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SAVINGS IN THE INDIAN UNION (1949-50 - 1954-55)

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1. An attempt is made in this note to present estimates of savings in the economy over the period 1949-50 to 1954-55; the year 1948-49 is not covered because adequate information is not available due to the partition of the country a year earlier.
2. The estimation of savings can, theoretically, proceed either on the basis of data on income and consumption or on the basis of enumeration of changes in financial assets and liabilities, except in cases where savings are transformed into investment without the creation of an equivalent financial asset. Neither of these methods has been used for the economy as a whole, though logically it would be desirable to do so. Actually, recourse is necessary to both these methods for the estimation of the savings of the various sectors in the economy owing to gaps in information. This raises problems of double counting which have to be avoided. Even so, there are gaps and imperfections in the available information, and the estimates presented here are subject to errors of an unknown magnitude.

Savings of the Government Sector

The economy has been divided, for the purpose of this study, into three sectors: government, corporations and households. The Government sector includes the Central and

State Governments and commercial undertakings owned and operated by them, as well as local authorities. The undertakings of Government include not only industrial enterprises but such bodies as the Reserve Bank of India. The corporate sector comprises all companies registered under the Indian Companies Act. Households comprise individuals and un-incorporated enterprises as consumers. The division of the economy into these three sectors is usual for two reasons; it helps to focus attention on the magnitude of saving by the three fundamental operating categories; and secondly it helps to break down savings into convenient compartments for the purpose of estimation.

4. Savings of the government sector may be identified with the surplus of current transactions in goods and services by the Government and are the same as the estimate of government savings derived for purposes of national income accounting. Accounts of all government administrative entities and enterprises (i.e. the Central Government, the State Governments, local bodies like Municipalities, Port Trusts, and government enterprises like the Railways) are analysed by the National Income Unit (NIU) and data relating to savings are readily available. The NIU estimates of savings of Government include the current surplus of Government enterprises (i.e. surplus over and above the transfer of dividends, e.g. by the Railways, payable to Government). The surplus of Government commercial undertakings can, in theory, be included either in the savings of Government or of the corporate sector; by and large, however, Government commercial undertakings are not organised as corporate bodies, and hence, it is preferable to show all Government enterprises in the Government sector. The estimates of Government savings for the period 1949-50 to 1954-55 are given below:-

Table (1) : savings of Government

Year	Rs. crores
1949-50	103
1950-51	142
1951-52	226
1952-53	112
1953-54	97
1954-55	708

Savings of Corporate Enterprises

5. The savings of corporate enterprises can be estimated in two ways: (i) by an analysis of profit and loss accounts and balance sheets of companies and (ii) by an analysis of income-tax data. The undistributed profits of corporate enterprises can be derived indirectly from income-tax data. The 'All India Income-Tax Revenue Statistics' gives details of incomes of all assesses charged at company rates of income-tax, together with their tax liability. In deriving income assessable to tax, however, depreciation is allowed for at the rates permitted under income-tax rules. To the extent that the actual provision of companies differs from that allowed by the income-tax authorities, there would be a discrepancy between the actual savings of corporation and savings derived from income-tax data. A similar discrepancy would be caused by the difference between the tax demand and the tax actually paid.

6. We thus derive corporate income after tax, out of which dividend can be distributed. The value of dividends distributed is separately available from the tax data. This figure is a slight underestimate of total dividend payments because these are calculated from returns filed by assesses and therefore, may not fully include the dividend incomes of

\*Based on an estimate prepared by the Board of Directors.

those who are not subject to tax because their total incomes are below the exemption limit. In fact, the available data till 1952-53 are subject to this limitation but from 1953-54 separate estimates of dividends received by persons with incomes below the exemption level are available. These estimates are fairly accurate because companies distribute dividends after deduction of tax at the maximum rate, and those below the exemption limit have to claim a refund of income-tax if they do not wish to pay the tax. However, this is not fully comprehensive, because such claims for refund need not always be made. Estimates of dividend payments for the years prior to 1953-54 have been revised upwards on the basis of dividend incomes of persons below the minimum exemption level for 1953-54 and 1954-55. Deducting total dividend payments from income after tax, we get the undistributed profits of corporations or corporate savings.

7. Income-tax data have another limitation; the income of companies assessed to tax at company rates includes the profits of the branches of foreign companies. Undistributed profits calculated in the above manner would include the profits remitted abroad by these branches, and to that extent the savings of corporations as also total domestic savings would be an over-estimate. The profits retained in this country by branches and subsidiaries should also be deducted from undistributed profits as calculated above in order to obtain national savings. The retained profits of branches and subsidiaries will, however, be tantamount to borrowing from abroad and should therefore find a place in our transactions with the rest of the world.

8. Data regarding the profits remitted abroad by branches of foreign companies for 1952-53 have been worked out by the Reserve Bank of India (REI Bulletin, January 1956). On the basis of these estimates and the figures of total investment income payments recorded in the balance of payments, profits

the estimates of savings derived from income-tax data.

Reinvestment of profits of branches and subsidiaries over the period, July 1948 to December 1953 has been estimated by the Reserve Bank at Rs. 60 to Rs. 70 crores (Survey of Foreign Assets & Liabilities), i.e. an annual rate of Rs. 11 to Rs. 12 crores, and these have been adjusted accordingly.

9. Corporate savings can be estimated in another way.

Until lately, a rebate of one anna per rupee was granted to all public limited companies on the total amount of undistributed profits. The total loss in revenue on this account is given in the 'All-India Income-Tax Revenue Statistics', from which the total undistributed profits of public limited companies can be estimated. This provision was applicable only to such companies as had made arrangements to distribute dividends in this country, but, not to private limited companies. Since subsidiaries and branches of foreign companies are not likely to make such arrangements, the estimate of undistributed profits is likely to be close to the figure of savings of the domestic corporate sector. But to the extent that it leaves out of account private limited companies, the estimate as derived above is likely to be inadequate. Private companies are required by law to distribute the whole of their profits when their reserves are equal to their paid-up capital, and the adequacy of this estimate of undistributed profit of corporations really depends upon the number of companies below this limit, and the extent of their saving.

10. A third method of estimating corporate saving is by an analysis of profit and loss accounts and balance sheets of all companies. However, available analysis of company balance sheets, are on a strictly limited sample basis and are rather inadequate in coverage, and do not also extend to the period desired. The estimation of the undistributed profits of all companies on the basis of the scrappy company data available would be rather risky.

11. The estimate of undistributed profits by the first method has been used in this note. Since this relates only to joint stock companies, savings of cooperative institutions have to be added to obtain total savings of the corporate sector. Data relating to cooperative societies are available only up to 1952-53 and the figures for 1953-54 and 1954-55 have been estimated on the basis of past trends.

Table (2.1): savings of joint stock companies.

Year	income assessed to tax	tax payable	dividends	(Rs. crores)	
				branch profits remitted & retained; and retained profits of subsidiaries	savings of joint stock companies
1949-50	186	80	41	21	44
1950-51	146	70	40	20	16
1951-52	200	92	57	24	27
1952-53	200	102	50	25	23
1953-54	220	96	60	30	34
1954-55	198	87	63	26	22

Table (2.2): corporate savings

Year	(Rs. crores)		
	jt-stock cos.	cooperatives	total
1949-50	44	5	49
1950-51	16	4	20
1951-52	27	7	34
1952-53	23	7	30
1953-54	37	7	41
1954-55	22	8	30

Personal savings and savings of unincorporated enterprises

12. The method used for estimating government and corporate saving has been to derive the difference between their income and current expenditure. This cannot



be used for estimation of personal saving because no comparable information is available about personal expenditures on consumption. But since savings of individuals must be held in some form or the other an estimate of such savings can be made by tracing the changes in the value of assets in which these savings are held. The forms in which personal savings are held can either be financial assets like securities, shares, insurance policies, or physical assets like house property in which savings have been directly invested and which have no financial counterpart, or liquid assets like gold and cash. To the extent that saving can liquidate a financial liability, or to the extent that assets can be acquired with the help of a debt, the estimate of saving should take into account the increase or decrease in liabilities of persons. However, changes in inter-personal obligations cancel out and, therefore, only the changes in the obligations of persons to corporations (like banking institutions) or to Government are relevant in this connection.

13. Personal savings have been divided into two broad categories; financial assets and physical assets. Financial assets can be further subdivided into: (i) liquid assets, like cash and deposits with banks and gold; (ii) contractual saving, like insurance payments, provident fund contributions, pension payments, social security payments; and (iii) other financial assets like government securities, national savings certificates and other savings transferred to government; and industrial shares and securities. Physical assets resulting from direct investment of saving will include residential construction, improvements in agriculture

for/.....

(for which estimates are available), and investment by unincorporated enterprises.

Savings in the form of liquid financial assets

14. The increase in the liquid savings held by individuals has been estimated by taking into account (i) the changes in the notes and coin in circulation less currency with banks and joint stock companies and currency at treasuries; (ii) changes in bank deposits held by persons and (iii) the net absorption of gold. The estimate of changes in currency in circulation has been taken over from the figures published by the Reserve Bank of India and they are exclusive of currency with banks and with the treasuries. It has been assumed that the cash holdings of corporations other than banks remain constant over time so that net changes in currency in circulation are taken to represent changes in personal cash holdings. In any case, their holdings are so small that errors arising out of neglecting them are not likely to be significant.

15. The treatment of increased supply of currency over a year as saving during the year begs the question that increased currency circulation may well result from people selling off physical assets to banks or government and acquiring money, in which case there is no net saving in the community. Thus, while increased currency supply can be defined as saving, correspondingly, any decline in personal holding of physical assets has to be treated as a deduction on the estimate of savings. This problem is a general one and affects the acquisition of all financial assets. No allowance has been made for this because there is no information available on the subject.

16. The deposit liabilities of the commercial banking system include deposits of corporations and other institutions as well. To arrive at an estimate

of personal deposits these have to be taken out from total deposit liabilities. Use has been made of the Reserve Bank of India's Survey of Ownership of Deposits to arrive at this figure. Deposits with cooperative institutions have been added to these to obtain total deposits. An adjustment for non-personal deposits should have been made for cooperative institutions also but has not been done because of lack of information about these. It should be noted that deposits here include both time and demand deposits. This should be adjusted for any increases in bank advances - creation of credit should not be confused with the generation of savings - and the adjustment has been made later, as an offset to saving in the form of increase in liabilities. As a limitation to the data presented here it may be noted that deposits with cooperative institutions are not available for the years, 1949-50, 1953-54 and 1954-55. They have been estimated on the basis of data for the years 1950-51, 1951-52 and 1952-53.

17. Finally, the treatment of the net absorption of gold raises both theoretical and practical issues. Is holding of gold and silver saving? It is well known that gold and silver ornaments are a way of holding savings in India, especially in the rural sector. These ornaments are liquidated in times of distress, and therefore their value has to be treated as saving. The difficulty arises in trying to find a corresponding category on the side of capital formation. The United Nations study, 'Concepts and Definition of Capital Formation', recommends treating increases in private gold hoards as foreign investment. To the extent these gold hoards are held

the monetary authorities, they cannot be treated as lending abroad. However, the justification for this treatment is that in a national emergency this gold can be mobilised by government and can therefore be looked upon as the country's potential monetary reserves. That they deserve the purpose of monetary reserves in an emergency can be seen from the distress sales (abroad) of gold from India during the Depression of the thirties.

18. The estimation of gold absorption is beset with difficulties because legally no imports of gold are allowed. It is known, however, that there is some gold inflow into the country through smuggling, payment for which is made, by smuggling out Indian currency, to the Persian Gulf territories, which is repatriated later on. Part of the currency repatriated is, however, due to the expenditure of Haj pilgrims. Their expenditure is estimated at about Rs. 2 crores annually. The difference between the total Indian currency repatriated from Persian Gulf territories and the expenditure of Haj pilgrims is taken to be the value of gold smuggled into the Indian Union. Finally, the domestic production of gold sold in the market has to be added to the import of gold.

19. The estimates of increases in currency holdings, bank deposits and deposits with cooperative institutions by persons, and of the net additions to private gold hoards, are presented below:

Table (3): liquid saving

Year	(Rs. crores)			
	currency	deposits	gold	total
1949-50	-1	-1	8	6
1950-51	88	-9	17	96
1951-52	-115	21	25	-69
1952-53	-17	14	32	29
1953-54	30	24	21	75
1954-55	82	41	11	134

Financial assets acquired through contractual saving

20. Personal saving through insurance premiums paid raises some conceptual problems relating to their estimation. A part of the premium is undoubtedly a payment for the service rendered by the assumption of the risk on the life of the insured and therefore an imputed deduction has to be made from the total premiums paid. Two methods are open to us: (i) the expenses of management of insurance companies may be assumed to equal the imputed cost of insurance, adjusted for the claims paid and accruals of interest on past saving which have not been distributed to policy holders; and (ii) the increase in the life-fund of the insurance companies, which signifies the insurance companies increased liability towards policy holders. In the present instance, the increase in the life-fund, which takes into account all incomings and outgoings, is considered to give the best index of the change in the assets of persons arising from the holding of life insurance policies.

21. As regards Provident Funds, figures are available only in respect of Government employees with the Centre and the States. It is known that private institutions and organisations also have provident fund schemes and

total saving through provident funds would be higher if all these were taken into account. No attempt has been made to estimate these as the required information is not available. It may, however, be mentioned that to the extent that the receipts of Provident Funds of private institutions (like Universities, colleges, etc.) are invested in government securities, and to the extent that the holdings of those securities by the public are included in personal savings, there is no error in the estimate of savings, though there may be errors in the estimate of the form in which personal savings are held.

22. The estimates of savings through life insurance and through Government's provident funds are given below:

Table (4) : contractual savings by persons

Year	insurance	provident funds	total
1949-50	19	6	25
1950-51	20	11	31
1951-52	15	13	28
1952-53	24	13	37
1953-54	27	20	47
1954-55	29	22	51

Savings in the form of other financial assets

23. These can be of two types: government loans, and industrial shares and securities. Government loans can be further subdivided into market borrowing through the sale of government securities, small savings, and other debt. Government securities may either be long term loans or treasury bills, though the holding of the latter by individuals is negligible. It is, however, necessary to take both these into consideration, in deriving personal savings held in the form of Government

securities, because the estimate of government securities held by the public is derived as a residual after deducting from the figure of government securities outstanding, the holdings of insurance companies, banks, corporations, etc. Separate figures for the holding long and short term debt are not available. In this connection, adjustments have also to be made for government securities held by the Reserve Bank of India and the investment accounts of the Central and State Governments.

24. The holdings of insurance companies, banks, the Reserve Bank and the various Government funds are available from published sources. In the case of non-Indian insurers, figures of their investment in Government securities are not available and so an estimate has been made on the basis of the proportion of their assets to the total assets of Indian insurers. The security holdings of corporations have been estimated on the basis of studies of company finances carried out by the Taxation Enquiry Commission and the Reserve Bank after adjustment for coverage.

25. As noted earlier, no data are available regarding holdings of securities by universities, private employers etc. through their provident funds. Similarly non-private institutions, like building societies, may hold their funds in the form of Government securities. All such entities are treated as part of the household sector and their holdings of securities as those of households. To this extent, the role of financial intermediaries is underplayed but the magnitude of personal saving is in no way affected.

26. Net contributions to small savings are available in the budgets. There is a third form of personal saving taken over by the Government, arising out of miscellaneous deposits, advances and other net payments by the public. These include items like the advance

payment of income-tax, deposits by contractors, various remittances and other miscellaneous payments which, in an expanding economy, are likely to be positive over a number of years. In the First Five Year Plan, for instance, credit was taken for a total amount of Rs. 135 crores; credit for a slightly smaller sum has been taken in the Second Five Year Plan as well. A part of these, however, are repayment of loans made by the Government. These miscellaneous receipts of the Government in the "public account" constitute a withdrawal of saving of the private sector, and provide finance to Government for capital formation. These receipts, though different from market borrowings, are nevertheless of the nature of withdrawal of private savings by the Government. Logically, therefore, these receipts ought to be included in estimates of Government borrowing. However, in the present estimates, these miscellaneous (deposit and other) receipts of Government have not been included because it is felt that the savings embodied there have been covered by the estimates of personal savings invested directly - for which no clear-cut estimates are possible and recourse is, therefore, taken to arbitrary and over-all measures of saving. This has been discussed more fully in para 36.

27. The table below gives estimates of personal holdings of long and medium Government securities and treasury bills, and of miscellaneous receipts of Government, as derived from tables 5.1 and 5.2.

Table (5.1): total borrowings of Government  
(Rs. crores)

Year	long & medium term Govt. securities.	treasury bills	small savings	total
1949-50	-21	-3	25	-4
1950-51	- 4	16	33	45
1951-52	-25	-44	39	-30
1952-53	13	1	40	54



Table (5.2): non-personal holdings of Government securities

(Rs. crores)						
year	RBI	banks	ins. cos.	other corps.	State & Central Govt. investment accounts.	total
1949-50	23	-34	2	8	-8	4
1950-51	70	-17	8	-4	-30	27
1951-52	-19	-25	20	3	7	-14
1952-53	-21	9	14	-	6	8
1953-54	-59	18	5	-	-28	-64
1954-55	66	28	-	-	21	115

-: Not available

Table (5.3) : personal holding of Government obligations

(Rs. crores)			
Year	total Govt. obligations (net)	holdings by Govt. agencies & by the corporate sector (net)	personal holdings (net)
1949-50	- 4	- 9	5
1950-51	45	27	19
1951-52	-30	-14	-13
1952-53	54	8	46
1953-54	54	-64	119
1954-55	315	115	200

28. No allowance could be made in regard to holdings of commercial concerns for years after 1951-52; to that extent personal holding would perhaps be overestimated, but the error is likely to be small.

29. The other type of financial assets held by individuals are industrial shares and securities. These are estimated from data on the net increase in the paid-up capital of joint stock companies allowing for the estimated increases of bonus issues and the non personal holdings of industries/.....

industrial shares and securities. The changes in paid-up capital of companies are compiled by the Registrars of Joint Stock Companies; information on bonus issues sanctioned is available with the Controller of Capital Issues. In the absence of data on actual issues of bonus shares, it has been assumed here that such consents or sanctions of bonus issues will be equal to actual issues as such consents are likely to be always utilised for actual issue of bonus capital. Similarly, it is assumed that all consents granted to the issue of debenture capital are utilised, and these consents are, therefore, taken to represent the changes in industrial "securities". However, no allowance is made for repayments of debenture capital, as no data are readily available on these.

30. The holdings of industrial shares and securities by banks and insurance companies are available in published sources. Difficulty is experienced, however, about the subscriptions to new issues by existing companies. An estimate of such inter-company investment has been made on the basis of the company finance studies referred to above though they are not up-to-date. The sample estimates as given there have been blown up to get estimates for the whole of the corporate sector.

31. Yet another adjustment necessary in this connection is the holding of industrial shares and securities by the Government. This is necessary now in view of the increasingly greater participation of Government in industry, and of the large number of limited liability companies floated entirely on government capital. Adjustment has been made in respect of holdings of shares of Finance Corporations and some of the major undertakings of the Government such as the Sindri Fertilizers and Chemicals, Ltd., Hindustan Shipyard Ltd., Hindustan

derivation of new investment by persons in industrial shares and securities, as described above.

Table (6): personal holdings of industrial shares and securities

year	total shares and debentures.	bonus shares	holdings of corporate rate sector	(Rs. crores)	
				holding of public sector	personal holding
1949-50	110	10	16	-	84
1950-51	69	9	6	1	53
1951-52	97	11	6	20	60
1952-53	59	8	-1	6	46
1953-54	66	15	8	5	38
1954-55	56	10	12	8	26

Savings invested directly

32. Even after taking into account all the above forms of personal savings, the total magnitude of saving appears fairly small. This is because a major part of personal saving in India is invested directly by savers themselves without recourse to financial intermediaries, and therefore has no financial counterpart of the kind we have been enumerating above. The forms of saving referred to here relate to private residential construction, land improvement and investment in unincorporated enterprises, family business, etc.

33. Private residential construction has been estimated on the basis of the estimates of net construction prepared by the NIU. Thus, in respect of construction, the estimate of capital formation is identified with the saving required for construction, and the presumption is that construction activity (at least for residential housing) is financed directly by persons and of their savings. A deduction has to be made from this on account of construction financed out of loans from Insurance

Companies/....

Companies, Provident Funds, etc., because we have already taken account of these funds as savings through such financial intermediaries. This adjustment has not been made here, but shown separately as an item in the total change in the liabilities of persons, which is entered separately below. An allowance has similarly to be made for residential construction by companies. An estimate of this has been made on the basis of rough figures available in the company finance studies of the Taxation Enquiry Commission and the Reserve Bank.

34. The estimate of outlay on land improvement has, similarly, been taken over from the estimate of capital formation of the NIU, and is based primarily on the results of the National Sample Survey. Here also the deduction for improvement through loans is not made at this stage but later, in connection with changes in personal debt.

35. Savings invested by individual businessmen directly in their own business is the last item of personal saving. No information is available either regarding the rate of saving or of the likely volume of savings of such unincorporated enterprises. It has, therefore, been assumed (arbitrarily) that unincorporated enterprises plough back the same proportion of profits as corporate enterprises. The income of unincorporated enterprises has been estimated by deducting from the total income (after tax) of all business enterprises, the income (after tax) of corporate enterprises. Income-tax data, however, give information only about such unincorporated businesses as are assessed to tax and are perhaps subject to a large margin of error due to evasion. Investment out of such (evaded or exempted-from-tax) income is therefore missed by the above method. On the other hand, a portion of the saving of unincorporated enterprises has

perhaps been reflected already in personal residential construction, insurance premium and holdings of government securities and no adjustment has been made either on this account, or in respect of the income of unincorporated enterprises missed by the income tax data. In any case, the entire procedure of estimation depends upon an arbitrary assumption as to the proportion of plough-back of profits of unincorporated enterprises.

36. We had earlier noted the point that part of private savings are channelled to the Government in the form of civil deposits, advance payments of income tax etc. (cf. para 26). However, these savings must come out of either corporate or personal savings (or savings of unincorporated enterprises). Corporate savings have been based on income tax data and so take account of such deposits; to the extent that personal savings (or savings of unincorporated enterprises) are estimated (arbitrarily) as a percentage of income, it is assumed that these savings would obviously cover savings which are reflected in civil deposits, advance tax payments, etc.

Table (7): personal savings invested directly

(Rs. crores)				
year	residential construction	land improvement & agriculture	unincorporated business	total
1949-50	116	69	39	224
1950-51	123	71	42	234
1951-52	138	69	57	264
1952-53	141	66	43	250
1953-54	164	77	60	301
1954-55	180	68	65	313

38. A person who saves need not necessarily acquire a financial asset; he can reduce a liability. Similarly, he may acquire an ~~asset~~ and at the same time incur

a liability. At any time, while some persons are acquiring financial assets others may be incurring financial liabilities. So, for an estimate of total saving, a deduction for the increase in total liability has to be made from the total increase in assets. So, changes in the loans and advances by banks, insurance companies, cooperative institutions and provident funds have to be adjusted for. Similarly, an allowance has to be made for loans from government like taccavi loans or building loans. The following table presents figures of indebtedness of persons to financial institutions but not to the government because such information is not available to any great extent. The figures are admittedly not complete.

Table(8): Increase in financial liabilities of persons.

(In crores)

year	insurance companies	cooperative concerns	banks	total
1949-50	4	-	-	4
1950-51	3	21	4	28
1951-52	5	10	-4	11
1952-53	8	-1	3	10
1953-54	5	10	4	19
1954-55	4	10	9	23

39. We have now reached a stage where the various components of personal saving can be aggregated to give an estimate of personal saving in the community. The table below gives personal saving as estimated by us for the years 1949-50 to 1954-55.

Table (9) : personal saving

year	liquid	contrac- tual	Govt. secur- ities.	other financ- ial assets	savings directly invest- ed	Less incre- ase in debt.	total
1949-50	7	25	- 5	84	224	- 4	341
1950-51	96	31	18	53	234	-28	404
1951-52	-69	28	-16	60	264	-11	256
1952-53	29	37	46	46	250	-10	398
1953-54	75	47	118	38	301	-19	560
1954-55	134	51	200	26	313	-23	704

40. The savings of Government, corporations and house- holds can now be aggregated together to give an estimate of total savings of the community. The following table gives the estimates for 1949-50 to 1954-55.

Table (10) : savings in the Indian Union

year	Government	corporate enterprises	households and unincorporated enterprises	total*
1949-50	106	44	341	491
1950-51	142	16	404	562
1951-52	226	27	256	509
1952-53	122	23	398	543
1953-54	96	34	560	690
1954-55	70	22	704	796

41. To reconcile these figures of savings with the estimates of domestic capital formation, it is necessary to adjust the savings figures for net lending (or borrowing from) abroad and official donations. Net foreign lending could either be taken as the surplus on current account or as the difference between import and export of capital. Ideally, of course, the two should be equal. For certain reasons

it is preferable to take the figures as given in the capital account of India's balance of external payments, and so figures of net lending abroad have been taken from the capital account with an adjustment for the estimated amount of unpaid imports of machinery and equipment by branches of foreign companies, which are not recorded in our balance of payments as well as branch and subsidiary profits retained in India. Figures relating to these have been based on the Reserve Bank Survey of Foreign Assets and Liabilities. The following table gives the details.

Table (11) : net borrowing from abroad

year	capital movement	retained profits	machinery imports without payment	total
1949-50	33	10	12	55
1950-51	-38	10	14	-14
1951-52	208	12	15	235
1952-53	-35	12	13	-5
1953-54	-50	14	18	-18
1954-55	5	15	20	40

42. Official donations from abroad have to be included because while they help reduce the estimate of borrowing from abroad they do not swell the estimate of government saving because they do not enter the budget at all. The table below gives the estimate of savings and lending abroad, official donations and the net domestic capital formation as derived from these three.

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Table (12) : capital formation in the Indian Union

year	domestic saving	official donations	net borrowing from abroad	domestic capital formation (net)
1949-50	491	-	55	546
1950-51	562	4	-34	532
1951-52	509	5	235	749
1952-53	543	11	- 5	549
1953-54	690	19	-16	691
1954-55	796	16	20	832

43. Finally, the table below compares the figures of savings with the estimates of capital formation prepared by the NIU. The estimates for government investment are taken from this paper on capital formation because it contains revised estimates while the estimates of government saving are taken from the white paper on national income. It has not been possible to separate other investment into the two categories, corporate and others, because no such information is available.

44. It will be seen from the table that agreement is fairly close between the two sets of figures for all years except 1951-52, 1953-54 and 1954-55. The estimates of savings, as we have stated at the beginning, are subject to errors of an unknown magnitude; so are the estimates of investment. A certain amount of disparity is therefore inevitable. Secondly, the figures of saving include financial provision for holding of inventories while those of investment do not take account of changes in stocks. It is obvious that heavy stocks in 1951-52 are responsible for the difference between these two figures; it is also possible that there was some stocking in 1954-55 following the relief from monetary stringency. The discrepancy in 1953-54, however, is difficult to explain.

Table (13): capital formation and its financing in India

							(Rs. crores)						
	'49-50'	'50-51'	'51-52'	'52-53'	'53-54'	'54-55'	'49-50'	'50-51'	'51-52'	'52-53'	'53-54'	'54-55'	
	<u>saving</u>						<u>investment</u>						
government	106	142	226	122	96	70	government	192	199	211	218	254	364
corporations	44	16	27	23	34	22	others	336	322	391	370	375	385
individuals	341	404	256	398	560	704							
borrowing from abroad	55	-14	235	-5	-18	40							
official donations	-	4	5	11	19	16							
<b>total:-</b>	<b>546</b>	<b>552</b>	<b>749</b>	<b>549</b>	<b>691</b>	<b>852</b>	<b>total:-</b>	<b>528</b>	<b>521</b>	<b>602</b>	<b>588</b>	<b>629</b>	<b>749</b>

'AHUJA'

**A PRELIMINARY CONFERENCE ON RESEARCH IN NATIONAL INCOME**  
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CENTRAL STATISTICAL ORGANISATION

DEPRECIATION IN THE NATIONAL INCOME ACCOUNT

P. N. Mathur

1. Mr. Fabricant in his 'Capital Consumption and Adjustment' has defined capital consumption as 'the current value of durable goods used up in production'. To get an estimate of capital consumption (depreciation charge) on this basis the allocation of the value of an asset equally per unit of output has to be done. Thus if the production of one year is double that in another, the depreciation charge for the former should be double that for the latter.
2. There is, however, another approach for estimating depreciation in which the average life of the capital good is first estimated and then the total cost of the capital good is recovered as depreciation during this lifetime in accordance with some rules like equal instalments every year. The depreciation chargeable in any year is not affected by the output except when the output is very low and then the charge for depreciation due for that year is held in abeyance to be charged in the first subsequent good year.
3. In support of this it has been said that "much if not most of the maximum of service available in a period is simply lost through non-use, rather than left in the good for future exploitation."<sup>1</sup> On the other hand as there is a cyclical pattern in the utilization of an asset there is something to be said for distribution of the cost of depreciation over the whole cycle in proportion to its use. Further, there is a

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<sup>1</sup> W.D. Hance in Studies in Income and Wealth, Vol. II, p. 246.

case for all the units of the product sharing the cost of an asset equally even though the wear and tear due to non-use is different between the production of different consecutive units.

4. What is required to be estimated is the effect of just passing away of time as well as of the use on the potentiality of the capital good. Whether just passing away of time has got a preponderating effect on the decrease in potentiality of a capital good or the intensity of its use has not been tested empirically. A large scale study of the history of the different types of machines may throw some light on this problem. Probably it may be found that a combination of the two estimates in some specified proportions give the most desirable result.

5. In practice if the two methods outlined above give similar estimates, there is not much for choosing between them. But if the results are very different, detailed investigations as to its cause are necessary because in such a case both the methods will be in the nature of approximations.

6. The changes in the market value of the assets during their lifetime introduce many complications. However, they have not been dealt with here as the subject has already been discussed thread-bare in many publications. However, it may be pointed out that if we assume the relationship in the prices of an asset and its products more or less constant, the adoption of the method of charging equal depreciation per unit of output will automatically allow for the same.

7. In making allowance for depreciation an individual firm is interested in recovering the value of the fixed capital invested by it before that capital is worn out and is in need of replacement. If they base the depreciation charge of the capital asset on the basis of the average life of that capital asset, it is clear that on only half of those assets their owners will be able to write off their value by depreciation charge in their lifetime. But an individual firm which has

only a few units of a particular asset with it cannot possibly take such large risk of capital loss. So they will be more interested in the minimum life of an equipment rather than its average life, and their calculations of depreciation are expected to be made with a view to recovering the entire cost of the capital good in that period. The minimum life of an equipment cannot be guaranteed. But an individual firm is prepared to bear a reasonable risk on that account. They will be prepared to adopt a period as the basis of the calculations for depreciation purposes, if they are satisfied that there is a sufficiently good chance of the working of their particular capital good for at least that period. This sufficiently good chance should be much more than fifty per cent, say, of the order of 95 per cent.

8. If the average life of a capital good 'a' be  $I_a$  years and if the standard error of that life is  $s_a$ , then the life which a firm will take into account while calculating the depreciation will be  $(I_a - \alpha s_a)$  where  $\alpha$  is a constant. On the value of  $\alpha$  depends the amount of risk which the individual firm will be bearing, as for instance when the value of  $\alpha$  is equal to 2, the risk involved will be approximately  $2\frac{1}{2}$  per cent. Thus there will be  $97\frac{1}{2}$  per cent chance that the equipment 'a' will work at least  $(I_a - 2s_a)$  years. In this case the firm's calculation of depreciation will be at the rates which will enable it to recover the amount invested in  $(I_a - 2s_a)$  years. These calculations need not be and are not done by individual firms. This is the net effect of the quality control work done by the manufacturers of the machines if individual firms are guided in their decisions about depreciation by the life of machines quoted by their manufacturers.

9. For national income purpose it is desirable that every unit of the value added through the instrumentality of one type of the capital goods should contribute equally towards the cost of them. In other words the cost of those capital goods should be

in their lifetime. If the working conditions such as load, speed, working time per day etc., remain the same year after year during the working life of the capital equipment the above concept becomes operationally equivalent to dividing the cost of the capital goods equally throughout their working life. So that the estimate of the depreciation for the national income purpose can be got by spreading the cost of capital good over its average life equally. If the cost of the capital good 'a' is  $C_a$  the rate of depreciation for national income purpose should be such that the cost is recoverable in  $l_a$  years and not in  $(l_a - \alpha_a)$  years as is the case for the calculation of depreciation allowance for individual firms.

10. When the cost of the particular capital good is written off completely by the accumulation of the depreciation, the book value of the asset becomes zero and it may then be called an invisible asset. An invisible asset goes on producing the goods but no depreciation is charged on them. In a static economy, therefore, there will be only a slight difference between the total of the depreciation allowed by all the individual firms and the depreciation which should be allowed for the national income purpose. The extra depreciation allowed for the visible assets by the firms if they base their calculations on the above basis, will be only slightly lower than the notional depreciation which should have been allowed for the "invisible assets".<sup>2</sup>

11. In a changing economy the above approximate identity will not hold good. If the change is according to some pattern such as being constant from year to year or having a constant rate of change, it is possible to find out a functional relationship between the firm's depreciation and the depreciation in the national income sense. But this will be more an exercise

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<sup>2</sup> There will be a slight difference between the two depreciation as there will be some mortality even in the safe limits an individual firm is operating. If, however, the firm is insured for the risk on no profit basis, the value of the depreciation plus insurance premium will be equal to the other depreciation.

in mathematics than any guide to the reality as the changes in individual industries are known to be very erratic from year to year.

12. Thus in an expanding economy the total of the depreciation reported by the firms will be more than the notional depreciation required for the national income purpose even if the individual firms charge the depreciation on the basis of the quoted life of the capital goods. But in fact in charging depreciation they are mainly guided by many other considerations such as income tax rules; their profit earning capacity; their dividend policy, etc. These considerations are further removed from the considerations on which the national allowance of depreciation for national income purpose be based.

