. Economic Commission for Africa) "a central statistical service is not expected to provide the complete range of information needed in a country" it does have responsibility for or control over the major items; for co-ordinating statistical activities; for preventing the publication of conflicting data; for ensuring or facilitating comparability of the information supplied by the different statistical organisations in the country.

### Statistical Organisation

23. The issues just raised necessitate a consideration of the best way of organising statistical services for the public sector in order to facilitate their various tasks. Generally speaking, there are two types of statistical organisations - the Centralised and the Decentralised, but each type usually has within it elements of the other. Very often the type of organisation found in a country is a product of historical circumstances. This is true of statistical organisation in Nigeria. But in this country the question whether statistics should be centralised or decentralised is hardly of practical interest at the moment. (Although in theory we have at the national level a decentralised system - in the sense that each government has its or the nucleus of its own statistical organisation - the size of the Federal Office of Statistics in relation to all the other statistical bodies in the country makes the system, in effect, a centralised system. On the other hand, at the state level the system is a centralised one). What is of immediate interest is how the existing system could achieve its ends. Statistics is a Concurrent Subject under the present Constitution and each statistical agency is therefore, free to collect statistical data on a wide range of topics without the fiat of any other statistical body. In these circumstances there is, clearly, a need to work out a modus vivendi et operandi in the statistical field. Even if statistics were to become exclusively a federal responsibility under a future Constitution and all the state statistical departments were to be merged with the Federal Office of Statistics (as in Australia) there would still be need for co-ordination of the statistical activities of the resulting department and those of federal 'corporations' such as NISER and the Central Bank if unnecessary duplication were to be avoided, respondent - resistance minimised and comparability of data promoted.

### Relationships with other suppliers, collectors and users of statistics

24. Most statistical agencies are both collectors and users of statistics. Nigeria's statistical departments are no exception. The chief aims of relations with suppliers are to ensure their co-operation and to ensure that they supply accurate statistics and supply them on time. These objectives can best be attained by suitable promotional work, by drawing attention to the safeguards against unlawful disclosure of confidential information and by minimising the burden of response through the co-ordination of requests from collectors. With users, relations are aimed at making them understand the scope, coverage and limitations of the data presented and getting them to articulate their needs fully and clearly. These aims are often achieved by encouraging and securing the participation of their representatives at the planning stages of a statistical enquiry and by inviting their critical appraisal of the statistical product, preferably before its release for public consumption.

25. As for other collectors the aim of relations are to ensure comparability (through the promotion of established techniques, adoption of uniform concepts, classifications and definitions), to obtain information as economically and quickly as possible (through collaboration in projects and co-ordination of activities), to share responsibilities for collection so that their respective activities are, as far as possible, complementary rather than competitive, thereby minimising respondent - resistance.

26. A good deal has already been done by the different statistical agencies by way of co-ordination and co-operation. For example, until the suspension of the Constitution made it impossible, the Standing Sub-Committee on Statistics (of the Joint Planning Committee of the National Economic Council) used to meet fairly regularly to consider statistical programmes and other matters of common interest. Its place has however been taken by the newly formed National Advisory Committee on Statistics. Also, a number of statistical projects have been jointly planned and executed by the Federal Office of Statistics and other agencies including the former regional government statistical departments, the National Manpower Board, and the Central Bank. Moreover, the Federal Office of Statistics services the statistical posts in federal ministries with statistical staff. But more can and should be done - especially in respect of relations with users and suppliers.

#### Relations with State Statistical Organisations

27. The introduction of the present federal structure to replace the erstwhile regional set up has necessitated a re-examination by the Federal Office of Statistics of the question of statistical organisation in the country. In the course of this re-examination consultations were held by the Department with the Ministries and officials responsible for statistical matters in the Northern States. Similar consultations with their counterparts in the Eastern States are planned to take place in the near future. On a number of points agreement was reached with those already consulted but before enumerating them a brief note on the history of statistical development in Nigeria which, as it were, conditioned the agreement, is apposite.

28.9 When the Federal Office of Statistics came into existence in 1947 Nigeria had a unitary form of government. But within the next seven years a federal structure was introduced. In order to enable it provide a statistical service on the spot for the new regional governments the Federal Office of Statistics established a branch office in each regional capital. These branch offices had a dual role, namely, to serve as co-ordinators of our activities in the regions and at the same time, to act as a statistical service for the regional governments.

29. Although both roles were (as far as we knew) satisfactorily fulfilled, within a few years each regional government started planning and establishing its own statistical department. But despite the introduction of economic planning ministries and the drawing up of regional development plans since then the growth of regional statistics divisions has been a rather slow affair. On the other hand, the regional branches of the Federal Office of Statistics grew appreciably. Relations between our branch offices and the regional statistics divisions were generally satisfactory - thanks largely to the fact that we concerned ourselves mainly with national statistics while our counterparts, in the main, collected and published administrative statistics.

30. The slow growth of the former regional statistics divisions is the main fact which has led to apprehension on the part of this Department that under the new federal structure the development of state statistical services may be slower still. This prospect of slow growth is obviously not one that those responsible for or interested in promoting economic and social development in the country could contemplate with indifference. The initiative of the Federal Ministry of Economic Development in exploring ways of assisting the new governments to get an adequate statistical service is therefore understandable.

31. After the brief review of the preceding three paragraphs we are now in a position to appreciate the rationale of the agreement referred to earlier on. The following are some of the main points of the agreement: -

- (i) The Federal Office of Statistics is to assist the states in publishing an annual statistical year-book and a quarterly publication as well as series appropriate to an annual publication while the quarterly will be limited for the most part to monthly, quarterly and some bi-annual data.
- (ii) The State Statistical Units will, of course, carry out any assignments given them by their respective Ministries. They will, however, consult the Federal Office of Statistics, before undertaking any field surveys in order to avoid unnecessary duplication.
- (iii) No financial compensation is expected by the Federal Office of Statistics for work done by the department for any state except where a field survey which is of purely state interest or is an extension of a federal survey in a state, is requested.

32. In the discussions with the state ministries and at the meeting of the Chief Statistician and the state statisticians engaged on planning work the point was stressed that what this Department envisages is the simultaneous but complementary development of federal and state statistical departments. The former unified, centralised system - the prototype of the present Australian System started after half a century of operating the present system in Nigeria - is not favoured at present despite its advantages. For there is no reason to suppose that the reasons which led the regional governments to set up their own statistical departments side by side with the Federal Office of Statistics soon after the introduction of a federal Constitution in 1954 are no longer valid or considered valid. Indeed echoes of them were heard in some states during the consultations mentioned above.

33. Therefore, in the light of the long-term policy of this Department the working relationship agreed upon and outlined above must be considered an interim arrangement. The key-note of the relationship in due course must be interdependence not dependence and the aim a complementary rather than competitive relationship.

#### IV STATISTICAL LEGISLATION

34. The experience gained in the thirteen years since the enactment of the Statistics Act of 1957 has shown areas in which the Act could with



advantage be revised or extended. One of such areas is the part requiring the F.O.S. to obtain the permission of the governor-in-council of a State before statistics other than the population census and those relating to the Federal Territory of Lagos (?) and to items on the Exclusive Legislative List, can be collected. The limitation inhibits not only the planning of a statistical programme but also its execution because of the uncertainty of and delays in obtaining the necessary permission. Except in a period of emergency in a state it is suggested that it should be sufficient to inform the state authorities in advance of the intention to collect statistics in a state. It may be mentioned in passing that this curb on our powers is one of the main factors in the slow development of our urban consumption surveys. The problem which was serious enough when we had to deal with four regions could easily become insoluble under the new federal structure.

35. Another area which could profit from a fresh look is the part dealing with regional (now state) jurisdiction as to Statistics. If state authorities and bodies like the Central Bank were to use the powers they have to collect statistics without consultation with the Federal Office of Statistics and with one another the result could be large-scale duplication and, consequently, a lowering of the quality if not the quantity of the information obtained. In this matter a leaf could be borrowed from Canada which is trying to avoid this kind of development by making it obligatory for organisations and persons desiring to collect statistical information from more than ten respondents to inform (and, it is understood, to obtain the permission of) the Dominion Bureau of Statistics. Apart from minimising the burden on respondents the procedure should increase knowledge of statistical sources. If the Federal Office of Statistics is effectively to discharge the duty laid upon it by law "generally, to organise a co-ordinated scheme of social and economic statistics relating to the federation" or "any part thereof" it must have some powers of control over the mounting of survey-type statistical enquiries.