13. To find out whether the aforementioned practices of the firm with respect to depreciation charge lead to substantially different estimate than that required for the national income calculations, the ratio of depreciation allowed to the gross value added has been calculated for five years 1949 to 1953 for the industries reported in 'Summary of Census of Indian Manufacture 1949-53'.<sup>3</sup> If the ratios change much from year to year it is indicated that the actual depreciation charged is different from the notional one that should have been charged for national income purposes.

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<sup>3</sup> Published as supplement to The Indian Trade Journal, March 31, 1956.

Table 1

Depreciation as percentage of 'gross value added'

Industry	1949	1950	1951	1952	1953
1. Wheat flour	3.35	3.03	3.47	10.32	7.35
2. Rice milling	13.80	13.29	12.87	10.73	11.60
3. Biscuit making	5.92	4.70	7.03	12.01	12.04
4. Fruit and veg. processing	9.09	8.31	4.42	8.17	11.17
5. Sugar and gur	7.87	5.58	5.07	6.15	6.67
6. Distilleries and breweries	11.80	13.13	12.24	11.93	12.70
7. Starch	16.33	10.23	11.39	25.14	8.03
8. Vegetable oils	16.41	19.53	23.27	10.23	13.47
9. Paints and varnishes	2.57	4.89	3.22	3.55	3.45
10. Soap	5.09	5.54	3.72	0.71	4.85
11. Tanning	4.42	3.50	4.31	4.30	3.91
12. Cement	15.13	11.45	13.35	11.23	12.63
13. Glass and glassware	11.71	10.73	6.53	12.22	12.15
14. Ceramics	5.27	3.54	6.08	7.89	8.06
15. Plywood and tea chests	7.99	8.30	3.73	0.49	9.77
16. Paper and paper board	10.25	13.78	10.74	10.78	12.64
17. Matches	2.19	1.85	2.15	2.38	2.32
18. Cotton textiles	2.80	3.65	2.85	3.73	3.64
19. Woollen textiles	2.58	2.12	3.06	5.81	5.46
20. Jute textiles	4.86	3.03	2.91	3.39	3.01
21. Chemicals	9.03	9.29	6.88	16.59	15.61
22. Aluminium, copper and brass	10.53	8.19	8.75	9.92	12.70
23. Iron and steel	7.81	8.71	7.32	3.52	6.67
24. Bicycles	5.53	4.56	5.62	3.57	9.23
25. Sewing machine	7.67	4.17	4.70	7.02	4.11
26. Electric lamps	7.74	11.90	14.76	12.53	11.24
27. Electric fans	6.10	4.91	5.04	5.09	5.07
28. General engineering and electrical engineering	7.91	7.41	7.33	7.00	7.93
Total	5.66	5.93	5.18	6.18	6.31

14. From the table above it will be seen that the ratio is highly variable in the following five industries: starch; Biscuit making; woollen textiles; chemicals and bicycles. In each of these industries the highest value of the ratio is more than double the lowest value. On the other hand industries of electric fans; general engineering; matches; wheat flour; distilleries; tannery; iron and steel and rice milling may be considered as those not showing much variation in the ratio. The remaining fifteen industries though not showing as much variation as the above mentioned five, do still show sufficient variation for one to be sceptical about the value of the



depreciation allowance declared by those industries for the national income purpose.

15. Conclusion: The figures given above show that there is too much variation from year to year and no definite system is detectable in that variation. The amount of depreciation as reported by the firms is thus not suitable for national income purposes. To get an estimate of the latter, systematic studies should be planned in the technical history of various types of existing industrial units. It will be only on the basis of such data that we shall be able to get a reasonably correct estimate of the depreciation to be used in our national income estimates.

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**A PRELIMINARY CONFERENCE ON RESEARCH IN NATIONAL INCOME**  
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**CENTRAL STATISTICAL ORGANISATION**

CONSUMPTION EXPENDITURE: HYDERABAD STATE - 1952

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In economics, consumption expenditure means the amounts of money that the people spend annually for the purchase of goods and services, which enable them to live as useful social individuals, to keep their health intact, to educate their children, dependents and also themselves, to ensure their general personal well-being, to meet their obligations due to social customs, and even to provide ordinary as well as extraordinary pleasures of life whether on a continuous or occasional basis. It also includes imputed purchase value of goods produced for own use. The range of such goods and services is indeed very wide. They cover all kinds of goods such as foodgrains, eatables and drinks, clothing articles, footwear, books, newspapers, medicines, furniture, utensils, ornaments etc., and services, such as are offered by the doctors, lawyers, hospitals, clinics, religious institutions, schools and colleges, providers of recreation e.g., cinemas, providers of transport facilities, e.g., railways, bus services, etc., barbers, washermen, domestic servants, etc., the house-owners and also the government whose services in shape of maintenance of law and order and other welfare measures, the people get because of payment of various kinds of taxes both direct, like income-tax, and indirect like the sales-tax, excise, cesses and other rates and charges.

2. Reliable knowledge of the aggregate private consumption expenditure of a nation, and the break-down of the expenditure according to various groups of goods and services, is vastly

important for a variety of purposes. Firstly, consumption expenditure per person provides a very useful measure of the general prosperity and the standard as well as the level of living of a nation. It also provides the Government the basis for judging the taxable capacity of the nation, particularly in respect of indirect taxes, such as sales-tax, cesses, rates, charges, etc., thus formulating judicious taxation policies. To the businessman, whether the trader or the manufacturer, consumption expenditure on different groups of goods and services, provides a most valuable guide for basing his decisions, for starting new ventures or expanding or contracting his activities. To the businessman facts regarding quantities of different products consumed by the people are even more useful. To the sociologist and nutrition expert also the consumption expenditure estimates provide a useful basis for the study of many characteristics of the people.

3. The unfortunate fact, however, is that, despite the usefulness of detailed information about consumption expenditure of the people, meagre material is readily available. Till independence, except for small family budget studies for industrial workers, little or no information was available on the subject. However, since 1950, the National Sample Survey of the Government of India, under the inspiring leadership of Prof. P.C. Mahalanobis, has undertaken nation-wide economic enquiries which among other facts have now given us for the first time a fairly detailed picture of the pattern of our per capita consumption expenditure. The results of this survey were also utilised by the Taxation Enquiry Commission under the Chairmanship of Dr. John Mathai, to study the problem of incidence of taxation in India in its various ramifications. One has however to recognise the fact that the data collected by the National Sample Survey are firstly obtained from a sample of some 12,000 households or 60,000 people scattered all over India. Even though the sample is designed according

to modern techniques of stratified random sampling, and should therefore give a representative picture of consumption expenditure (and other facts) in different parts of India, the results are subject to certain known errors. Secondly, owing to prevalent illiteracy, and the general apathy even amongst the educated classes to maintain any detailed accounts of consumption expenditure, the task of collecting highly accurate data even from the sampled households is extremely onerous. It is therefore quite likely that the data collected under the survey do not give us very highly accurate estimates. Despite these limitations of the available data, in view of the importance of the subject, it seems worthwhile to use them in the best possible manner and try and see what useful conclusions they can lead us to. With this purpose in view I have in my personal capacity undertaken a research project on consumption expenditure in Hyderabad State\*. It is not proposed here to go into the details of methodological aspects of the investigation. Broadly speaking, however, the technique followed here is to split up the per capita estimates of rural consumption expenditure in 1952 for Hyderabad State, as given in Volume I of the Report of the Taxation Enquiry Commission, into constituent estimates for different groups of items by using the group percentages for the Central Zone as given in the National Sample Survey reports on consumption expenditure for 1951-52, check these estimates by independent evidence in respect of Hyderabad State as far as possible, modify estimates if necessary on the basis of such evidence, and then blow up the per capita estimates by rural population figures to get the group aggregates for rural area in Hyderabad. Urban estimates are also similarly developed after first estimating per capita urban expenditure, from the urban consumption figures of the National Sample Survey as given in the Taxation Enquiry Commission Report. Hyderabad urban area estimate has been

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\* as it existed before the Reorganisation of States.

derived from this data, as the weighted average of estimates for different size-groups of towns (excluding four big towns of the country, viz., Calcutta, Bombay Madras and Delhi). The weights in the case of Hyderabad State being the total population of towns falling in each size-group. An attempt is also made to derive quantitative estimates of consumption of certain important commodities. Broadly, the method used is to divide the total expenditure on a commodity by an estimate of unit retail price of the commodity. But in many cases the actual procedure becomes somewhat complicated and it is also necessary to make certain reasonable assumptions, not invariably based on quantitative facts. Thus for instance in case of rationed cereals, average unit retail price had to be first estimated on the basis of a rough knowledge of ratio of urban: rural consumption, production used by farmers for own consumption, and difference in the issue prices for rationed cereals and those prevailing in the open market both in the urban and rural areas. Though some idea of urban retail prices could be had for a number of commodities, from the consumer price index for six centres in the State, rural price had to be assumed in many cases, sometimes on judicious but nevertheless arbitrary considerations. The provisional findings based upon such analysis and synthesis are presented here for what they might be worth. Owing to limitations of the data it is possible to analyse the consumption expenditure for Hyderabad State only for the year 1952. But the consumption pattern does not seem to change rapidly and the results may roughly hold good even to-day.

4. The main features of the estimates are presented below:-

(1) The total consumption expenditure of all people in Hyderabad State in 1952 amounted to Rs. 408.69 crores. Taking the estimates of population of Hyderabad State in 1952, at 1.865 crore persons, the per capita expenditure comes to Rs. 216.8. All-India estimate comes to about Rs. 273.5.

Hyderabad Expenditure is thus 21% below the all-India level. This gives some quantitative idea of the low level of economic development of Hyderabad State.

(2) Out of this total of Rs. 408.69 crores, nearly Rs.294.60 crores of expenditure was incurred in rural areas of the State and Rs. 114.09 crores in urban areas. The urban and rural percentages were roughly 72% rural and 28% urban. Per capita expenditure for rural and urban areas would come to Rs. 192 and Rs. 325 respectively. (Rural population: 1.534 crores and urban population: 0.351 crores). Urban per capita expenditure is 70% more than the rural estimate, corresponding figures for the whole of India being Rs. 257 rural and Rs. 351 urban. Hyderabad rural per capita expenditure is thus 75% of the all-India figure and the urban expenditure 92% of the all-India figure.

(3) The above figures include the expenditure incurred in cash purchases of various articles, as well as the imputed value of items which were consumed by producers themselves, without first selling them to wholesale merchants and then purchasing from retailers. In Hyderabad State the division between cash and imputed expenditure was as follows:-

items	total expenditure	cash expenditure	imputed expenditure
total (Rs. crores)	408.69	268.55	140.14
percentage	100.00	65.70	34.30
per capita (Rs.)	216.80	142.40	74.40

(4) The division of cash and imputed expenditure between rural and urban areas was:-

items	cash expenditure			imputed expenditure		
	rural	urban	total	rural	urban	total
total (Rs. crores)	164.91	103.64	268.55	129.68	10.46	140.14
percentage of total expenditure	55.98	90.83	65.70	44.02	9.17	34.30
per capita (Rs.)	107.5	294.6	142.4	31.5	30	74.4

(5) The pattern of total expenditure for the whole State

in rural and urban areas was:-

items	rural		urban		total	
	Rs. crores	percent- age	Rs. crores	percent- age	Rs. crores	percent age
1. food-grains	107.72	36.56	21.95	19.24	129.67	31.73
2. other eatables	77.70	26.37	38.31	33.58	116.01	28.38
3. total food	185.42	62.93	60.26	52.82	245.68	60.11
4. clothing and footwear	23.44	7.96	8.35	7.33	31.79	7.78
5. fuel and lighting	19.50	6.62	6.86	6.01	26.36	6.45
6. ceremonials	15.64	5.31	6.37	5.59	22.01	5.38
7. intoxicants	11.25	3.82	3.75	3.30	15.00	3.67
8. services (professional and domestic)	9.96	3.38	8.74	7.66	18.70	4.57
9. tobacco	7.02	2.38	2.06	1.80	9.08	2.22
10. conveyance	5.57	1.89	2.56	2.24	8.13	1.99
11. medicines	2.77	0.94	2.94	2.58	5.71	1.40
12. rent	2.60	0.88	2.90	2.54	5.50	1.34
13. toilet and petty things	3.16	1.07	1.79	1.57	4.95	1.21
14. ornaments	2.94	1.00	1.34	1.17	4.28	1.05
15. education	1.63	0.55	2.43	2.13	4.06	1.00
16. taxes (direct taxes only)	1.23	0.42	1.28	1.12	2.51	0.62
17. recreation	1.40	0.47	1.09	0.95	2.49	0.61
18. other articles	0.20	0.07	0.93	0.81	1.13	0.28
19. utensils	0.70	0.25	0.24	0.21	0.94	0.23
20. furniture	0.17	0.06	0.20	0.17	0.37	0.09
(a) total	294.60	100.00	114.02	100.00	408.62	100.00
(b) total mainly commodities	258.20	87.64	91.15	79.89	349.35	85.48
(c) total mainly services	36.40	12.36	22.94	20.11	59.34	14.54

The figures show that for the State as a whole:-

- Roughly 68% of total expenditure is on food (Rs. 246 crores) and clothing (Rs. 32 crores); (60% on food and 8% of clothing) and 32% on other non-food items, food grains accounting for 32% and other eatables 28%.
- Percentage expenditure on food is relatively greater in rural than in urban areas, the former expenditure being 63% and the latter 53% of the total. Hence in rural areas only about 37% of expenditure is incurred on non-food items. It is about 47% in urban areas. In urban areas the people spend relatively more on other eatables (milk, meat, vegetables, ghee, butter, oils etc.) than in rural areas (26% rural, 34% urban).
- Next in importance to food and clothing ranks fuel and lighting, the total expenditure being Rs. 26 crores. It accounts for roughly the same percentage of total expenditure of about Rs. 11 crores in rural and urban areas and is about Rs. 6 crores in rural areas and about Rs. 5 crores in urban areas.
- The expenditure on ceremonials is high, amounting to Rs. 22 crores a year. Some may regard this as unwarranted or avoidable expenditure, which could be tapped either through taxation or borrowing.
- Similarly, expenditure on ornaments, also appears to be large for poor people (Rs. 4.28 crores a year).

- (f) Expenditure on Education is low, about Rs. 2 per capita; and people seem to be spending a little over a rupee per head per year on cinemas, theatres, games and other forms of recreation. Per capita expenditure on medicines is Rs. 3/-. In urban areas it is Rs. 8.76 per head, and in rural areas Rs. 1.81 (i.e., urban expenditure is 4½ times as large as in rural areas).
- (g) In Hyderabad State expenditure on intoxicants seems to be quite large. Roughly Rs. 15 crores a year are being spent, or about 6½ rupees per head annually, about Rs. 7½ in rural areas and Rs. 10 to Rs. 11 in urban areas.
- (h) Expenditure on goods (commodities) is about 85%, and only about 15% on different services.

5. In urban areas the percentage expenditure on goods is relatively less (80%), and relatively more on services (20%), as compared to rural areas (88% and 12%). But the basic pattern remains the same, and strongly indicates the undeveloped nature of the economy of the State. Many more interesting conclusions are possible. But these are some of the main findings from the data.

6. From the businessman's point of view, it would be more interesting to examine the pattern of cash expenditure. For the whole State, out of the total expenditure of Rs. 245.63 crores on food items; the cash expenditure is Rs. 125.77 crores i.e., about 51%. The rest of the expenditure on food items is accounted for by food grains, milk, milk products, vegetables, etc., produced by the people and directly used by themselves. Similarly, in case of fuel and lighting only about Rs. 11 crores, i.e., 42% of the total expenditure of Rs. 26 crores, is incurred in cash, the balance of about Rs. 15 crores being the imputed value of fuel and lighting materials for which the people do not pay. Nearly Rs. 13 crores of such imputed expenditure obtained in rural areas. An interesting point is that even in case of intoxicants only about 75% of the total expenditure of Rs. 15 crores is paid for, the balance of about Rs. 3.75 crores not being accounted for through purchases. Is this the extent of illicit distillation, brewing etc.? For other items it appears that all consumption is mostly purchased with money. The overall position would seem to be that out of the total expenditures of Rs. 409 crores, some 66% of it



(Rs. 269 crores) is paid for and the balance amounting to Rs. 140 crores (34%) is not purchased by the people with money.

7. The businessman would be more interested in knowing the quantities of goods purchased with cash; for that would give a concrete idea of the physical demand for commodities, or the volume of commodities marketed through wholesale and retail stages, down to the consumer. Some of the findings in this regard may be stated as follows:-

item	unit	quantity marketed	total consumption	percentage marketed
1. rice	000 tons	246	719	34.2
2. wheat	" "	187	283	66.0
3. jawar	" "	222	1019	21.8
4. other cereals	" "	271	610	44.4
5. total	" "	926	2631	35.2
6. pulses	" "	136	312	43.6
7. vegetable oils	" "	88	105	83.8
8. sugar and gur	" "	95	116	81.9
9. spices	" "	112	140	80.0
10. milk and milk products	" "	130	282	46.0
11. meat, fish and eggs	" "	48	60	80.0
12. vegetables	" "	260	278	68.7
13. cotton cloth	crore yards	22	22	100.0
14. footwear	000 tons	4850	4850*	100.0
15. intoxicants	crores of bottles <sup>o</sup>	22	30	73.7
16. bidis and cigarettes	crores**	1155	1345	85.9
17. pan	crores	1536	1622	94.7

8. Another interesting and useful set of estimates made in the investigation relates to per capita consumption in terms of quantities, for some of the important items. These are presented on the next page.

<sup>o</sup> quantities are in terms of one seer (32 ozs.) bottles of local drink (sendhi).

\* urban consumption of footwear seems to be the order of 500,000 pairs per year.

\*\* tobacco group expenditure is assumed to be mainly on bidi and cheap cigarettes.

item	units	per capita consumption (cash and legal)
1.rice	ozs. per day	3.58
2.wheat	" "	1.47
3.jawar	" "	5.31
4.other cereals	" "	2.16
5.total cereals	" "	13.52
6.pulses	" "	1.62
7.vegetable oils	" "	0.55
8.spices	" "	0.73
9.sugar and gur	" "	0.60
10.salt	" "	1.03
11.milk & milk products	" "	1.47
12.meat, fish and eggs	" "	0.31
13.vegetables	" "	1.56
14.pan	no. of pans per day	2.36
15.bidis and cigarettes	nos. per day**	1.95
16.cotton cloth	yards per year	11.70
17.footwear	pairs per year	0.26
18.intoxicants	bottles per year@	15.00 or 1.4 ozs. per day

The cash expenditure on refreshments comes to Rs. 7 crores per year (i.e., Rs. 3.70 per head per annum). Similarly, the expenditure on recreation comes to Rs. 2.49 crores or Rs.1.35 per head per year.

9. It is also interesting to note that out of total cash expenditure of Rs. 269 crores, the people in the State seem to be spending some Rs. 22 crores on ceremonial, Rs. 15 crores or more on intoxicants and over Rs. 4 crores on ornaments. One may well ask whether the total of such expenditure amounting to about Rs. 40 crores cannot be regarded as more or less redundant expenditure in a poor country intent to planning. One may at least want to know why the amount is not being used for more desirable forms of expenditure such as better food, better housing, better clothing, etc. At the level of taxation current in 1952 the people in Hyderabad had been paying something like 5.5% (Rs. 22 crores) of the total consumption

@ quantities are in terms of one seer (32 ozs.) bottles of local drink (sendhi).

\*\*to tobacco group expenditure is assumed to be mainly on bidi and cheap cigarettes

expenditure, or about 8.2% of the cash expenditure, in all forms of taxes. The question may be asked, whether in view of the existence of some undesirable forms of expenditure, more taxation or borrowing is not possible, not only here but also elsewhere in India, particularly in view of the finance needed for the Second Plan. The answer seems to be in the affirmative, and this seems to be the view of the planners as well.

preliminary and confidential

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**A PRELIMINARY CONFERENCE ON RESEARCH IN NATIONAL INCOME**  
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**CENTRAL STATISTICAL ORGANISATION**

REGIONAL INCOME ESTIMATION:

A note compiled by the  
Economic and Statistical Organisation, Punjab

The scope of this paper is limited to the estimation aspect of the national income at the State level (Regional Income). The Punjab State Statistical Bureau has been on this work since February this year. The problems discussed in this paper are the outcome of the practical experience in the field.

2. It would be relevant to begin this paper with a brief description of the broad outline of our scheme and the progress made so far. The State Statistical Bureau is trying to work out the regional income for the three years, 1952-53, 1953-54 and 1954-55 simultaneously. Three Investigators and two Computers are working full time on this project. The Investigators received practical training in estimation work and tuition in the concepts for about two months in the National Income Unit of the Central Statistical Organisation.

3. To the extent possible the same procedure of estimation is being followed as is given in the Final Report of the National Income Committee. It was decided to collect information and present the results for each industry separately, according to the industrial origin table in the Final Report of the National Income Committee (page 106), and later to piece them together to obtain the figures for the regional income. In view of the fishing activity in the Punjab being not of much significance, this sector has

been lumped with the sector "agriculture, animal husbandry and ancillary activities".

4. The Punjab Bureau has completed the analysis of working force. The estimation work in regard to (1) agriculture, (2) large scale enterprises, (3) organized banking and insurance, and (4) minerals, is nearing completion. Information in respect of (1) professions and liberal arts and domestic service, (2) small scale enterprises, (3) animal husbandry, and (4) forestry has been collected for the most part. The sectors (1) other commerce and transport, (2) public authorities, and (3) house property have not yet been tackled. It is hoped that the regional income estimates of the State will be ready by the end of March, 1957.

5. Out of the three approaches production, income and expenditure, the last one has not been made use of because statistics on expenditure are not available at the State level. Resort has, therefore, to be had to the first two approaches according to the availability of data in different sectors. The approaches found appropriate for various sectors are given below:-

a. production approach

- (1) agriculture including fishery,
- (2) animal husbandry,
- (3) forestry,
- (4) mining and
- (5) large scale enterprises

b. income approach

- (1) small scale enterprises,
- (2) organized banking and insurance,
- (3) other commerce and transport,
- (4) professions and liberal arts and domestic service,
- (5) public authorities and
- (6) house property

6. The practical difficulties in the field of estimation emanate from the absence, insufficiency and unreliability of the available statistics, or their being in a form which does not lend to easy assimilability in estimation work. These difficulties will evidently vary from State

to State according to the position of data available to each of them. There are, however, some problems which are inherent in the estimation of national income at the regional level, and these are more or less common to all States. In this paper attention will be focused on these problems though a few other points arising out of our practical experience will also be mentioned.

7. Broadly speaking, we are faced with two kinds of problems (a) those primarily due to narrowing the scope of estimation from the country as a whole to a component State and (b) cases where only limited or no information is available at the State level. These problems are discussed below.

(a) Difficulties arising out of narrowing the scope of estimation.

(1) Very little information about the balance of payments statistics is available in the Punjab and it is likely to hold good in the case of other States. Even the inter-State movements of goods are not fully known: they are limited to a few commodities and that too by rail and rivers. It also looks extremely difficult to work out such statistics by inquiries. So, in the circumstances it is not possible to build up the estimates for the regional income which may be defined as the factor incomes which accrue in enterprises owned by the normal residents of the State. In the Punjab, we have, therefore, decided to remain content at estimating only the regional domestic product which may be defined as the factor incomes which accrue in enterprises located in the region.

(2) There are many enterprises which have activities extending beyond the boundaries of the State. One important difficulty in this respect relates to the Central Government's activities in the Punjab. The various cases are discussed below:-

(i) Posts and telegraphs:- Accounts are available either

at the Union or circle level. The Punjab circle extends to the Punjab, Himachal Pradesh, Pepsu, Delhi and Jammu and Kashmir States. An easy though not very satisfactory solution of this difficulty would be to first estimate the income originating from the Punjab circle and then to calculate the regional component on the basis of the number of employees.

(ii) Railways:- Detailed accounts are available only at Union and zonal levels. We propose to build up an estimate from the northern zone accounts and then allocate the Punjab share on the basis of the number of railway employees in the State.

(iii) Defence Services:- The accounts are maintained only at Union level, and for obvious reasons information about the number of employees is not divulged. The problem is really hard to tackle, and requires discussion,

(iv) In the sector "other commerce and transport", this problem arises in the case of air transport and railway freight earnings. For air transport passenger earnings, we may find out some estimate of passenger miles for our State and in case no such independent estimate is forthcoming, we may adjust our share from the all India estimates on some such basis as the number of persons engaged in the air transport in the Punjab. Similar basis may be applied in the case of railway freight earnings for the Punjab.

(v) In the sector "organised banking and insurance" wages and salaries, directors' fee and the surplus, are to be treated as net contribution to the national income from banking. Wages and salaries paid by various bank offices in the State during 1952-55 (calendar years) have been collected. But there is a minor problem from the point of view of the Punjab. This relates to the adjustment for banks which have gone into liquidation or have otherwise ceased to function during the period under reference. We are trying to ascertain

the facts and only then will be in a position to decide upon the course of adjustment.

(3) For directors' fee and surplus, we have allocated our share on the basis of "wages and salaries" from all India estimates. Another problem at the regional level arises from the unique position of the Reserve Bank of India (RBI). For its banking department's operation, net value estimated at cost, i.e. wages and salaries has been taken by the National Income Committee as the Reserve Bank of India does not accept deposits from private individuals, and all deposits are from banks, etc., only. This procedure has been followed by the National Income Committee to avoid imputing a surplus to Reserve Bank of India and then offsetting the entire surplus of Reserve Bank of India by an imputed charge on other banks. At the regional level, there is no branch of the Reserve Bank of India in the Punjab whereas the banks in the State including those having branches in the Punjab must be incurring some expenditure on this account and the Punjab share of costs should be deducted from her share of surplus. We are making efforts to find out our share of costs.

(4) Another problem is to find out our share of the net investment income of banks for calculating the imputed deductions from other sectors. We have allocated our share on the basis of "wages and salaries" paid in the Punjab. For calculating the imputed deductions for various sectors, the basis adopted by the National Income Committee has been the ownership of deposits. No details of the ownership of deposits at State level are available and so we will be utilizing the all India percentages.

(5) For calculating the contribution of insurance to the regional income, the state of published data leaves us with no other basis except the number of persons engaged in insurance in the Punjab. We will, however, try to explore



some other basis such as number of policies, for our estimation purposes.

(b) Cases where limited or no information is available.

(1) The number of such cases is very large. They are primarily of local interest as their being in this category has been due to the present position of data in our State. In all such cases, besides taking into consideration all possible published information we have tried to consult the specialists on the subjects, e.g., Economic Botanist (cotton, cereals and oilseeds) for the production of various straws including cotton sticks and maize stalks; fruit specialist for average value per acre of various fruits; poultry Development Officer for average yield of eggs per fowl, etc., and State Biochemist (Compost) for information regarding compost. The district officers of the agriculture, industries and other departments have also been contacted to get information pertaining to their sphere of activities. Ad hoc inquiries for large scale enterprises and banking have been made. In the sectors "professions and liberal arts and domestic service" and "small scale enterprises" almost the entire information about earnings has been collected by personal inquiries. A large number of growers has also been contacted personally for certain items in agriculture.

(2) In some cases such as evaluation of 'other pulses', 'operational costs' on materials required for cultivation in agriculture, and 'production of fuel' per square mile in the case of private forests in forestry, where no authentic information from State sources is available, we have utilized the ratios adopted by the National Income Committee. The number of such cases is, however, very small. There are still a few cases such as grass about which no information from any source can be obtained.

(3) The other problem relates to various adjustments, e.g., in some cases the information may relate to previous years and has to be adjusted to the current year and vice-versa; adjustment of data relating to daily and weekly earnings to yearly figures, etc.

(4) In the case of minerals the Geological Survey of India prepares consolidated statement on the quantity and value of minerals produced in the country. It covers all the minerals produced in the Punjab. Some discrepancies have, however, been noticed in the information supplied by the Geological Survey of India for the Punjab and these are discussed below:-

(i) Geological Survey of India did not make any mention of limestone production in the Punjab while it is being quarried in the State since December, 1953. The relevant figures in this case have been got independently.

(ii) The figures supplied by the Geological Survey of India about "miscellaneous building materials" were found to be gross underestimates when one of our investigators on a visit to an important centre found that three among those concerns were collecting minerals much more in quantity than reported by the Geological Survey of India for the whole State. The discussions with the persons engaged in this industry have shown that the Geological Survey of India figures may safely be inflated 50 times over.

The figures supplied by the Geological Survey of India are being collected by the State Director of Industries. We are trying to reconcile this discrepancy but so far without substantial result.

(iii) The figures collected by the Geological Survey of India relate to refined rather than crude saltpetre. The processing in this case is to be covered under large and small scale enterprises depending upon the size of various concerns. We are, however, trying to find out the approximate quantity of crude saltpetre from the figures relating to the refined

material, and its price at the producing points by discussions with the persons engaged in this industry. We are also trying to check up the figures supplied by the Geological Survey of India in this respect by local inquiries.

8. The problem of indifference on the part of the general public in the matter of the supply of information is quite serious. It has been noticed that people are very much suspicious, and are afraid of taxes. It is seldom that information about earnings is given correctly. It is one aspect of the broader problem of social improvement, and is expected to be solved gradually with the social advancement and development of a sense of appreciation of the importance of statistics by the people. It is primarily a long term problem. The only short-term solution appears to be that the persons engaged in the collection of statistics should be very sober and tactful. Some sort of training in understanding of human behaviour will also be necessary.

9. Undertaking of various socio-economic surveys will also go a long way in facilitating the national income estimation, both at regional and at Union levels. A network of such surveys in collaboration with various educational institutions should be started. The National Income Unit can play a helpful role in this connection. The district statistical offices when set up in the Punjab will be utilised for filling in the gaps in the statistical picture.

10. Lastly, it is for consideration whether the State Bureaus should at this stage limit their activities to collecting accurate data for the use of the National Income Unit in order to make the national estimates more perfect and at a later stage attempt at regional income estimation, or they should go ahead with estimating income for their respective States. This is an important question of policy which deserves consideration.

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**A PRELIMINARY CONFERENCE ON RESEARCH IN NATIONAL INCOME**  
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CENTRAL STATISTICAL ORGANISATION

STATE INCOME OF MADHYA PRADESH: 1947-48 TO 1950-51.

National Income Division

Directorate of Economics and Statistics

Government of Madhya Pradesh

The various practical uses to which the figures of National or State Income can be put by persons in the different walks of life obviate the need of advancing any plea for carrying out such an empirical study.

The concept of State income.

2. There remains hardly any theoretical difference between State income and national income concepts as regards their scope and content, if we assume the State to be an independent political and economic unit like the nation. The State income may be defined as "the sum total of all incomes received by the members or the group of residents of a State in a given period of time, say a year, provided that institutions, Government, companies and other associations of persons are included as members and that no item of income is either omitted or counted twice".

3. The concept adopted for the purpose of the estimation of the State income of Madhya Pradesh has been taken to be the "net domestic product at factor cost". Thus the State income of Madhya Pradesh includes all the incomes originating within the twenty two districts of the old Madhya Pradesh irrespective of the fact whether the income is owned by persons living inside or outside the State. The concept of "net State product at factor cost" (corresponding to net national product at factor cost) could not be adopted since the limitations of the available statistical material do not permit adjustment for "net earned income from other States".

period under study

4. The estimates relate to the period 1947-48 to 1950-51. This particular period was selected with a view to get an idea of the pro-

plan economic conditions in Madhya Pradesh.

Method of measurement

5. The method followed for estimating the State income of Madhya Pradesh has been primarily decided by the availability of statistical data. We would have preferred to prepare the estimates by both the output and the income methods so as to have a cross check of the estimates arrived at. The use of the 'output method' requires the existence of a comprehensive census of production. The 'income method' on the other hand depends firstly on income tax statistics that cover an appreciable part of the earning population and secondly on an adequate wage census. So far as Madhya Pradesh is concerned, none of the above requirements are wholly fulfilled. The only remaining alternative, as such, was to arrive at the estimates by combination of both the methods. The 'output method' was used for estimating income arising out of agriculture, animal husbandry, mining, forestry fisheries, large scale industries, house property and agricultural trade. Incomes originating in the remaining fields of economic activity were estimated by the 'income method'.

The working force

6. It is the working force of a State which by its labour upon the natural advantages and resources gives rise to the State's income. A study of the working force of a State and its distribution into different economic activities is not only instructive as to the comparative productivity of the workers in different branches of economic activity but also indispensable for estimating income in the sectors for which quantitative output figures are available.

7. The periodic population censuses subject to their inherent limitations yield much information on the topic. The census of 1951 divides the total population into eight livelihood classes and three sub-classes (self supporting persons, earning dependents and non earning dependents). The self supporting persons in the non agricultural classes are further classified according to their secondary economic status, namely, employer, employee and independent worker and are distributed over the 10 divisions and 83 sub-

divisions of industries and services as given in the Indian Economic Classification Scheme.

8. The working force of Madhya Pradesh has been taken to be equal to the self-supporting (economically active) plus earning dependent (economically semi-active) population of the State. It has been considered advisable to treat self-supporting and earning dependent persons on the same level since under the joint family system which is prevalent in the country, an old and infirm father is likely to be returned in the census as self-supporting whereas his robust and earning sons would be returned as earning dependents. In order to bring about a correspondence between the livelihood classification adopted for the purpose of the census and that for the purpose of the State income calculations and for certain other adjustments, knowledge of the figures of self supporting and earning dependents for every occupation included in the census is necessary. In the absence of the information regarding earning dependents for the different sub-divisions, and groups, it has been assumed that the ratio of earning dependents to self supporting persons in any sub-division or group is the same as in the livelihood class to which they belong.

9. The working force in the various occupations and sectors except in large scale industry has been estimated with the help of census data. For large-scale industries the employment statistics as given in the 'Annual Reports on the Administration of Factories Act in Madhya Pradesh' have been used and adjusted for absenteeism since the data relate only to the average number of people actually in attendance in the factories. The average absenteeism for workers in the factories of Madhya Pradesh has been estimated at 9.6 per cent.

10. It has also been attempted to obtain the rural and urban distribution of the working force. The rural and urban distribution of the self supporting persons in different occupations is available in the census report. The number of earning dependents has been estimated under the assumption mentioned earlier. However, no splitting up is attempted in the case of occupations which may be exclusively allocated to either rural or urban area.

11. The ascertainment of income arising from agriculture involves the estimation of the outturn of each crop, price at which the outturn is to be evaluated and the various costs involved in the process of production. The estimation of income arising from agriculture relates to the 'gross cropped area' of the State. Separate evaluation of as large number of commodities as possible has been made in order to reduce the coverage of the collective groups like 'other cereals', 'other oilseeds' etc.

12. The area and production figures for a large number of food and non-food crops have been obtained from the department of agriculture. The production of certain fruits and vegetables was estimated on the basis of information contained in the various published and unpublished marketing reports and research dissertations.

13. As regards prices, multiple sets of price data are available for Madhya Pradesh. There are wide disparities in the prices of the same agricultural commodity in the different districts of the same economic region. As such, a perfect measure of accuracy can only be achieved if each individual transaction is treated individually. But the limitations of time and resources do not permit the luxury of such a theoretical perfection. As such some sort of averaging had to be resorted to.

14. The Farm Harvest Prices in Madhya Pradesh as given in the 'Agricultural Prices in India' issued by the Economic and Statistical Adviser, Ministry of Food & Agriculture, are in fact the median averages of the district figures of the wholesale harvest prices reported in the Season and Crop Reports of the State. It was preferred to use these prices wherever available or capable of being estimated since they represent the nearest approximation to prices at the farm level. These prices being available for only the principal crops of the State, it becomes necessary to use other set of prices as well. The other set used has been that of wholesale prices, on account of its wide coverage and sufficient representativeness. In the case of certain crops where absolutely no price data were available for the period under consideration, prices were estimated on the basis of

the prices of related commodities taking into account the price parity existing between those commodities over a period of time for which necessary data for both the commodities are available. The retail rates of certain commodities were converted into wholesale rates on the basis of the information regarding the price spread between wholesale and retail rates of these commodities. Quotations from the largest possible number of markets were taken into account for the purpose of averaging. However, no attempt was made to arrive at harvest price estimates by providing a straight percentage deduction in the wholesale prices. Both the marketed and non-marketed portions of the agricultural output have been evaluated by similar prices. The value of output in agriculture does not strictly represent the income of the industrial classification denominated as agriculture because prices used are quoted for certain final products. Thus it contains payments for certain ancillary activities performed by the producer such as husking, cleaning and similar other processings for the market.

15. Since neither data nor sound basis for estimation exist in respect of the outturn and prices of a number of crops, usually of an inferior and low priced variety, it becomes necessary to treat them collectively under different groups and apply value per acre estimates. The value per acre adopted for a particular group has been that of the lowest valued commodity of the same group for which figures are available. However, in the cases where the unknown crops of a group are much inferior even to the lowest valued crop for which information is available it was thought desirable to provide for a 10 per cent deflation of the value per acre of known crops for valuation of minor crops. The gross value of agricultural output has been calculated for the State on the lines outlined above.

Deductions for the derivation of net value of output in agriculture:

16. It is necessary to deduct costs and wastages from the gross value of agricultural output to arrive at the net value of agricultural output. Since no survey was undertaken to estimate the cost ratios involved in agricultural production, use was made of the published literature on the



subject - which however shows a wide divergence of opinion both regarding the variety of deductions to be provided and the relative magnitude of each of them. An examination of some of the viewpoints and a description of the method adopted for the present estimates is given below:-

(I) Ridges

17. It has been rightly stressed by many that due to inclusion in the Patwaris register of the areas covered by field ridges, there is likely to be certain over estimation both in the figures of area as well as output. In the absence of any local surveys or enquiries or any other sound basis whatsoever giving an idea of the extent of over estimation involved, it has not been considered desirable to provide for deduction on this account.

(II) Wastage and seed

18. The Finance Commission of 1880 estimated the loss from wastage to nearly 5 per cent of the gross output while the Finance Commission of 1900 put it as 4.7 per cent. Dr. V.K.R.V. Rao in his book 'National Income of British India' adopts the figure of 3 per cent.

19. The National Income Committee in its Final Report do not deduct wastage from the gross value of agricultural output. They have transferred to the trading sector the wastage involved in the marketed portion of the output while for the non marketed portion the view taken is that the loss is a part of wastage attending on consumption and need not therefore be deducted when computing agricultural income. It is easy to realise that all the wastage involved in the marketed portion of the agricultural output need not and perhaps does not originate solely and completely in storage. Moreover, it is doubtful whether any reasonably accurate allocation of wastage between the various causes can be made. It is also not completely correct to treat the wastage of non marketed output as necessarily attending upon consumption. Wastage may be due to a variety of causes either while the crop is still on or near the field or during transportation of the product from the field to the house of the farmer. In view of these considerations it

has been decided to provide for wastage. In the absence of any better information, Dr. Rao's estimate (3 per cent) has been adopted.

20. So far as seed is concerned, Dr. Rao took into consideration the estimates of the Famine Commission, 1880 and the Famine Commission, 1900 and adopted for his calculations 6 per cent of the gross outturn to be deducted for seed. The method of providing a straight percentage deduction on gross output on account of seed has been criticised on the ground that the volume of seed used in a given year depends upon the area sown and not upon the outturn. However, the percentage deduction method does not involve error of a high magnitude. Since the figure of seed requirement adopted by the National Income Committee is based on a much more comprehensive information, the same is used by us. Thus deduction for seed and wastage has been provided at 8.2 per cent (5.2% + 3%) of the gross agricultural output.

(III) Interest on agriculture debt

21. The total rural debts of Madhya Pradesh has been estimated by apportioning Indian Union's total rural debt of Rs. 913.6 crores (as mentioned in the First Report of the National Income Committee), on the basis of the ratio of rural population of Madhya Pradesh to that of the Indian Union. Out of the total rural debt, two third is assumed to be incurred for agricultural purposes and on this interest has been provided at the rate of 12%.

(IV) Operational costs on materials required for cultivation

22. Provision has been made at the rate of 2.1% of the gross agricultural output for this item.

(V) Repairs and depreciation of implements and bullock carts etc.

23. The Form Report of the National Sample Survey estimates the value of all implements including carts at purchase price at Rs. 60.25 per household for 1950-51. Using this rate for the entire agricultural households the total value of implements etc. has been ascertained. 20% of this value has been taken as the cost of repairs and maintenance.

(VI) Market charges, cost of livestock required on the farm and miscellaneous expenses.

24. Sufficient information relating to the above costs not being available the ratios adopted by the National Income Committee were used for the purpose of the present estimates.

25. After providing for the above deductions from the gross value of output in agriculture, the net contribution of the agricultural sector to the State income of Madhya Pradesh has been ascertained.

Income from animal husbandry.

(I) Production and value of milk and milk products.

26. Applying the average annual yield rate of milk to the total milk yielding animal population of the State, the total milk production has been ascertained. On the basis of information regarding the utilisation of milk given in the Report on the livestock Census of Madhya Pradesh (1961), the total output of various milk products, e.g., butter, ghee, khoya, etc., has been ascertained. For the purpose of evaluation of these products wholesale prices have been utilised.

(II) Production and value of meat, fat and edible offals.

27. The total number of animals slaughtered in Madhya Pradesh has been ascertained with the help of data supplied by the Director of Veterinary Services and the Marketing Section of the Agriculture Department. Applying the figures of the average yield per animal of meat, fat, edible offals, etc. the total production of these products in the State was ascertained. For evaluation, retail prices were used for meat. The value of head, legs, and edible offals was estimated at Rs.2/- per animal.

(III) Output and value of bones, horns, hoofs and tail stumps.

28. The records of the Marketing Section of the Agriculture Department, Madhya Pradesh furnish figures regarding the combined yield of

bones, horns, hoofs and tail stumps per animal in the cases of buffaloes, sheep, goats and pigs. Applying this rate to the number of animals slaughtered as well as those dying natural death, the output of these products has been arrived at. Wholesale prices have been used to value the product.

(IV) Output and value of hides and skins

29. The number of hides and skins yielded by slaughtered animals has been arrived at on the basis of our earlier estimates of slaughtered animals. The number of fallen hides has been ascertained on the basis of the percentage of fallen hides to total cattle and buffalo populations given in the Report on the Marketing of Hides in India (1952). The number of fallen skins has been estimated on the basis of information obtained from the marketing section. Wholesale prices have been utilised to evaluate the product.

(V) Output and value of wool and bristle.

30. On the basis of data relating to number of sheep, output of wool and the prevailing wholesale prices in the year 1951, estimates have been built up for other years as well. As regards bristles it has been estimated that 50% of the pig population produces bristles and that the annual yield rate per animal is roughly 4 ozs. Wholesale price data form the basis for evaluation of the product.

(VI) Value added due to increment.

31. The value added by increment in livestock has been ascertained with the help of livestock census data. So far as poultry is concerned there did not seem to be any significant value added by net increment. Again no estimates were made for horses, mules and donkeys due to the absence of price data.

(VII) Output and value of poultry products.

32. The poultry population for the different years was obtained by interpolating between the livestock census data. The total egg production has been ascertained by applying the egg production rate of hens

and ducks as given in the Livestock Census of Madhya Pradesh to the poultry population of the State. With the help of the information contained in the Report on the Marketing of eggs in India, the number of eggs lost before collection and the number of eggs retained for hatching has been ascertained. The balance has been taken as eggs used for consumption. The poultry used for consumption has been estimated on the assumption that the poultry population is just replaced every year. Thus poultry used for consumption would equal chickens that survive. Chicken survivals have been ascertained by applying relevant ratios given in the First Report of the National Income Committee to the number of eggs retained for hatching.

(VIII) Output and value of dung

33. Daily evacuation rates of dung per animal is available from different sources. Scrutinising most of these figures it was considered preferable to use the figures given in the First Report of the National Income Committee. The information contained in the Marketing Report on cattle about the utilisation of dung for different purposes has been used with slight modification.

34. So far as manurial services of sheep and goats are concerned the result of investigations of Shri M.G. Joshi of Poona have been utilised.

Net income arising from animal husbandry

35. In absence of sufficient information about the various constituents of livestock feed, a straight percentage deduction from gross value has been made to arrive at the net output. The percentage of cost used by us to the gross value of output is the one adopted in the Final Report of the National Income Committee.

Income from mining

36. Production and value figures for different minerals have been taken from "Records of the Geological Survey of India" for different years. The production figures which are given for calendar years have been adjusted for the financial year on the assumption that production is uniform

over the whole year. In order to arrive at the net value of output the following deductions have been made:-

- 1) Cost of materials and electricity used within the mines,
- 2) Value of coal consumed in the collieries or waste and
- 3) Depreciation.

Since separate estimate for taxed incomes has been made, the net income in mining as ascertained above has been adjusted for taxed incomes in mines and quarries.

#### Income from forests

37. Figures for the outturn and value of major and minor forest produce are available from the State Forest Department. Since no sound basis exists for estimating the quantum of value of the unauthorised collection of the forest products which escape the knowledge of the Forest Department and since the Forest Department calculates the value of the products on the basis of sale price to contractors, there is likely to be a lot of under-estimation of the income arising in the sector. 5% of the gross value of the forest products has been provided for costs and materials used. Adjustment for taxed incomes has also been made.

#### Income from fisheries

38. To arrive at the total catch of fresh water fish in the State marketable surplus of the fresh water fish and its consumption by producers themselves have been estimated. The value figures for 1948-49 were adjusted for other years on the basis of the changes in the export prices of fish in the Indian Union. 5% of the gross value has been provided for operational cost and depreciation of boats, fishing equipments, etc. Finally 25% of the net output of the fresh water fish has been added as the contribution of the subsistence fishing and angling by all classes of people other than professional fishermen.

#### Income from hunting

39. The per capita income of persons engaged in this activity has been taken to be two thirds that of a fisherman.

Income from large scale industries

40. The only difficulty in the estimation of income arising in large scale industries is the incompleteness of the coverage of the census of manufactures. Evidently the figures of the value added by manufacture given in the census of manufactures for an industry need adjustment to provide for the factories covered in the Factories Act Report but not in the census of manufactures. This has been done by applying to the total number of workers as given in the Factories Act Report to the value added per worker as obtained from the census of manufactures.

41. It is necessary in the first instance to classify the 29 census industries under the broad industry classification groups given in the Factories Act Report. The total number of factory workers were also classified under the eight broad industry classifications.

42. The value added per worker for a group has been taken to be the weighted average of the value added per worker in different census industries coming in that very group. The weights employed are the number of workers in the industries. The value added per worker for miscellaneous group of the Factories Act Report has been taken to be the average of the figures of all the groups for which information is available from the census of manufactures since there is no census classification corresponding to the 'miscellaneous' group of the Factories Act Report.

43. Having obtained the number of workers and the 'value added per worker' in each group as described above, it was easy to obtain the adjusted value added by manufactures for all the groups. The contribution of large scale industry to the State income is taken to be equal to the 'net value added' i.e., the value added by manufacture as given in the census of manufactures minus a summary deduction of 10% for miscellaneous expenses like insurance, advertising, etc. Since taxed incomes are being estimated separately, taxed income from industry will have to be deducted from the net value added to avoid duplication. The item of deduction is the total of

income taxed which are shown under groups 2 to 6 in the statement No. 4 of the Income Tax Revenue Statistics issued by the Central Board of Revenue.

Income from small scale and cottage industries.

44. The number of persons employed in the rural and urban areas in the various textile and non-textile establishments has been ascertained from the District Census Hand-books. The information which relates to nearly 63 industries has been classified under seven broad groups. Per capita earnings data for the above industry groups were adopted from the Report of the National Income Committee. Provision for other factor payments has been made at the rate of 20% of the workers' total earnings.

Income from house property

45. Rural :- The number of occupied rural houses has been ascertained by interpolating between the census data. The average rental value of a rural house and the current value of the same has been estimated on the basis of information contained in the Reports of the National Income Committee. 10% of the current value has been taken as gross rental. From the gross rental, the cost of repairs and maintenance, as ascertained from the National Sample Survey has been deducted to get the net rental.

46. Urban :- The number of urban houses has been obtained by interpolating between the census figures. The average annual rental income per house has been taken to be the same as adopted by the National Income Committee.

47. Deductions for repairs and maintenance and house taxes have been made to derive the net income.

Income from agricultural trade

48. The income arising out of agricultural trade has been calculated by first ascertaining the marketable surplus of each crop and then applying to it the estimated margin existing in the trade of different crops. All estimates are based on theoretical marketable surplus since no allowance for estimated repurchase of grains by producers has been made. The marketable



surplus has been determined with the help of information contained in the various marketing reports. The trade margins for different crops have been estimated on the basis of the information given in the report of the Food Grains Investigations Committee, 1950 and the Reports of the National Income Committee.

Income from commerce, transport, other services and miscellaneous.

49. Due to the non-availability of data regarding earnings in the various occupations coming under the above sectors, it has become necessary to consider the various occupations in collective groups. As such, under the group 'commerce' estimates relate to the income of persons engaged in retail and wholesale trades (in commodities other than food-stuffs), insurance, banking and other financial business and real estate business.

50. The distribution of working force in these sectors has been ascertained from the census report 1951 and adjusted for the different years. Since the taxed incomes have been separately estimated, it is necessary to calculate the income of only those persons who are not subject to income tax. The total number of persons who are subject to income tax in these sectors can be estimated on the basis of statement number 4 and 5 of the Income Tax Revenue Statistics. Deducting this number from the total working forces, the number of persons whose incomes are not subject to tax has been obtained.

51. It has not been possible to obtain any reliable and consistent data regarding average earnings per worker in these sectors. Under these circumstances it has been considered advisable as an interim measure to use the information contained in the Final Report of the National Income Committee regarding per head earnings of persons not subject to income tax, in these sectors.

Taxed incomes

52. Information regarding incomes subject to income tax has been taken from the Annual Income Tax Revenue Statistics (Sec. A, statement No. 3).

The main classifications covered are: salaries, interest on securities, property, business and professions, capital gains, other sources, etc.

Total state income

53. A simple aggregation of the net income arising in different sectors would give the total State income (see Appendix 'A'). It is evident from the table given in the Appendix that the State income has been continuously on the increase during the period under study except in the year 1950-51 which was year of serious crop failure. The share of the primary, secondary and tertiary sources in the State income were 61.8%, 8.5% and 29.7% respectively. Rural and urban split up of the sectoral estimates has also been attempted on the basis of the ratio of rural to urban to working force in each sector. It was, however, assumed that the income arising from large scale industries and the taxed incomes originate in the urban areas and income from hunting arises in the rural areas. Nearly 78% of the States total income originated in the rural areas in the year 1950-51.

The inadequacy and deficiency of the available statistical material

54. The slender empirical basis and venture-some hypotheses that lie behind the estimates in certain sectors could hardly be avoided in the income study of a State like Madhya Pradesh which till recently did not possess any Statistical Bureau.

55. There is a complete blackout of statistical material in certain sectors. Whatever meagre data are available for other sectors are the by-product of general administrative activity and are of doubtful accuracy. Besides the absence of such basic information as the extent and volume of the non-monetised section of the State's economy, the following are some of the limitations of the existing statistical material.

56. Leaving apart the census data, very little information exists regarding either the estimate of the total working force or its distribution by various occupation. There is complete absence of data regarding the outturn of various fruits and vegetables, annual catch of fresh-water fish, output of various livestock products and the value added by small scale and cottage industries.

57. Another vital and wide gulf is the absence of information regarding costs involved in the output of the various sectors of the State's economy. The price statistics of various commodities are incomplete in coverage and contain not too few paradoxes. Information which may help in the estimation of income arising from house property is not available. There is very little information on the value of internal trade, current trade margins and average earnings per worker in the commerce, transport liberal arts and professions.

58. Any attempt to catalogue comprehensively the existing statistical gaps and gulfs which lie in the way of State income studies is likely to prove unsuccessful. Earnest and determined attempts to improve the present state of affairs have been long overdue.

sectors	1927-28			1928-29			1929-30			(Rs. lakhs)		
	urban	rural	total	urban	rural	total	urban	rural	total	urban	rural	total
	1	2	3	4	5	6	7	8	9	10	11	12
1. agriculture	431	20891	21322	468	22706	23174	530	25710	26240	490	23766	24256
2. animal husbandry	86	1569	1655	130	2380	2510	114	2084	2198	175	3195	3370
3. mining	48	333	381	65	451	516	88	613	701	94	655	749
4. forestry	72	189	261	75	197	272	97	255	352	108	284	392
5. fisheries	5	42	47	5	46	51	5	43	48	8	73	81
6. hunting	3	3	3	3	3	3	3	3	3	3	3	3
7. large-scale industry	645	645	645	980	980	980	630	630	630	1012	1012	1012
8. small-scale and cottage industry	503	1502	2005	696	2094	2790	775	2351	3126	714	2183	2897
9. house property	1100	1045	2145	1122	1350	2472	1138	1423	2566	1160	1461	2621
10. agricultural trade	716	738	1454	753	776	1529	797	822	1619	777	801	1578
11. commerce	914	868	1782	964	916	1880	980	931	1911	992	942	1934
12. transport	552	317	869	638	366	1004	656	376	1032	661	379	1040
13. other services and miscellaneous sources	2050	2603	4653	2379	3020	5399	2441	3098	5539	2449	3100	5549
14. taxed income	1331	1331	1331	1178	1178	1178	1382	1382	1382	1586	1586	1586
15. total income	8453	30100	38553	9453	34305	43758	9633	37114	47347	10228	36873	47091
16. population (in lakhs)	29	179	208	29	180	209	29	182	211	29	184	211
17. per capita income (Rs.)	291	168	185	326	191	205	332	207	224	353	200	224

**A PRELIMINARY CONFERENCE ON RESEARCH IN NATIONAL INCOME**  
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A NOTE ON PROCEDURES OF ESTIMATION OF NATIONAL INCOME IN  
UTTAR PRADESH

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1. This note is confined to problems of estimation of national income of a state. It is based on experience obtained in the estimation of national income of Uttar Pradesh for a number of the past years.
2. Estimates of national income of Uttar Pradesh are being published in the Monthly Bulletin of Statistics brought out by the Department of Economics and Statistics, Uttar Pradesh. A note on the Procedure of Estimation was printed on pages 1105 to 1118 in the November, 1955 issue of the Monthly Bulletin of Statistics of the State. The note attempts to describe in detail the procedure of estimation of national income of Uttar Pradesh as well as to bring out the important gaps that exist at present and the steps taken to meet those gaps in the absence of suitable data. A reproduction of the note has been added as an appendix to this paper.
3. Apart from other gaps, which may be important in themselves but are perhaps relatively of minor importance, the two most important gaps in the present estimates of national income of Uttar Pradesh are:
  - (1) that data regarding cottage or small-scale industries in the rural areas are not available nor is there any indication of the variation from year to year in the contribution of that sector to the national income of the State, and
  - (2) that the present procedure of estimating the urban income of the State is based on indirect approach to approximation in the absence of relevant factual data.
4. It is appreciated that the National Sample Survey (NSS) have been attempting to collect some data on household enterprises in rural areas.

The data thus collected, cannot, however, fully serve the purpose in view. Indeed the approach to the problem has to be basically different from the MSS approach. The cottage and small-scale industries in rural areas cannot be looked upon as being one homogeneous whole of enterprises, from which a single sample can be drawn by simple sampling for the purpose of obtaining a reliable estimate. As a matter of fact, the cottage industries are widely heterogeneous in character and productivity. Apart from this, practically for every important cottage industry there are intensive localized pockets. These two factors must be taken into account in drawing a random sample for obtaining an estimate of the contribution of cottage industries in rural areas to the national income of the State. Moreover, it goes without saying that the sample size itself will have to be sufficiently large for a proper estimate of each cottage industry, at least for once to start with. While it would be necessary to conduct recurring annual surveys to obtain up-to-date data regarding contribution of such industries and the variation in that contribution from year to year, perhaps the sample size need not be quite as big as in the first instance, though it may be desirable, if not necessary, to repeat that size periodically after every three or five years.

5. While for the rural sector it has been found feasible to adopt the production approach for the purpose of estimation of national income, it has not been possible to follow that procedure for estimation of the urban sector of national income. It is true that some data are available, under the Industrial Statistics Act, regarding the net contribution of certain industries to the national income, but these industries cover only a portion of the organised mill-industry sector, and on account of this incompleteness of the data, it has not been found feasible to make direct use of them. The income approach has had, therefore, to be used for estimating urban national income as much for other sectors as for the organised mill-industry sector, though for the latter some data which may be considered relatively more reliable are available in respect of income

per capita, which has to be inflated by the corresponding population of the sector concerned. Amongst sectors other than organised mill-industry sector, an almost complete gap exists with regard to factual data relating to trade and business sector. Efforts so far made to take into account the limited data which should be available in connection with the sales-tax assessment have not been fruitful. Another important sector includes the professional classes. In Uttar Pradesh, a survey was conducted some years back to obtain reliable data relating to consumption expenditures of certain urban professional classes. The efforts succeeded and the data have come in handy for estimating the contribution of these classes to the urban sector of national income of the State. But the weakness lies in that the data relate to only one year and there is nothing to indicate annual variations. Still another important sector for which data are wanting covers the workers, skilled as well as unskilled, in sectors other than organised mill-industry sector. In Uttar Pradesh, the Department of Economics and Statistics has recently started regular collection of data which should give some indication of the level of wages of workers in this sector. Data regarding rates of wages or earnings of unskilled or skilled workers in urban areas other than the organised mill-industry sector would seem to provide a useful direction in which the NSS can widen the scope of their activity.

Appendix: A:-- Note on Estimation of National Income of U.P.

(Reproduced from the Monthly Bulletin of Statistics,  
Uttar Pradesh, November, 1955)

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Concept:

1. The basic concept which has been adopted for the final estimates of provincial national income is 'net national output at factor cost' and step by step refinements shall be made to this end. However, at present the figures put forward can be even at their best construed only as 'Net geographical output at factor cost', as no deductions could be made for 'net income from abroad'.

Method:

2. The methods adopted have been necessarily governed by the availability of data. Because of lack of basic economic and financial statistics, it has not been possible to estimate net output by consistent methods i.e. either by the output approach alone, by evaluating net product of each industry or by the income approach alone i.e. by computing income payments to factors of production. The figures given are based on a mixed method of estimation i.e. certain elements of the national income, especially the primary production sector and industry are based on 'value added' method whereas other elements are compiled on the basis of incomes received. Adjustments have been necessary to avoid duplication sometimes and sometimes gaps have had to be left unfilled after leaving a note to that effect.

Classification:

3. Total national income of Uttar Pradesh is classified into rural and urban income. In fact they have been built up separately and the provincial national income is an aggregate of the two. The idea of giving this classification was further strengthened by the fact that different approach was made for estimation in two sectors - output approach in the rural sector and income approach in the urban sector. However, it may be understood that the classification of items in the two sectors has been necessarily circumscribed by the available data.

Rural income of Uttar Pradesh

Approach to estimate of rural income:

4. An attempt has been made to estimate rural income of the State by the 'net product' approach. It is built up as an aggregate of net outputs of different constituents of rural economy, viz: (1) Agriculture (2) Animal Husbandry (3) Forests (4) Cottage Industries (5) House Property (6) Interest on Agricultural debt and (7) Rural Trade. The first three comprise primary production and the last four non-primary production.

Net output of agriculture:

5. The net output of this sector has been estimated by estimating first the gross output of Agriculture (rural) and



then deducting allowances for (1) Seed (2) Maintenance of work Cattle (3) Interest on Agricultural Debt and (4) Repairs and Depreciation of Agricultural Implements.

Gross output of agriculture (total):

6. Value of agricultural product is built up from 32 different crops of the State. Crops of the State may be classified under 'forecast crops' and 'non-forecast crops'. The former include 25 crops and their gross out-turn is available from forecasts published by the Agricultural Department of the State; the non-forecast crops include five crops and their yield has been estimated from area figures (obtained from the Land Reforms Commissioner, U.P.) multiplied by figures of normal yield per acre (finalised in consultation with the Agricultural Department, U.P.) and by modifying the product in the light of crop condition factor as reported by the Land Reforms Commissioner, U.P. from year to year. For the remaining two crops namely bhusa and cotton seed, the yield has been estimated by utilizing information on allied crops given in the published forecasts; thus, the yield of bhusa has been estimated as 1.75 times the yield of wheat and barley, and that of cotton-seed as double the yield of cotton lint.

7. The Agriculture Directorate did not publish any crop forecasts for Jute and Potato before 1950-51, for Arhar before 1951-52, for Urd, Moong, Masoor, Peas and Moth before 1952-53 and for Koton and Sawan before 1953-54. The yield of these crops for years before their respective forecasts began to be published, has been calculated as for non-forecast crops.

8. The 32 crops are as follows; the non-forecast crops are marked with an asterisk and in their case the normal yield per acre is indicated within brackets as also in case of those crops which were originally non-forecast crops but have since become forecast crops.

(1) Wheat; (2) Rice; (3) Gram; (4) Barley; (5) Maize; (6) Bajra; (7) Juar; (8) Koton (7 mds.); (9) Sawan (11 Mds.); (10) Manua; (11) Arhar (8.5 mds.); (12) Urd and Moong (11 Mds.); (13) Masoor (7.5 Mds.); (14) Peas (10.9 Mds.); (15) Moth (9 Mds.); (16) Bhusha; (17)\* Fodder (187.5 Mds.); (18) Rape and Mustard seed; (19) Linseed; (20) Til; (21) Groundnuts; (22) Cotton seed (23) Castor seed; (24)\* Hemp Fibre (7 Mds.); (25) Cotton Lint; (26) Jute Fibre (10 Mds.); (27) Sugar Cane; (28) Potato (100 Mds.); (29)\* Fruits and Vegetables excluding Potato (100 Mds.); (30) Tobacco; (31)\* Opium (1 Md.) and (32)\* Hemp manure (187.5 Mds.).

9. It may be of interest to add here that out of the total area under cultivation (of these 32 crops) the area covered by 25 forecast crops constituted roughly 95 per cent in 1953-54.

11. While using these yield figures, it should be borne in mind that comparability is distorted to the extent that upto the year 1948-49 figures for merged States, viz. Rampur, Banaras, and Tehri Garhwal have not been taken into account. But from the year 1949-50 figures for Rampur and Banaras have been included for all commodities while those for Tehri Garhwal are included only in case of rapeseed and mustard in the years 1949-50 and 1950-51 and in case of maize in the year 1950-51. From 1951-52 all crops in Tehri Garhwal have been included.

11. It may be noted here that a residual item like 'other crops' has not been adopted for the purposes of our yield calculations. Attempt has been made instead to list exhaustively different crops. Having smaller number of crops and then estimating separately the yield of 'other crops' would have resulted in less accuracy specially because estimation of the yield of the heterogeneous item like 'other crops' can at best proceed on certain assumptions which may not be called so legitimate.

Prices:

12. The gross crop out-turns have been evaluated at wholesale prices prevailing in the harvest period. The objective was to evaluate at the point of production but with the lack of data on prices received by farmers at the place of production closest approximation was made by determining harvest time for different crops and utilizing the wholesale prices prevailing in those months. In most cases they are available amongst data reported by the Economic Intelligence Inspectors of the department; in other cases, alternative sources have been tapped. For each commodity they are based on a number of centres, important for the commodity from the point of production, and are weighted according to the quantity of production in the year 1948-49 in the region represented by the centre. The price for a particular centre is the simple average of prices ruling at the centre during the harvest period.

13. It may be relevant to add that in the rationing period, for the totally rationed commodities open market wholesale prices were not available; instead, the godown issue rates have been utilized. For the period rationing was at its apex they amounted to roughly 19% of total price quotations utilized.

14. It should be noted that harvest prices are also available in the 'Season and Crop' reports published by the Land Reforms Commissioner, U.P., but these prices are retail prices which include contribution of distributive trade and such could not be utilized for estimating contribution of agriculture at the point of production. Another set of harvest prices are available in the 'Agricultural Situation of India' - a publication of the Directorate of Economics and Statistics, Ministry of Agriculture, New Delhi, but they too could not be utilized, being only for a very limited number of crops.

15. It has, however, to be admitted that the method followed for estimating value of gross agricultural output has serious limitation of non-specification/qualities as far as estimation of yield goes and of evaluating at a price which includes something over and above 'true harvest price'. But no data are available at the moment which can enable further improvement in these directions. Making a summary percentage deduction from the wholesale prices to derive harvest prices would be almost completely arbitrary and has therefore not been followed.

Gross output of agricultural (rural):

16. Out of the gross output of agriculture (total) so estimated, deduction has been made for gross output of agriculture (urban) in order to get gross output of agriculture (rural). The total output of agriculture has been divided into rural and urban on the basis of rural and urban population in the agricultural livelihood class as given in the 1951 population census volume.

This involved an assumption that gross output of agriculture per person is the same in rural and urban areas. Since, however, urban wholesale prices are used for computing gross value of agricultural produce, the income accruing from Agricultural trade also comes to be included in the value thus arrived at. In order to eliminate it, the income accruing from agricultural trade in rural areas is deducted to get gross output of Agriculture(rural).

Deduction items:

17. In order to get net output of agriculture(rural) deductions are made for (1) seed, (2) maintenance of work cattle, (3) repairs and depreciation of agricultural implements and (4) interest on agricultural debts. 8% of agricultural production (rural) was worked out as seed rate in our estimates of Rural Income Inquiry obtained from the pilot study and this rate has been used for deduction on account of seed. Allowance for maintenance of cattle covers two items - (1) bhusa and fodder, and (2) concentrates. For the former it has been assumed that the total quantity of bhusa and fodder produced is used up in maintaining cattle. For deduction on account of concentrates, it has been assumed that total value of concentrates consumed by cattle varies as a constant proportion of total value of bhusa and fodder consumed. This proportion has been determined by taking into account the different figures given for these two items in the National Income of India, 1945-46, a publication of Ministry of Commerce, Government of India. This expenditure has been divided under two heads, namely maintenance of work cattle and maintenance of milch cattle. The allocation of these two sub-heads has been done in proportion to the number of work cattle and milch cattle. For the purposes of work cattle all male cattle and he-buffaloes over one year and for milch cattle all female cattle and she-buffaloes and male cattle and he-buffaloes below one year as reported in the cattle census of 1951 have been taken. To make a deduction on account of repairs and depreciation of agricultural implements, it has been assumed that expenditure on agricultural implements varies directly in proportion to the net area sown in the year and total value of agricultural implements is calculated at the rate of Rs.22 per acre of net area sown in the year. The figure of Rs. 22 per acre is taken from the Government of India, National Income Committee report of 1948-49. In this connection it may be noted that the committee had tabulated average value of Farm implements for more than a hundred holdings in U.P. on the basis of size of holdings and they derived the average value of implements per acre of cultivated land on the basis of weights given by the Zamindari Abolition Committee Report (1948). The total value of agricultural implements has thus been arrived at, and repairs and depreciation have been worked out as 20% of the total value.

18. In case of agricultural debt, the problem is still more difficult as on reliable estimates of rural indebtedness for U.P. are available. Assuming the figure of Rs. 9138 Crores given in the National Income Committee Report of Government of India (1948-49) as the outstanding rural debt of India and utilizing the ratio of rural population of U.P. to that of India, a rough estimate is made as regards the total rural indebtedness of Uttar Pradesh. Out of this, two-thirds is assumed to be incurred for agricultural purposes and on this interest has been calculated at the rate of 9%. It may be worthwhile here to add that this procedure has also been adopted in the Government of India publication on National Income of India 1945-46.

Net output of Animal Husbandry:

Gross output of livestock:

19. The important constituents of gross output of Livestock are (i) Milk (ii) Meat (iii) Fish and Eggs (iv) Hides and Skin and (v) Wool and each has been estimated separately. From gross output of Livestock, expenditure on maintenance of milch cattle in rural areas has been deducted to get net output of Animal Husbandry.