## V OTHER FACILITIES OFFERED BY THE F.O.S.

### Data Processing

36. For some time yet it is unlikely that the operations of state statistical bodies will be large enough to warrant the installation of their own high-speed data processing equipment, especially of the electronic type. Equipment - even conventional ones - is expensive to acquire or hire. The initial requirement is usually for calculating (desk) machines. Even so statistical organisations are often unable to resist the temptation prematurely to instal expensive equipment. This situation often arises partly because of the prestige value of such equipment and partly because of the aggressive salesmanship of sellers of equipment. The Federal Office of Statistics is planning a publicity campaign to make other statistical organisations aware and take advantage of its new IBM 360/25.

### Training Facilities

37. The F.O.S. runs a fairly well-established two-stage-in-service training scheme for junior statistical staff. Training at the first stage (conducted by the F.O.S.) equips statistical clerks to enter the statistical executive class (as assistant statistical officer-in-training) while training at the second stage (undertaken as a joint project with Ibadan University) should accelerate the progress of trainees within that class and qualify them to enter the professional class as statisticians.

This scheme already helps state governments and statutory corporations to train their staff and the F.O.S. is prepared to consider some modification of the entry qualifications to the first stage in order to enable it to do more for the states.

38. In the training of data processing staff the F.O.S. already gives assistance to federal agencies. This assistance can be extended to state bodies whenever required.

39. At the professional level the F.O.S. is prepared to accept state statistical staff either on secondment or attachment. Staff exchange between planning offices and statistics department should also be mutually beneficial.

#### Information Service

40. An information service to intimate statistical and planning offices with work planned and in progress is under way. The Statistical Standards Branch of F.O.S. will be glad to offer advice on sampling questions while the F.O.S. can put the experience and (to some extent the field organisations of its Survey Units) at the disposal of sister departments at need.

The Role of the Statistical Agency in National  
and Regional Planning

1. In Tanzania the role of the Statistical Agency has been conceived as that of furnishing the required data for national and regional planning and to assist in economic forecasting by observing various trends, correlations and inter-relationships of economic flows. While most statistical offices in Africa are attempting to collect statistics on aggregates like population, national accounts, capital formation, employment, prices, industries, agricultural output etc., the contribution of such data to regional planning has remained inadequate.

2. From Tanzania's point of view statistics for regional planning purposes are defective in various ways e.g. lack of data on economic flows between regions, regional estimates in respect of national accounts, internal trade, management of wholesale and retail trade. Much of this anomaly can be attributed to the fact that some statistical information is available within Government ministries, but is not yet tapped for public consumption. Moreover, there are instances of duplication in collecting statistics, a situation which obviously needs to be rectified so as to have a more economic use of limited statistical resources.

THE ROLE OF THE STATISTICAL AGENCY IN NATIONAL  
AND REGIONAL PLANNING AND ITS RELATIONSHIP TO  
THE PLANNING OFFICE

1. Introduction

The role of the Statistical Agency in a Country will vary with the structure of the statistical system existing at the time; variation dependent on whether it is a centralised system or a decentralised system or partly centralised or decentralised. Its role in national and regional planning and its relationship to the Planning Office will also vary in accordance with the nature of the planning activities in the Country; for example whether there is centralised economic planning or not. Generally, it will be observed that the nature of the economic planning activities of the Country has to a large extent influenced the structure of the statistical system itself. For example, in most of the countries of the Commonwealth where there is centralised economic planning there is established a centralised statistical agency with responsibility for the collection, compilation and publication of all official national statistics and for the coordination of all official statistics and statistical activities and services. There is the exception, however, in the case of Canada where there is no formal centralised economic planning as such, but where you will find the most highly centralised statistical system. Even in cases where there is a centralised statistical system, not all the statistical functions of collecting, compiling and publishing are concentrated in the central office. For example, in Australia "where compilation and publication of official statistics by other Departments are virtually precluded by certain coordination arrangements", (see paper on the subject by Australia at the Sixth Conference in Ottawa 1966), a few agencies are permitted to set up small statistical units to meet their special needs. In Canada, there is the centralised system at the federal level and a decentralised system at the provincial level. In India, there are statistical agencies both at the Centre and in the States and there is close collaboration between the Statistical Units of the Central Ministries and the States Statistical Bureaus. In the much smaller independent countries of the Caribbean Commonwealth, a centralised system is evolving. In Trinidad and Tobago in particular, the statistical system is highly centralised and is patterned along the lines of the Canadian system.

2. The outstanding example of the decentralised system is that of the United Kingdom where a specialised branch of statistics is prepared by the relevant Department or Ministry; but steps are now being taken towards centralising the system.

3. It would appear that the trend throughout the Commonwealth is for centralisation of the Statistical Services, and in the context of overall national economic planning, this would appear to be the more practical and effective system.

4. Whatever the system, centralised or decentralised or partly one and partly the other, the necessity for close and continuous mutual relationship between the statistical offices and the planning agencies is clearly established.

5. To what extent there are differences in the relationship between the Statistical Agency and the Planning Office from one country to the other, and from one system to the other will be examined below for selected countries.

II. Some Characteristics of the Statistical Agencies in relation to the Planning Agencies in selected countries

6. Only five countries have so far submitted papers on this topic. These countries are Canada, India, Lesotho, Nigeria and Tanzania. A brief summary of these papers is provided below.

(a)

CANADA

7. The statistical system in Canada is a centralised one "with the function of producing an integrated system of statistical data which provide the basis for the understanding and planning of many aspects of social and economic life and institutions".

III. The context of National Economic Policy within which the Statistical Agency operates

8. Over the last few decades the demand for statistical services in Canada (as in most countries) grew faster than the Statistical Agency could satisfy. This was due largely to the increase in the number of new agencies involved in the planning process: for example, the Economic Council, the National Energy Board, the Department of Manpower and Immigration etc. These were supplementary to the existing federal agencies dealing with national economic policies. The Economic Council has set the following economic goals: full employment, high rate of economic growth, reasonable stability of prices, a viable balance of payments and an equitable distribution of incomes. The DBS has made significant contributions towards meeting these new demands for statistical data; but the rate at which such demands have increased, require a more flexible capacity than the DBS now has.

IV. Regional Economic Policy

9. During the early 1960's a number of provincial agencies (and federal also) were created for promoting balanced regional growth and social adjustment; and with the creation of the federal Department of Regional Economic Expansion economic planning has been given new emphasis.

10. The increasing severity of urban problems have stimulated activity in urban and regional planning resulting in an increasing interest in urban studies; and nearly all the programs (at both federal and provincial levels) are being based on substantial research that places a heavy demand on DBS for timely and regional small-area data.

V. The influence of National and Regional Policies on DBS programs.

11. The impact of these policies are recognised in the form of demands for more timely and more detailed information on a greater variety of topics, the more important of which in the context of economic planning

are prices statistics; data on the service industries (the fastest growing sector in the Canadian economy); education and labour statistics (particularly new job vacancy statistics), small area data (initially, intercensal small-area estimates of population, employment and unemployment, incomes etc.)

12. In an effort to satisfy the demands for more statistics, without great increases in costs and burden on the respondent, attempts are being made to utilize as much as possible the administrative records of various government programs (income tax, insurance, family allowances etc.)

#### VI. Relationship with Planning Agencies

13. The DBS adopts the policy of developing and maintaining close relationships with users of statistics in planning agencies at federal, provincial and regional levels. The main objects are to detect changes in demand for statistics; to consider new concepts, coverage and reporting problems; and to determine priorities. The policy is being implemented and the objectives are being achieved through the operation of committees, working groups, task forces, personal communication etc. But there are certain problems. These range from indifference to exaggerated demands; from failure to appreciate problems of data development to difference in objectives.

#### VII. Relationship with Provinces

14. The relationship with provincial bodies is particularly important. Means of contact are usually federal-provincial conferences and their associated committees. There are also joint surveys with some provinces. But some problem again arise e.g. differences in size, structure and potential of the various provinces.

15. In order to improve communication with the provinces a few years ago the Provincial Liaison and Consultative Services Staff was created.

16. "In summary, it seems fair to say that although DBS has been making efforts to develop and maintain effective relationships with policy and planning bodies at the various levels of government, certain problems still exist. In order to overcome at least some of the outstanding difficulties the central statistical agency might apply different means and approaches; the central theme, however, of all these should be - it appears - to aim at better communication and mutual understanding. Mutual understanding of problems is an essential element in satisfying user needs to the extent that resources permit and in planning the most relevant future statistical programs."

(b)

#### INDIA

17. The Statistical system is partly centralised and partly decentralised and is influenced by the planning structure in the country, which is federal oriented. Close liaison is maintained between the planning Commission, Ministries at the Centre and the State Governments.

18. At the Centre, the C.S.O. is responsible for laying down standards for coordinating the development of the national statistical system for

meeting the requirements of data for planning. The C.S.O. is the technical wing of the Department of Statistics, and the Planning and State Statistics Division of the C.S.O. also functions as the Statistics and Surveys Division of the Planning Commission; and this Division works in close collaboration with the various Divisions of the C.S.O., the Statistical Units of the Central Ministries and the State Statistical Bureaus.