Milk yield:

20. Quantity of output of milk has been obtained by multiplying the number of milk-yielding animals (cows, buffaloes and goats) by the average yield of milk per animal. The number of milk-yielding animals has been taken from Livestock Census 1945 and 1951 and the yield of milk per animal is obtained from the 'Marketing Report of Milk in India'. The entire quantity of milk has been divided into Rural and Urban sectors on the basis of the cattle in milk in rural and urban areas obtained from the Cattle census of 1951. The total quantity of milk in the rural sector has further been divided into three components viz: (i) the quantity used for ghee making, (ii) the quantity used for curd making and (iii) the rest of the milk, which has been assumed to be consumed as milk. The ratios for obtaining quantities of milk used for purposes of ghee and curd have been obtained from a brochure on the Marketing of Milk in the Indian Union. After estimating the quantities of milk used for ghee and curd making, the out-turn of ghee and curd are estimated on the basis of conversion ratio of milk into ghee and curd obtained from Indian Livestock Statistics, published in 1952.

Prices:

21. Fluid milk (rural) has been evaluated at the same retail prices as in urban areas. The values of ghee and curd have also been worked out on the basis of urban retail prices. All these three have been totalled to obtain estimates of value of milk in the rural areas. The entire quantity of milk for urban areas has been evaluated at urban milk prices.

22. It may be stated that the calculations of prices have been made for financial years, while figures of output refer to calendar years, as the parent sources (Livestock census, marketing reports, etc.) give statistics for calendar years. It has been assumed that the calendar years 1948, 1949 correspond to the financial years 1948-49, 1949-50, and so on.

Meat:

23. Output of meat has been estimated on the basis of statistics of animals slaughtered in the licensed slaughter houses, which are available in the administrative reports of the Animal Husbandry Department, U.P. Animal, slaughtered are given by types-cattle, buffaloes, sheep and goats. But these can be at most construed to be animals slaughtered in the urban areas. The Department of Animal Husbandry, Uttar Pradesh has been contacted to give also the estimates of animals slaughtered in the rural areas and the figures obtained from them have been utilized. Yields of meat per animal for the above types have been taken from the report on National Income of India, 1945-46 issued by the Ministry of Commerce, Government of India.

24. The output of cattle, buffalo, and sheep and goat meats so derived is evaluated at estimated prices. For evaluating sheep and goat meat, retail prices of goat meat have been taken from this Department from 16 centres and are weighted according to the number of goats slaughtered at each centre during the year 1942-43; for buffalo meat retail prices from one centre (the only centre from which prices of buffalo meat are available in the Department) have been taken. Cattle-meat prices have been estimated as the simple average of goat-meat and buffalo meat prices. For estimating the value of meat in the rural and urban areas, prices for rural and urban areas respectively have been taken. Rural prices have been estimated from urban prices on the basis of the ratio between 1953-54 rural prices in Lucknow district and 1953-54 urban prices at Lucknow.

25. Having thus estimated the value of cattle, buffalo, sheep and goat meat, pig and poultry remain to be accounted for. The live-stock census in both these cases gives the total population in the year 1945 and 1951; on that basis year-wise population of each has been estimated assuming constant increase (or decrease) over the period. The meat yield per pig has been estimated as an average of two estimates, one from the Animal Husbandry Department, U.P. and the other utilized by the Government of India in the year 1945-46 pamphlet of National Income issued by the Ministry of Commerce, Government of India. Meat yield per poultry has also been estimated as simple average of meat yields per hen and per duck as given by the Animal Husbandry Department U.P. Prices of pig and poultry meat are, however, not available at present in the Department. Instead, goat meat prices have been utilized with a suitable adjustment factor for each, the adjustment factor being determined on the basis of the ratio which existed between the price in question and the goat meat price in the year 1944-45 as recorded in the Animal Husbandry Department file on the relevant marketing report.

Fish:

26. The total value of marketed fish in U.P. has been taken from the Marketing report on Fish in India (1948) issued by the Agricultural Marketing Adviser to Government of India and value of home consumed fresh water fish has been assumed to be 7.5% of the above, based on the percentage figure given in the marketing report for sea water fish. The total value has been assumed as constant over the entire period, as prices of fish are available in the Department only from the year 1948.

Egg:

27. The egg production figures for the year 1950-51, as supplied by the Director of Animal Husbandry, U.P. have been used and evaluated at urban prices. The production of eggs for other years was estimated on the basis of rate of increase indicated by figures supplied by the Director of Animal Husbandry, U.P. A weighted average has been worked out of retail prices from 12 centres, weights being the number of hens in the year 1944 as given in the Livestock Census. For each centre, price has been taken as the average over the financial year.

Hides:

28. The report on the Marketing of Hides in India (Series No. 70) is the main source of information regarding the output of hides of different types kips and buffs. In the report, annual production is given as an aggregate of (1) fallen and (2) slaughtered production. From there the ratios of total production to slaughtered for kips and buffs have been worked

out separately and then utilizing the estimates of total number of animals slaughtered, we get the total number of kips and buff's produced in the year. Wholesale prices for the financial year have been obtained from the Department from 6 centres in case of kips and 2 centres in case of buff's. Average weighted prices have been used for evaluation, weights being the number of animals slaughtered in 1942-43 (cattle in case of kips and buffaloes in case of buff's) in the particular centres, as given in Livestock Census Report of U.P. in 1944.

Skins:

29. Production of goat and sheep skins has been estimated on the same lines as that of hides, utilizing the marketing report on Skins in India, published in 1943. Weighted wholesale prices have been utilized for evaluation, weights being the number of animals in 1944 at the particular centre. For goat skins prices from 11 centres have been used, while for sheep skins from 2 centres.

Wool:

30. Quantity of production of wool has been taken for this period from the brochure on the Marketing of Wool in India (1942) and prices have been taken from 2 centres from the Department. A simple average of prices has been worked out, there being no suitable data for weights. The price for each centre is the average price over the financial year and the two centres (Kanpur and Almora) have been selected in such wise as to take into account the differences in the quality of wool.

Increment in Livestock:

31. The figures of yearly increase in the number of cows and buffaloes have been obtained from the Livestock Census and these have been multiplied by the prices of cow and buffalo-calves at Lucknow in 1953-54. For other years they have been deflated with the help of Index of Agricultural Wholesale prices in U.P.

Deduction item:

32. The total expenditure on maintenance of milch cattle has been divided into rural and urban sectors according to their population in the two sectors. The expenditure on rural milch cattle has been deducted from the gross value of livestock products.

Forest Products:

33. The administrative reports of the Forest Department U.P. were the only source which could throw light on the output from forests in the State. From them information has been culled as regards the output of timber, fuel, bamboos, raisins and other products, sold and used departmentally, sold to purchasers, and removed by the agency enjoying rights, privileges and free grants. Corresponding value figures are also given in the reports, except for the items removed by purchasers in which case, they have been evaluated on the same rates as in the case of those enjoying rights, privileges and free grants.

There being no data on the costs involved, no deduction could be made and the estimate here at best should be treated as gross output.

Cottage industry:

34. The items so far covered, viz, agriculture, livestock and forests constitute primary production. Coming to the non-primary production sector, the most important constituent is cottage industry. It has to be admitted that data available for this sector are meagre, the only sources of information being two publications of the Directorate of Cottage Industries, U.P. viz. (1) Let Figures Tell and (2) Commercial Directory, 1949. Both of these give value of gross output by major industry groups but do not throw any light on the costs of production. As such, net output cannot be determined on the basis of these publications. Summary percentage deductions were made from gross output of each major industry group in order to estimate net output, the percentage deduction for each major industry group being based on figures given in the N.I.C.R. (Feb.1954) of the Government of India.

House property:

35. In case of house property the average value per rural house has been derived from inventory data collected under the pilot inquiry into Rural Income. The method which has been adopted for estimating house property, taking into account also the final report of National Income Committee, is to depreciate value of house property as the gross imputed rental. To get the maintenance expenditure, again, data collected in the Rural Income Inquiry have been used.

Interest on agricultural debt:

36. In the non-primary production sector also we have 'interest on agricultural debt' as one component. In fact, the item presents a case of transfer of incomes. To ensure a fair degree of accuracy in the evaluation of such categories as primary and non-primary production, the total interest charges on agricultural debt have been calculated as a subtractive factor in the evaluation of net output of agriculture and animal husbandry and as an additive factor in the estimation of non-primary production. It has, however, been assumed that the entire agricultural debt has been taken from rural areas and thus interest on it forms part of rural income of the State.

Rural trade:

37. The method adopted to measure contribution of agricultural trade is to estimate first value of marketable surplus of each crop and then calculate contribution of trade in that crop, taking into account the distributive margin for that crop and its marketable surplus. Trade margins for different groups of crops expressed as percentages of value of products as given in the N.I.C.R. (1948-49) have been utilized for the purpose. The percentages of total produce which constitute marketable surplus can be, at best considered only as conjectures. These estimates are subject to revision in the light of additional data when made available. Besides getting the contribution of trade crop-wise, it has also been estimated as

13% of the total value of marketable surplus of all crops, the figure of 13% being again taken from the W.I.C.R. on the basis of information available in the Foodgrains Investigation Committee Report 1950. Average net trade margins (including labour charges for handling packing, transportation, etc) are, in effect, estimated at 5% of gross value of produce entering into trade for wholesale and 8% for retail transactions, the assumption here being that net margins allowed by Government apply to all trades in grains and other agricultural products. The final estimate adopted is an average of the two estimates arrived at by these two approaches. To this final estimate has been added a figure of Rs. 22 crores on account of business enterprise; this latter figure has been obtained from results of pilot study of data collected under the Rural Income Inquiry.

Accuracy and general limitations of the estimates in rural income sector:

38. Out of the various constituents of rural income, the estimates of agriculture and animal husbandry have the highest degree of reliability while those of industry the highest degree of error, followed closely by those of trade and house property. Further it should be borne in mind that the estimates given here are generally not based on any probability sample inquiry conducted for the purpose but are based on data available at the moment in different departmental publications of the State and other Governments, in different reports and enquiries etc. As such, the margin of error for different estimates cannot be calculated in the probability sense; only rough and ready ranking can be made by taking into account the field covered, the approximations made and the estimation procedure utilized. Also, no claim is made for exhaustiveness in the sense that all sectors of rural economy are covered and this is specially true when we come to consider the non-primary production sector. For illustration, in industry what has been taken into account is only the data on cottage industry as made available in the Commercial Intelligence Directory of the Director of Cottage Industries, U.P. It may be that full account has not been taken of all village industries. Further it should also be stated that the demarcation line between rural and urban income is not very clear-cut; border line cases exist and sometimes it is difficult to determine the portion of an aggregate which should go to rural income. This is specially so in case of trade where we had to make the assumption that distributive margins in case of agricultural marketable surplus constitute the trade incomes of rural areas only.

Urban income of U.P.

Approach to estimate of urban income:

39. For this sector primarily 'Income' approach has been adopted in contrast to the 'net product' approach followed in estimating rural income. In brief, the methodology used is to get separate estimate of:-

- (a) Income from agricultural urban population;
- (b) Non-taxed incomes of all non-agricultural urban population except those following production other than cultivation;
- (c) Total taxed income from the Income Tax Statistics;
- (d) Net value added from industry; and then make allowance in their aggregate for duplication because of (c) and (d) by having a deduction item from industry viz. (c) taxed income.



(e) Income from other industries.

Income from agricultural urban population:

40. Income from agricultural urban population has been estimated as the gross output of agriculture (Urban) minus 8 deduction for seed.

Non-taxed incomes:

41. Non-taxed incomes have been estimated separately for non-agricultural urban population having (i) Commerce, (ii) Transport, (iii) Other services and Miscellaneous sources, the three livelihood classes given in the 1951 Census. For this purpose it is essential to find out the number of earners who do not pay income-tax in each of the three classes, and their average earnings. From the income-tax statistics published by the Central Board of Revenue, in the publication entitled 'All India Income Tax Revenue Statistics' we know the number of assesses under certain trade classification of incomes, say, under distribution and communications professions, etc., finance and so on, we also know the number of assesses according to certain classes of incomes, say, salaries. An attempt has been made to establish correspondence between the 1951 Census livelihood classes and the income-tax classification as follows:-

Census livelihood classes:

Income tax classifications

Commerce

Statement No. 4 (Trade Classification of Business and Professional Incomes assessed to Income Tax and Super-tax)

Classification

Group 5. (Distribution and Communications).

- Class (i) Wholesale - Merchants, Warehousemen, Agents, etc., concerned with the distribution of goods, produce or merchandise but who do not carry on any manufacturing process other than sorting, packing and blending.
- Class (ii) Retail (a) - Hotel, Refreshment Houses and Retailers of Beers, Wines, Spirits, Liquors and Mineral Waters.
- Class (iii) Retail (b) - Retailers who render no personal service other than distribution (e.g. Grocer, Green-Grocer, Tobacconist, Butcher, News-agent, Draper etc.)
- Class (iv) Retail (c) - Retailers who render some service other than distribution or do some productive process (e.g. Carpenter, Blacksmith, Landry, Baker, Tailor, etc.)
- Class (v) Special Distribution:- Large concerns which exist mainly or solely for the widespread distribution of a standardised product (e.g. Petrol).

Transport

- Class (vi) Shipping:- (Including docks, Bridges, etc.)
- Class (vii) Managing Agents:
- Class (viii) Railways;
- Class (ix) Road and Air Transport - (Tranways, Omnibuses, Lorries, Removers, Taxis, etc.)

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Other services and Miscellaneous Sources. Statement No.4(Trade Classification of Business and Professional Incomes assessed to Income-tax and Super-tax in the year)

Classification

Group 6. (Building and Manufacture of Miscellaneous goods).

Class (i) Building and Works Contracting;

(ii) Group 9(Profession etc.)entire group.  
Statement No.3(Analysis of the Net Demand of Income-tax and Super-tax --- for the year according to the class of income assessed).

(iii) A-Demand

Salaries

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42. Thus the number of assesseees under each Census Class has been estimated. It has been then assumed that these assesseees have, on an average, individual families of the size 5.1 persons, the average size of house-hold given in the 1951 Census. With this assumption we get the total number of tax payers with their dependents. At this stage another assumption is made that the total number of tax payers with their dependants all belong to urban population. This is more true in Uttar Pradesh as the number of aggregate tax payers constitutes a small percentage of the total population. Thus we derive the total number of urban tax payers with their dependants. By simple deduction from the estimated urban population in the Census livelihood class for the year, we get the number of urban non-tax payers with their dependents. The urban population in a particular livelihood class for any year is estimated by adjusting the corresponding population in the year 1951 with the ratio of estimated total urban population in the year to that given in the 1951 Census.

43. It is essential now to estimate the number of earners, as we have at this stage only data of earnings per earner. Another assumption has been made that, on an average, there are two earners for every five persons and on this basis, the number of earners in the non-income tax paying urban population has been estimated. It may be added here that in the national income literature of our country similar assumption are not rare. Dr. Sri Gopal Tewari in his book entitled 'Economic Prosperity of the United Provinces' makes the assumption that two principal earners are equivalent to five subsidiary workers; Dr. V.K.R.V. has utilized the scale of equivalence between principal earner and a subsidiary worker as 1:4. Our assumption according to this amounts to assuming that in all average family not paying income tax there will be three subsidiary workers and at least

one non-working dependant. However, it must be admitted that the assumption is arbitrary and could not be verified for lack of data.

44. As regards average earnings per earner, we have utilized the information given in Dr. Tewari's book, which deals solely with U.P. and contains estimates based on ad-hoc enquiries. For commerce and transport, average earnings have been taken straight from the above book but for the third group - other services and miscellaneous sources - a weighted average has been worked out, taking into account the State Government employees class and professions and liberal arts class, weights being the number of non-tax paying earners in 1938-39 in the two classes. The estimate of non-income-tax-paying earners professions and liberal arts in 1938-39 together with their average earnings is available in the above book but for State Government employees it had to be estimated. From the 1938-39 income-tax statistics, we found out the percentage which the tax paid by them bears to the total tax paid by the salaried class and apportioned the total incomes taxed under salaries accordingly, thereby getting taxed incomes of the State Government employees. Thus, utilizing the information given in the book as regards total incomes of State Government employees we can estimate incomes of State Government employees who do not pay tax. Their number is estimated from the total number of government employees got from information in Dr. Tewari's book by assuming that the ratio of tax payers to the total in the State Government employees remains the same as in 1940-50; this latter ratio itself is roughly estimated from the State employment statistics published in the Monthly Bulletin of Statistics issued by the

45. These estimates of average earnings given in Dr. Tewari's book relate to 1938-39 and have, therefore, been inflated by the factories' earnings index, got from the Payment of Wages Act report.

Total taxed incomes:

46. Statistics for the taxed incomes have been directly taken from the Central Board of Revenue publications on Income Tax Statistics. Total incomes recorded under section 4 of Statement No.3 entitled 'analysis of net demand of income tax according to class of income assessors' have been utilized. No account has been taken of reductions in demand. The main classifications covered are salaries, interest on security, property, business and professions, other sources and income arising from abroad.

Net value added from industry:

47. For estimating the contribution of industry, data are utilized from Census of Manufactures and the Factories Act reports. The census at present covers only 29 industries and even in these industries only the factories registered under section 2(j) are covered i.e., those which use power and have 20 or more workers while the Factories Act Report upto the year 1949 covered all the factories registered under section 5(1) and 5(2) i.e., those factories with or without power which have 10 or more workers. According to the new act of 1948 the report covers those registered under section 2m(1) and 2m(2) i.e., (1) those which use power and have 10 or more workers and (2) those without power but having 20 or more workers. But though the coverage of the Factories Act Report is wider than the Census, it has to be admitted that it still ignores all unregistered factories, and also the smaller registered factories without power the average workers between 10 and 20.

48. The contribution of industry to the national income is measured by net value added i.e., value added by industry in the Census of Manufactures minus summary deduction of 10% for miscellaneous expenses like insurance, advertizing, etc.

49. The value added figure given in the Census of Manufactures for an industry needed adjustments, to make allowance on two accounts - (i) for the industries not covered in the Census (ii) for the factories covered in the Factories Act Report but not in the Census of Manufactures. For this purpose the 29 Census industries have been first classified under the broad industry classifications given in the Factories Act Report and then, the total number of average daily workers for a particular industry classification of Factories Act Report has been apportioned to the different constituent Census industries in the proportion of respective average daily numbers of workers given in the Census of Manufactures for these constituent industries. Thus we have for each Census industry an inflated average daily number of workers in such wise as their aggregate corresponds to the average daily number of workers for the Factories Act Report industry classification, given in the Factories Act Report. From Census of Manufactures we evaluate for each of these constituent industries value added per average daily worker and by multiplying it with the estimated average daily number of workers we get estimated value added for the constituent industries and, aggregating we get it for the Factories Act Report industry classification. Doing this for all Factories Act Report classifications and adding up, we get the estimated value added figure for the State, from which a deduction of 10% is made to estimate the net value added.

50. It may be added that the International Standard Classification of Industries was adopted for the purpose of the Factories Act Report only in 1950 and as such the correspondence between the industry classification of the Factories Act Report and the constituent Census industries had to be altered from the year 1950 and to that extent comparability in the estimation procedure has been distorted. In fact before the year 1950, there remained three classifications viz:- (i) Government and Local Fund Factories (ii) Seasonal (iii) miscellaneous, where the procedure indicated in the above para could not be adopted. In these cases value added per worker was estimated by taking into account total value added and total average daily number of workers in (i) Textiles, (ii) Engineering, minerals and metals (iii) Paper and Printing (iv) Processes relating to wood, stones and glass and (v) Processes connected with hides and skins. An attempt had also been made to allocate as many of the sub-industries under Government and Local Fund Factories as possible to major industry group and to treat only the residue under the above head on the same lines as the miscellaneous group. Since 1950, with the adoption of the standard industrial classification, the problem of the first two groups mentioned above vanished with their elimination and final correspondence has been established in the Factories Act Rule classification and the standard industrial classification. The estimation procedure indicated in the above para has been uniformly applied with the exception that for the miscellaneous group value added per worker has been calculated on the basis of all Census industries taken together.

51. Before proceeding further, it is essential to point out certain assumptions which had to be made while working out the above estimates. In the Census of Manufactures for certain industries value added was not given separately for this State,

but a combined figure was given for more than one States including Uttar Pradesh. In such cases, value added was estimated on the basis of the ratio of the number of registered factories in existence in Uttar Pradesh to the total number of reporting factories in question, assuming all factories were making equal contribution to the industry. Further, estimated value added for census industries takes into account the non-reporting factories by inflating the value added figure given in the Census of Manufactures to the level of the registered factories in existence; the same is done while estimating average daily number of workers for Census industries. The assumption here is that the non-reporting population of factories is not significantly different from the reporting sector in the above two aspects. It may be that the non-reporting factories are smaller factories, however, no studies have been made which may warrant this conclusion.

Income from other industries:

52. This item seeks to cover unorganised industry. It has been estimated by working out figures of average wages paid to workers in the organised industry and number of workers engaged in unorganised industry. The latter have been obtained by deducting total number of workers as given in the Factories Report and number of assesseees (under the industry group) in the income tax reports from the self-supporting persons having for their occupation production other than cultivation (excluding those listed under the head 'primary industries not specified elsewhere'). The latter figure has been worked out on the basis of proportion obtaining between this class and the total population of 1951. To the figure of income so arrived at has been added the net value of milk in urban areas, which has been obtained after deducting proportionate expenditure on the maintenance of milch cattle in urban areas from the value of milk in urban areas.

Deduction item - taxed income from industry:

53. The procedure so far indicated gives us separate estimates of non-taxed incomes (of all urban population except those following production other than cultivation), taxed incomes and net value added from industry. Their aggregate does not truly correspond to urban income in the sense that non-taxed incomes of those following production other than cultivation are ignored; instead total contribution of industry is taken into account. The latter does not exclude taxed incomes from industry and to that extent there may be duplication. As such a deductive item 'taxed income from industry' is estimated from the Income Tax Statistics. It is the total of incomes taxed as given under the following heads in Statement No. 4 (Trade Classification of business and professional incomes assessed to income tax and super-tax):-

1. Group 1 (Mines, quarries etc.)
2. Group 2 (Textile manufacture)
3. Group 3 (Manufacture of metal and metal goods)
4. Group 4 (Food manufacture, etc.)
5. Group 5 (Manufacture of chemical, leather, paper etc.)
6. Group 6 (Building and manufacture of miscellaneous goods) excluding sub-class, building and works contracting.

However, it should be borne in mind that even after this deduction the urban income so obtained has its own limitations - the net - value added is obtained from net product approach - while other components of urban income have been obtained from the income approach. Consistent with the Income approach, it would have been better to estimate the income of those following production other than cultivation by the income approach but lack of data makes this impossible.

Accuracy of estimates of the urban income sector:

54. Out of components of urban income, the taxed incomes have estimates with highest accuracy closely followed by that of the deduction item and these will most probably not need any revision in future. The estimate of net value added is also sufficiently reliable but that of non-taxed incomes has the least accuracy and should be treated as provisional and subject to changes in the light of subsequent information.

Accuracy of national income estimates:

55. A word may be said about the accuracy of these estimates. As to the absolute level of the figures given, it is probable that they are erring on the low side. Because of the importance of subsistence income and unpaid household activity (which is really very often tough to be demarcated from the usual economic activity in the present economy) it is difficult to estimate the full value of the national product and the likelihood of under-estimation is therefore greater than the possibility of over-estimation. Of the two sectors, estimate of the rural sector is more accurate than that of the urban sector. Further, the estimates of income per capita are more reliable than those of total income, partly because these are ratios and, partly because the estimates of population have the least degree of error and do not need any further revision, being estimated on the basis of the two population censuses of 1941 and 1951.

56. So far only estimates of national income of U.P. at current prices were being published. We are now also publishing corresponding estimates at constant prices as in 1948-49, which is the year adopted by this Department at present for all its other series of index numbers. The methodology indicated in the preceding paragraphs applies to estimates of national income at current prices, as well as to estimates of rural income at constant prices. For estimating urban income at constant prices, the estimate of urban income at current prices for each year has been deflated on the basis of the consumers' retail price index number for mill workers at Kanpur for that year in relation to the year 1948-49; these indices are prepared and published by the Labour Commissioner, U.P.

**A PRELIMINARY CONFERENCE ON RESEARCH IN NATIONAL INCOME**  
NEW DELHI 28-30 JANUARY, 1957  
**CENTRAL STATISTICAL ORGANISATION**

CONTRIBUTION TO NATIONAL INCOME BY WEAVING, LEATHER-WORKING AND BLACKSMITHY  
INDUSTRY (COTTAGE AND SMALL-SCALE SECTOR), IN BOMBAY STATE  
FOR THE YEAR 1954.

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Government of Bombay)

The object of the note is to summarise the procedure adopted in arriving at the estimates of the contribution of cottage and small-scale sector of weaving, leather-working and blacksmithy industry, etc., to the national income.

2. The Bureau conducted a Census of some cottage and small-scale industries of Bombay State in 1953. As the main purpose of the survey was to assess the extent of smaller units, the capital investment in the industrial unit has been adopted as a criterion to determine the cottage establishments and accordingly a lower limit of the capital investment has been put to include an establishment in this particular sector. The establishment with capital investment upto Rs.6,000/- and employing not more than 10 persons has been defined as cottage establishment, while the establishment with capital investment above Rs.6,000/- but less than Rs.30,000/- and employing not more than 50 persons has been termed as a small-scale establishment. It would be clear from this definition that the establishments included in the cottage sector are definitely left outside the purview of the Factory Act, while some establishments in the scope of small-scale sector may be within the purview of Factory Act. However, the Census results reveal that more than 97% of the establishments (as enumerated in the Census) are pertaining to the cottage sector of establishments.

3. The Census of Cottage and Small-scale establishments also provided a suitable frame for sample survey. As it was not possible to cover all the establishments of all centres even on sample basis on account of administrative difficulties, the sample survey has been restricted to important centres of cottage establishments in Bombay State. The fact, however, stands that the sample survey

covered good many centres of each industry. Hence, the estimates per unit obtained on the basis of sample survey results have been used in the present analysis to arrive at the estimates of relevant characteristics for all the units in the Census. It may also be mentioned that the sample survey has been conducted in three rounds - each round comprising of four months' duration and the results of such three sample survey rounds have been pooled to get the estimates of production, the cost of production, etc. The necessity of conducting the sample survey in rounds had been acutely felt on account of the fact that the establishments belonging to this particular sector of industry, being unorganised, were unable to furnish information on annual basis.

4. Table (1) shows the net earnings per industrial unit per annum for each of the industries. The net earnings have been obtained by considering the annual value of production and the corresponding cost of production. At the outset, it may be mentioned that the value of production is evaluated at market price. On account of the peculiar character of the establishment in respect of its turn-over etc., the products produced by these establishments are generally not subject to excise duty and sales-tax. Thus, the production even though evaluated at market price, can be regarded as evaluated at ex-factory prices of goods.

5. As regards the constituents of the cost of production, the constituents studied in the present analysis are cost of raw-materials, payment to hired labour, rent of industrial units (other than imputed). It may be necessary to cite out the reasons for not considering the depreciation charges. The average capital investment in machinery for industrial unit is found to be of the order of Rs.300 to Rs.500, the life of the machinery being 20 to 30 year renders the depreciation charges as phenomenally low. The net earnings per annum per unit is calculated by deducting from the annual value of production the corresponding cost of production. As the industrial units surveyed have been rarely found to be owned by partners, the net earnings per industrial unit has been equated as the net earnings per family owning the industrial unit. It will be clear from the table (1) that the net earnings per family per annum for the industries under review varies between Rs.750 to Rs.800. The main factor of cost of production is observed to be the cost of raw-materials. In case of leather-working and



weaving establishments relating to cottage sector, the proportion of cost of raw material to the value of production is estimated at 63 per cent and 70 per cent respectively. However, the proportion of cost of raw-material (which also includes cost of fuel, lubricants, chemicals, packing materials, etc.) to the cost of production of blacksmithy industry has been found to be 35 per cent. The low proportion of cost of raw-materials in case of blacksmithy establishments is attributed to the fact that the main source of income for these establishments is the income from repairing work. Hence, the essential raw-materials required for the purposes of repairing work comprises of fuels- the cost of which is likely to be of the low order as compared to the cost of raw-material used in the units pertaining to other industries. It may be mentioned that the proportion of the gross value of income from repairs value of production (including income from repairs) is 42 per cent, while the proportion of cost of fuels to the total cost of materials is 36 per cent in the case of blacksmithy establishments. In view of this peculiar characteristic of blacksmithy establishments, it has been observed that in spite of low cost of production per unit as compared to the value of production of other industrial units, the net earnings of the blacksmithy establishments is of the same order as the net earnings from industrial units of other industries.

Table (1)

Item	Industry					
	Leather tanning		Blacksmithy		Weaving	
	In Rupees	Percent to value of production	In Rupees	Percent to value of production	In Rupees	Percent to value of production
Value of production (per establishment)	2,502	100.00	1,631	100.00	3,646	100.00
Cost of raw-materials (per establishment)	1,512	60.43	574	35.15	2,563	70.30
Cost to hired labour (per establishment)	133	5.32	160	9.81	241	6.61
Other establishment (per establishment)	101	4.04	92	5.64	75	2.06
Income per establishment	756		805		767	

6. Table (2) shows the value added per annum by industrial units of each industry. The value added is defined as the ex-factory value of production less the value of raw-materials purchased and consumed in the process of production. Thus, the value added is gross in the sense that it is measured without the deduction of provision of depreciation. However, on account of the reasons mentioned in the above para, the deduction attributable to the depreciation charges is phenomeno-ly low and is, therefore, not taken into consideration. Hence, the gross value added per unit can be regarded as a fairer approximation to the net value added per unit. The net contribution to national income from these industrial units is the product of value added per unit and the number of units of each industry. The estimates of net contribution to national income from leather-working, black-smithy and weaving are Rs.2.09 crores, Rs.1.89 crores and Rs.6.24 crores respectively.

Table (2)

Industry	per establishment per annum			for all the units per annum (crores of Rs.)		
	value of production	value of raw material	value added	value of production	value of raw material	value added
leatherworking	2,502	1,512	990	5.30	3.20	2.09
blacksmithy	1,631	574	1,057	2.91	1.02	1.89
weaving	3,646	2,563	1,083	21.00	14.76	6.24

7. Table (3) shows the earnings per day for two types of labour (i) self-employed labour and (ii) hired labour. The salient feature of the labour force employed in this sector of industry is that the labour force essentially comprises of self-employed labour. The proportion of self-employed labour to total labour force is found to be more than 80 per cent in each of the industries. By considering the average net earnings per annum of industrial unit and the average work-days put by self employed labour in the industrial unit, the net earnings per day per worker belonging to self employed group is arrived at. As regards

the earnings of hired labour, the wages paid by industrial unit to hired labour, and the workdays put by hired labour in a year in the unit have been used to estimate the earnings per day for hired worker. There appears to be little difference between the earnings per day for worker belonging to self-employed group and for the worker belonging to hired group. On account of the predominance of self-employed labour in total labour-force, the average earning per day per worker has been observed to be of the same magnitude as that of self-employed labour. The earnings of self employed labour from the industrial process accounts for at least 85 per cent of the total earnings. It has been observed that the average income of family engaged in leather-working industry from all the sources is Rs.826 per annum, while the average annual earning from leather-working process is Rs.786.

Table (3)

industry	earning per day family labour (annas)	earning per day hired labour (annas)	earning per head per day (annas)
leatherworking	28	25	28
blacksmithy	27	28	27
weaving	22	21	22

8. Table (4) shows the value of production per day per worker. The ex-factory value of production per annum per unit and the work-days put in by self-employed and hired labour in the unit in the year have been taken into consideration to arrive at the value of production per head per day. It would be clear from the table that the value of production per head per day varies between Rs.3.03 and Rs.4.87. The value of production per head per day in case of blacksmithy establishments is comparatively low on account of the fact that the main production activity in these establishments comprises of repairing work. This aspect has also been made clear earlier.

Table (4)

Industry	value of production per head per day (Rs.)
Weaving	4.87
Leatherworking	4.87
Blacksmithy	3.03

-: 6 :-

9. The limitation of the above analysis is that the estimates do not relate to the complete sector of industrial activity (of the industries under review) outside the purview of Factory Act. However, it can be emphasised that the units covered in the above analysis relate to a major portion of cottage and small sector of these industries. The possibilities of industrial units with capital investment more than Rs.30,000/- each and outside the purview of the Factory Act are meagre.

preliminary and confidential

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**A PRELIMINARY CONFERENCE ON RESEARCH IN NATIONAL INCOME**  
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CENTRAL STATISTICAL ORGANISATION

NOTE ON INCOME FROM FISHING IN THE BOMBAY STATE

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1. Income from fishing during the year 1954 for the Bombay State is estimated at Rs. 7.02 crores.
2. The estimates are based mainly on the data collected from the Survey of over 1000 fishermen's families conducted by the Bureau during the year 1954. The Survey was confined to the five coastal districts of Kolaba, Ratnagiri, Thana, Kanara and Surat. From the important fishing villages in each of these districts 12 villages were chosen at random and from each of these villages about 20 families were chosen following fishing as their occupation. In order to take account of the seasonal variations in the fishing industry, the field work was so arranged that each of the 12 villages in a district were visited after every three months, the number of villages visited every month being 4 per district.
3. In the schedule canvassed in each of the selected family the information was collected on the amount received by fishermen by the sale of fresh fish, by the sale of dry and salted fish, etc., and the expenses incurred on production and those on repairs and maintenance of capital assets. The figures of number of earners, i.e., the number of self-supporting and earning dependent persons in each family were also obtained. On the basis of these figures the income from fishing per earner other than employee is calculated, the value of fish retained by fisherman being assumed at 7% of the value of sales. In case of employees the average earning per employee is calculated on the basis of wages earned by them from fishing in the reference week.

4. The estimate for income for the state as a whole is obtained by multiplying the per capita earnings figures by the estimate of the number of earners obtained from the 1951 Census. The Census gives only the number of self supporting persons engaged in fishing industry and not the number of total earners which should include earning dependents also. The number of earners is therefore obtained by calculating the ratio of the earning dependents and the self supporting persons to the self supporting persons from figures of the number of persons engaged in 'production other than cultivation' given for the State as a whole and by assuming that the same ratio prevails in the fishing industry. Some adjustment was also effected because of the fact that the Survey was carried out in 1954 while the Census figures relate to 1951.