19. The system or framework for maintaining effective collaboration between the C.S.O. and the planning agencies in India is described briefly below:-

"The Statistical Units in the various Ministries meet the day to day requirements of planning and in addition feed information for wider uses. Working in close collaboration with the policy making agencies they provide basic statistical framework for development programmes in their respective sectors.

At the State level, Statistical Bureaus play an important role in the formulation, implementation and evaluation of plans. The Bureaus participate in various technical working groups, supply statistical data for formulation of plans, conduct surveys for data collection and undertake progress reporting and evaluation.

The statistical agencies at the national and State levels have been servicing the planning process at various stages. Some of the basic methodological and Statistical work performed by various agencies, both statistical and economic, very much facilitated planning at successive stages".

20. In addition the following developments have taken place in the field of Statistics in relation to planning:

- (a) A number of working groups on statistics were formed to take an integrated view of the development of statistics for planning.
- (b) An Expert Committee on Population Projections was set up by the Planning Commission.
- (c) To ensure rapid processing of socio-economic data all aspects of work relating to the NSS are being brought under unified control.
- (d) The E.D.P. Centre of the I.S.I the Computer Centre of the Department of Statistics and the Computers of Reserve Bank of India are collaborating on computerisation of data needed for planning.

21. With the growth in the economy, the problems of planning and the statistical requirements of planning are becoming more complex; and improvements have been registered in the coverage and quality of statistics required for planning as follows:-

- (a) Revision of national income estimates on the basis of better data and more refined methods of estimation;

5(a) - TRINIDAD AND TOBAGO

- (b) Progress towards compiling comparable estimates of income originating in different States for the commodity-producing sectors;
- (c) Refinements in the construction of index numbers of industrial production and consumer price index numbers;
- (d) Extension of the coverage of crop statistics to more crops and large areas;
- (e) Introduction of a system of rationalised supervision of collection of area statistics.

In spite of improvements indicated above, there remain areas where information is inadequate in terms of quality and timeliness and steps are being taken to effect further improvement:

- (a) A Committee on data improvement has been set-up to review the existing machinery for the collection of data in different Ministries/Departments.
- (b) The reliability and timeliness of crop statistics are receiving attention.
- (c) A number of significant steps have been introduced in the programme for the 1971 Census to enlarge the scope of certain topics e.g. housing, business establishments etc.

22. A few selected schemes called "core schemes" have been initiated on a priority basis to fill some of the major gaps in statistics for planning. With the intensification of statistical work for planning, statistical agencies are expected to play a more significant role in the planning process in India.

NIGERIA

23. The paper from Nigeria has indicated that in theory there is a decentralised system at the national level, in the sense that each government has its own statistical organisation. But the size of the Federal Office of Statistics in relation to all the other bodies in the country makes the system in effect a centralised one. At the State level the system is a centralised one.

24. In accordance with the Constitution of the country, Statistics is a concurrent subject and therefore each statistical agency is free to collect statistical data on a wide range of topics without the fiat of any other statistical body. Accordingly there is need for coordination of statistical activities.

VIII. Relationship between the Federal Statistical Office and the State Statistical Organisation.

25. The introduction of the present federal structure to replace the erstwhile regional set-up has necessitated discussions with the state-organisations resulting in agreements on a number of points with some



States as follows:-

- (a) The Federal Office of Statistics is to assist the states in publishing an annual statistical year-book and a quarterly publication as well as series appropriate to an annual publication while the quarterly will be limited for the most part to monthly, quarterly and some bi-annual data.
- (b) The State Statistical Units will, of course, carry out any assignments given them by their respective Ministries. They will, however, consult the Federal Office of Statistics, before undertaking any field surveys in order to avoid unnecessary duplication.
- (c) No financial compensation is expected by the Federal Office of Statistics for work done by the department for any state where a field survey which is of purely state interest or is an extension of a federal survey in a state, is requested.

26. The relationship with the Planning Office may be as a user of the statistics produced by the statistical agencies may be summed up in the following extract from the Nigeria paper:

27. "With users, relations are aimed at making them understand the scope, coverage and limitations of the data presented and getting them articulate their needs fully and clearly. These aims are often achieved by encouraging and securing the participation of their representatives at the planning stages of a statistical enquiry and by inviting their critical appraisal of the statistical product, preferably before its release for public consumption".

#### TANZANIA

28. In Tanzania, the role of the Statistical Agency has been conceived as that of furnishing the required data for national and regional planning and to assist in economic forecasting.

#### OTHER COUNTRIES

29. A short summary of the papers contributed on this topic for the Current Conference was given above. In view of the importance of the experiences of certain countries which have not contributed, some indication of the situation in such countries are provided below (as obtained from the Report on the 6th Commonwealth Conference, Ottawa, 1966).

#### UNITED KINGDOM

30. "Most of the additional requirements for statistics arise and are identified by the statisticians themselves in the course of using the statistics they collect. The fact that statisticians are very much involved in the actual use of their statistics and are present in the discussions of

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their implications for policy purposes, makes them aware of the kind of improvements which are desirable. This is particularly so in the United Kingdom, where the organisation of statistical services is decentralised and the members of statistical divisions of departments act as statistical advisers to the administrative and other staff in their department.

31. There are regular meetings of committees on economic and on social statistics whose membership includes both statisticians and economists and administrative staff who are users of the statistics."

CEYLON

32. In structural organisation, Ceylon enjoys a somewhat unique position in regard to its statistical activities. There is only one single organisation in Ceylon which carries the responsibility for the collection of statistics in the Government Sector, namely, the Department of Statistics. Accordingly, the Department of statistics, in addition to its centralised work in the Head Office, controls a large number of statistical units scattered throughout the length and breadth of the various Ministries and governmental organisations. Apart from statistical units in Government Departments, there are small units in each of the 22 districts into which the Country is divided in order to cater for the statistical requirements of the District Administration.

33. The relationship between the Statistical Agency in Ceylon and the Department of National Planning is maintained through a number of Committees according to subjects e.g. a Committee on Demography; on Trade and Industry; on Agriculture and social services; on National Accounts.

34. The Chairman of each Committee is an Assistant Director or a very senior Statistician with considerable experience in the particular subject.

35. The membership of Committees include all statistical personnel dealing with the various units and subjects falling under the general title; and in addition, included representatives from the Central Bank.

TRINIDAD AND TOBAGO

36. There is a centralised statistical system in force in Trinidad and Tobago, patterned along the lines of the DBS in Canada; and resembles the system described above for Ceylon and to some extent the structure in Australia, where there is a highly centralised system. The relationship between the CSO and the Planning Agency is indicated briefly below:-

- (a) Statistics for Planning: The Ministry of Planning and Development in Trinidad and Tobago is responsible for the formulation of quinquennial development plans. The country is now on its third plan - 1969-73. Progressively through the years, from the first plan in 1958, there has been a definite tendency towards "indicative planning". The role of the

Central Statistical Office in the formulation of these development plans have been at two levels. At one level, the C.S.O has found itself providing technical assistance to the Ministry of Planning in demonstrating the use of statistical techniques for purposes of projection; and at the second level, the C.S.O., as the source of all official statistics, has been responsible for supplying the statistical inputs into the plan.

- (b) Financial limitations: There are temptations for Planning units to be desirous of entering into the field of data collection, especially in "centralized" systems such as ours. The temptation is generally brought about by tardiness on the part of the C.S.O to supply information as required and in the format required. Many reasons can be given to explain the cause of this.

The experience in our part of the world has been competition for scarce financial resources in the Government budget and the relative inexperience of professional manpower in the field of economics and particularly statistics. There is also the question of status in the hierarchy of Government Ministries. Planning units came into vogue with the introduction of self-government. The great need for strategies to be devised to push development created a situation in which the Ministry of Planning in developing countries became not only very important but powerful. These Planning units were thus in an advantageous position to obtain the best quality staff and financial resources at the expense of other Ministries. The C.S.O., receiving little financial support, and worse yet staff, were at a disadvantage to keep up with the growing demand for statistics.

- (c) Coordination (The role of the Statistics Priorities Committee): A Statistics Priorities Committee under the chairmanship of the Director of Statistical Service has been established to deal with the allocation of the statistical priorities for each year's programme of the Central Statistical Office as well as to advise and to assist the Director of Statistical Service in planning for the expansion of the Statistical Programme of Government whether this is being carried out directly by the Statistical Office or by either Ministries and Divisions under the control of the Central Statistical Office. This Statistics Priorities Committee is appointed by Cabinet on the advice of the Prime Minister. In this way all Ministries are assured that although the Statistical Office remains for administrative purposes under the Prime Minister as Head of Cabinet, that the programme of the Statistical Department will be geared to meet as fully as possible the statistical needs of every Ministry.

5(a) - TRINIDAD AND TOBAGO

The Director of Statistical Service is required, after consultation with the Statistics Priorities Committee, to submit to Cabinet through the Prime Minister, by October of each year the programme of work for the following year, so the Ministers of Cabinet could ensure that the needs of their Ministries are being adequately provided for, or if not, could refer the matter for reconsideration by the Director of Statistical Service and the Statistics Priorities Committee.

Membership of the Statistics Priorities Committee includes the Permanent Secretary of the Ministry of Finance or his representative as Vice Chairman, the Head of the Economic Planning Division, the Permanent Secretary of the Ministry of Labour, the Permanent Secretary of the Ministry of Health and Housing or his representative, the Permanent Secretary of the Ministry of Agriculture, Industry and Commerce or his representative, the Permanent Secretary of the Ministry of Mines.

The Statistics Priorities Committee has the power to co-opt members from other Ministries especially when the statistical needs or the statistical responsibilities of these other Ministries are being considered. In addition, each Ministry has the right to require that a representative sit in at any meeting of the Statistics Priorities Committee at which matters concerning that Ministry are to be discussed. Reports of the meeting of the Statistics Priorities Committee are to be submitted for the information of . . . Cabinet, and where necessary for decision by Cabinet on matters which have not been fully agreed upon.

GENERAL COMMENTS

37. So far the experiences in most countries suggest that the acceptable approach to achieving some effective coordination of activities of the central statistical agency and the planning agency is through standing committees; some dealing with general administration as the Statistical Priorities Committee in Trinidad and Tobago; and others with specialist subject matters as for example in Ceylon and in Trinidad and Tobago. There is also the method which permits close working relationship between a specialist officer in the statistical agency and the officer-in-charge of the subject matter in the other Ministry or Department.

38. The Committee method may involve a Committee with a representative of the Statistical Agency as Chairman; or a Committee dealing with a specialist subject matter in another Ministry, on which a representative of the statistical office is requested to serve.

39. The primary consideration however underlying all the discussion is that for statistics to have any value, the independence and objectivity

of the statistics must be ensured. Further, they must be seen to be objective. One might suppose that this hardly needs to be said. However, it follows that the statistical agency must also be independent and seen to be objective. Where this is not so, there is a broad temptation for the executive branches of the Government to bend statistics a little to suit a particular purpose. Or at least where there is insufficient data, subjective evaluations are introduced to give a more optimistic picture.

Confidence in the collecting agency is of a special importance in developing countries with less sophisticated views on statistics. If suppliers of information lack this confidence then the data will be of limited use anyway.

40. Nevertheless, the users of the statistics must be served with what they need; statistics are of no value for their own sake. A planning agency is necessarily a major, or the major user of economic and social statistics. While some planning may be done without much quantitative data, increasingly as planning becomes more sophisticated, the demand for data grows. There are never sufficient resources for the production of all required data and it therefore seems that the first connection between the statistical agency and the planners is to establish and coordinate priorities for the statistical programme. In fact the statistical agency must anticipate the users' requirements since, in our experience at least, the users are seldom prepared to specify their needs in advance - they want it 'yesterday'. We have for some time worked at coordinating the statistical work by means of a 'statistics priorities committee' on which the planning agency is the chief representative. This does not seem to be sufficient and we suggest that to ensure the supply of resources in time to meet the needs, that the instrument of an agreed and jointly supported programme may help.

41. There is a serious problem in the developing countries of insufficient trained and experienced personnel over the several fields of statistics, planning, financial and other administration. It may be that part of the relationship is that the few are spread too thin, fail to develop the machinery of government so as to be able to delegate authority and allow each agency to perform its own function. Friction develops and coordination can be badly affected. There are in practice too few persons available to perform the independent functions and if it appears to be an economy to merge the functions, such an economy appears to be a false one. Provision must therefore be made for independence and coordination within this context.

## 5(a) - United Kingdom

THE ROLE OF THE STATISTICAL AGENCY IN NATIONAL AND  
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PLANNING OFFICE

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1. An important feature of the United Kingdom Government Statistical Service is its decentralised character, with separate Statistics Divisions located in all the main Ministries. In addition to their responsibility for organising the collection processing and analysis of basic current statistics for the subjects with which the particular Ministries deal, the Statistics Divisions contribute to policy-forming discussions, including making estimates and forecasts required for forward planning. Typical examples are forecasts of the future demand on the transport system, housing requirements, the development of the energy sector of the economy, and education needs. The present tendency is for increasing attention to be paid to formal planning and for separate planning units to be set up within Ministries. There are increasing calls on Statistics Divisions for participation in the work of these units; in some cases statisticians have become full-time members of the units.
2. On a more central basis, the United Kingdom does not have any formal overall national plan or separate planning agency although a number of indicative and conditional medium-term projections of the development of the economy have been prepared and published at intervals during the 1960s by the National Economic Development Council and by the former Department of Economic Affairs.
3. The preparation of medium-term projections for use mainly in reaching decisions about the total level and allocation of public expenditure is now regularly carried out in the Treasury. A computerised system has been developed which, although not a self-contained, dynamic forecasting model, is of great value for handling quickly numerous variants of the basic projections. The team engaged in this work is a mixed one of statisticians, economists and econometricians.
4. For certain statistics where medium or long-range projections are needed as a basis for many different kinds of forward planning the Central Statistical Office acts as a co-ordinator of inter-departmental discussions leading to agreed estimates. Examples of this are the estimates of future population (where the finally agreed figures are published by the Government Actuary's Department), of the working population, and estimates of migration into and out of the United Kingdom and between the major regions of the country.

## SHORT TERM ECONOMIC FORECASTING AND MINIMUM DATA REQUIREMENTS

For purposes of this paper short term economic forecasting is taken to refer to forecasts extending some twelve to eighteen months into the future. Such forecasts may refer to the overall performance of the economy, in which case they must inevitably be related to the national accounts of the country concerned or at least refer to the main aggregates contained in those accounts. Forecasts may be prepared for a particular sector of the economy or a specific field of economic statistics such as the government budget, the balance of payments, the construction industry, retail prices, or average wages. Desirably these forecasts should also be related to the national accounts though this might not be essential or practicable in all cases. Again forecasts may be concerned with a number of successive estimates for future periods (say the next five or six quarters) or with a single future period. Examples of the latter could include forecasts of the government budget or of agricultural production, but even in these cases the forecasts may frequently be only an intermediate stage. Interest may well centre on how the outcomes in these areas are likely to affect general economic conditions in the future. This paper is concerned with forecasting broad economic trends in national accounts.

2. The Commonwealth Bureau of Census and Statistics is represented, together with the Department of the Treasury and the Reserve Bank of Australia, on two interdepartmental forecasting committees. The National Income Forecasting Committee prepares forecasts of major national accounts aggregates for the remaining quarters of the current year and the four quarters of the ensuing year. The Balance of Payments Committee prepares, seven times a year, successive revisions of an annual forecast of current and capital transactions in the balance of payments accounts. In addition, the Bureau is represented on a committee which meets twice a year to prepare forecasts of wool production. Woolgrowers, wool brokers and the Bureau of Agricultural Economics are also represented on this committee.

3. The National Income and Balance of Payments forecasts are made specifically for use by the other participating bodies in connection with planning economic policies and recommendations. In all cases the Bureau participates fully and actively not only in supplying and interpreting statistical data, but also in the development of econometric methods and computer operations.

4. The Bureau is also engaged in research work to develop improved analytical techniques for use in specifying, estimating and simulating dynamic econometric models. This work is not described in this paper, which is limited to present practices and data requirements in the forecasting field, but the results of this research will naturally lead to modifications in existing practices.

National Income Forecasting Committee - Present Methodology

5. The present framework is designed to yield forecasts of the inflationary or deflationary gap at constant prices. The steps in the procedure are as follows:

- (a) Forecasts of exogenous variables at current prices, seasonally adjusted, are prepared by the appropriate specialist areas within the participating organisations. The major exogenous variables are government expenditure, private gross fixed capital expenditure (except on dwellings), government imports and imports of petroleum and civil aircraft, exports of goods and services, gross farm product and farm stocks. The estimates of farm product, farm stocks and farm exports are reconciled with each other so that the forecasts for this related group of variables are fully consistent;
- (b) Given the exogenous variables, a small simultaneous equation econometric model is used to obtain current price seasonally adjusted forecasts of personal disposable income (non-farm), durable and non-durable personal consumption expenditure, investment in non-farm stocks, aggregate demand (non-farm), gross national product (non-farm) and the remaining components of imports of goods and services. Attention is centred on non-farm gross product, since fluctuations in the farm sector (regarded as exogenous) have relatively little impact on the demand for labour, imports, etc. in the short term;
- (c) These forecasts of demand for non-farm gross product at current prices are converted into forecasts at constant prices using independently projected values for "normal" price increases. The rate of growth of demand for non-farm gross product at constant prices is then computed over the forecast period;
- (d) Independently of the demand forecasts, projections of the rate of growth of supply (potential non-farm gross product) at constant prices are prepared. These are based on separate estimates of the growth in the workforce (participation rate, school leaving, migration, etc.) and product per worker, these estimates are determined on a fairly subjective assessment of past trends and prospective developments without any systematic assessment of investment trends in particular industries or of inter-industry shifts; and
- (e) The rate of growth in demand for non-farm gross product at constant prices is compared with the rate of growth in supply and the inflationary or deflationary gap is then revealed. No attempt is made at present to forecast the actual price changes and actual level of imports, etc. by which the ex ante gap will be eliminated ex post.