5. The Survey results are mainly for sea-fishing and the method of estimation described above inter-alia assumes that the per capita earnings from fresh water fishing is the same as that from sea fishing. In view of the fact that fresh water fishing forms only a small per cent of total fishing in the Bombay State, the method is not likely to err seriously on this score.

6. The income stated above does not take into account income earned by intermediaries in the fishing trade.

7. The basic results of the Survey and calculation of the income estimates are shown in the following tables:

Table(1): average yearly sales, etc., per producer.

item	Rs.
1. value of sales	958.70
2. value of fish retained by fisherman	67.11
3. total value of output	1025.81
4. less expenses on production including repairs and maintenance of capital assets.	56.96
5. income per producer	968.85

\*These do not include employees.

Table(2): income from fishing in the Bombay State during 1954.

class of persons	no. of self supporting persons as per 1951 census.	estimated number of earners in 1951 dependents	estimated number of earners in 1951 (col.2+col.3)	estimated number of earners in 1954 (col.4 x 1.005)	average** income per earner in Rs.	total income in lakhs of Rs. (col.5xcol.6)
col.1	2	3	4	5	6	7
producers*						
i) males	40749	4748	45497	47999)	968.85	669.06
ii) females	5915	14045	19960	21058)		
employees						
i) males	5581	650	6261	6574	479.22	31.50
ii) females	318	755	1073	1132	144.80	1.64
total	52563	20198	72761	76765	-	702.20

\* These do not include employees.

\*\* The figures are based on the Survey conducted by the Bureau of Economics and Statistics, Bombay.

**A PRELIMINARY CONFERENCE ON RESEARCH IN NATIONAL INCOME**  
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INTER-INDUSTRIAL RELATIONS IN THE INDIAN UNION, 1951-52.

Inter-Industry Relations Section,  
Indian Statistical Institute.

A conceptual background of the table presented.

A table of inter-industrial relations presents a single unified picture of the flow of goods and services between the different sectors of the economy. Although the presentation runs in terms of money-values, it is nevertheless possible to construct technological relationships in terms of physical quantities of resources delivered and received by the different sectors. However conceived of, viz., either as a table of physical flows or as one of monetary flows, the chief purpose of the transactions table is to reveal the vast scheme of economic interdependence of different sections of the economy through and on account of the circular flow of resources or monetary purchasing power.

2. While, obviously, these flows are essentially continuous, it is nonetheless possible to obtain a still picture, as it were, of these flows. In the pioneering work on the presentation of such pictures, capital formation and consumption have been regarded as final uses of product. From a strictly logical view-point, one should have taken the capital formation of 1951-52 as the input for the future output of industries; similarly, consumption should have been taken as the "input" required for producing labour-power and exports should have been regarded - in a strikingly correct fashion, - as inputs for procuring the imports.

3. The picture of the national economy presented here (see table at the end) refers to the fiscal year, 1951-52. Two considerations have led to selection of this particular year (rather than any other later year). In the first place it was found expedient to gain experience and to carry forward the pioneering work of Dr. Richard M. Goodwin relating to 1950-51 in the Statistical Institute during the fall and winter of 1954. Secondly, the year selected happens to be the first year of the First Five Year Plan, and it was deemed desirable to compare the pictures of the economy at the start and finish of the First Plan.



4. The picture of inter-industrial relationships may be regarded alternatively as an accounting of the national product, including how the incomes were generated. The national product, again, may be conceived of either in terms of market values (= supply-prices of producers plus the indirect or commodity taxes net of subsidies, which are imposed as and when the goods and services pass into the hands of buyers) or in terms of supply-prices. The distinction between these two pictures is briefly indicated in the following paragraphs:-

- (1) If a table of inter-industrial relations is to pass even the most elementary scrutiny, then the total delivery out of a domestic sector should tally with some independent or prior estimate of the value (reckoned at producers' prices, i.e., price paid by buyer less the distributive margins included therein) of the output of that sector. This check can never be fulfilled unless we deduct the imports of products generated in a similar sector in one or other foreign country. Thus, the imports have to be classed not in respect of their probable utilisers, but in respect of the sectors from which they might be flowing. Since the entire reasoning is on the basis of market value, the appropriate duties too have to be deducted. Needless to mention, the total delivery out of a domestic sector is the value at supply-price of the year's output augmented by the commodity taxes collected on the particular sort of product. This is the cornerstone of the table presented.
- (2) On the other hand, one may deduct the imports sorted according to probable domestic users, (i.e., if one deducts the estimated imports from the inputs entering (i) the productive activities of home (ii) final uses of output), and obtain a different table which enables one to compute the import-propensities of productive sectors as well as of household consumption. A table of this nature, which has also been worked out, is not included in the present paper.
- (3) The table presented does not distinguish between (i) the amounts of indirect taxes borne in the first instance by producers and (ii) the amounts directly borne by the final users, e.g., consumers. The second approach on the other hand, attempts to estimate the probable amounts directly and indirectly borne by the final users of output.
- (4) The accounting principles governing the table can be summarised as follows:-

$$\begin{aligned} \text{Product at market price} &= \text{Product at supply - price} + \text{commodity taxes} \\ &= \text{Sum of deliveries to users at home} \\ &+ \text{exports} \\ &- \text{imports} \\ &= \text{All material inputs (domestic and foreign)} + \text{depreciation} + \text{entrepreneurial earnings.} \end{aligned}$$

5. The table consists, in the first instance, of an equal number of columns and rows, each representing a sector of the economy. Each entry in the table represents the value of goods and services originating in the sector represented by the row and directed to the sector represented by the column. A table

like this is equivalent to a double entry book-keeping scheme applied to the several sectors of a nation's economy. In fact, the entire column designated for any particular kind of activity gives us all the typical entries to be found in the debit side of ordinary operating accounts of business concerns, with only this difference that all payments in the nature of mere accounting transfers or in the nature of financial payments are excluded. As a prelude to the elucidation of the entries, we shall discuss,

- (1) the classification of the economy into sectors,
- (2) specification of transactions to be considered for the construction of the table, and
- (3) our decision regarding the kinds of transactions distinguished.

The primary classification of the economy is naturally one of producing sectors though, equally obviously, one and the same individual can occur in both sides of sector, viz., once as producer of some goods or service and again as a consumer. For all practical purposes this division into producing and consuming sectors is very essential, although from a strictly logical viewpoint, the circular nature of money-flows renders it unnecessary to distinguish between the two. However, the impact of most economic measures of government or other public authorities is likely to fall primarily on consumption and only at the more remote stages on production. It is, therefore, essential to insist that there should be a clear-cut economic definition of income, such that expenditure on personal or domestic consumption can be distinguished from business costs. The former arises out of profit-making from the business, whereas the latter is the necessary expenditure of the enterprise. consumption is not an ~~enterprise~~, but the mere utilisation of the fruits of enterprise. If this distinction were really futile, our work would have been much simpler; we could, for instance, lump together taxi-owners' business expenditure on gasoline and their house-hold expenditure, and not worry how far the taxi was used for carrying business traffic and how far for pleasure-rides-but the result of an increase in the tax on gasoline would be very different in the two cases.

6. Although a number of consuming sectors (i.e. types of consumers) could theoretically be distinguished, the present analysis has been confined to a distinction between personal or household consumption and consumption by public authorities and port trusts. Institutions or non-profit concerns like educational institutions, hospitals and other research institutions have not been compounded with households or government's consumption; instead, they have been treated along with professions and services.

7. A very puzzling problem arises in connection with government consumption. How far is it collective consumption, and how far is it an element of business cost of the nation as a whole? For the purpose of the present paper, the convention laid down in the Final Report of the National Income Committee has been adopted without modification. Accordingly, even the "defence capital outlay" has been treated as an element of government consumption. It should be noted, more as an exercise in logic, that certain public outlays - e.g., current outlays on roads maintenance cannot be treated as something independent of the structure and over-all level of the economy. Such problems of imputation have not, however, detained us here.

8. It will be noticed that in the table presented here fixed capital formation is also taken as a non-producing sector. In brief, different kinds of transactions cannot be distinguished (e.g., between current, i.e., operating, appropriation and resting accounts) in an ordinary two-way table. For a certain kind of transactions, viz., transaction in commodities and services employed in building capital within the country, we can ignore the ultimate destination of the commodity-flows and simply represent this kind of transaction in a two-way table by merely adding a receiving sector to our table. The producing sectors (better known as activities or businesses) can be divided into any arbitrary variety of groups. The sectors are composed of establishments and the nature of each establishment is determined by its characteristic output. From a scientific viewpoint, inter-industrial relations must run in terms of products, though the available statistics as well as the administrative applications of the fruits of analysis dictate a presentation in terms of industries. The precise manner in which industries are to be selected and the optimum number of sectors, no doubt present a tough problem. In

practice, the nature of the data and the general structural characteristics of the economy are enough to dictate the demarcation of sectors. The theoretical condition for grouping producing units of the economy into sectors seems to be either (a) that their cost-structure should be identical, or (b) that the relative distributions of their outputs between sectors should be as clearly similar as possible. The fulfilment of either of these rules of thumb is enough to ensure reasonably good grouping. In the table presented here, several industry-aggregates (built up from firms engaged in producing similar main product) have been merged together to form a sector, the criterion adopted being maximum homogeneity of cost-structure within each sector. It can be seen at once that such a treatment may be expected to yield reasonably dependable results where problems of income-forecasting are involved.

9.1 Three kinds of production sectors have been distinguished in the present analysis:

- (1) commodity producing sectors (numbering 27),
- (2) distributive trades (i.e., wholesale and retail trade), and
- (3) transport and services (other than trade), including ownership and operation (i.e., upkeep) of residential property.

9.2 Commodity producing activities were again subdivided into the following major groups: (1) primary production, i.e., agriculture (in all forms), plantations, animal husbandry and forestry and fishery, coal mining and other mining and quarrying; (2) secondary production, i.e., fabrication of materials furnished by the first group, including (a) large scale factory production of producer goods, (b) large scale factory production of consumer goods, and (c) small scale and domestic production of several forms.

9.3 Some interesting issues arise from this sort of classification. Repair work, for instance, is organised over a whole range of enterprise-units, from factories down to individual workers (self-employed persons) working on materials at the site of other enterprises or at the consumers' home on consumer's materials. A very good example is furnished by garments: if they are made in factory establishments (as defined in the Factory Act, 1946), the consumer is deemed to buy a "garment", but if they are made by a tailor,

the customer is recorded as assembling together the different ingredients of garments, including the services of tailor. In several cases, it was noticed that a firm worked on a commission for other firms, though the latter firms could not be identified; similarly, a good deal of industrial servicing was observed in the samples of firms, but this could not be credited to any definite industry-group. For consistency the outward servicings were naturally ignored, and the payments for servicing were credited to appropriate delivering sectors. In practice, almost the whole of inward servicing was regarded as intra-sector transaction, the entry being recorded in the diagonal cells.

10.1 The nature of distributive trades needs some elaboration. The distributive trade, as understood here, includes warehousing and storage in course of transit of merchandise. These two functions are also undertaken by the railways (specially for perishables); however, the functions of warehousing and storage, when performed by the railways, have been merged with the activity-head, rail transport.

10.2 One outstanding peculiarity of distributive trade (commerce) is that it may function in the first place as agents for the producing industries (enterprises) and pass on the merchandise to the user (who may be a customer of a business firm using the merchandise for current production or for fixed capital formation) without owning them, a task for which traders may be remunerated either by the buying users or selling producers. Secondly, it may buy the merchandise from the producers and resell at a higher price. The number of intermediary links and the legal-financial implications of the transactions involved are not, of course, relevant. All that matters is that we have to make a decision between the two alternatives. First, we may regard the wholesale and retail trades as entering into transactions with sellers on the one hand and buyers (who in turn may be traders or other users) on the other hand. Secondly, we may regard the distributive trades as simply adding to the costs of production to the extent that they hand over the merchandise after adding a margin of gross profit.

has been decided to provide for wastage. In the absence of any better information, Dr. Rao's estimate (3 per cent) has been adopted.

20. So far as seed is concerned, Dr. Rao took into consideration the estimates of the Famine Commission, 1860 and the Famine Commission, 1900 and adopted for his calculations 6 per cent of the gross output to be deducted for seed. The method of providing a straight percentage deduction on gross output on account of seed has been criticised on the ground that the volume of seed used in a given year depends upon the area sown and not upon the output. However, the percentage deduction method does not involve error of a high magnitude. Since the figure of seed requirement adopted by the National Income Committee is based on a much more comprehensive information, the same is used by us. Thus deduction for seed and wastage has been provided at 8.2 per cent (5.2% + 3%) of the gross agricultural output.

(III) Interest on agriculture debt

21. The total rural debts of Madhya Pradesh has been estimated by apportioning Indian Union's total rural debt of Rs. 313.8 crores (as mentioned in the First Report of the National Income Committee), on the basis of the ratio of rural population of Madhya Pradesh to that of the Indian Union. Out of the total rural debt, two third is assumed to be incurred for agricultural purposes and on this interest has been provided at the rate of 12%.

(IV) Operational costs on materials required for cultivation

22. Provision has been made at the rate of 2.1% of the gross agricultural output for this item.

(V) Repairs and depreciation of implements and bullock carts etc.

23. The Poona Report of the National Sample Survey estimates the value of all implements including carts at purchase price at Rs. 60.25 per household for 1950-51. Using this rate for the entire agricultural households the total value of implements etc. has been ascertained. 20% of this value has been taken as the cost of repairs and maintenance.

10.7 In the table presented here, the second method - recording at sellers' values - has been adopted because it is believed to yield results more suggestive of true economic relationships. The chief reason is that trade margin on purchases by households is much too far bigger than on any other transaction to permit us believe that trade margins on these two kinds of transactions are proportionate. The fact that all entries are at "sellers' values" also implies that some - accounting should be made for the total difference between the buyers' price and sellers' price. This total difference is obviously the gross trade margin which includes transport charges incurred by the trader. Two methods may be alternatively adopted. In the first place, one might record the entire gross trade margin (=buyers' price - sellers' price) as a payment by the buying sector to trade sector; in that case, there would be no question of recording a transport margin because all payments for transport would be likewise entered as costs of trading activity. This method was not adopted in our table, though data were available in appropriate form. The other method is to make a separate record of the buyers' quota of transport charges, apart from the 'pure' trade margin; in this case, there is no need to enter transport charges (though borne by the traders in the first instance) in the cost of operation of trade, except insofar as there is a transport margin on the material inputs used up in the current operation of trade. The present interindustrial relations table is constructed on this principle of recording.

11. Tertiary productions, other than trade and transport by rail and other means, includes, (a) banking, insurance and co-operatives, (b) professions and services and institutions (non-profit bodies) and (c) upkeep of residential house-property. Here, all the services considered are accepted in the official national income estimates as services produced for the market. Contrary to the usual practice, hotels and restaurants have been merged with industries connected with drink and tobacco, both large scale and small scale. Amusement services, e.g., film projection, theatres, circuses, etc., have been regarded as services proper. By professions is understood the whole set of activities of rendering services by self-employed individuals. Where non-profit institutions are concerned, e.g., schools, colleges and hospitals and other research institutions, the payments passing into the hands of employees (teachers, doctors, technicians, etc.)

are recorded as wage-payments. It would have been clear from this text that entrepreneurial earnings of professions refer only to the earnings of self-employed professionals like auditors, physicians, etc.

12. A necessary distinction has been made between real and financial transactions, real transactions being those that involve movement of real assets or services from one sector to another. Three kinds of real transactions are distinguished:

- (a) real transactions compensated by other real transactions, i.e. barter;
- (b) real transactions compensated by financial transactions, i.e. buying and selling property; and
- (c) real transactions not compensated, i.e., real transfers.

Only these three kinds of transactions have been considered in the table. A large bulk of the so-called real transactions is no doubt compensated by their conjugate financial transactions and, hence, the table can also be taken to represent a subset of total financial transactions of the community. This is dictated by the consideration that the main purpose of a transactions-table or inter-industrial relations table is to analyse economic relationships in real terms.

13.1 Although real transactions are taken into account, they have been considered as transactions between sectors which respectively produce and consume the goods and services, neglecting the *modus vivendi* of financial ownership and other associated implications. For example, foreigners' gifts-in-kind are recorded as flows from "rest of the world" to any appropriate sector(s). Various social transfers in kind often pass directly to households, e.g., payments or other benefits in kind given to employees; these benefits have been included within wages and salaries. Other instances of real transfers occurring in the table are (1) provision of irrigation facilities, (2) Payments of grants to institutions, and (3) purchases and sales on account of government transactions.

13.2 These remarks naturally lead to the question how income would fit into the scheme of representation. Incomes are represented in the following way which fits in with the treatment accorded to business disbursements. They are regarded as payments to households, and enterprises or "rest of the world", though no separate allocation has been attempted.



for this last component. Payments to government, in the shape of direct taxes, have been completely eliminated from the table. Direct taxes have been ignored because they are not relevant to industrial or real analysis. Since subsidies do not represent a purchase, they have been treated as negative taxes, fundamentally amounting to reduction of operating costs where received.

14. Let us now come to the treatment of interest incomes. These are the remunerations for supplying the service, viz., waiting. Logically, interest and profit should have been accounted for only in connection with the description of financial flows. But if the real aspect of interest were thus ignored, there would be no explicit place for it in the inter-industrial relations table; row totals would have exceeded the column totals to the extent of the operating surplus, i.e., the total interest and profits generated in the sector concerned. This was the principle followed by Dr. Goodwin in the inter-industrial relations table for 1950-51. In the present table, the procedure has been slightly modified. All interest and premia paid on business account have been recorded as payment by the respective sectors to the sector "banking, insurance and cooperatives"; payment of interest on consumer-loans has been completely ignored, and so has been the payment of interest by the public authorities. Overhead income in the shape of insurance and banking charges have also been ignored. Thus, interest payments and receipts to and from the banking system have been entered exactly as if they were real transactions.

15. Profits, in many important cases, could not be distinguished from the earnings of self-employed persons, e.g., self-operating farmers and others. Instead of showing them as the differences between the respective column and row totals, they have been entered exactly as they would otherwise have been entered in ordinary book-keeping practice, viz., as items which "close" the current operating account.

16. Let us finally come to the treatment of the distinction between different types of transactions. This distinction obviously depends upon the specific classification of goods and services involved. Although the detailed estimates were done in terms of a large number of commodities, the only distinction finally maintained is between the transactions of con-

and capital accounts.

17. For each sector, it was thus necessary to draw up a current and a capital or "resting" account, remembering at each stage that only real transactions were to be taken into account in either case. The table, therefore, actually had a size four times that of the present one, because every column and the appropriate row would have to be partitioned into four cells corresponding to current and capital accounts respectively. This procedure would have looked extremely cumbersome and unwieldy and, therefore, all deliveries on capital account originating the current or capital accounts of other sectors were merged so as to obtain the deliveries by producing sectors.

18. Following established procedure, capital accounts were not set up for households and for the sector "rest of the world". Thus, residential buildings are part of capital of households; but the maintenance of residential property has itself been regarded as enjoying the net rental (gross rental minus the local taxation minus depreciation).

19. The amount of goods which are traditionally regarded as capital or producers' goods represents a flow to the current and capital accounts of different productive sectors as well as of government and other public authorities. The scrap value of machinery and other fixtures is delivered back from the capital accounts to the scrap (i.e., second hand tool) using sectors. Flow of scraps was treated as a negative flow of the output of capital goods, and was thus separated from depreciation. The total value of scraps so treated was very small in that estimates were available only for the use of scraps in the operating account of some capital goods industries. Exports of second hand machinery, etc., were negligible, and hence, there was no further flow from capital accounts to be accounted for. Wherever these occurred they were treated as offsets to installation or purchase of new equipments during the accounting period.

20. The nature of depreciation raises very important issues from the pure accounting besides purely economic aspects. However, it is easy to see that there are almost equally weighty arguments alike for and against showing it as a real transaction. If we were prepared to show "capital formation" as an

activity which adds to the productive capacity and which is also used up in course of current operations then, of course, depreciation might be shown as a delivery from "capital formation" to the several productive sectors' current accounts. But since we are not at present interested in the dynamical problem of the technical relation between capital formation of one period and output of another, we have followed the more practical procedure adopted by the National Income Committee, viz., to enter depreciation as equivalent to current cost of maintenance calculated on the basis of the average economic life of equipments at replacement prices as against original cost, i.e., cost at installation.

21. Depreciation, in the present table, has been entered as a current item of input. For large scale and small scale productions as well as for mining and other services, the material costs have been made to include depreciation; hence, no separate entry is made for depreciation. Expenditures on consumers' durables have been merged with consumption of the current period, and therefore there is no entry for depreciation in the corresponding columns. Similarly, our estimate of capital formation is net, i.e., net over and above depreciation; hence, here too there is no entry for depreciation. With respect to depreciation allowances for agriculture, plantation, other transport and house property, appropriate delivering sectors could not be located; hence, either of two courses might be taken. Either the estimated depreciation could be entered in a separate row, or the products might be netted for the depreciation allowances. The latter procedure has been adopted here. A third alternative might be to treat the entrepreneurial earnings as net earnings plus retained depreciation allowances.

22. Looking to any column one can observe that the column is but a prototype of the debit side of the operating account for any ordinary firm, with only this difference that the accounting is now done for a broad aggregate of economic activity represented by the sector. It shows the materials used (i.e., opening stock plus purchases minus closing stock, of materials used in the process of production); the payments to labour; the payments for land rent and rent on nonresidential buildings and other equipments (if hired), and, finally, the profits or entrepreneurial earnings.

Thus, even on accrual basis, the accounting identity is maintained; all operating expenses plus depreciation allowances plus profit taken to appropriation account equal the aggregate sale proceeds.

23. Thus, for each producing sector the column total equals the corresponding row totals. These totals are equal to the gross output of the sector in question, which also includes the intra-sector transactions, i.e., transactions between the activities included in a sector. Such intra-sector transactions can of course be skinned out to obtain the transaction of the sector in question with all the other sectors only.

24. It should be observed that double-entry recording has not been done in the case of those activities which we have chosen to regard as final uses of output. As they stand in the table, the totals of these columns, viz., consumption, current government outlay and private and public net investments and exports net of imports, add up to the net national income at market price. Savings and other international transactions of a financial nature do not naturally enter the table.

#### B. A SUMMARY OF SOURCES AND METHOD OF ESTIMATION.

25. Broadly speaking, the sources of information fall into three divisions: (1) sample surveys (chiefly, the second, third and fourth rounds of the National Sample Survey, and the 1952 round of the Sample Survey of Manufacturing Industries), (2) government publications, including the publications of various government agencies, like the Reserve Bank of India, and (3) unpublished dossiers of the Central Statistical Organisation, (C.S.O.) These last were consulted wherever some allocations of estimates had to be confirmed; this, however, should not be construed to mean that there is complete and universal accord between the estimates used here and the estimates prepared in the C.S.O.

26. The very exhaustive bibliography published in the National Income Committee's Report proved useful wherever sample surveys or official publications were found to be inadequate. As was pointed out earlier in this paper, the inter-industrial deliveries might be regarded either as a picture of purchases by so many sectors from other sectors, or as one of sales of such and such sectors to such and such other sectors. As a first step in the preparation of the picture presented here, decision had to be taken about the mode of estimation of these entries. While from the purely logical stand point one could build the entire picture by collating the estimates of sales by different sectors to other sectors, practical considerations led against this procedure. The chief reason is that in course of the surveys mentioned above it was precisely the payments handed out by different types of activity that were sampled. In other words, the method of filling in the tables was governed by how the data were organised in the shape of estimates from the sample surveys. This, however, did not present any real difficulty, because if all outlays can be allocated according to the recipient sectors one also obtains the picture of deliveries by the sectors. There is, nevertheless, a very important case where it is equally necessary to depict the flows as sales in the first instance. For instance, it is necessary to check whether the deliveries from some important sector, as estimated through the expenditure and also tally with known allocation of deliveries in physical or value terms. In fact, it is quite likely that a certain flow when estimated as an outpayment might be different from what it would have been if one could obtain the information from the seller or deliverer of the flow. This sort of confirmation has, in fact, been tried in the case of some important products like steel, cement, food-grains, commercial crops and bulk chemicals and coal.

27. In so far as the National Sample Survey is concerned the framing of schedules and the subsequent tabulation and preparation of national estimates had, in most cases, been such as to yield information in respect of some heavily grouped "inputs" which, of necessity, had to

be taken as such and credited to almost equally heavily aggregated sectors of activities. This means that the outlays of productive sectors could not in many cases - and more particularly in the case of small scale and cottage production - be accurately identified by the sectors whose products were involved therein. The most immediate consequence of this shortcoming in the tabulation of estimates is that the picture drawn here does not reveal any significant interlinking between large and small scale forms of production; neither is it easily distinguishable in the case of expenditure. Indeed, it was hard, merely on the basis of aggregate estimates of different sorts of outlays, to guess how much of which sort of outlay represented a draft on the products of large scale enterprises and how much on the products of the corresponding small scale enterprises. It might be argued, however, that one could use the ratio of the estimates of total value of output to the value added in each sector as the sign-post to warn us against gross misallocation of expenditures over similar large and small scale productions. A little reflection shows that even this argument is not without shortcomings; for, in spite of these sign-posts there would be a large variety of ways in which we could conceivably fill in the cells without violating the so-called warnings. As a general rule of procedure, we have cut across these considerations, and attributed inputs of certain activities as coming from certain specific types of small scale and cottage industries chosen primarily out of commonsense considerations.

28. As all the inputs for the 34 productive sectors were filled in, attention was turned to the estimates of consumption, private and public and investment and net exports. The estimates of household consumption (available in the form of per capita urban and rural expenditure) by groups of items were furnished by the second and third rounds of the National Sample Survey, but on account of heavy lumping in the final published estimates, it was decided to estimate household consumption as a residual. Fairly reliable estimates were

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19	small scale & cottage products										tertiary activities					sub-total	house-hold consumption	public authorities	capital formation in productive enterprises	other installations by public authorities	export (ex-factory) with duty	import (cif)	domestic product at market price
	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34								
0.09	20.94						4.05		1.18				33.34	0.48	96.51		11.60			15.76	0.76	- 22.26	1.245
0.07	1.25						0.01	1.33	0.21	0.12	1.45	1.86			41.41	4.59	2.23		0.50	0.97	- 20.91	25.79	
1.11							0.08	13.56	13.43	0.20	0.11	5.32			90.91	43.00	19.58	125.98	50.43	2.40	-159.29	173.01	
0.24	0.1		2.10	0.04	0.01	2.92	1.15	0.51	0.67	0.05	0.05	30.62			86.89	102.31	5.77		8.70	- 65.45	136.22		
0.51							0.37						18.91	2.10	22.85		1.99		0.50	- 0.48	24.86		
							0.49						15.16	2.45	22.16		0.78		0.15	- 3.24	21.42		
			4.09	2.05	0.04		0.96	11.56	0.38	0.29	2.24				130.11	573.93	2.16	0.23	94.97	- 30.88	772.32		
							0.22	0.30							42.57	474.43	5.94		56.78	- 61.84	574.65		
			14.06				0.08								41.17	41.69	6.57		5.67	- 36.00	57.10		
0.08			0.01	1.23			0.19	0.18	0.06	6.45	0.08				42.02		3.09		270.71	- 2.13	313.69		
							0.21	0.12	0.36	0.05	4.67	2.19			8.89	2.46	3.24	0.44	0.09	0.23	- 3.47	11.88	
							0.40	0.15	13.50	0.12	0.63				16.54	10.74	7.13	0.05	0.20	17.76	- 2.45	52.00	
0.32			0.03	1.40			1.30	1.44	0.08	2.24	1.66	10.71			35.40	29.04	8.18	2.60	0.92	- 18.28	57.86		
3.11							0.04	2.54	0.27	3.62	0.15	0.68			26.02	6.34	1.89				34.25		
									0.62		0.05	22.50		0.18	74.27	76.96	0.02	17.79	0.09	0.05	- 0.07	169.14	
										0.30	0.17	13.00	72.02	0.26	143.71	19.67	4.02	71.47	0.55	0.23	- 20.91	239.65	
												5.72			5.72	190.43			5.50	- 0.02	201.63		
									0.13			0.35			12.15	463.47			13.76	- 7.79	481.49		
												5.40	1.75		7.15	44.00			0.07		51.62		
															1.89	29.25			0.14		31.28		
			0.07	0.75	1.45	1.43		2.71							12.65	52.70		2.06	0.06	3.24	- 4.36	66.41	
1.26	5.03	0.43	1.55	6.30	0.50	0.51	1.81	11.24	3.91	19.26	2.99	11.20	9.26	1.28	102.56	199.83	13.04	5.15	2.24	9.86		332.63	
1.23	0.38	0.30	2.05	4.35	0.04	0.62	0.07	2.52	2.08	3.01	4.35	5.13	4.05	0.57	56.93	220.70	12.24	2.75	0.88	7.97		301.52	
1.55	6.74	2.02	4.58	22.05	0.87	3.61	3.74	16.30	8.37	2.45	4.21	26.56	31.75	4.12	326.81	1018.47	15.43	10.25	6.29	56.37		1441.01	
1.12	1.17	1.46	2.31	4.33	0.21	0.23	0.08		2.28	32.71	13.44	0.55		0.47	81.65	31.89						113.55	
									3.16	16.00	10.34	46.55		6.32	79.39	706.49	65.05	1.54		0.70		851.23	
																		193.52	136.38			329.90	
																		4.00				23.98	
																		43.46				443.46	
1.72	39.77	15.81	22.31	282.31	3.39	23.97	34.49	54.54	219.47	84.05	39.99	207.03	215.35	20.06	4461.30	9121.35	673.29	440.63	215.27	702.00	-356.40		
1.19			2.78	30.96			0.00		9.13						474.38								
1.32	12.03	29.37	223.84	162.35	168.22	48.23	7.29	31.33	38.14	82.05	1847.84	73.56	64.20	114.55	403.92	443.40	9827.70						
1.77	12.03	1.87	3.20	51.04	0.47	1.25	9.06	136.07	37.21	100.50	40.94	493.32	114.55	79.57	43.40	3517.53							
1.46	1.57	2.65	0.00	2.84		0.24	2.70	1.18	1.79	10.00	0.86	12.06			790.00								
1.09	13.87	11.32	11.12	136.27	113.16	47.70	5.80	20.07	11.03	3.25	11.03	27.76	138.02	324.36	5220.23								
1.86	34.35	10.14	239.65	201.63	481.49	51.62	31.28	664.1	332.68	307.52	1471.62	113.55	851.23	329.90	423.95	443.46						14763.44	





prepared for the current outlays of government and local authorities and, therefore, these were regarded as given while estimating household consumption. Investment, which was estimated from survey data and other published materials, could not be classified as private and government, barring the cases of railway and communications and other constructions and installations which were definitely known to have been made on government account. Exports and imports were estimated from the Annual Account of Sea and Airborne Trade of India, after re-arranging the entries so as to conform to the schedule of sectors adopted for the purpose of the present study.

29. While preparing the table, in the first place, a deduction was made for trade cum rail cum other transport; these deductions were later split up into the three separate components and recorded against the corresponding sectors, thus filling in the rows for these sectors. In the second place, a deduction was made for all commodity taxes. All commodity taxes were first sorted out according to the types of commodities on which they were collected. In the next step, the total collection on each commodity or group of commodities was distributed over all the activities according to the types of commodity or group of commodities produced by them. Thus, the total collection of duties and taxes from a particular group of products was entered under the column representing that group of products. The basis adopted for the allocation of commodity taxes was the value of delivery, though with better information more exact deductions could be possible. For instance, it is well-known that rubber tyres and tubes, etc., carry different rates of excise duty according to certain specifications of the products; but in our current practice these differences have been ignored, with the effect that though the estimate of a tax aggregate is substantially correct, estimates of its components might be well off the mark. However the ultimate check on the approximate validity of the estimates is the simultaneous check with the estimates of net value added and estimates of the total value of product of the sectors and such check have proved more or less satisfactory considering, the preliminary nature of our enquiry.

**A PRELIMINARY CONFERENCE ON RESEARCH IN NATIONAL INCOME**  
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CENTRAL STATISTICAL ORGANISATION

VISIBLE AGRICULTURAL UNDER-EMPLOYMENT IN INDIA

A. Qayum

1. Under-employment is not a peculiar phenomenon of Indian agricultural industry alone, it has persisted in acute degree in East European countries <sup>1/</sup> in the years preceding the World War II. Estimates of the degree of under-employment in these countries varied from 25 to 45 per cent <sup>2/</sup>. All the methods that were employed to measure under-employment are based on certain norms such as 'work-unit' or 'crop-unit' or 'per-capita output' or 'disparity between agricultural and non-agricultural incomes'. It is also not clear whether the aim is to measure the actual surplus labour-power or that which would result according to the norms adopted. In India also, efforts have been made recently by some economists for measuring agricultural under-employment. But all of these estimates are based on the conception of 'work-unit' of cultivation <sup>3/</sup>. Thus the methods so far adopted for measuring agricultural under-employment have been very crude and arbitrary. No attempt has been made to estimate the degree of under-employment, by first estimating the total amount of labour-time utilised in the industry in a given year, and the total amount of labour-time available. The concepts regarding different forms of under-employment have also not been clearly stated.

<sup>1/</sup> Estonia, Latvia, Lithuania, Poland, Czechoslovakia, Rumania, Hungary, Yugoslavia, Bulgaria, Albania, and Greece.

<sup>2/</sup> Datta, B; 'The Economics of Industrialisation'; The World Press Ltd., 1952, Op. Cit. pp.82-90. The book provides a summary of various attempts made by individual economists and institutions like League of Nations to measure the degree of under-employment.

<sup>3/</sup> (a) Tarlok Singh: 'Poverty and Social Change'; Longmans, Green and Co., Ltd., pp.25. A work unit of 10 acres is assumed here. (b) Gupta, M.L.: 'Problems of Unemployment in India' pp.25. He assumes 3 sizes 10, 7.5 and 5 acres according to the fertility of the soil.

2. Under-employment may exist in an industry in three forms: visible, invisible and potential. Visible <sup>4/</sup> under-employment measures the proportion of surplus labour time in an industry to total labour-time available.

$$U = \frac{W - E}{W} = 1 - \frac{E}{W},$$

where U is the degree of visible under-employment; W, the labour-time available, and E the labour-time actually utilised. Invisible under-employment measures the proportion of labour-time utilised if such labour-saving techniques of production and organisation are adopted that do not involve any net addition of capital outlay. Potential under-employment refers to the labour-time that would be released when some fundamental changes in the techniques of production or organisational structure are introduced that involve a net addition of capital outlay. The main purpose of this paper is to study the degree of visible under-employment which is a immediate concern to the people in general and to the planners in particular.

Labour-time\* available in Agricultural Industry in 1950-51:

3.1 The rural population of India <sup>5/</sup> in 1950-51 was 294,810,286. The percentage of earners, helpers and dependents to the total rural population was <sup>6/</sup> :-

	earners	helpers	dependents
male	22.5	7.5	1.8
female	6.9	9.0	13.9
boys and girls	1.0	2.4	35.0

<sup>4/</sup> International Labour Review June, 1952, Forms of Under-employment.

<sup>5/</sup> 'Summary of Demographic and Economic Data 1951 Census' pp. 35.

<sup>6/</sup> Rural Manpower and Occupational Structure; Government of India, Ministry of Labour, Agricultural Labour Enquiry pp. 509, Appendix VI.

\* The calculations have been made in terms of labour-days of 8 hours.

3.2 The occupational structure of the rural labour-force, i.e., of earners and helpers is not identical with that of the families. This is shown in the following statement. For purposes of this classification, the occupation of the helper is taken to be that of the head of the family, whom he helps <sup>7/</sup>.

	(percentage to total)			
	land-owners	tenants	agricultural workers	non-agricultural workers
family occupation	26.6	25.7	30.4	17.3
occupation of labour-force	26.4	25.6	26.9	21.1

3.3 As the helpers are expected <sup>8/</sup> to follow the family occupation, the occupation distribution of earners can be discovered by deducting the number of helpers from the total number of workers in each occupation. About 26 per cent of the total number of earners had subsidiary occupations and the remaining had to depend only on one occupation, however, inadequate it may be:-

Subsidiary occupation of earners<sup>9/</sup>  
all-India.

main occupation	percentage of earners having subsidiary occupation	percentage of earners having the following subsidiary occupations			
		ownership	tenancy	agricultural labour	non-agricultural labour
ownership	5.1	-	1.9	0.9	2.3
tenancy	5.1	1.4	-	1.4	2.3
agricultural labour	8.1	2.5	2.3	-	3.3
non-agricultural labour and other non-agricultural work	7.8	2.6	2.6	1.7	0.9
all earners	26.1	6.5	6.8	4.0	8.8

<sup>7/</sup> Ibid pp. 19, statement VII  
<sup>8/</sup> Ibid pp. 19 line 1  
<sup>9/</sup> Ibid pp. 21, statement IX

3.4 From the above table, it is seen that the percentages of owners, tenants, and agricultural labourers having non-agricultural secondary occupations were 2.3, 2.3 and 3.3 respectively and that of non-agricultural workers having agricultural subsidiary was 6.9. It can be stipulated that about one-third of labour-time of a worker is utilised in the subsidiary occupation. It means that the percentage of labour-time of owners, tenants, and agricultural labourers utilised in non-agricultural occupations was 0.77, 0.77 and 1.1 respectively and that of non-agricultural workers in agricultural was 2.3. On this basis the net number of agricultural earners can be calculated.

3.5 A male worker cannot work on all days of the year. On some days, he is not able to work for reasons other than want of work such as ill-health, bad weather, festival and festivities. It is assumed that a male worker can work on 350 days <sup>10/</sup> per year. If, as is the case in other industries, a week is taken of 6 days only, then a male agricultural worker can work for 300 days only. A female worker who participates in agricultural work is assumed to work for 120 days in a year. A boy or girl worker is assumed to work for 150 days in agriculture. These assumptions are based on the findings of Agricultural Labour Enquiry <sup>11/</sup> regarding agricultural labouring families.

3.6 The total number of labour-days available in 1950-51 in Indian Union were 3002 crores on the assumption 350 working days for men and 2654 crores on the basis of 300.

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<sup>10/</sup> This is based on the estimates made by the 'Report on Intensive Survey of Agricultural Labour, Government of India, Ministry of Labour, Vol. 1, All-India, pp. 42.

<sup>11/</sup> Ibid pp. 32 and 83.

Labour time worked in Indian agricultural industry  
in 1950-51:

4.1 Labour-days worked in agricultural industry can be classified in 3 categories:-

- (a) labour-days worked in growing main crops;
- (b) labour-days worked in growing other crops;
- (c) labour-days worked in the up-keep and maintenance of draught cattle.

The estimate of labour-days worked in growing main crops are based on the National Sample Survey (NSS) data contained in the schedule No.2.1 of fifth, sixth and seventh rounds. Average number of labour-days worked for growing each crop per acre were arrived at by dividing the total number of estimated labour-days worked for growing a major crop <sup>12/</sup> by the total number of acres under it for all the three rounds and for all the seasons. For major crops, first an arithmetic average of labour-days per acre was taken for all seasons and for each round and then a geometric mean was calculated after discarding the abnormal figures.

4.2 The number of labour-days worked per acre were then multiplied by the number of acres under each crop in 1950-51 <sup>13/</sup>. The total number of labour-days worked in growing other crops <sup>14/</sup> has been taken as the average of total number of labour-days worked in the fifth and sixth rounds, for which alone data were available. The number of labour-days utilised in cattle services were calculated on the basis 2 1/2 labour-hours per cattle per day or 114 labour-days per year.

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<sup>12/</sup> Rice, wheat, barley, maize, jowar, bajra, small millets, ragi, gram, jute, cotton, groundnut.

<sup>13/</sup> Area under crops was obtained from 'Abstract of Agricultural Statistics', India, 1953.

<sup>14/</sup> Mango, citrus, banana, and other fruits, coconut, arecanut, and other nuts, betel leaves, bamboo, cane and reeds, fuel wood, timber, soft wood, fodder, grass, flowers, etc.

4.4 The total number of labour-days worked in 1950-51 was:-

	(in crores)
main crops	879
other crops	213
livestock	734
	<u>1826</u>

Visible agricultural under-employment in India  
1950-51:

5.1 Total number of labour-days available with men working 350 a year was 3002 crores and was 2654 crores with men working 300 days a year. And the total number of labour-days worked was 1826 crores. This shows that visible under-employment was about 39.17 per cent on the assumption that a man worker works for 350 days a year and 31.18 per cent on the assumption of 300 days.

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AN ESTIMATE OF THE REPRODUCIBLE TANGIBLE  
WEALTH IN INDIA, 1949-50.

Uma Datta and Vinod Prakash

1. The estimates of the reproducible tangible assets in India for the year 1949-50 are presented in table (1). The figures, in concept, always relate to current market value of the assets.

2.1 The methods applied to get the estimates of the capital stock in the various sectors of the economy as given in the above table are considered in the paragraphs below.

(a) Agriculture and livestock

2.2 The capital stock in the agricultural sector consists of implements, irrigation works, livestock and tractors.

2.3 Agricultural implements: Statistics relating to a few types of agricultural implements in 1951 are available in the Livestock Census, 1951. But an estimate of the total value of all implements in the Indian Union based on this data, is not comprehensive because, apart from iron and wooden ploughs and a few other implements no estimate is given in respect of the different types of implements which constitute a very important part of the total number and also, nothing is known about the adequacy of coverage of these figures. The other sources which could be made use of for an estimate of the total value of agricultural implements in India are independent studies carried on by private research workers and the Report on the Poona Schedule of the National Sample Survey (1950-51). Estimates of the value of all implements per acre was made by Shri J.P. Bhattacharjee for West Bengal (1945-46), Shri G.P. Aggarwal (1948-49) and D.S. Chauhan (1946-49) for U.P. and Professor D.R. Gadgil (36-37 & 37-38) for Bombay - all based



Table (1): reproducible tangible wealth in India, 1949-50

(Rs. crores)

items	value
(1)	(2)
1. agriculture and livestock	
(i) agricultural implements	236
(ii) irrigation works	218
(iii) livestock	2186
(iv) tractors	7
(v) total of agriculture and livestock	2647
2. fishery	11
3. forestry	10
4. incorporated banking companies and co-operative societies	57
5. incorporated insurance companies	30
6. incorporated trading and miscellaneous companies	187
7. large enterprises	
(i) electricity generation and transmission	176
(ii) factory establishments included in SSMI* (excluding electricity generation and transmission)	1176
(iii) public enterprises	232
(iv) total of large enterprises	1584
8. mining	86
9. plantations	182
10. private house property	
(i) rural	2655
(ii) urban	2703
(iii) total of private house property	5438
11. professions and services	20
12. public property	464
13. small enterprises	718
14. stocks with traders	1520
15. transport and communication	
(i) airways	9
(ii) communication	68
(iii) other incorporated transport companies	45
(iv) railways	1530
(v) roads and bridges	522
(vi) shipping and navigation	107
(vii) vehicles on roads	281
(viii) total of transport and communication	2562
16. total	15516
17. adjustment for double counting	- 525
18. total reproducible tangible wealth	14991

\* Sample Survey of Manufacturing Industries

on limited enquiries. The estimates inflated for 1949-50 work out at Rs.22 per acre for Bengal, Rs.25.4 and 22.0 for U.P. and Rs.23.6 for Bombay. The average of all these estimates when inflated for the whole of the cultivated area of the Indian Union would be of the order of Rs.500 crores. But this value, as is obvious, is based on enquiries of limited nature. A much more representative estimate can be obtained from the Poona Report of the National Sample Survey which gives the total value of all implements (including carts) per household as Rs.69.25 in 1950-51. This, when inflated for the whole of the agricultural population, both urban and rural work out at Rs.415 crores. This value has been accepted after adjustment to obtain the corresponding figure for 1949-50. This figure has, also, been adjusted to exclude bullock carts which are included in transport.

2.4 Irrigation works: The Statistical Abstract, 1951-52 gives progressive totals of capital outlay in both productive and un-productive irrigation works upto the year 1949-50. In the absence of any other material, the figure for 1949-50 has been accepted as the estimate for capital employed in canals and other irrigation works as well as in embankments, drainage works, etc., after adjustments to obtain the market value.

2.5 Livestock: Statistics relating to the number of livestock by different categories in 1949-50 are obtained by logarithmic interpolation between the corresponding livestock census figures for the years 1945 and 1951. However, for cattle (males over three years, females over three years and youngstock) and buffaloes (males over three years, females over three years and youngstock), breakdown of the population by rural and urban areas is not given for the year 1951 and the rural and urban breakdown of number of cattle and buffaloes has been worked out on the basis of the corresponding ratios obtained from the 1945 livestock census. The average prices of different categories of rural cattle and buffaloes are taken from the 'Report on the Poona Schedules of the National Sample Survey'

(1950-51) while the corresponding urban average prices as well as prices for other animals are based on the data available in the National Income Unit of the Central Statistical Organisation.

2.6 Tractors: No accurate data relating to the total number of tractors in India are available, although the Planning Commission's report on the 'Programmes of Industrial Development, 1951-56' puts it roughly at 10,000 in 1949-50. In the absence of more accurate data, this has been accepted for the estimate of the value of tractors in India. The average price of a tractor is computed from the value and number of imported tractors in 1949-50. The average life of a tractor is assumed to be 15 years and the depreciation rate is taken to be 6.66 p.c. per annum. The value of tractors in India thus estimated is Rs.6.77 crores.

(b) Fishery

2.7 The capital assets used in the fishery sector is in the form of boats, canoes, catamarans, power vessels and nets, besides inventories. Data relating to the number of boats, canoes, catamarans and power vessels used for sea-fishing in the whole of the Indian coast excepting Bengal and Orissa coast, are given in the 'Report of the Marketing of Fish in the Indian Union' (1951). The number of boats, etc., used in Bengal and Orissa coasts is estimated by relating the number of boats used to catch of fish. Having obtained the total number of boats, etc. used in sea fishing, the number used in inland fishing is arrived at by the same method, i.e., relating the number of boats used to the total catch of fresh-water fish. Due weight has been given to the fact that for the same catch of fish the number of boats used is likely to be more in sea fishing than in river fishing as, in the latter, fishing can be done even without the use of boats. Data pertaining to the number of nets used either in sea-fishing or fresh water fishing has been roughly estimated on the basis of the capacity of the

different types of boats, canoes, etc., to carry man. The average prices of boats, canoes, etc., and nets are not available and notional values have been used based on a study of the description of these as given in the Marketing Report. The total value of all boats, canoes, catamarans, vessels, and nets in India thus computed has then been adjusted for inventories taking the current material stock to be 10 per cent of fixed capital. The total capital employed in the fisheries works out at Rs.10.6 crores.

(c) Forestry:

2.8 In the absence of any data what so ever, the capital in forestry sector is arbitrarily taken to be Rs.10 crores.

(d) Incorporated banking companies and co-operative societies:

2.9 In the 'Banking and Monetary Statistics of India' published by the Reserve Bank of India, data are available on assets (comprising mainly of premises, furniture and fitting, etc.) of the Reserve Bank of India, the State Bank of India and other commercial banks. The total value of capital in banking companies has been estimated on the basis of these details. This has been inflated by the ratio of net output of banking companies and co-operative societies to the net output of banking companies only to arrive at the figure for the entire sector.

(e) Incorporated insurance companies:

2.10 Use has been made of the analysis of balance sheet of insurance companies for the year 1949 available in the Insurance Year Book for 1950 to obtain the value of land and house property of the Indian life insurance companies. This has been inflated by the ratio of premium receipt in all insurance companies to that in the Indian life insurance companies only, to estimate the capital stock in the sector.

(f) Incorporated trading companies and miscellaneous companies:

2.11 In the case of incorporated trading companies and miscellaneous companies, use has been made of the series of net fixed assets to obtain the market value of capital stock by the

method of 'price-adjusted depreciated original cost'. The procedure has been described fully in paragraph 2.14.

(g) Electricity generation and transmission

2.12 An independent estimate of capital employed in electricity generation and transmission has been made from the data available in the 'Public Electricity Supply, All-India Statistics, 1950'. This publication gives the capital expenditure (original cost of plant, equipment, etc.) on public electricity undertakings upto the end of 1949 as well as 'Index of progress of Installed Generating Plant Capacity' from 1939 to 1950. These indices have been used to break up the total capital expenditure upto the end of 1949 into annual expenditures over a series of years with 1939 as the initial year. The original cost has then been adjusted by investment cost index to obtain the corresponding replacement value. The deduction of depreciation has been made on the basis of the analysis of balance sheets of electricity generation and supply companies carried out by the Reserve Bank of India.

(h) Factory establishments included in the Sample Survey of Manufacturing Industries:

2.13 Statistics relating to the capital employed (book value) by the various manufacturing industries are available in the Census of Manufactures which cover 29 groups of industries and in the Sample Survey of Manufacturing Industries which covers 63 groups of industries. The data obtained from the Sample Survey of Manufacturing Industries have been taken owing to its wider coverage.

2.14 The market value of capital employed in large enterprises has been estimated by the method of 'price-adjusted depreciated original cost'. But before this could be done, it is necessary to get a time series of assets of the enterprises. As only time series material relate to paid up capitals, we had no way out but to work out a relation between paid up capital and net fixed assets on the basis of sample studies. In this way figures relating to net fixed assets over a number of years have been

obtained. Though no economic relation need necessarily exist between paid-up capital and net fixed assets, it is interesting to note that for most of the joint stock companies where this method is followed, the statistical relationship between paid-up capital and net fixed asset has been found to be more or less stable over a number of years. Next, an index of investment cost has been constructed for these years by combining an index number of the import price of various types of machinery and an index number of construction cost with the investment on the corresponding items in the base year as weights. Use has been made for this purpose of material supplied by the Reserve Bank of India regarding imported machinery, 'Report of the Committee of Experts for Building Works' (1952) and 'Accounts Relating to the Sea-borne Trade and Navigation in India' for a number of years. The annual increments in capital are then adjusted by this index of investment cost and totalled up along with the initial (adjusted) value of capital. This value would give a measure of the market value of capital employed in the last year.

2.15 The value of capital thus estimated however is for fixed assets only and does not include the value of stocks of semi-finished and finished goods and raw materials with the industries in that particular year. The value of inventories as given by the Sample Survey of Manufacturing Industries for the year 1949 has been added to the estimated market value of fixed capital to obtain the total value of capital stock in large enterprises.

(i) Public enterprises

2.16 The figures given above for organised industries relate to both the private as well as the public sector. But some important government undertakings like, ordnance factories and mints which are exclusively in the public sector are not included in the above estimates. Apart from this, an estimate of the amount of capital locked up in public enterprises is

worth undertaking for its own sake and is not out of place in the present study. Adjustment for double counting on this account has been made in the aggregate.

2.17 In the case of all the industries constituting the public sector, capital per unit of labour is calculated from data regarding capital and labour available for similar undertakings and then the number of people employed in the various government industries (obtained from Statistical Abstract, 1951-52 and 1950) are multiplied by the respective ratios of capital to labour to obtain the total capital stock in government industries at market value.

2.18 The value of the total amount of capital sunk in the public undertakings excluding public utilities such as railway workshop, telegraphs, telephones and dockyards, etc., is estimated at Rs.232 crores. The government utilities mostly in the form of services have been excluded from the estimate of government industries as these have been included in the respective sectors, viz., railways, communications, shipping, etc.

(j) Mining

2.19 Statistics relating to the paid-up capital in mining companies over a number of years are obtained from the Statistical Abstract, 1950 and 1951-52. Paid-up capital has been adjusted to obtain the series of net fixed assets on the basis of the ratio of net fixed assets to paid-up capital from the data given in the analysis of balance sheet by the Reserve Bank of India as described earlier and then adjusted for price changes to arrive at the total capital employed in the mining companies. This estimate has been checked against the estimate obtainable from the analysis of balance sheet of mining companies carried out by the Reserve Bank of India and the two five fairly close estimates. An estimate of inventories has been added on the basis of available data on stocks from the analysis of balance sheet of mining companies and other

similar sources.

(k) Plantations

2.20 The Statistical Abstract 1950 and 1951-52 gives the total paid-up capital of tea planting and other plantation companies over a number of years. This, however, represents the capital employed by roughly a third of all the plantation companies. The value of capital estimated by adjustment of series of net fixed assets has therefore been inflated 3 times to get the total capital employed by all plantation companies.

(l) Private house property

2.21 The value of house property in India has been estimated separately for urban and rural areas and the approach to the problem in the two cases is different, as the data available in the respective domains are of different nature. The total number of urban and rural occupied houses in India in 1941 and 1951 are available from the Census and number of rural and urban houses in 1949-50 are estimated by interpolation between the census figures of 1941 and 1951. But while an estimate relating to the all-India average price of a rural house is available from a preliminary tabulation of the National Sample Survey data, no such estimate is available for the urban counterpart.

2.22 For urban house property therefore an indirect method of estimation had to be followed. The total net rental from urban occupied houses in 1949-50 is available from the 'Final Report of the National Income Committee.' From this net rental, the total value of urban houses is obtained by assuming that the annual income derived from this type of investment is 7.5 per cent of the capital.

2.23 An estimate of the total value of rural house property is obtained from the data on the total number of houses and the value of a rural house. The 'Final Report of the National Income Committee' gives an estimate of the current market value of all rural houses based on the National Sample Survey results with regard to the value of a house and the age-



distribution of rural houses. This estimate of Rs.2655.8 crores has been accepted for the present study.

(m) Professions and services

2.24 The capital locked up in the professions are in the form of (i) hospitals and dispensaries and working capital in the medical professions (ii) educational institutions and equipments therein and (iii) inventories besides capital sunk in various professions and services like hairdressing saloons, laundries, etc. The only statistics available in this sphere are restricted to the employment and income in the various professions, obtainable from the 'Final Report of the National Income Committee'. A purely notional estimate of Rs.20 crores has, therefore, been made.

(n) Public property

The capital stock in the public sector not considered so far relates to the stock in the civil aviation department comprising mainly of aerodromes and the aerodrome equipments, the capital expenditure on the ports, (i.e. buildings, docks and berths, ferries, floating crafts, etc.), development schemes like the Nilokheri Colony, Central Tractor Organisation as well as the capital stock in semi-public sectors like the port trusts, municipalities and other local bodies. The original capital expenditures on these items as obtained from the budgets of the Central and State Governments are of the order of Rs.170 crores comprising of Rs.10.07 crores in aerodromes and aerodrome equipments, Rs.10 crores in the ports, Rs.2 crores in broadcasting equipments, about Rs.80 crores in semi-public sectors like municipalities and local bodies and the rest in other government development projects. This however does not include public property in the form of office buildings, furnitures, etc. An estimate of the public property in the form of buildings etc. can be made from the 'Combined Finance and Revenue Accounts of Central and Provincial Government in India for the year 1946-47'. This, however, gives the details upto the end of March 1947 only. In the

absence of any later publication estimate of public property in 1946-47 has been taken from this publication and the <sup>net</sup> price adjusted capital formation under these items by the public sector in the years 1947-48, 1948-49 and 1949-50 have been added to obtain the corresponding figure for 1949-50. The total obtained for the public property when adjusted for current market prices and double counting gives a figure of Rs.464 crores.

(o) Small enterprises

2.26 Data regarding employment and income generated in different types of small enterprises are available in the 'Final Report of the National Income Committee'. This material can be used to arrive at an estimate of wealth by the method of 'capitalization of income'. Alternatively, an attempt may be made to estimate the total capital in small enterprises from the 'capital output' ratios as obtained from different studies about the structure of small-scale industries. Both the methods have been used to prepare alternative estimates. The outstanding sources made use of for the second method are, 'Report on a Survey of Cottage Industries in Aligarh Town and Surrounding Rural Area for the year 1949' (Ministry of Commerce and Industry, 1949-50), S.K. Iyengar's 'Rural Economic Enquiries in Hyderabad State, 1949-51', 'Economic Enquiry of Saurashtra' by C.N. Vakil, The Development of Industries in U.P. (1949) prepared by the Uttar Pradesh Directorate of Cottage Industries, Report of the Fact-Finding Committee (Handloom and Mills), 'Rural Problems in Madras - Monograph' by S.Y. Krishnaswamy and similar other studies carried on by private research workers and institutions. These ratios have been checked against the corresponding ratios in large enterprises for similar industries. The estimate based on case studies has been accepted here in preference to the one arrived at by the first method. The market value of capital stock in small scale industries thus obtained is Rs.718 crores.

(p) Stocks with traders

2.27 Practically no reliable data are available regarding the value of stocks with traders and a rough estimate of the same has been attempted by the method of 'capitalization of income'. The estimate of the net income of all traders is available in the 'Final Report of the National Income Committee' and the income of traders whose incomes are subject to income-tax is available in the income tax statistics. The estimate of value of stock has been attempted in two parts as the nature of stocks and the period of replacements is likely to be different for the traders with big establishments and the smaller ones.

2.28 According to the 'All India Income Tax Statistics' published by the Central Board of Revenue trading income during 1949-50 amounted to Rs.168.8 crores. If we assume an average return of 10 percent on the investment for these traders, their total outlay would be of the order of Rs.1688 crores. The traders, however, have to replace their stocks from time to time depending on the nature of the goods handled by them. If it is assumed that all stocks have to be completely replaced once in every three months i.e. 4 times in the year, the total value of stocks held by traders during the year would come to about Rs.420 crores.

2.29 For an estimate of the value of stocks held by traders whose income do not fall within the income tax level, the income of these traders is taken as the residual of the total trading income as given in the 'Final Report of the National Income Committee' and the part already accounted for. This part of the trading income come to roughly Rs.1055 crores. In the case of these traders the return on investment is likely to be somewhat more than in the case of bigger traders with large establishments and ancillary expenses. Therefore, taking the return on investment to be 12 per cent, the total outlay of these traders during the year comes to Rs.8792 crores. These traders will, however, have to replace their stocks more frequently than the traders with bigger establishments. Assuming that they replace their stocks completely 8 times a year, the total value of stock held by them at any particular time during the year may

roughly be estimated at Rs.1100 crores. The total value of trading stocks, therefore, comes to Rs.1520 crores.

(q) Transport and communication

2.30 This sector has been considered under the heads:

(i) airways, (ii) communications, (iii) other incorporated transport companies (iv) railways, (v) roads and bridges, (vi) shipping and navigation, and (vii) vehicles roads in the form of motor cars, lorries, bullock carts, etc.

2.31 Airways: The details of the working of airway companies are available in 'The Investor's Encyclopedia, 1951-52' and the balance sheets of various companies. These data, in the form of total capital and depreciation from 1945 to 1949, along with the investment cost index have been utilized to estimate the market value of total capital employed in airways.

2.32 Communications: The Statistical Abstract gives the series of capital at charge in communications upto the end of the year. This, along with the series of investment cost index, have been used to estimate the total value of capital.

2.33 Other incorporated transport companies: The actual value of capital locked up in incorporated transport companies, viz. docks, harbours, landings, warehousing, tramways, etc., is on the basis of figures relating to net fixed assets.

2.34 Railways: The Railway Board reports give the total capital at charge on railways upto the end of the year over a number of years and this original cost of capital employed has been adjusted by the investment cost index (described earlier) to obtain the depreciated market value of capital employed in railways.

2.35 Roads and bridges: Statistics relating to the length of roads classified under various heads are available in the Basic Road Statistics of India, 1954, both for metalled and unmetalled roads and the approximate costs of construction of the different types of roads are taken from 'Transport in Modern India'. The value of roads thus obtained has been

age structure and useful life period of Indian roads from the above publications. The total value of bridges has been calculated on the basis of the ratio of capital expenditure on roads to bridges as obtained from the available data.

2.36 Shipping and navigation: The capital stock in 11 shipping companies has been estimated from the analysis of balance sheets of shipping companies (Reserve Bank of India) and this has been inflated to obtain the total for all 19 companies in India. The figure has then been adjusted to obtain the market value. For navigation the method used depended on a series of net fixed assets obtained from the paid-up capital data.

2.37 Vehicles on roads: Data regarding the number of motor vehicles taxed in India in the year 1949-50 are obtained from the Statistical Abstract, 1951-52. Average values of the relevant types of motor vehicles have been obtained from the Ministry of Transport. The total depreciated market value of all vehicles is then calculated on the basis of these prices and the number of vehicles of various types. As the prices relate to vehicles of average age, no deduction has been made for depreciation. The number of all bullock carts are taken from the livestock census, 1951 and the price per bullock cart is taken from the Report on the Poona Schedules of the National Sample Survey (1950-51). The estimated total value of all bullock carts comes to Rs.164 crores and depreciated value has been obtained from this on the basis of the available data on life period, etc. No statistics are available either on the total number or the average value of horse-driven and similar other types of vehicles and a notional value of Rs.50 crores has been taken for such means of transport.

3.1 Before any conclusion can be drawn from the estimates presented in table (1), it is necessary to compare these against the figures of net incomes originating in 1949-50. For this comparison it is necessary to re-arrange table (1)

to conform with the sectors of the industrial origin table as prepared by the National Income Unit. The following table gives the sectoral breakdown of the reproducible tangible wealth along with the corresponding capital-output ratios.

Table (2) : estimates of capital stock by industrial origin and capital-output ratio:1949-50

items	capital stock (Rs. crores)	net output (Rs. crores)	ratio of capital stock to net output
(1)	(2)	(3)	(4)
1. agriculture, animal husbandry and ancillary activities	3774	4484	0.84
2. mining	86	63	1.37
3. factory establishments	1870	543	3.44
4. small enterprises	719	898	0.80
5. communications	70	30	2.33
6. railways	1530	180	8.50
7. organised banking and insurance	87	62	1.40
8. trade	1707	1244	1.37
9. other transport	934	143	6.83
10. professions and other services	314	984	0.32
11. house property	4373	389	10.97
12. total	15516		
13. adjustment for double counting	- 525		
14. net total	14991	9030	1.66

3.2 We get an overall capital-output ratio of 1.66 with large variations between sectors because of the differences in structure of the different industries. Thus, private house property has the largest ratio with the transport activities coming next in order. Next, large scale enterprises has a capital-output ratio of 3.4. On the other extreme, we get a figure of 0.84 for agriculture and 0.80 for small enterprises if we leave aside the notional figure for professions and liberal arts and other services. However, no conclusion can be

drawn regarding the capital structure of various industries within the economy unless these estimates are examined much more carefully.

3.3 Though we have limited our study to the estimate of reproducible tangible wealth in the country it may not be quite out of place to attempt a rough estimate of the total of value of agricultural land in this context. The All-India Rural Credit Survey, Vol.III (Technical Report) gives data on the 'value of owned land' and 'area sown' per family for rural cultivating families in seventy-five districts. For the purpose of this survey a cultivating family has been defined as 'a family cultivating some land, owned or leased, other than small garden plots' (Ref. All-India Rural Credit Survey - Report of the Committee of Directors, Vol.I. The Survey Report - Summary). Using the rural population figures obtained from the Census of India, 1951 for the respective districts as weights all-India average figures of both the value of owned land per family and the area sown per family have been estimated. If it is assumed that the value of land remains the same for urban and rural cultivating families and also for the class defined as the 'non-cultivating owners of land' in the agricultural population in the Census of India, this will give us an estimate of the total value of land owned by all agriculturists when multiplied by the total number of families. The value of land owned by cultivators and non-cultivating rentiers etc., thus estimated, gives a figure of Rs.15,550 crores. This however, excludes agricultural land which may be owned by non-agriculturists i.e., cultivated by agricultural labourers who do not own land and also cultivable land not sown in that particular year. We have, therefore, estimated the total area sown by all cultivators on the basis of the average area sown per cultivating family as obtained from the Rural Credit Survey data and the total number of cultivating families (on the basis of Census of India, 1951). The value of land estimated above has then been adjusted by the ratio of gross cultivable area

to the total area sown by cultivating families in 1951-52 to obtain the value of all agricultural land in the country. This gives a figure of approximately Rs. 18,735 crores. This figure however excludes all non-agricultural land in the urban or rural areas which are not used either for construction of buildings (residential and non-residential) or roads and bridges and irrigation projects. Since the extent of such land is not likely to be much the value of land other than those included in the estimate of reproducible tangible wealth may perhaps be estimated at Rs.20,000 crores on the basis of the value of agricultural land already estimated. This figure however is indicative of the dimension only rather than an estimate of the total value of land.

5.4 The total value of capital stock in the country, both reproducible and non-reproducible, would, therefore, be of the order of Rs.34991 crores in 1949-50 giving an overall capital-output ratio of 3.87.

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SHARE OF URBAN AND RURAL SECTORS IN THE  
DOMESTIC PRODUCT IN 1952-53

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1. Introduction:

1.1 The National Income Committee in its First Report indicated that the distribution of domestic product between urban and rural sectors is one of the lines along which the national income work should develop in future. For a fruitful planning of economic development it is necessary to maintain a proper balance between the two sectors of the economy and this is very much facilitated if we have estimates of income originating in the two sectors separately. Besides, as pointed out in the recent Report of Rural Credit Survey conducted by the Reserve Bank of India, unless the capacities to save are known separately for rural and urban areas even on a rough basis it is not possible for the government to mobilise all possible savings within the country for development purposes.

1.2 However, any attempt to segregate the total income into incomes originating in the two sectors raises certain conceptual problems which should be clarified before going into the details of the estimates. The income originating in any area may be defined either in 'national' or in 'domestic' terms, i.e., the income originating in the enterprises owned by the residents of an area and the income originating in the productive units located in the areas respectively. The difference between the two estimates is the net incomes flow from the sector going outside. In practice, it is almost impossible to measure this income flow between areas within a country and hence it is desirable to follow the domestic concept while estimating the net output of a part of a country. The present estimates of incomes in urban and rural areas are based on the domestic concepts.

1.3 For our study, the definition of urban and rural areas given in the population census of India for the year 1951 has been used. According to this source, any town is defined as a continuous group of houses permanently inhabited by not less than 5,000 persons and/or an area recognised for its importance as a centre of trade, distribution and administration. The totality of all such areas forms the 'urban' area whereas the rest of the area is defined as 'rural'.

2. Method of estimation:

2.1 Limited by the paucity of data, it has not been possible to have direct estimates of the incomes originating in urban and rural areas. What has been done instead is to allocate the contribution to domestic product by an industrial sector in a State between urban and rural areas. The State-wise allocation of the estimates of domestic product for the Indian Union in 1952-53 had already been worked out by the National Income Unit as an experiment and this material has been utilized for the calculation of urban and rural shares. In general, the distribution between the two areas has been made on the basis of the number of workers and wage rates in the urban and rural areas.

2.2 Given the percentage of working population to the total working population in either of the two areas and the average levels of income per worker in the areas under study by different industrial sectors, the distribution of the net outputs by urban and rural areas has been calculated as follows. Let  $n_i$  and  $w_i$  denote the total working force and the net output per person in the  $i$ th sector of the economy. Let subscripts  $r$  and  $u$  respectively refer to the rural and urban areas. Then  $n_{i,r}$  would refer to the number of working population in the  $i$ th sector in the rural area. We also define  $n_{i,u}$ ,  $w_{i,r}$  and  $w_{i,u}$  similarly. Then the net output in the  $i$ th sector can be denoted by  $n_{i,r} w_{i,r} + n_{i,u} w_{i,u} = Y_i$ . This when summed over  $i$  (i.e. the total number of sectors in the economy) will give the total domestic product. For  $i$ th sector, let  $f_i$  denote the proportion

of the total working force in the rural area and  $\phi_i$  denote the ratio of the net output per person in the urban area to that in the rural area. The net output in the rural area for the sector is then given by

$$x_{i,r} \cdot w_{i,r} = y_i \frac{\phi_i}{\phi_i + \alpha_i(1-\phi_i)} \quad (4)$$

This equation enables us to distribute the total net output between the two areas under study. A similar expression can be obtained for the net output in the urban area. This method has been followed for each individual sector with  $\phi_i$  and  $\alpha_i$  varying between regions within the country, i.e., the ratios assume different values according to the sectors, areas and the region to which they are related. The distribution between areas of each sector net output by States as estimated from the above formulae are then summed up to obtain the national totals for rural and urban areas.