6. The detailed forecasts are prepared by a sub-committee which prepares a report for consideration by the committee. At both the sub-committee and committee levels component forecasts prepared by the specialist areas and results from the application of the model are discussed and amended before adoption.

National Income Forecasting Committee - Future Developments

7. Improvements to the model currently being undertaken include:

- (i) amplified treatment of factor share relationships, concentrating, in the first instance, on personal disposable income with equations for income tax liabilities and explicit treatment of cash social service benefits;
- (ii) amplified treatment of imports of goods and services which involves the treatment of some imports, such as major defence imports and civil aircraft, as exogenous and a search for better equations for determining the endogenous components;
- (iii) endogenous relationships for some or all private gross fixed capital expenditure components; and
- (iv) departure from gap analysis; this step requires, as a minimum, expenditure variables and functions in constant price terms, price and wage equations, an aggregate production function and labour market relationships. Only when this has been done does it become useful to experiment with various values of the exogenous variables, particularly those that are subject to policy control, in order to determine the explicit ex post effects on prices, imports, stocks, etc. by which an ex ante gap is likely to be resolved, and to be able to assess the acceptability of those effects.

National Income Forecasting Committee - Data Requirements

8. As has been indicated, this committee is concerned with forecasting broad economic trends over the course of the next five or six quarters. If it is accepted that for short term purposes this is more informative and useful than forecasting figures for the next year, it follows that the minimum data requirements are seasonally adjusted quarterly national accounts, in reasonable detail for wages (with supporting employment and unemployment data) and all main expenditure aggregates (including stocks, which from our experience is the most difficult item to estimate and forecast), and with adequate supporting detail for the government sector, the balance of payments and the monetary sector. Anything less than this makes forecasting hardly worthwhile, but beyond it there is almost no limit. Data requirements expand steadily as methods develop from fairly crude and subjective forecasts for various items treated separately, through the stage of incorporating functional relationships for some items, to the stage of a fully integrated econometric model.

9. The present framework employs quarterly seasonally adjusted estimates of national income and expenditure components at current prices. For the most part these are available from the official quarterly estimates, usually in greater detail than is necessary for models now in use or proposed. The official published estimates contain a farm/non-farm dissection of gross national product. Details not available from the official estimates include stock valuation adjustment (though this should be available shortly), stocks of fixed capital equipment, non-farm personal income tax payable, and government and civil aircraft imports. But quarterly estimates of these series are prepared for forecasting purposes.
10. To effect the planned developments of the forecasting model, quarterly estimates of national expenditure and product at constant prices are required. These are in course of preparation.
11. Revisions are difficult complications in the compilation and publication of current estimates, but become even more troublesome in estimates for econometric work. It is not only that revisions affect the whole system of equations, but once the number of series used becomes at all large the work involved in keeping the series up-to-date can become burdensome. Another problem is gaining quick access to series for processing in the production of actual forecasting or in experimental work designed to test and improve the models. The Bureau is endeavouring to meet these problems by a more fully integrated system of computer processing. Developmental work is well advanced on random access storage of time series data. Eventually all analytical and compilation programs, including those used in preparing quarterly estimates and forecasts, will have direct access to this time series file system. The use of a uniform data base is expected to have an important effect in reducing the length of time that elapses from the close of a quarter to the publication of the quarterly national accounts and subsequent preparation of forecasts.

#### Balance of Payments Committee

12. Forecasts are prepared in annual current price form using indicator and trend information for detailed components of the current and capital accounts. The committee keeps the likely results during the current year and following year under regular review. The emphasis on annual data is largely historical and is changing. It reflects some concern with the likely level of international reserves. It also reflects, to some extent, the lack in the early years of the committee's work of much quarterly data for the production of sound quarterly estimates. For the purposes of National Income forecasting, annual forecasts of imports and exports of goods and services are converted into quarterly current and constant price estimates. At present the relationships between items in the accounts, both with themselves and with domestic macro-economic variables, are implicitly treated. Research is beginning on the explicit (econometric) formulation of some of these relationships.
13. Forecasts of exports of goods are estimated in detail using information on trends in production, consumption, shipment rates and overseas prices, supplemented by contract details, particularly in the case of minerals and some agricultural products. Imports of goods are disaggregated into

government (including defence), civil aircraft, petroleum and all other goods. The latter are related to selected components of gross national expenditure. Forward estimates of the other import components are based largely on information obtained from government sources. Statistics of letters of credit and a survey of import orders provide partial cross-checks on the import forecasts. Imports are an integral and important part of the national income model in which they are functionally related to national expenditure and a "pressure" variable. It seems likely that for balance of payments purposes it will be desirable to develop the equations for forecasting imports in greater detail than would have been justified in the national income model. Any work in this regard would be consistent with the central model and would be used wherever necessary.

14. Transport services are related to flows of goods and migration projections. Foreign exchange and migration statistics provide current indicators for travel and private transfers. Property income forecasts are based on latest indications from a quarterly profits survey (national accounts), the withholding tax base (monthly dividend income), monthly foreign exchange statistics, company reports, and production trends, etc. The part of property income credits that is interest on international reserves is related to the forecast of the level of reserves and overseas interest rates.

15. In the preparation of current account forecasts there are data deficiencies, although not to the same extent in the case of the capital account. The survey of import orders has not proved as useful a forecasting tool as was envisaged. Several of the major components of the published estimates (e.g. transportation and property income) are based on annual surveys. The lack of corresponding quarterly surveys hampers the preparation of both current estimates and forecasts. The foreign exchange statistics are the source of published estimates and latest indicators for a number of items such as royalties and copyright which could be obtained more accurately by direct survey.

16. Government capital transactions are based on budgetary information. Changes in assets of marketing authorities are obtained from known credit arrangements. A quarterly survey provides limited information on private capital inflow. It is supplemented for forecasting by foreign exchange statistics, announced borrowing arrangements and the survey of anticipated capital expenditure.

17. The lack of sound estimates of quarterly private capital inflow is the major data deficiency for forecasting and preparing current estimates of capital account transactions. There is also virtually no direct information on the balancing item. Thus for forecasting, the aggregate of private capital inflow, the balancing item and movement in international reserves is in effect obtained as one figure. The component dissection is, at best, notional. There is at present no explicit account taken in national income forecasting of the effect of these capital flows on domestic economic aggregates. The difficulty in obtaining component split of forecasts of capital movements will be a serious problem in future development of the monetary side of the forecasting model.

Wool Forecasting Committee

18. Forecasts for the year (July to June) are made each July and December. They are required for such industry purposes as market studies and scheduling of sales. The economic importance of the industry in Australia makes these forecasts of considerable importance in the work of the Balance of Payments Committee and, to a lesser extent, in that of the National Income Forecasting Committee. The forecasting methods employed are non-technical and make use of statistics supplied by the Bureau on numbers of sheep and lambs shorn, production of various categories of wool, lambings, average fleece weights, etc. for the most recent season; also in preparing estimates for the current season, limited use is made of current sample surveys of average clips.

**SHORT-TERM ECONOMIC FORECASTING AND MINIMUM  
DATA REQUIREMENTS**

There are certain significant differences in the requirements as well as possibilities of short-term economic forecasting between countries with highly developed industrial economies and financial and monetary systems, and a developing country such as Kenya. These differences affect the nature and quality of data collected and are influenced by the following important factors:-

- (1) Statistical services in a developing country are usually rather weak and rudimentary.
- (2) Economic forecasting has to take greater account of natural conditions such as weather which affect crop production but are of less significance in an industrialized economy.
- (3) The financial and monetary system in developing countries is usually fairly simple and of an uncomplicated nature; movements in the financial and monetary flows may be less indicative of economic conditions.
- (4) The sources of data are weak: few enterprises are able to provide information on what transpired in the immediate past or to make forecasts for the immediate future.
- (5) The "psychological" impact of developments in other economies is not so immediate because the institutions through which this works are weak.

2. This paper discusses short-term economic forecasting methods used in Kenya and the data collected for these. The discussion can be placed in better perspective by indicating briefly the economic structure within and for the management of which economic forecasting is undertaken. A quarter of GDP is made up of non-monetary product and about 15 per cent of "general government". In the rest (60 per cent of the total) manufacturing accounts for 10 per cent of GDP, agriculture for 15, wholesale and retail trade for 10 and transport and storage and communications for a similar proportion. There is a thriving but highly seasonal tourist industry. Ten per cent of the population lives in urban areas. Exports which are about 20 per cent of GDP consist largely of agricultural or derived products. About 30 per cent of total exports, consisting largely of manufactures, go

to the other partner states within the East African Community. There is a fairly serious employment problem. The bulk of enterprises are either family firms or branches of foreign firms and very few shares are quoted in the local stock exchange. Building and construction accounts for about 12 per cent of capital formation and is an important outlet for domestic investible funds. The level of stocks, particularly of imported goods, held by distributors is an important indicator of businessmen's attitudes.

3. Given these features of the economy and the general characteristics of the developing country situation mentioned earlier, collection of data for short-term forecasting in Kenya is concentrated on the following:-

- (1) the level of sales
- (2) employment
- (3) capital expenditure
- (4) stocks
- (5) commodity supplies and prices
- (6) building plans
- (7) tourism trends

The first four items are obtained from a Quarterly Business Expectations Enquiry (B.E.E.). Data for the rest are collected separately as part of routine information obtained by the Statistics Division. For data not collected as part of the B.E.E., the "forward" element, although obtained, is less specific.

4. The Business Expectations Enquiry was started in 1964 at the request of economic planners who were anxious to assess short-term movements and to discern future trends within the economy as a whole and also in its major sectors. In its development since 1964, the inquiry has undergone several changes. The original objective extended beyond the "short-term" and visualized forecasting up to two or three years ahead. However, this longer horizon was subsequently abandoned as assessments made by the firms concerned for up to two or three years ahead were highly unreliable. The original enquiry had also laid more stress on the structure of employment by job category. However, job category classifications have also been eliminated, partly in the interests of simplification of the survey both for those who supply information and for those who have to analyse it as quickly as possible.

The sectors included in the inquiry are:-

- (1) Mining and Quarrying
- (2) Manufacturing

- (3) Building and Construction
- (4) Electricity
- (5) Commerce
- (6) Transport, Storage and Communications
- (7) Services

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Agriculture is a notable omission. However, this does not mean that no data on the sector are obtained for short-term forecasting purposes. What is excluded is the inclusion of farming enterprises as such. Agricultural commodity transactions are included through "commerce". A good deal of information on agriculture is also obtained direct from the statutory marketing corporations and independently of the B.E.E. Account is also taken of the other factors which influence the agricultural out-turn - weather, international commodity prices, etc.

5. Some of the public sector bodies with enterprise functions are included in the survey but others are not.

6. For the private sector, there is complete coverage of all firms in which 50 or more persons are engaged. In addition, a sample is taken of firms with 20 to 40 persons. For mining, manufacturing and building and construction the sampling fraction is 25 per cent and for the other sectors 20 per cent.

7. In its evolution since 1964, perhaps the most notable feature of B.E.E. has been its gradual simplification by a reduction in the questions asked. In fact, this has represented a scaling down of the ambitions behind the original conception of the inquiry. Information is now requested on actuals and expectations for employment, sales and stocks every quarter and capital expenditure in the fourth quarter only. The questionnaire also includes a column for the previous year. The "expectations" requested vary from six to fifteen months ahead, depending on the quarter. For example, at the end of the 2nd quarter 1970 firms were asked to make estimates up to the end of the year, whereas at the end of the 3rd quarter, forecasts were required up to the end of 1971. The total number of firms covered is about 700.

8. Results are available both in absolute terms and in the form of a simple index which has the 4th Quarter 1967 as its base year. Aggregation is at the one-digit level for all sectors except manufacturing for which it is done at the two-digit level also.

9. Until recently, the results of the inquiry tended to be used more to determine what had just happened than to forecast ahead. However, the inquiry was recently given careful scrutiny with a view of revisions which would enable for reliable forecasts to be made. These led to changes in procedure for selection of firms, changes in the weighting system used and dropping of the chain index formally employed. Although this has created a discontinuity in the series derived from the inquiry this is not so important in inquiring whose primary purpose is to enable short-term assessments and forecasting.

10. Checks of reliability of the forecasts made after those changes show a distinct improvement. Overall, taking of firms together, it would seem that they are able to estimate the next quarter's sales and employment to within eight per cent of actuals. Beyond the first quarter the margin of error begins to widen. But for two sectors, manufacturing and commerce there is an encouraging degree of reliability even for yearly forecasts.

11. The enquiry is the basis of a quarterly assessment of the economy made by the Statistics Division. Formal presentation of this assessment is in a Quarterly Economic Report issued by the Government. The enquiry has been invaluable in enabling estimates of gross domestic products to be made well before the end of the year. Data derived from it have also been used to fill response gaps in other inquiries.



SHORT TERM ECONOMIC FORECASTING AND  
MINIMUM DATA REQUIREMENTS

The New Zealand Survey of Overseas Orders and Payments as an Example of Short-Term Forecasting.

1. One of the statistical developments recommended by the Technical Committee on Statistics which carried out a review of official statistical services in New Zealand (see the New Zealand paper on provisional agenda item 5(a)) was an increased range of short-term statistical projections. Development work on this project has been commenced, but progress has not as yet been sufficient to permit a general formulation of the problems involved, methodological advances and data requirements. The Department of Statistics has in the past concentrated on demographic and related projections of key economic significance. Because of the major difficulties involved, short-term projections of direct economic aggregates have been viewed with caution, it being considered that statistical services generally could be brought into an unfavourable light if short term projections were prepared which did not prove to be realistic. This attitude is changing, however, as is evidenced by the Technical Committee's recommendation.

2. The following material relates to a survey of overseas orders placed by New Zealand importing firms which has served as a basis for short-term projections of overseas exchange payments for private imports. New Zealand's open economy, with its relatively large dependence on overseas trading, has made this survey of great value for economic policy review purposes within the New Zealand Government.

3. The Department conducts a sample survey of overseas orders placed and payments made by importing firms. This survey was instituted for the express purpose of providing a basis for forecasts of private import payments. This survey is a monthly one, covering firms which, in total, import approximately 50 percent of all private imports. Each month these firms supply the following two figures:

- (a) Estimated total value c.i.f. in New Zealand currency of firm orders placed direct with overseas firms during current month (whether for delivery to other New Zealand firms or for the firm's own trading stock).
- (b) Value in New Zealand currency of all payments for goods made to overseas firms during the current month. (Irrespective of when the goods were ordered or imported and whether for delivery to other New Zealand firms or for the firm's own trading stock).

The method of projection of private import payments uses the orders figures obtained from (a) above.

4. Shortly after the survey was begun in 1961 it became apparent that there was no satisfactory correlation between the month by month totals of overseas orders placed and the month by month totals of private import payments. Nor were correlations improved by grouping the ordering firms according to commodity type. After a great deal of preliminary investigation, a separate statistical study of the time lag between orders and payments for each firm in the sample was made. The procedure used was one which would not have been feasible without the use of the Department's computer. In brief, records of each firm over some three years were analysed and correlation co-efficients produced for each, first on the basis of no lag between orders and payments, then on the basis of one month lag between orders and payments, then on the basis of two months' lag, and so on, up to eleven months. On the basis of these correlation co-efficients it was possible to decide which was the most likely time-lag between orders and payments for that particular firm. The firms were then grouped according to their most likely time lag. (There was an unimportant small residual of firms for which no lag pattern could be distinguished.)

5. Separate import payments estimates are made for each time-lag group. On this basis it has been possible each month to make reasonably satisfactory projections of private import payments for each of the coming six months.

6. Each month the orders are summarised according to their lag patterns. These are added to similar figures for the preceding ten months so as to arrive at the total payments which could be expected to fall in particular months in the future. The projections are calculated for each of the following six months of the future. At this point the Department has six figures which relate only to the surveyed firms. These figures are then converted into projections of Reserve Bank private import payments by applying a ratio. The ratio is fixed by experience accumulated, from the past, of relationships between similarly prepared figures and actual Reserve Bank figures.

7. Recent Performance. The projections have been in reasonably close correspondence with actual figures up until May of this year. In June, however, it was found that the projected payments figure was well below the actual figure for payments made through the Reserve Bank. A detailed examination of the projection was made but did not reveal the cause of the discrepancy. It did appear, however, from this review that the July projection would also considerably understate actual payments. This has now been confirmed. The current understatement by the projections may be purely a temporary fluctuation, or it may result from a general change in importing patterns. The information as yet available gives no definite indication as to which is the case.