2.3 Number of workers in various sectors: Determination of  $\phi$  involves the knowledge of the total working population and working population in the rural area by sectors. From Census of India, 1951, - Economic Tables Part II-C, the breakdown of self-supporting persons under each of the industries between rural and urban areas are available. But we have to take into account the earning dependents as well in the total working force. The Census 1951 gives the number of earning dependents in the rural and urban areas under non-agricultural livelihood classes by four major heads. Similar data are available for agricultural livelihood classes also. For a satisfactory solution to the problem of the inclusion of earning dependents in the total working force for each of the industries, we have assumed that the distribution of earning dependents within the non-agricultural livelihood classes is similar for all sectors.

That is, if

$$\phi_i = \frac{(S_i + E_i)_r}{(S_i + E_i)_t} \quad (5)$$

and  $\phi'_i = \frac{E_{i,r}}{S_{i,t}} \quad (5)$

(where S and E denote self-supporting persons and earning dependents respectively and the subscripts r and t denote respectively the rural and the total area),

$$d_i = \frac{1 + E_{r,i}/S_{r,i}}{1 + E_{t,i}/S_{t,i}} \quad (4)$$

Since  $E_r$  for each industry is not known we have used  $\frac{E_r}{S_r}$  and  $\frac{E_t}{S_t}$

of non-agricultural livelihood classes as a whole for all 'i' except agriculture. The adjustment factors ( $\alpha$ 's) were calculated for all the States separately. These adjustments were not used in the case of 'agriculture' where the number of earning dependents is available by States from the Census of India, 1951. Thus the approximate values of  $\phi$  for all the States under each of the sectors were determined.

2.4 The levels of net output: Our formula involves determination of  $f$  also as defined earlier. We have assumed that the levels of net output remain the same in urban and rural areas for the following sectors, viz., (a) mining, (b) factory establishments, (c) railways, (d) communication and (e) bank and insurance. It is obvious that this assumption cannot be strictly true. But it is likely that the differentials are low for these industries and hence the overall error arising out of this assumption cannot be very large. The determination of the difference in wage levels between the urban and rural areas in the rest of the sectors are discussed below.

2.5 Agriculture: In this case, the value of  $f$  for the country as a whole has been estimated as the weighted (by the percentage of the working force under this industry) average of the per capita monthly incomes obtained from the National Sample Survey (NSS). From the Agricultural Labour Enquiry Report (ALE), indices of wages for men and women (combined) for all agricultural operations were prepared for individual States. Using these indices, the difference in wage levels for all the States were obtained from all-India figure arrived at from the NSS. For some of the States the ALE Report does not give the figures and the average indices of the corresponding Census zones in which

they are situated were substituted. The value of  $\bar{c}$  for animal husbandry, forestry and fishery were assumed to be the same as those of agriculture.

2.6 Small enterprises: From the Census of Manufactures, 1952 (CMI) indices of wages and salaries for the States were prepared with all-India figure as 100. Making a study of available data on the difference in wage levels in small-scale industries between urban and rural areas, the results from the 'Report on a Survey of Cottage Industries in Aligarh Town and Surrounding Rural Area' for the year 1949 (Ministry of Commerce and Industry) were accepted. Taking this to be the value of  $\bar{c}$  for the United Provinces, the values for all other States were arrived at with the help of the indices of variation as obtained for large scale industries.

2.7 Trade and transport: The all-India figures of  $\bar{c}$  separately for trade and transport were obtained on the basis of the available data in 'Economic Prosperity of the United Provinces 1921-29' by Tiwari, 'The National Income of British India: 1931-32' by V.K.R.V. Rao and some other studies. To determine the values of  $\bar{c}$  for the various States the indices prepared from the ALE Report were used.

2.8 Professions and liberal arts: Tiwari in his book Economic Prosperity of U.P., 1921 to 39 gives some figures of average rural and urban incomes in various types of professions e.g. religion, law, medicine, instruction, etc. Also some data are available in 'The National Income of British India: 1931-32' by V.K.R.V. Rao and some other studies. From these figures the all-India average of rural income as percentage of urban income was obtained and the variation between the States were determined by using the wage indices prepared on the basis of the ALE Report.

2.9 Government Services (admin): The net output of this sector in the rural area is estimated as the sum of the net outputs of district boards and village panchayats, plus a share of the total net output of civil administration of Central and State

Governments calculated on the basis of the proportion of government servants like village police and village officers to the total. The difference in wage level between urban and rural sectors has been worked out on the basis of the material available in the State Budgets.

2.10 House property: The net rental incomes of rural and urban house property are estimated separately by the National Income Unit. The rural income is on the basis of the number of houses whereas the urban income is on the basis of municipal tax receipts and the tax-rent ratios.

3. Share of urban and rural sectors:

3.1 The industrial origin table showing the share of urban and rural sectors is presented below:-

Table (1): Domestic income by industrial origin, 1952-53

items	in Rs. abja*		
	rural	urban	total
(1)	(2)	(3)	(4)
agriculture			
1. agriculture, animal husbandry and ancillary activities	45.6	1.5	47.1
2. forestry	0.5	0.1	0.6
3. fishery	0.3	0.1	0.4
4. total of agriculture	46.4	1.7	48.1
mining, manufacturing and small enterprises			
5. mining	0.8	0.1	0.9
6. factory establishments	3.0	3.4	6.4
7. small enterprises	5.8	3.9	9.7
8. total of mining, manufacturing and small enterprises	9.6	7.4	17.0
commerce, transport and communication			
9. communication (post, telegraph and telephone)	0.1	0.3	0.4
10. railways	0.7	1.3	2.0
11. organised banking and insurance	0.2	0.5	0.7
12. other commerce and transport	5.8	8.9	14.7
13. total of commerce, transport and communication	6.8	11.0	17.8
other services			
14. profession and liberal arts	1.6	2.3	3.9
15. personal and sanitary services	0.7	0.6	1.3
16. domestic services	0.4	0.9	1.3
17. government services (administration)	1.0	3.6	4.6
18. house-property	2.0	2.3	4.3
19. total of other services	5.7	9.7	15.4
20. net domestic product at factor cost	68.5	29.8	98.3

\* abja = 100 crores = 10<sup>9</sup>

3.2 Taking the total population in India in 1952-53 as estimated by the National Income Unit and assuming that the distribution of the total population between urban and rural areas is same as in 1951, the population in urban and rural areas in 1952-53 have been obtained. The per capita incomes on this basis works out at Rs.225 in rural area and Rs.468 in urban area against the all-India figure of Rs.267.

4. Net output per person in urban and rural areas:

4.1 As already indicated, the main sources used for the estimation of rural and urban shares in total domestic product are the working force and the respective levels of earning in the two areas. It may therefore be of interest to work out the overall levels of net output per person by sectors as they emerge at the final stage. The following table gives the number of workers and the net output per person by sectors in the two areas along with the corresponding all-India figures.

contd....

Table (2): Working force and net output per person  
in rural and urban areas: 1952-53

sectors	working force in 000s			net output per person in Rs.		
	rural	urban	total	rural	urban	total
1. agriculture and allied pursuits	102613	3179	105792	444	472	445
2. forestry	270	80	350	1845	1246	1714
3. fishery	498	84	582	603	1187	687
4. mining and manufacturing	2349	1432	3781	1618	2444	1931
5. small enterprises	6573	5182	11755	882	753	825
6. communication	73	161	234	1370	1863	1709
7. railways	440	761	1201	1590	1709	1665
8. other commerce and transport*	4297	5577	9874	1396	1686	1560
9. professions and liberal arts	1704	2042	3746	916	1107	1021
10. personal and sanitary services	1999	1102	3101	365	572	439
11. domestic services	1233	1926	3159	354	457	417
12. government service (adm.)	2306	1841	4147	434	1955	1109
13. total	124595	23092	147687	550	1290	66

\* including organised banking and insurance.

4.2 For the estimation of rural and urban shares in the total income we have used State-wise data, i.e., we have taken account of the variation between States. The levels of urbanization being very different between States, the overall picture as it emerges from detailed calculation is of a very different nature than what was assumed to hold within States. For example, though we assume that the differential in wage level between rural and urban areas is very little for mining industries and factory establishments, the table shows considerable difference at the all-India level. This is due to



the fact that some of the States are much more urbanised than others.

5. Estimates of urban and rural shares in the domestic product on the basis of NSS data:

5.1 In the estimates rural and urban incomes presented above, no use has been made of the data on the subject available in the NSS. On the basis of published and unpublished data from the NSS it is possible to have an independent estimate of incomes in urban and rural areas both by the method of distribution of the national totals as well as by the method of independent estimates by areas. An attempt is made in this section to have a distribution of the incomes in urban and rural sectors entirely on the basis of the NSS data.

5.2 Data on the percentage distribution of gainfully occupied persons and the average per capita monthly incomes by urban and rural areas are available in the NSS for a number of industries. Since the scheme of classification by industries adopted in the NSS is different from that of the national income estimates, the sectors of the economy have been combined into four broad groups; viz., (i) agriculture and allied pursuits, (ii) mining, manufacturing and small enterprises, (iii) commerce, transport and communication, and (iv) other services. On the basis of the distribution of gainful population by sectors between the urban and rural areas and the levels of average monthly income per gainfully occupied person, the distribution of income between urban and rural areas has been arrived at by the method which has been used earlier. The estimates thus obtained are given below:-

Table (3): distribution net domestic product  
in 1952-53.

items	in Rs. abja*		
	rural	urban	total
(1)	(2)	(3)	(4)
1. agriculture and allied pursuits	46.1	2.0	48.1
2. mining, manufacturing and small enterprises	8.1	8.9	17.0
3. commerce, transport and communication	7.8	10.0	17.8
4. other services	5.7	9.7	15.4
5. total	67.7	30.6	98.3

\* abja = 100 crores =  $10^9$

5.3 It is interesting to note that the estimates obtained entirely on the basis of the NSS data are not very much different from the estimates obtained from other independent materials.

5.4 The above estimates are however allocation of national totals. It is also possible to build up quite independent estimates by areas from the NSS data. The percentage of gainfully occupied person in urban and rural areas are given in the NSS as well as the percentage distribution of the working force by industries. The total number of gainfully occupied persons by urban and rural areas in the various sectors can be obtained on this basis. The NSS also gives the average monthly income per gainfully occupied person, by various industries and areas. On the basis of these figures it is possible to obtain the total income receipt of the residents of a particular areas. However, the scope of the term 'average monthly income' used in the NSS is not very clear, i.e., it is not

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known how much of factor incomes other than wages and salaries are included or whether they are wage receipts only. As such, no independent estimate along this line has been attempted and the data have been used for a distribution of the national totals only.

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**A PRELIMINARY CONFERENCE ON RESEARCH IN NATIONAL INCOME**  
**NEW DELHI 28-30 JANUARY, 1957**  
**CENTRAL STATISTICAL ORGANISATION**

**ESTIMATES OF DOMESTIC FIXED CAPITAL FORMATION**  
**IN INDIA : 1948-49 to 1954-55**

Baldev Kumar

The estimates of domestic fixed capital formation in India are given below in table 1. The method of estimation is described in the preceding paragraphs.

Table 1. estimates of domestic fixed capital formation  
(In Rs. crores)

	1948- 49	1949- 50	1950- 51	1951- 52	1952- 53	1953- 54	1954- 55
private investment							
(i) construction							
(a) urban-gross	112	148	155	181	189	207	237
-depreciation	62	66	67	73	80	83	90
-net	50	82	88	108	109	124	147
(b) rural-gross	106	112	116	114	110	126	112
-depreciation	65	68	73	71	65	71	64
-net	41	44	43	43	45	55	48
(ii) improvement of land and construction of irrigation works							
-gross	77	81	84	82	79	91	81
-depreciation	11	12	13	13	13	14	13
-net	66	69	71	69	66	77	68
(iii) agriculture, small enterprises, etc.							
-gross	105	110	113	128	133	133	137
-depreciation	61	68	74	78	81	92	91
-net	44	42	39	50	52	41	46
(iv) mining and large scale manufacturing enterprises							
-gross	111	135	114	143	133	133	129
-depreciation	56	60	62	66	70	73	76
-net	55	75	52	77	63	60	53
(v) transport equipment							
-gross	90	82	93	117	115	102	111
-depreciation	58	62	67	74	80	84	88
-net	32	20	26	43	35	18	23
(vi) total							
-gross	601	668	675	765	759	792	807
-depreciation	313	336	356	375	389	417	422
-net	288	332	319	390	370	375	385
Government investment							
-gross	200	257	262	286	304	337	457
-depreciation	46	66	63	75	86	83	93
-net	154	191	199	211	218	254	364
total investment							
-gross	801	925	937	1051	1063	1129	1264
-depreciation	359	402	419	450	475	500	515
-net	442	523	518	601	588	629	749

Private investment

(1) construction (a) urban - gross investment

The estimates are based on the value of cement and iron and steel used in construction. The available supply of cement is estimated on the data on production, imports, exports and stock of cement. The information about cement allocations is obtained from the Ministry of Heavy Industries. The categories of allocation are Central, agriculture, rehabilitation, education, States, railways, Central Public Works Department (CPWD) and defence. The figures of available supply of cement are split up in the above categories on pro rata basis as the allocation figures represent the anticipated figures of production. The allocation of cement to railways, CPWD and defence is considered to be utilized in the construction activity in the public sector. A fixed percentage\* of cement in the other categories is assumed to be utilized for private construction purposes. The average price of cement used for construction activity is calculated to be Rs.93.7 per ton for the year 1950-51 on the basis of information relating to value and quantity of cement used for construction by the Public Works Departments in various States. The year to year variations in the prices are based on the index number of wholesale prices of cement obtained from the office of the Economic Adviser to the Government of India. The cost of private construction is estimated on the assumption that the cost of cement forms 10.5 p.c. of the value of residential construction and 12.4 p.c. of the value of non-residential construction.

The cost percentages of bricks, cement, and iron and steel, obtained from the data collected from the Central and State Public Works Departments, the Report of the Committee of Experts for Building Works, and the percentages are given below:

categories of allocation	percentage of allocation for	
	private residential construction	private non-residential construction
1. Central	40	20
2. agriculture	20	40
3. rehabilitation	80	20
4. education	10	90
5. States (excluding cement released for govt. bodies)	70	25

(percentages based on the allotments for the year 1951-52)

Report of the Environmental Hygiene Committee, etc., are given in table 2. The information relates to the period between 1949 and 1953 and deals with construction activity in the public sector. The technological ratios used in this paper have been assumed to be constant during the period 1948-49 to 1954-55.

Table 2. cost of certain building materials expressed as percentage of total cost of buildings

		bricks	cement	iron & steel
<b>(I) residential buildings</b>				
1. Report of the Committee of Experts for Building works		13.6	14.4	8.0
2. Report of Environmental Hygiene Committee		18.5	4.2	5.5
3. A note on building cost (CPWD)		10.4	8.8	5.8
4. CPWD Construction Division		-	12.7	6.7
5. CPWD Rehabilitation Scheme I		14.6	10.6	4.2
6. CPWD Rehabilitation Scheme II		14.5	12.2	3.6
7. Bombay (PWD)	1949-50		13.5	3.2
(contractors)	1949-50		12.6	3.4
(CPWD)	1950-51		12.5	3.2
8. Madras (PWD)	1950-51		6.8	3.3
(Co-operative Deptt.)	1950-51		8.7	6.8
(Corporation)	1950-51		15.4	5.7
9. Punjab (PWD)	1951-52		5.5	5.1
	1952-53		5.1	5.9
10. PEPSU (PWD)	1950-51		14.3	7.9
11. Delhi (PWD)	1950-51		6.7	3.2
	1951-52		7.0	9.8
<b>(II) non-residential buildings</b>				
1. CPWD Rehabilitation Division		13.4	10.2	
2. CPWD Rehabilitation Division		11.2	4.4	
3. Bombay (PWD)	1949-50		8.2	10.4
(contractors)	1950-51		12.9	19.0
(CPWD)	1950-51		5.6	3.1
4. Madras (PWD)	1950-51		13.0	7.2
(Corporation)	1950-51		12.4	3.9
5. PEPSU (PWD)	1950-51		15.0	19.7
6. Delhi (PWD)	1950-51		14.1	7.1

4. Another estimate of urban construction is based on the amount of iron and steel used for residential and non-residential buildings. The data are available about the production of finished steel in various categories like heavy structural, light structural, heavy rails and fish plates, tin plates, black sheets, galvanised sheets, plates, bars, rods, wire and wire products, wheels, tyres and axles, steel castings, spring

steel, tool steel and others. It is assumed that a certain percentage\* of finished steel in the categories of heavy structural, light structural, bars, rods, steel castings and others is used in the construction of buildings. The price of steel used for private residential construction and non-residential construction for 1950-51 is assumed to be Rs.521.6 per ton and Rs.401.3 per ton respectively on the basis of the schedule of base prices fixed by government for sales by all persons other than registered producers and controlled stock-holders. The prices for years are calculated on the basis of the index numbers of whole-sale prices of mild steel bars and rounds obtained from the office of the Economic Adviser to the Government of India. The estimate of urban construction is prepared on the assumption that the percentages of values of iron and steel in residential and non-residential construction are 6.3 and 10.6 respectively as indicated from the information available in the various sources as given above in table 2.

5. The two estimates of urban construction prepared on the basis of value of cement and value of iron and steel utilised for building activity given below in table 3 show similar figures for the year 1951-52 but the figures diverge for the earlier and later years. The average of the two estimates are taken to represent the value of urban construction. No allowance is made for those buildings in the urban areas which do not use cement or steel.

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\* the percentages are given below:

categories	percentage of finished steel used in	
	private residential construction	private non-residential construction
1. heavy structural	10	20
2. light structural	10	20
3. bars	40	40
4. rods	40	40
5. steel castings	10	10
6. others	10	10

Table 3 estimates of private gross investment in urban construction

(in Rs. crores)

year	cement basis			iron and steel basis			average
	residen- tial	non-resi- dential	total	residen- tial	non-resi- dential	total	
1948-49	63	24	87	30	47	137	112
1949-50	92	35	127	111	58	169	148
1950-51	95	36	131	113	61	179	155
1951-52	129	49	178	121	63	184	181
1952-53	122	47	169	138	71	209	189
1953-54	127	46	173	130	81	241	207
1954-55	146	56	202	179	93	272	237

6. An attempt has been made to have a third estimate of urban construction based on the value of bricks used for the construction of urban buildings. The method involves the estimation of the number and value of bricks produced from coal despatched by rail for brick burning. Adjustments are made to get the value of bricks used for private construction. The gross investment in urban construction is estimated on the assumption that the value of bricks forms 14.3 p.c. of the value of urban buildings. Further adjustment is made to include the value of those buildings where bricks are not utilised. The trend of investment shown by this third estimate of urban construction is altogether different from the trends in the other two estimates and is therefore not considered to be appropriate for averaging with the other two estimates.

(i) construction (a) urban - depreciation.

7. Depreciation is estimated by assuming a depreciation rate of 2 p.c. A certain net value is assumed of the total number of buildings existing before 1948-49 and to it is added the gross value of capital formation for the year 1948-49. Depreciation is deducted at the rate of 2 p.c. The difference between the value so obtained and the assumed value of buildings before 1948-49 shows the amount of net investment during 1948-49. For estimating the net capital formation for the year 1949-50, the value of all buildings existing before 1949-50 thus obtained is adjusted for the price change. The figure of gross capital formation for the year is added to it and the depreciation



is deducted again at the rate of 2 p.c. This process is repeated for other years. The estimates of net value of urban houses are checked by evaluating the annual increase in the number of urban houses obtained by projecting the census figures of 1951.

(i) construction (b) rural - gross investment

8. The value of construction or improvement of houses, wells, tanks, bunds, etc., in rural areas was Rs.14.78 per household during the year June 1950 - May 1951 as shown by the results in the second round of the National Sample Survey (NSS). The figure for the reference period: October 1950 - September 1951 was Rs.21.41 in the third round of the NSS. The average of the two figures (Rs.18.10) is taken as the representative value per household for the year 1950-51. Assuming 60 millions, as the number of rural house-holds, the value of construction is estimated to be Rs.108.6 crores. This is marked up by 33 p.c. to get the gross estimate of construction of Rs.144.8 crores. From this value is deducted the value of rural construction of irrigation works of Rs.28.4 crores estimated by another method as explained in para 10 below. The gross value of rural houses is thus estimated to be Rs.116 crores for the year 1950-51. The estimates for the years 1948-49 to 1954-55 are prepared on the basis of an indicator based on the gross value of agricultural output adjusted by the index numbers of wholesale prices of food articles.

(i) construction (b) rural - depreciation

9. The annual rate of depreciation is assumed to be 2.5 p.c. as adopted by the National Income Committee in their Final Report. The estimate of net value is prepared by assuming a current value of rural houses existing before 1948-49 by the same method as adopted for estimating the net value for urban construction and is checked by evaluating the annual increase in the number of rural houses obtained by projecting the census figures of 1951.

(ii) improvement of land and construction of irrigation works - gross investment

10. The value of improvement of land was given as Rs.8.89 per household during the year June 1950 - May 1951 in the second round of NSS. The value in the third round was Rs.7.89 per household. The average of the

two values is Rs.8.39 per household. The value of capital formation is estimated to be Rs.50.34 crores for 1950-51 for the 60 million rural households. The estimate of private construction of irrigation works is estimated to be Rs.28.4 crores for the year 1950-51 from the number of persons employed and the value of output per person engaged in the construction of irrigation works. The total figure of gross capital formation of Rs.84 crores for 1950-51 is obtained by adding Rs.28.4 crores to the value of capital formation in improvement of land marked up by 10 p.c. The figures of gross value for the years 1948-49 to 1954-55 are obtained by the same method as is adopted for estimating the gross value of rural houses for these years.

(ii) improvement of land and construction of irrigation works - depreciation

11. Depreciation is estimated by assuming a depreciation rate of 1 p.c. The method of estimation is the same as adopted for urban and rural construction.

(iii) agriculture, small enterprises, etc., - gross investment.

12. The gross investment is estimated from the data on imports and domestic production of capital goods in the small enterprise. The estimates of the values of imports and domestic production are given below in table 4.

Table 4. estimates of private gross investment in agriculture, small enterprises, etc.

	(in Rs. crores)						
	1948-49	1949-50	1950-51	1951-52	1952-53	1953-54	1954-55
imports	3	7	7	10	4	5	6
domestic production	102	103	106	118	129	128	131
total	105	110	113	128	133	133	137

13. The principal items of imports included in capital formation are agricultural machinery and implements. The total value of imports and import duties are marked up by 20 p.c. to allow for the trade and transport charges. The method of estimating the domestic production of capital goods in the small enterprises involves the estimation of the number of persons engaged in the capital goods industries and the

value of output per person. The small enterprises are assumed to cover all the manufacturing activities carried out in small establishments or households falling outside the purview of section 2(j) of the Factories Act., 1934. The number of persons engaged in small enterprises are estimated from the figures of occupied persons in 'industry' available in the Census occupation tables after deducting the number of persons employed in factories. A certain percentage of the value of output estimated in some of the sub-divisions\* of industries and services according to the Indian Census Economic Classification is assumed to contribute to the capital formation. The percentages have been fixed after taking into consideration the various groups under the sub-divisions indicated in "Census - 1951 - Tabulation Plan" by the office of the Registrar General, India. The value of transport equipment produced is segregated on the basis of some further assumptions and is lumped up with its counterparts in the value of imports and the domestic production under factory establishments. The method of estimating the value of output per person has been explained in the First and Final Reports of the National Income Committee.

(iii) agriculture, small enterprises, etc. - depreciation.

14. Depreciation is estimated by assuming a depreciation rate of 10 p.c. The value of implements etc., existing before 1948-49 is assumed on the basis of information available in various sources given in the Final Report of the National Income Committee. For rates of depreciation, the information available is very limited. According to NSS third round unpublished results average depreciation rate of power equipment used in household manufacturing establishments worked out at about 5 p.c. and the depreciation rate of other machinery and tools worked out at about 16 p.c.

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\* 3.0 manufacture of metal products, otherwise unclassified : 33.3 p.c.  
3.3 transport equipment : 60.0 p.c.  
3.4 electrical machinery, apparatus, appliances and supplies :  
50.0 p.c.  
3.5 machinery (other than electrical machinery) including engineering  
workshops : 50.0 p.c.  
4.0 manufacturing industries otherwise unclassified 5.0 p.c.  
4.6 Wood and wood products other than furniture and fixtures :  
25.0 p.c.

(iv) mining and large scale manufacturing enterprises - gross investment.

15. The gross investment in mining and large scale manufacturing enterprises is estimated from the statistics of imports, exports, import duties and domestic production of capital goods. The values of imports and domestic production are given below in table 5. The value of machinery and other equipment purchased by the government is deducted from the total value of imports and domestic production to arrive at the gross value of investment.

Table 5. estimates of private gross investment in mining and large scale manufacturing enterprises.

	(in Rs. crores)						
	1948- 49	1949- 50	1950- 51	1951- 52	1952- 53	1953- 54	1954- 55
imports	97	117	95	118	103	100	94
domestic production	24	30	31	37	37	39	45
less government investment	- 10	- 12	- 12	- 12	- 7	- 6	- 10
total	111	135	114	143	133	133	129

16. For estimating the value of imports, the following capital goods are taken from the 'Accounts relating to the foreign (sea, air and land) trade and navigation of India', and the 'Customs and Excise revenue statement of the Indian Union', Department of Commercial Intelligence and Statistics, Calcutta: belting for machinery, prime movers other than railways, aerated water making machinery, boilers, leather tanning and shoe-making machinery, machine tools, mining machinery, oil crushing and refining machinery, paper mill machinery, pumping machinery, rice and flour mill machinery, saw mill and wood working machinery, sugar machinery, tea machinery, textile machinery, other sorts of machinery, electrical machinery, typewriters, printing and lithographic machinery, knitting machines, cinema talkie apparatus and equipment, refrigerators other than domestic, air compressors, metal working machinery, excavating machinery, earthmoving and shifting machinery. The values of re-exports and exports of these items are deducted to get the net import value of capital goods. The import duties on these items are added and the total value is marked

of 20 p.c. has been estimated after analysing a large number of price quotations of producers, wholesalers and retailers culled from various reports and publications.

17. The domestic production of capital goods is estimated from the Census of Manufacturers and the Sample Survey of Manufacturing Industries (SSMI). The items included are 5 p.c.\* of output of industries in the group 'aluminium, copper and brass', 25 p.c.\* of output of industries in the group 'general engineering and electrical engineering (excluding generation and transformation of electrical energy), textile machinery and accessories, and other iron and steel manufactures. The value of output of domestic production is estimated in some cases from the indices of production and prices generally for those years for which no information is available. For instance, the variation in the output from year to year of the textile machinery is determined from the combined value at constant prices of production of plain calico looms, ring spinning frames and carding engines and is adjusted by the index of wholesale prices of metal products. The indicator of output in the group 'aluminium, copper and brass' is obtained from the interim index of industrial production of non-ferrous metals and the index number of wholesale prices of manufactured metal products. The indicator used for the group 'general engineering and electrical engineering' is obtained from the general interim index of industrial production. The domestic production under the group 'other iron and steel manufacturers' is estimated from the allotment figures of iron and steel in the quotas for industrial maintenance and packing and private industrial development schemes obtained from the Iron and Steel Controller. The price per ton for the year 1950-51 estimated from the SSMI is adjusted from year to year on the basis of index of whole-sale prices of the iron and steel manufactures obtained from the office of the Economic Adviser to the Government of India. The total figure of domestic production is also marked up by 20 p.c. to allow for the trade and transport charges.

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\* Percentages assumed on the basis of available information.

(iv) mining and large scale manufacturing enterprises - depreciation.

18. Depreciation is estimated by assuming a depreciation rate of 5 p.c. The average life of machinery is taken to be 20 years on the basis of information available in the Report of the Taxation Enquiry Commission, the unpublished results of NSS and various other publications.

(v) transport equipment - gross investment

19. The value of gross investment in transport equipment is estimated from the statistics of imports and domestic production. The value of imports and domestic production are given below in table 6. The value of transport equipment purchased by government is deducted from the total value of imports and domestic production to arrive at the value of gross investment.

Table 6. estimates of private gross investment in transport equipment

	(in Rs. crores)						
	1948-49	1949-50	1950-51	1951-52	1952-53	1953-54	1954-55
imports	33	23	32	43	33	25	36
domestic production	61	63	64	76	85	80	79
less government investment	- 4	- 4	- 3	- 2	- 3	- 3	- 4
total	90	82	93	117	115	102	111

20. The value of capital goods included in imports are carriages and carts not mechanically propelled (excluding railway carriages), parts of carriages and carts, air craft, parts of aircraft, motor cars including taxi-cabs (50 p.c.), motor omnibuses, motor vans, etc., tram cars, other sorts, parts of mechanically propelled vehicles and vessels. The values of re-exports and exports are deducted from the value of total imports. The import duties on these items are added and the total value is marked up by 20 p.c. to allow for trade and transport charges. The domestic production of transport equipment in factory establishments is estimated from the SSMI. The industries taken are automobiles and coach building (50 p.c.), ship-building and aircraft assembling. The estimates for 1948-49 and 1954-55 are

prepared from the indices of production and prices. The domestic production from large establishments is marked up by 20 p.c. to allow for trade and transport charges. The value of transport equipment produced in small enterprises as estimated in para 13 above is added to get the total value of domestic production.

(v) transport equipment - depreciation

21. The depreciation rate in transport equipment is assumed to be 15 p.c. This is based on the information obtained from various sources about the average life expectancies of the various transport equipments. The rate of depreciation for vehicles and tools according to unpublished NSS results is about 9 p.c. The average expected life of a lorry on the other hand is 4 years (that is, the rate of depreciation is 25 p.c.) according to another source\* of information.

Government investment - gross value

22. The gross value of government investment is estimated from the accounts of the various public authorities. The estimates for the year 1948-49 to 1953-54 are based on the "actuals" and the estimates for the year 1954-55 are based on the "revised estimates". The public authorities comprise the Central and State Governments, Port Trusts, Improvement Trusts, Municipal Corporations, Municipalities, District and Local Boards, and Village Panchayats. The investments in railways, post and telegraph, forest, road transport, irrigation and electricity departments of the Central and State Governments are also included in the public sector but the outlay on the purchase of shares of private commercial undertakings have been excluded from the capital formation in the public sector. Further the expenditure on acquisition of land for development purposes has also been excluded from the capital formation in the public sector. The problem arises about the public corporations like Air India International Corporation, Indian Airlines Corporation, Delhi Road Transport Authority, Bombay State Road Transport Corporation, etc., whose accounts are not included in the government budgets. The capital outlay by these public bodies have been included in the private sector.

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\* The Eastern Economist, Vol. XXI, No.6, August 7, 1953, p. 220.

23. An attempt has been made to classify the capital outlay by the public authorities under buildings, roads and bridges, other construction and works, transport equipment, and machinery and other equipment. The purpose of this classification is mainly to segregate the value of capital goods into these categories so as to avoid double counting in the estimates prepared for the private sector. However, the data presented in the accounts prepared by the public authorities do not permit this classification in most of the cases and the error resulting from this incomplete classification affects the figures of capital formation in the private sector.

24. A number of problems arise while analysing the accounts of the public authorities. The Central and State Governments make a distinction between their revenue and capital accounts but it has not been possible to adhere strictly to this classification. The capital outlay financed out of revenues and so included in the revenue account of the public authorities has been treated as capital expenditure. But the expenditure on defence, payment of compensation to landholders, etc., on the abolition of the Zamindari system, and payments of commuted value of pensions although included under "capital expenditure outside the revenue account" in the accounts of the public authorities has been excluded from the estimates of capital formation. The criterion adopted by the Central and State Governments for classifying the expenditure on civil works in the capital account is that the cost of civil works should exceed a specified limit. For instance the Central Government fixed a limit\* of Rs.1 lakh which has now been lowered to Rs.20,000 from the year 1956-57. The procedure adopted in this paper is to treat all outlays on works, whether included in the revenue or capital accounts as capital expenditure. Further the expenditure on development schemes has not been treated as capital expenditure unless the expenditure is made for the creation of a fixed tangible asset. Thus only that part of expenditure on community development projects or national extension service schemes of the public authorities has been included under capital formation which involves the construction of buildings, roads or other works.

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\* Explanatory memorandum on the budget of the Central Government for



Government investment - depreciation

25. The expenditure on renewals and replacements is available in some cases in the accounts of the public authorities. For some departments like railways, post and telegraph, a specified amount is transferred to the depreciation reserve fund every year and the expenditure on renewals and replacements is met out of the depreciation reserve fund. The figures of depreciation provision are not always equal to the figures of expenditure on renewals and replacements. Further no depreciation provision is made for buildings, roads and other works. One method of estimating depreciation in the case of government construction is to apply appropriate depreciation rates for the various types of works. This method has not been attempted. The actual expenditure on capital maintenance of Civil Works has been included in the figure of gross investment. The depreciation for irrigation works and other works has not been estimated. The figure of net investment represents the actual expenditure on construction of new works.

Estimates of domestic fixed capital formation at 1948-49 prices.

26. The estimates of domestic fixed capital formation at 1948-49 prices are obtained by deflating the estimates at current prices by appropriate price indices and are given below in table 7. The deflator used for private urban construction and government investment has been based on the costs of construction. For rural houses, improvement of land and construction of irrigation works the deflator has been based on the prices of consumer goods. The deflator for mining and large scale manufacturing enterprises, and transport equipment is based on the prices of capital goods imported and produced in India. For agriculture, small enterprises, etc., the deflator has been prepared on the basis of the deflators used above for rural houses, manufacturing enterprises and transport equipment.