Short Term Economic Forecasting and  
Minimum Data Requirements

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1. The importance of realistic projections in economic planning can hardly be overemphasized. Even in capitalist economies where supply is supposed to match demand through price mechanism, utility of projections is widely recognized. In a planned economy, a number of projections are needed. Population projections, income projections and demand projections for important commodities are among the important projections which are essential for effective planning. In economies which have a shortage of trained personnel, manpower projections also assume great importance.
2. These projections, by their nature can not be very accurate or precise. Various factors are responsible for this. In the first place many economic variables are functions of unpredictable factors. For instance, national income partly depends upon rainfall. Lack of accurate and adequate data is another important factor, which causes many inaccuracies. Though it is an admitted fact, that projections can not be 100 per cent accurate, they lose all practical importance if the margin of error or uncertainty is very large.
3. It is therefore necessary that the margin of error and uncertainty is reduced to a minimum. For this, availability of accurate and sufficient data is essential. As stated earlier, there are certain projections which are important for any meaningful planning. The most important perhaps is population projection because it is the welfare of the population which should be the ultimate aim of planning apart from being a factor of production. Hence, it is necessary to have data on birth rate, death rate, projections of demand for consumer goods etc.

SHORT TERM ECONOMIC FORECASTING AND MINIMUM  
DATA REQUIREMENTS

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1. The UK paper submitted under 5(a) has described the institutional arrangements for and the involvement of statistical staff in the medium term economic forecasting. The present paper is confined to discussion of the short term forecasting work, which is of considerably more immediate importance for policy purposes and which functions in a somewhat different way from the medium term arrangements. The following three paragraphs outline the short-term forecasting procedures and the data requirements imposed by these procedures. The next sections consider in more detail some of the more important groups of data which have to be fed into the forecast in its initial stages, and the last two sections indicate the way in which the various strands of the work are drawn together into one consistent over-all picture.

2. More detailed accounts of UK short-term forecasting are available elsewhere (see Bibliography. 1-5). There are normally three major short-term forecasting exercises each year, taking place in June/July, October/November and January/February. A forecast normally takes 6-7 weeks to complete and relates to a period of  $1\frac{1}{2}$  to 2 years ahead. The forecasts are prepared under Treasury leadership using the framework provided by the national income and expenditure accounts, the balance of payments accounts and the financial accounts, and statisticians involved in the preparation of these and of other basic forecasting material are intimately involved in the whole forecasting procedure. The forecast endeavours to incorporate all known policy decisions, whether in the field of public expenditure, or of fiscal policy, monetary policy, etc.

3. At the end of each exercise, forecasts are presented of:

a. the quarterly seasonally adjusted path of the main items of final expenditure at constant (currently 1963) prices, and also of employment and unemployment and the retail and consumer price index.

b. the quarterly path, both seasonally adjusted and unadjusted, of the main components of the balance of payments, at constant and also current prices.

c. the current price equivalents of the constant price final expenditure items and the components of total domestic income, together with complete current and capital accounts (quarterly, not seasonally adjusted) for the personal, company, public corporations, central government and local authorities sectors.

d. also quarterly, not seasonally adjusted, the financial flows between these sectors, with the company sector further broken down into banks, other financial institutions and industrial and commercial companies. The borrowing requirements of the central government and public sector are also derived.

Work on (a) and (b) proceeds concurrently until consistency between the two is reached; (c) and (d) follow successively. But there are intermediate stages where the current price implications of the interim constant price picture are taken into consideration.

4. It is obviously a fundamental requirement to have as accurate as possible quarterly accounts for the past, both to provide a firm starting-point from which to project into the future and for the establishment of reliable econometric relationships between the major variables which are to be determined endogeneously and those which will be fed into the forecast as exogeneous variables. In addition there is needed:

1. the most up-to-date view possible of the present position of the economy, with provisional estimates ('running actuals' which incorporate varying amounts of firm information) to fill the gap between the latest firm quarterly accounts and the date of commencement of the forecast.

2. forecasts of the variables to be determined exogeneously.

The final forecasting picture is then produced from (1) and (2) together with the relationships for determining the endogeneous variables and any feedback effects between the successive stages of the forecast.

#### Recent Trends in the Economy

5. The United Kingdom short term forecasting process derives from and is uniquely bound up with the available quarterly national accounts data. Certain features of the quarterly accounts, however, need to be supplemented at the outset of the forecast. GDP data at constant prices is available quarterly based upon the three measures, expenditure, income and output; the GDP aggregate used both for the analysis of past relationships and for forecasting purposes is a series of compromise estimates representing a weighted average of these three measures. The components of total final expenditure are reconciled with the compromise GDP estimate by a process of smoothing to remove distortions and allocation of the remaining adjustments normally to consumers' expenditure and stockbuilding.

6. There is also a problem of the timeliness of the national accounts information available. Full accounts are provisionally compiled some eleven to thirteen weeks after the period concerned but currently the attempt is being made to provide more rapid estimates based upon early returns or monthly data. The most successful attempt so far is with preliminary estimates of the quarterly series of consumers' expenditure which are first released about two weeks after the period concerned; but running actuals are now compiled for all the other components of expenditure GDP, and for personal disposable income, expenditure and savings.

7. The early estimates of consumers' expenditure are built up as follows (see also Bibliography, 10):

An early preliminary estimate in terms of constant prices, seasonally adjusted, based predominantly on data for the first month or first two months of the quarter, or on closely related indicators, is available in the first month after the end of the quarter. These estimates, though liable to be appreciably wrong from time to time, usually provide a fairly reliable guide to the behaviour of consumers' expenditure in the quarter just completed. The estimate is published about four weeks after the end of each quarter. Four weeks later, a second preliminary estimate is published, together with

estimates for each of the main categories of consumers' expenditure, in some categories based on the experience of the full quarter, in others on methods very similar to those used in the first preliminary estimates. A firmly based estimate is published thirteen weeks after the end of the quarter.

The preliminary estimates are given at constant prices mainly because this series is more useful in assessing recent developments in the economy. They can also be compiled more easily in these terms; many of the early indicators on which the estimates are based are in quantity or volume terms, so that the preparation of figures at current prices involves an additional element of estimation.

The preliminary estimates, in the same categories as the published quarterly figures, start from a mechanical application of regression equations, using the experience of recent years, to indicators for the first one or two months of the quarter.

As a check on the first preliminary estimates built up in detail, regression equations have been calculated between the seasonally adjusted volume index for total retail sales and the total of the items - food, tobacco, clothing, durable goods (other than cars) and other goods - which in principle fall within the ambit of the Board of Trade retail sales series. Two equations are considered, the first taking separately total sales in each of the first two months and the second taking an average of the two months. The first equation is treated with reservation since, over this period, the coefficient for the first month is substantially greater than the coefficient for the second, a phenomenon which is difficult to explain in the light of the rising trend of expenditure. Where appropriate the first preliminary estimates are adjusted slightly in the light of the regressions of the total volume of retail sales.

#### Exogenous Components of final demand

The first stage of the forecast proceeds by a series of small working parties to discuss proposals for forecasts of the main exogenous variables. The main exogenous variables are exports of goods and services, public authorities current expenditure on goods and services, public authorities fixed investment, private sector house building and other private sector fixed investment. In a slightly different category comes a forecast of the behaviour of the hourly wage rate index, which contributes later on to the forecast of the level of earnings.

The methodology involved in the forecasting of exports has been described in detail (see Bibliography, 4) and is based primarily upon a detailed study of the economic prospects for the main United Kingdom export markets. The resulting exogenous forecast is of demand for exports and may be modified when all the competing demands upon resources are considered.

The initial forecast of the remaining exogenous variables depends to a greater or lesser degree upon the interpretation of particular forward indicators and surveys of business intentions. What follows describes in

detail the special data provision associated with forecasts of (a) public expenditure, (b) private investment, and (c) the wage rate index.

#### Public expenditure

12. The planning and control of public expenditure programmes is of course a major concern of central government departments, particularly the Treasury. In the United Kingdom the basic structure of information derives from the 1961 report of a committee on the control of public expenditure (the Plowden Report; see Bibliography, 6) which recommended that, "regular surveys should be made of public expenditure as a whole, over a period of years ahead, and in relation to respective resources; decisions involving substantial future expenditure should be taken in the light of these surveys." A revised statistical framework was subsequently developed to permit development along these lines. The principle features are:

- i. the whole of public expenditure, including outlays by the national insurance funds, local authorities and the capital expenditure of public corporations, are brought under review;
- ii. estimates of expenditure defined are made for five years ahead, not just for the one year covered by the initial Supply Estimates;
- iii. the level and pattern of public expenditure are considered in relation to their demand on resources based upon information in the various annual surveys.

13. Thus the Treasury control of public expenditure is intimately connected with the constant price forecasting structure as part of the management of the economy as a whole. As part of a regular pre-Budget exercise, each department of the central government returns estimates of the expenditures for which it is responsible, covering a five year period, starting with the current year. The main forms used in the survey provide for the recording of the forward projections and of the estimates of past outturn by national accounts category and spending authority, supplemented by occasional additional analysis, e.g. of the asset composition of gross domestic fixed capital formation (for industrial implications) and of overseas transactions (for balance of payments purposes). The forecasts are adjusted to constant prices so as to reflect changes in the volume of resources concerned. The original estimates are at "Survey Prices" of the year in question; estimates at 1970 survey prices, for example, are on a basis which for most of central government and directly related expenditure corresponds to that used for the 1970-71 Estimates of Supply Services and for the remainder corresponds to the price levels of early 1970. The adjustment to 1963 prices can then readily be made. At other times in the year, less detailed departmental returns enable the latest Survey figures to be brought up-to-date, in particular to take account of decisions agreed by Ministers. (See also Bibliography, 6 - 9).

#### Private investment

14. The forecast of expenditure on private housing is built up by detailed consideration of the pattern of lags between starts and completions, backed by a half-yearly enquiry by the Ministry of Public Buildings and Works into intended starts. The building societies views on how much extra money is

likely to be deposited with them in the following 18 months, and on what the demand for their funds is likely to be, are also taken into account.

15. Private industry's fixed investment is forecast mainly by reference to a regular survey of investment intentions analysed into three broad groups: manufacturing industry, distributive/service industries, and the shipping industry. For a detailed description of the procedure for manufacturing industry, see Bibliography, 11. Briefly, contributors to the regular quarterly capital expenditure enquiries (conducted as part of the structure of economic indicators) are also asked in a separate enquiry for forecasts of their expected capital expenditure on fixed investment. The unit of reporting is the business unit and investment intentions in calendar year  $t$  are reported in four quantitative enquiries (November/December of year  $t - 2$ , August/September of year  $t - 1$ , November/December of year  $t - 1$  and August/September of year  $t$ ) and two qualitative enquiries (May/June of years  $t - 1$  and  $t$ ). The respondent is asked to report all intended capital expenditure on assets for use or installation in the United Kingdom, under the asset headings: new building work (including substantial improvements and alterations to old buildings); vehicles; and plant and machinery and all other capital equipment. The enquiry, like the quarterly enquiries into actual expenditure, is conducted on a voluntary basis but most of the major businesses supply information. The results of the enquiry are not satisfactory for use unadjusted; but comparisons have been made over a considerable number of years between intended and actual expenditure, and the persistent biases in the returns - e.g. a tendency always to over-estimate next year's expenditure - can therefore be corrected for.

16. For manufacturing the bias has been fairly consistent so that the adjusted forecast is fairly reliable. The forecasts for the distributive and service industries have been much less consistent, and although a similar approach is used it does not yet produce as satisfactory a result. One reason is that the sample for distribution is smaller and less representative than for manufacturing. But also the nature of distributive and service industries is such that they appear to have felt less need than manufacturing for the discipline of planning capital expenditure a long way ahead, perhaps because the capital equipment used consists of smaller items of plant for which planning or contracting is less necessary. Although almost the whole of the shipping industry is virtually completely covered in the enquiry these forecasts also have proved rather worse than those in manufacturing. This is thought to be partly due to the domination of the industry by a small number of large companies so that there is little scope for the errors in the forecasts to cancel out; but the forecasting record by individual companies has not been good, which is surprising in view of the long period of construction of most ships. There are indeed erratic movements in the timing of payment as well as unexpected changes in the actual amount of work done.

17. Clearly, what the intentions enquiry is measuring is the expectations at certain points of time of what the firms think they are likely to spend in a particular year. These expectations change not only because firms have different outlooks of different time, or because they are improving their forecasting techniques; but also because they reflect in part real shifts of plans to take account of different circumstances both outside and inside the firm. These changes and circumstances may cover quite a wide range of events. The outside changes may be in the country's general economic situation or national economic policies, changes in taxation, changes in investment incentives, expected changes in demand for a certain product,



changes in the ability of the capital equipment producing industries to meet demands at a particular time and irregular breaks in technological processes, and changes in the likely availability of finance for investment. There is also no precise knowledge of the price basis on which the forecast is made. Hence, it is difficult to assess the overall predictive value of the intentions enquiry.

#### Hourly wage rate index

18. The Department of Employment and Productivity carries out a regular sample of major negotiating units involving 10,000 or more workers in order to investigate the probable future trend of the wage rate index. The units reporting are divided into three categories.

a. those covered by settlements already reached on wages council proposals issued, where the timing and amount of wage increases agreed is known firmly.

b. those covered by settlements so recently agreed that information is incomplete but a reasonable estimate can be made of the size of increase.

c. the remaining group; for these the forecast of wage rates is determined partly by reference to cases where claims have already been presented and partly by the general level of increases being currently granted.

#### Endogeneous variables and the iterative forecasting procedure

19. The forecast of wages and salaries is built up from the exogeneous estimate of the hourly wage rate index by combining it with forecasts of the earnings drift and of the number of wage and salary earners, the latter of which will be related to the total labour force available and the proportion of this employed at a given level of the pressure of demand. Consumers expenditure which on the one hand forms one component of pressure of demand on the other hand is also itself closely related to the level of wages and salaries. Reiteration at this stage of the forecast therefore proceeds until the forecast change in demand, including consumers expenditure, is consistent with that level of output and so of wages and salaries which within the personal account will generate exactly that level of consumers expenditure. This process thus leads on to a forecast in money terms of the personal sector income and expenditure account, and also, for converting consumers expenditure to a constant price basis, the establishment of relationships from which a consumer price index can be derived. This needs to be related back, with appropriate time lags, to the forecast increases in costs.

20. The other main variable determined endogeneously is stockbuilding; this is forecast principally from regression equations which relate current levels of stocks in a stock adjustment equation to levels in earlier quarters and also introduce changes in consumers expenditure and GDP. Equations are fitted separately for manufacturing, wholesale and retail stocks; other stocks are forecast on an ad hoc basis.

## Current Price and Financial Forecasts

21. Reasonable relationships are available for the other price indices needed to convert the other items in the constant price forecast into current price terms. The revenue departments contribute forecasts of taxes on income and expenditure, split where necessary by sector, which are consistent with the macro-economic aggregates so far forecast. Other transfers between sectors, and the flows of rent, dividends and interest, are forecast following broadly the same lines as in the compilation of the national accounts. In this way stage c. of paragraph 3 is completed, leading to current and capital accounts of the sectors there mentioned, and with resultant forecasts of the financial surpluses or deficits of these sectors, together with forecasts of the borrowing requirements of the sub-sectors of the public sector (see Bibliography, 5, for further details).

22. The financial surpluses, borrowing requirements, etc. form the starting point for the financial forecasts (stage d. of para 3) where the attempt is made to forecast the flows of funds between the sectors, analysed by type of asset. The methodology of this stage is still very much in its infancy; much work remains to be done. Two possible lines of approach offer hope for the future: one is more intensive study of the savings behaviour of the personal sector, its asset structure and the implications for the various financial transactions of the private sector, which may involve resort to direct enquiries into the savings habits of persons. The other is via the possible extensions of national accounts work to include the construction of balance sheets of real and financial assets and liabilities held by the different sectors of the economy; it seems possible that more satisfactory relationships might be obtained if stocks as well as flows of assets can be incorporated into the study of past behaviour. Despite its difficulties financial forecasting is of great importance since from it emerge forecasts of money supply and other operational money aggregates, whose future movements may be subject to policy limits and the levels of which may have feedback implications on earlier stages of the forecast.

### Inter-relation of stages of forecast

23. Although the present method of forecasts is in principle linear from the constant price to the financing forecasts, the iterative method of proceeding for the first stage means that there are breathing spaces in the process whereby the provisional pictures emerging from the next two stages can be fed back into the process - the provisional forecasts of company profits which are obtained as a residual in the total domestic income picture may look implausible and suggest alterations to the price forecast, or a large negative financial surplus in the company sector can indicate the need to take a more pessimistic view about investment intentions or stockbuilding. The flow of funds forecast may similarly suggest that there is no plausible way of financing the deficit which has emerged without violating other policy targets. In particular the forecast of money supply and its related velocity of circulation may indicate deviations from recent trends which are in themselves implausible and again lead to revision of earlier decisions.

24. The present procedure for allowing for feedback effects is not satisfactory as allowance can often only be made in a qualitative way for such effects. This has stimulated the attempt which is currently proceeding to formalise rather more of the forecasting procedure, at least to the point of producing national income and expenditure accounts in money terms. As more understanding is obtained about the inter-sectoral flows of incomes and finance, no doubt these parts also of the procedure will be formalised.

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