Table 7. estimates of domestic fixed capital formation at 1948-49 prices

(in Rs. crores)

	1948- 49	1949- 50	1950- 51	1951- 52	1952- 53	1953- 54	1954- 55
<b>1. private investment</b>							
(i) construction							
(a) urban-gross	112	143	152	169	164	178	196
-depreciation	62	64	65	69	59	71	74
-net	50	79	87	101	95	107	122
(b) rural-gross	106	110	107	109	118	126	126
-depreciation	65	67	67	68	70	71	72
-net	41	43	40	41	48	55	54
(ii) improvement of land and construction of irrigation works							
-gross	77	79	77	79	85	91	91
-depreciation	11	12	12	13	14	14	14
-net	66	67	65	66	71	77	77
(iii) agriculture, small enterprises, etc.							
-gross	105	105	104	121	131	121	135
-depreciation	61	65	68	74	80	84	90
-net	44	40	36	47	51	37	45
(iv) mining and large scale manufacturing enterprises							
-gross	111	122	106	130	105	97	92
-depreciation	56	54	58	60	55	53	54
-net	55	68	48	70	50	44	38
(v) transport equipment							
-gross	90	74	86	106	91	74	79
-depreciation	58	56	62	67	63	61	63
-net	32	18	24	39	28	13	16
(vi) total							
-gross	601	633	632	714	694	687	719
-depreciation	313	318	333	350	351	354	367
-net	288	315	299	364	343	333	352
<b>2. government investment</b>							
-gross	200	249	258	267	264	290	378
-depreciation	46	64	62	70	75	71	77
-net	154	185	196	197	189	219	301
<b>3. total investment</b>							
-gross	801	882	890	981	958	977	1097
-depreciation	359	382	395	420	426	425	444
-net	442	500	495	561	532	552	653

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PRIVATE CONSUMPTION EXPENDITURE IN INDIA, 1949-50

S.P. Dhar, M.G. Kanbur, K.N.C. Pillai  
and V.S. Puri.

This paper presents briefly the preliminary results of an investigation into personal consumption expenditure in India, including the State of Jammu & Kashmir, during the year 1949-50.

2. By personal consumption expenditure we mean the value of final expenditures on commodities, i.e., goods and services, of all individual consumers comprising households and non-profit institutions such as charity houses and orphanages. As this expenditure should relate to the normal residents, allowance has to be made for the difference between expenditure by foreigners visiting India and Indians visiting abroad. We have not, however, paid regard to this kind of adjustment, partly due to the absence of relevant data and partly due to the negligible magnitude of this part of the flow.

3. The acquisition of land or building, is not regarded as part of private consumption expenditure as it is treated independently as an enterprise activity. The estimate of housing expenditure is restricted, therefore, to the gross annual rentals. These rentals may be thought of as comprising the sums needed to maintain and to provide for the depreciation of the property, together with the residual net income accruing to the owner who may also be the occupier. In the case of a motor car or a refrigerator or any other durable household equipment, however, the item is treated as an object of consumer's expenditure and not as a fixed asset which yields service to its user.

4. Lastly it may be stressed that even though the consumption expenditure is designed to gauge the value of the sum total of consumer's utilities, it cannot claim to give us a complete coverage of all the goods and services which are generally needed to satisfy man's everyday wants. We have, therefore, to be content with the evaluation of only those items which allow measurement in monetary terms. Thus all services

rendered free by unpaid family members (for example food cooked by housewives, self-painted walls or owner-driven cars) are straightaway excluded from the process of evaluation. This remark, however, does not apply to the own-produced farm consumption and owner-occupied dwellings for which values have been imputed by suitable methods.

5. Estimates of private consumption expenditure can be made by pursuing one or more of the following methods, viz: (i) by direct analysis of family budget sample enquiries, (ii) by retail censuses, i.e., by estimating directly the total retail sales, (iii) by building up the final expenditure from price and quantity of each commodity consumed by the ultimate consumer and (iv) by application of 'commodity flow' method. Of the various methods mentioned above, we have mostly used the last one, i.e. the 'Commodity flow' method, which involves ascertainment of the proportions through different channels of distribution and application of a suitable mark-up factor to each flow in order to obtain values at the stage of final use. This is admittedly the most involved method and presupposes the availability of a huge mass of data on various types of activities such as production, distribution and consumption. But at the same time it has a great advantage in so far as it provides greater detail of private consumption by types of commodities and can simultaneously yield information on gross additions to producer's durable equipment. The greatest problem is perhaps to provide a measure free from duplication in the sense that all intermediate products are excluded, and that inclusive distributor's margins are not added to a total which already reflects some of the distribution costs. The necessary break-down of the different flows is considerably facilitated by the availability of the data on utilisation in a number of Marketing Reports on various agricultural and livestock products, in the Census of Manufactures as also in the report on Sample Survey of Manufacturing Industries. The details given in these sources have often made it possible to classify commodities directly as 'finished' or 'unfinished' and in a majority of cases, within the finished group, as producer's durable goods or consumer goods. Nevertheless a greater part of the value of commodities considered was represented by mixed product categories, which had to be

allocated between further processing uses and final uses.

6. The problem of estimation assumes more complicated dimensions in an under-developed country which is characterized by abundance of subsistence production. In India, for instance, quite a large part of the farm output is retained by the producer to meet his urgent needs. This retention may be for direct consumption such as food articles and self-woven cloth, or for future seed requirements and cattle feed, or for bartering purposes. All this output does not, therefore, find its way through the market mechanism. As is customary in national income estimation, this part of the output is valued at prices which its counterpart fetches in the market. This can be done by evaluating it either at producer's price or at retail price. The former is relevant if the total figure of private consumption expenditure has to be matched with the national income estimate obtained from the product approach, whereas the latter procedure would be more appropriate in case a comparison is sought with the National Sample Survey estimates or similar estimates based upon family budget studies. As we have both these purposes in view we have prepared the two estimates of private consumption expenditure using both producer's price as well as retailer's price as basis of imputation in respect of producer's consumption of own produce.

7. In the present study the method of 'commodity flow' has been employed to obtain roughly 84 percent of the total consumer expenditure. The different sectors in which this kind of measurement has been used are: (i) agriculture, (ii) livestock, (iii) forestry, (iv) fishery, (v) mining, (vi) organised industry and (vii) small enterprises. The values of output from sectors (i) to (iv) were mostly built up from quantity and price series made available by the Directorate of Economics and Statistics and Directorate of Marketing and Inspection. For 'mining' the values of individual items are given in the Mineral Production of India whereas those relating to 'organised industries' were directly taken from the report on the Sample Survey of Manufacturing Industries. The value of products originating from the sector 'small enterprises' was estimated on the basis of approximate number of persons employed in different industries and the 'per head' value of output as given in various published and unpublished studies. These values at producer's prices

were then adjusted for the portion utilised as seed, cattle feed and for other productive purposes. Of the balance available for human consumption purposes, the quantity marketed was inflated for gross trade and transport margins. For an alternative estimate of private consumer expenditure, retention by producers for personal consumption also has been inflated for trade and transport margins. All the final consumer goods have, then, been picked out leaving aside all intermediate and capital goods. In the case of mixed goods, e.g., oilseeds, sugarcane, coal etc., which are partly consumer goods and partly intermediate goods, the amounts of these used as raw materials in other sectors have been estimated (by a detailed analysis of the input items of all the sectors) and have been deducted. The value of domestic production of final consumption goods, has then, been corrected for import and export transactions which also have been adjusted for trade margins. This has been done by taking the c.i.f. value of consumer goods as given in the foreign trade statistics and then raising these values to the retail level by flat percentage mark-ups to cover the different distributive costs and the trading margins. A detailed note on the method of estimation followed for individual items has been prepared and can be supplied on request.

8. As indicated elsewhere, there are some items such as electric lamps, electric fans, chemicals, or sewing machines where a sizeable portion may be used by business concerns. The values of such portions have, therefore, got to be segregated from the private consumption expenditure. In the absence of firmer data we have had to assume certain percentages for such apportionments, supported, of course, by some rough indicators, wherever possible. For example, we have assumed that about 25 percent of total supply of electric lamps and fans are being used by business concerns and government. This has been done on the basis of utilization of electricity for non-industrial uses. In the case of sewing machines the allocation was done on fifty-fifty basis. These assumptions are, in quite a few cases, arbitrary and subjective. It is possible, however, that these errors may cancel out to some extent and may not result in a large error in the final estimate of consumer expenditure.

Table (1) : private consumption expenditure - Indian Union : 1949-50

(In crores)

	value of (domestic final products for consumer use at producers prices)			value of net imports	value of gross trade and transport margins			total consumer expenditure		
	total	retention for own consumption	marketable surplus		col. (3)	col. (4)	col. (5)	est. I	est. II	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<b>Food</b>										
1. food grains	1906	1196	610	73	186	104	11	1994	2180	
2. pulses	301	99	202	1	15	36	-	338	353	
total cereals and pulses	2107	1,295	812	74	201	140	11	2332	2533	
3. edible oils	315	36	279	- 7	7	76	1	385	392	
4. fruits and vegetables	326	73	253	2	36	128	2	458	494	
5. milk and milk products	651	167	484	3	22	74	2	730	758	
6. meat, egg and fish	136	16	120	- 1	5	8	-	143	143	
7. refreshments	192	29	163	-73	2	39	- 4	174	176	
8. salt	4	-	4	1	-	3	1	9	9	
9. spices	138	-	138	-14	-	46	1	171	171	
10. sugar	317	19	298	-	2	56	-	373	375	
total other food	2079	340	1739	-89	71	450	3	2443	2517	
food services	110	-	110	-	-	-	-	110	110	
total food	4296	1635	2661	-15	77	590	14	4885	5160	
<b>non-food</b>										
11. gin and tobacco	15	16	125	- 8	7	74	-	207	214	
12. intoxicants	2	6	40	-	1	9	1	56	57	
total gin and tobacco	17	22	165	- 8	8	83	1	263	271	
13. clothing and footwear	174	3	571	-39	-	-	-	-	-	
14. footwear	112	-	112	-	-	-	-	-	-	
total of them and footwear	686	3	683	-39	-	-	-	-	-	
15. fuel and lighting	222	118	10	2	-	-	-	-	-	
total fuel and lighting	222	118	10	2	-	-	-	-	-	
16. house rent, etc.	511	449	62	-	-	-	-	-	-	
total house rent, etc.	511	449	62	-	-	-	-	-	-	
17. amusements and musical instruments	71	-	71	1	-	-	-	-	-	
18. education	35	-	35	1	-	-	-	-	-	
19. medicine	43	3	40	-	-	-	-	-	-	
20. toilet	35	2	33	-	-	-	-	-	-	
21. petty articles and sundary equipment	161	-	161	5	-	-	-	-	-	
22. conveyance	158	-	158	11	-	-	-	-	-	
23. services including services	777	2	775	1	-	-	-	-	-	
24. furniture	8	-	8	-	-	-	-	-	-	
25. domestic utensils	228	-	228	1	-	-	-	-	-	
total services and miscellaneous	1506	7	1499	20	-	-	-	-	-	
total non-food	3172	999	2173	-85	-	-	-	-	-	
total consumption	7468	2634	5134	-100	-	-	-	-	-	

col. (1) = col. (2) + (3) + (4) + (5) + (6)      col. (10) = col. (9) + (6)

Table (1) : private consumption expenditure - Indian Union : 1949-50

(in crores)

	value of (domestic final products for consumer use at domestic prices)			value of (gross trade and transport margin)			total consumer expenditure		
	total	retention for own use	marketable surplus	imports	port margin		est. I	est. II	
					col. (3)	col. (4)			col. (5)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<b>food</b>									
1. food grains	1306	1196	610	73	186	104	11	1994	2180
2. pulses	301	99	202	1	15	36	..	338	353
total cereals and pulses	2107	1295	812	74	201	140	11	2332	2533
3. edible oils	315	30	279	-7	7	76	1	385	392
4. fruits and vegetables	326	73	253	2	30	128	2	458	494
5. milk and milk products	651	167	444	3	22	74	2	730	752
6. meat, egg and fish	136	16	120	-1	5	8	-	143	148
7. refreshments	192	29	163	-73	2	59	-4	174	176
8. salt	4	-	4	1	-	3	1	9	9
9. spices	138	-	138	-14	-	46	1	171	171
10. sugar	317	19	298	-	2	36	-	373	375
total other food	2079	340	1739	-89	70	450	3	2443	2517
food services	110	-	110	-	-	-	-	110	110
total food	4296	1635	2661	-15	97	590	14	4885	5160
<b>non-food</b>									
11. gan and tobacco	16	16	125	-8	7	74	-	207	214
12. intoxicants	6	6	40	-	1	9	1	56	57
total alcoholic beverages	12	12	165	-8	8	83	1	263	271
13. clothing and footwear	74	3	571	-39	-	136	7	678	678
14. footwear	112	-	112	-	-	13	-	125	125
total of textile and footwear	456	3	683	-39	-	149	7	803	803
15. fuel and lighting	222	118	10	2	9	44	4	272	281
total fuel and lighting	222	118	104	2	9	44	4	272	281
16. house rent, etc.	511	449	02	-	-	-	-	511	511
total house rent, etc.	511	449	02	-	-	-	-	511	511
17. amusements and musical instruments	71	-	71	1	-	4	1	77	77
18. education	35	-	35	1	-	11	1	37	37
19. medicine	43	3	40	-	1	15	-	58	59
20. toilet	35	2	33	-	1	12	-	47	48
21. petty articles and sundry equipment	161	-	161	5	-	44	3	213	213
22. conveyance	158	-	158	11	-	6	6	181	181
23. services including screenings	777	2	775	1	-	29	-	807	807
24. furniture	8	-	8	-	-	3	-	11	11
25. domestic utensils	228	-	228	1	-	50	-	233	233
total services and miscellaneous	1906	7	1899	20	-	177	11	1714	1716
total non-food	3117	299	2813	-85	9	433	13	3573	3582
total private consumption	7413	1934	5474	-100	106	1023	27	8458	8742

col. (8) = col. (1) + (2) + (3) + (7) + (8)

col. (10) = col. (9) + (6)



12. The private consumption expenditure will thus be ~~seen~~ to approximate to Rs.84.5 abja (estimate I), imputation of producer's consumption of own produce being at producer's price. Taking retail price as the basis of imputation this estimate gets pushed up to Rs.87.4 abja (estimate II). Our estimate I of private consumption expenditure arrived at in this manner permits direct comparison with one obtainable from its relationship with the estimate of national income for the year 1949-50 given in the Final Report of the National Income Committee. The following table will make it clear.

Table (c): consumer expenditure as derived from the national accounts

	(in Rs.abja)
	1949-50
net domestic product at factor cost	90.30
add indirect taxes	3.94
less subsidies	- 0.40
= net domestic product at market prices	93.84
net domestic expenditure at market prices	93.84
less general government expenditure at market prices	- 5.38
less net domestic fixed capital formation	- 5.23
add net imports of goods and services	0.40
= private consumption expenditure	83.63

13. The following table gives the percentage composition of consumer expenditure as derived by us.

Table (3) pattern of private consumer expenditure: 1949-50

(1)	Percent of total	
	1949-50	1948-49
food		
1. foodgrains	23.6	25.0
2. pulses	4.0	4.0
total: cereals and pulses	27.6	29.0
3. edible oils	4.6	4.5
4. fruits and vegetables	5.4	5.7
5. milk and milk products	8.6	8.6
6. meat, egg and fish	1.7	1.7
7. refreshments	2.1	2.0
8. salt	0.1	0.1
9. spices	2.0	1.9
10. sugar	4.4	4.3
total: other food	28.9	28.8
food services	1.3	1.3
total: food	57.8	59.1
non-food		
11. pan and tobacco	2.4	2.5
12. intoxicants	0.7	0.6
total: alcoholic drinks etc.	3.1	3.1
13. clothing and bedding	8.0	7.8
14. footwear	1.5	1.4
total: clothing and footwear	9.5	9.2
15. fuel and lighting	3.2	3.2
total: fuel and lighting	3.2	3.2
16. house rent, etc.	6.1	5.8
total: house rent, etc.	6.1	5.8
17. amusements and musical instruments	0.9	0.9
18. education	0.4	0.4
19. medicine	0.7	0.7
20. toilet	0.6	0.6
21. petty articles and sundary equipment	2.5	2.4
22. conveyance	2.2	2.1
23. services including ceremonies	9.6	9.2
24. furniture	0.1	0.1
25. domestic utensils	3.3	3.2
total: services and miscellaneous	20.3	19.6
total: non-food	42.2	40.9
total: all items	100.0	100.0

note: figures may not add to totals due to rounding.

preliminary and confidential

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**A PRELIMINARY CONFERENCE ON RESEARCH IN NATIONAL INCOME**  
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**CENTRAL STATISTICAL ORGANISATION**

Estimates of Gross Value of Output of Agriculture  
For Undivided India  
(1900-01 to 1942-43)

S. Sivasubramonian.

1. This note presents the results of an attempt to estimate the gross value of output of agriculture during the period 1900-01 to 1942-43 for undivided India excluding Burma. This is part of a study undertaken by the author regarding the estimation of National Income of India for the period 1900-50. A set of preliminary estimates have been prepared in order to provide an idea as to the dimensional orders involved in the estimation. An attempt at a rough estimate of the contribution of any sector to national income is bound to throw up complex problems and difficulties involved in the process. The estimates given in this note are therefore to be considered as tentative and illustrative.

2. Estimating the value of agricultural output requires statistics of acreage, outturn and prices of all the crops grown. The statistical information on agriculture in India is contained in the 'Agricultural Statistics of India - Vol. I for British India and Vol. II for Indian States, the provincial season and crop reports and the 'Estimates of Area and Yield of principal crops in India'. The Season and Crop Reports are issued by the provincial governments while the other two were issued until very recently by the Department of Commercial Intelligence and Statistics, Government of India. These provide details about land utilisation, area under crops, normal yield, estimated total yield in the case of principal crops, etc. The value of crops is not given but harvest prices for the different provinces of British India are available in the issues of

Gross Value of Output of Agriculture for undivided

India (1900-01 to 1942-43)

(Crores Rs.)			
Year	Value at current prices	Value at 1924-29 prices	Index (1924-29 = 100)
(1)	(2)	(3)	(4)
1900-01	681.7	1334.6	91.4
1901-02	642.5	1260.3	86.3
1902-03	669.4	1417.0	97.0
1903-04	693.3	1420.7	97.3
1904-05	782.0	1391.9	95.3
1905-06	839.9	1333.6	91.3
1906-07	983.6	1415.5	96.9
1907-08	957.3	1252.6	85.8
1908-09	851.6	1309.2	89.7
1909-10	946.4	1580.8	108.3
1910-11	963.0	1581.3	108.3
1911-12	1015.8	1498.6	102.6
1912-13	1100.9	1492.6	102.2
1913-14	1067.0	1383.7	91.8
1914-15	1140.9	1537.8	105.3
1915-16	1144.3	1524.7	104.4
1916-17	1174.0	1616.9	110.7
1917-18	1242.1	1608.6	110.2
1918-19	1351.5	1122.9	76.9
1919-20	1850.7	1595.5	109.3
1920-21	1330.9	1247.3	85.4
1921-22	1622.7	1511.2	103.5
1922-23	1404.9	1569.6	107.5
1923-24	1271.4	1450.4	99.3
1924-25	1535.4	1496.6	102.5
1925-26	1584.0	1472.9	100.9
1926-27	1479.1	1476.8	101.1
1927-28	1415.5	1440.3	98.6
1928-29	1457.3	1413.7	96.8
1929-30	1343.5	1525.5	104.5
1930-31	886.8	1528.8	104.7
1931-32	783.5	1551.3	106.2
1932-33	751.3	1568.6	107.4
1933-34	702.6	1564.2	107.1
1934-35	782.1	1554.5	106.5
1935-36	820.1	1566.4	107.3
1936-37	911.9	1666.8	114.2
1937-38	843.6	1658.3	113.6
1938-39	844.0	1488.6	102.0
1939-40	1087.6	1576.8	108.0
1940-41	1003.8	1580.1	108.2
1941-42	1247.5	1563.8	107.1
1942-43	2278.7	1592.0	109.0

Note: For valuing the output at 1924-29 prices, the weighted average prices given in 'Indian Agricultural Statistics' by Thomas and Shastri have been used.

Agricultural Statistics of India Vol.I since 1916-17. They also contain other allied information relating to agriculture, viz., rainfall, livestock, ploughs, carts, incidence of land revenue, etc. But as pointed out by the Indian Economic Enquiry Committee 'in spite of their bulk, the agricultural statistics published at present do not provide material for deducing either the quantity or value of the total agricultural production' (1), though Prof. Findlay Shirras in his 'Science of Public Finance' (2) strikes a note of optimism regarding the available agricultural statistics of India when he estimates the agricultural income of the country. Prof. A.L.Bowley and D.H.Robertson in their report on 'A scheme for an Economic Census of India' cautioned the user of agricultural statistics saying that 'the figures at present are quite insufficient to determine whether or not food is increasing in proportion to population'. (3) There is no denying therefore that from several points of view agricultural statistics are defective in many ways. Some of these, shortcomings relevant to the study undertaken in this note are examined here.

3. The basic statistics regarding area are contained in the 'Agricultural Statistics'. The annual figures given in this publication are not comparable because of the changing geographical coverage as years progressed. The earlier volumes of 'Agricultural Statistics' covered practically the whole of British India but only very few Indian States. As years passed by more states were included. Some important States like Baroda and Hyderabad were included only from 1918-19 and 19-20 onwards. Statistics from the native states are not considered as reliable as those of

(1) Report of the Indian Economic Enquiry Committee 1925, Vol. I, P.17.

(2) 'The Science of Public Finance' Prof. Findlay Shirras Page 188.

(3) A.L.Bowley and D.H.Robertson, A scheme for an Economic Census of India : P.35.

British India as the areas within the reporting states from which no returns were received formed quite a significant portion. Thus one of the ticklish problems faced by one using the available acreage statistics is the changing geographical coverage. Adjustments are necessary to make them as comparable as possible by allowing for areas not reported in the earlier volumes.

4. The 'Estimates of Area and Yield of Principal crops in India' gives the estimated acreage and outturn figures for various crops in British India and some states. This forms the primary source of outturn statistics. The outturn figures given here refer to forecast yields and not to actual yields. Hence the acreage figures contained in these issues refer only to those tracts for which forecast yields are available. The 'Estimates' do not relate to all the producing areas but only to those tracts where the respective crops were grown on an extensive and commercial scale. Tracts of minor importance have been added gradually. Owing to this development the estimates for later years are not strictly comparable with those for earlier years. It is important to note in this connection that the acreage figures in these two publications differ considerably. The reasons for this are : (1) Since the Agricultural Statistics is compiled only for those areas for which complete land utilisation statistics are available, and since additional area estimates are frequently available for the major products grown outside that area the coverage of forecasts included in 'Estimates' extends beyond the area covered by 'Agricultural Statistics'. (2) Certain tracts for which forecasts are not published are excluded in the 'Estimates'. Figures for these tracts, are however included in 'Agricultural Statistics'. The matter is also complicated further because the two sets of estimates are not strictly comparable in the sense that the extent of their coverage

is not precisely known.(4) So adjustments are required for such of those tracts which appear to be omitted in one source but included in the other.

5. The number of crops covered in the earlier issues of the Estimates upto 1912-13 are only eight but more crops were added gradually. But the 'Agricultural Statistics' contained acreage figures for more crops. This leads to another difficulty that for some crops like jowar, bajra, barley, maize, gram, etc., outturn figures are not available as they are not included in the earlier issues of the 'Estimates' but acreage figures for the same are available from 'Agricultural Statistics'. So the outturn of these crops has to be estimated on the basis of available data for later years.

6. The method of presentation has also undergone considerable change both in the 'Estimates' and 'Agricultural Statistics'. In the earlier volumes of the Estimates, the figures for most of the Indian states were given along with the corresponding British provinces, like Punjab including Indian states, United Provinces including states, Bombay including Indian states, etc. It is only since 1925-26 that figures are separately available for Indian states or groups of states. This leads to the difficulty of estimating exactly the outturn of different provinces separately. There have also been changes as far as provinces are concerned in that in the earlier issues Eastern Bengal and Bengal used to be given separately, Bihar and Orissa were given together, Agra and Oudh separately but were later on combined into one Province and given as United Provinces. Though the latter would not create much difficulty from the point of view of estimation, the former will involve difficulties regarding estimation of the shares of different native states included as

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(4) Final Report of the National Income Committee P.26.

part of the provinces. The introductory note in the beginning of each issue of the Estimates was found very useful as it contained estimates of acreage and yield of tracts for which forecast figures are not available. This covered Jammu and Kashmir and certain other states which were not covered upto very recently. In addition to this, it is to be mentioned that the grouping of crops have also undergone some changes and revisions. Apart from this it should also be borne in mind that the years for the various reporting provinces are not uniform.

7. It is also well known that the reliability of agricultural statistics is very closely related to the method of assessing the land revenue in the provinces on the basis of which a distinction is made between what are called temporarily settled areas and permanently settled areas. In the former there existed an elaborate machinery for the assessment while there was none in the latter. Thus the estimate for the earlier years specially 'are necessarily in the most favourable circumstances, only approximations to the truth, -----often imperfect and they have generally been too low'.<sup>(5)</sup> This defectiveness is reported to have improved since 1912-13. The estimates are primarily based on the reports of the village accountant, the defects of which have already been emphasised a great deal by many workers on the subject. The highly subjective nature of two out of the three factors viz., normal yield and condition factor, in the estimation of yield is quite well known. It is only recently, after a series of experiments by the I.C.A.R. and I.S.I. that the old subjective method of estimation of crop yields has been replaced by the objective crop-cutting experiments. In estimating the output of crops, direct estimates of outturn as available in the 'Estimates' have been used and hence the reliability of the outturn figures given in this note is very much

<sup>(5)</sup> Estimates 1912-13, P. 1.



subject to the reliability of the figures in the 'Estimates'.

8. The physical outturn of crops is thus estimated on the basis of acreage and outturn statistics available after making the necessary adjustments. For those states not included in the earlier issues of the 'Estimates' and 'Agricultural Statistics', rough estimates are prepared on the basis of the figures for the first five reporting years. For those crops which are included in the later issues of the Estimates, but whose acreage figures are available for the earlier years from the returns of Agricultural Statistics, estimates of physical outturn are prepared on the basis of the average yield per acre calculated from the figures of acreage and yield for the first ten reporting years. In addition to this, the estimates for non-reporting areas given in the introductory notes of the Estimates and 'Agricultural Statistics' have been used. The yield of rice was estimated by using the available statistics with the necessary adjustments for areas not reported in the earlier years. As regards wheat, the second important crop, it will be seen that the acreage under the crop accounted in the 'Estimate' is more than the acreage given in the 'Agricultural Statistics'. This indicates that coverage is greater in the Estimates'. Careful study of the acreage under wheat in each province and each state reveals that :- (a) 'Agricultural Statistics' contains area under wheat for Provinces like Madras and Ajmer Merwara and States like Kashmir which are not included in the 'Estimate' for some of the earlier years. (b) Hyderabad state which is not included in 'Agricultural Statistics of India' upto 1919-20 is covered in the 'Estimates' from the beginning of the period. (c) For some provinces like U.P., Bengal and Bihar and Orissa, the area given in 'Agricultural Statistics' is slightly more than in the 'Estimates' while in the case of Punjab and NWFP the area in 'Agricultural Statistics' is lower. In the case of Central Provinces and Berar, the area in

from both sources are more or less the same. Therefore, after careful study of the province-wise figures available in the two publications, the necessary adjustments were made. As regards other crops like jowar, bajra, barley, maize and gram the 'Estimates' do not give figures for the year prior to 1911-12. But area figures for the same are available in the 'Agricultural Statistics of India'. The outturn for the earlier years is estimated based on the average yield per acre computed from the data available for the first ten reporting years. Ragi has been included in the 'Estimates' only very recently - (1936-37). It is therefore difficult to estimate outturn figures for the this for the earlier years correctly. Therefore, upto 1931-32, ragi should be taken as included among 'other food grains and pulses'. The figures of production of raw sugar (gur) contained in the 'Estimates' are used for finding out the total outturn of raw sugar corresponding to the acreage under crop adjusted for coverage using the data available in the 'Agricultural Statistics'. The yield of linseed, sesamum and rape and mustard are estimated in a similar manner. Acreage and production figures for groundnut are available in the Estimates from 1898-99 onwards but they are reported to be not very reliable. They do not include the area under cultivation of groundnut in native states. This crop is treated as a separate category in 'Agricultural Statistics' from 1912-13 onwards. Before 1912-13 it is included among other oilseeds. There is also difficulty in securing harvest price or wholesale price quotations for groundnut in the earlier years. However, from 1916-17 onwards harvest prices are available from the 'Agricultural Statistics' Vol.I. For the purpose of the estimates given in this note groundnut is, therefore, treated as a separate crop from 1916-17 onwards, before which it is included in other oilseeds. For similar reasons, castor seeds is treated as a separate category from 1919-20 and is combined with other oilseeds for the period 1900-01 to 1913-14. As regards cotton and date the area and

outturn statistics are found to cover practically the whole area under the crop. Comparing these figures with those relating to net exports and home consumption of cotton also available in the Estimates, it is seen that the latter exceed the former on the average by about 11 to 12 per cent.<sup>(6)</sup> Therefore, the output of cotton has been marked up by 11 per cent. There exists a similar disparity of about 14 per cent between the production figures and trade estimates of jute but the trade figures relate to exports and not 'net exports. As such the estimates are not considered as reliable as those for raw cotton and so no adjustment has been made for jute. The estimates of production of tea are obtained from the issues of the 'Report on the production of Tea in India' and 'Estimates'. The 'Estimates' do not give the yield figures for coffee before 1919-20. But some figures for coffee production are available in the Statistical Abstract for the period upto 1909-10. For the middle years, therefore, there is a gap. Even the figures contained in the Estimates since 1919-20 are not considered complete as they exclude upto 1931-32 statistics for small estates having less than ten acres under coffee. From 1931-32, however, statistics of plantations having an area between five and ten acres have been included. The acreage figures contained in the Agricultural Statistics Vols. I and II are found to be greater than those given in the Estimates and so the former have been used for purpose of estimating the total outturn. The gap of the intervening years 1909-10 to 1919-20 is filled by calculating the yield from the acreage figures at the yield rate of 180 lbs per acre, estimates from the available figures of area and yield. Outturn figures are available for tobacco from 1919-20 only. For the earlier years, average yield per acre, as mentioned earlier, is used. Opium is not included in the Estimates and as such outturn figures are not available at all from this source. But, statistics of acreage under cultivation of opium

(6) Dr. V.K.R.V. Rao in his 'A Survey of India's Economy'

in Benares and Patna and the quantity of 'Bengal' opium produced annually are available in the 'Statistics of British India' Vol. I, (Financial) for the period upto 1919-20 and for the later years upto 1937-38 in the issues of the Statistical Abstract of British India (Combined). For the period 1939-40 to 1942-43 similar figures are collected from the Statistical Abstract of India, 1949 (New series). Only for the year 1938-39, no information could be collected as this table was discontinued in the old series of the 'Statistical Abstract' from that year. The figures of area under cultivation of opium is obtained, as in the case of other crops, from Agricultural Statistics, and the yield is estimated on the basis of available acreage and yield statistics for Benares and Patna. The estimation of the yield of indigo did not present any difficulty. This covers all crops for which figures of area and yield are available from one source or other and for which estimates of output could be prepared.

9. Having estimated the annual output of the different crops for the period, the next problem is to secure relevant prices for purposes of valuation. The main difficulty with regard to the prices is the absence of one single source from which prices could be used. Price statistics are available in K.L.Dutta's 'An enquiry into the rise in prices' for the period 1900 to 1912, in the issues of 'Prices and Wages in India' for the period upto 1922, and in the 'Agricultural Statistics of India' Vol.I, for the period beginning from 1916-17. The prices in the first two sources are wholesale prices and those in the third, harvest prices. These sources do not cover all commodities for which output has been estimated for which prices available from other sources are used.

10. The evaluation of outturns has been made as far as possible using harvest prices. Harvest prices are available

in Agricultural Statistics of India from 1916-17 for the crops rice, wheat, jowar, bajra, maize, ragi, barley, gram, linseed, sesamum, rape and mustard, groundnut, sugarcane, cotton, jute and tobacco. The harvest prices used are the annual average (median) prices for British India. In cases where the number of quotations are few, simple average of prices is used. Where harvest prices are not available, wholesale prices have been used. This mainly related to the period prior to 1916-17. The wholesale prices for this period are collected from the 'Prices and Wages'. The annual average median harvest prices available in the Agricultural Statistics of India Vol.I, covered Burma. As this study excludes Burma, annual average prices are calculated omitting Burma prices, for the period beginning from 1916-17. Average wholesale prices are not readily available for the period prior to 1916-17, and hence median averages are computed from the wholesale price quotations (excluding Burma) given in the 'Prices and Wages'. The median average prices so compiled from these two sources are used for valuation. Another possible source is the supplement to the Gazette of India and provincial gazettes. The returns in the former begin only from 1926 onwards while all provincial gazettes were not accessible readily here and so they are not consulted.

11. Harvest prices are not available for tea, coffee, castor, indigo and opium. Other sources are used for these crops. The average declared value per unit on export as given in the issues of the Review of the Trade of India are used to evaluate the output of coffee and castor. The average wholesale price of 'tea' as available in the issues of the 'Prices and Wages' (Table 7) and the 'Review of the Trade of India' are used for purposes of evaluation. The annual average wholesale prices available in the 'Statistical Abstract of British India' are used for estimating the value of indigo.

As regards opium, the average annual prices, as determined by the quantity and value of Bengal opium sold, available in the Statistics of British India, Vol.I, (Financial) are used. This covers upto 1920 only; so for the later years the prices available in the Review of the Trade of India are used. Thus wholesale and harvest prices available from various sources are utilised to value the output. This is bound to affect considerably the uniformity of valuation.

12. There are a number of other crops for which neither statistics of yield nor of price are available. Even detailed area figures are not available for many of them and are given as 'other food grains and pulses', 'other food crops' including 'condiments and spices', 'fruits and vegetables', 'other sugars' and miscellaneous food crops and other non-food crops covering 'other fibres', 'other drugs and narcotics', 'other dyes' and miscellaneous non-food crops. Only very indirect and crude methods could be adopted for valuing the output in these cases. The value of other food grains and pulses is estimated using the average value per acre of all food grains except rice, wheat and gram, and 'other oilseeds' are valued using the value per acre of castor seed.<sup>(7)</sup> The remaining categories of 'others', containing 'condiments and spices', 'fruits and vegetables', 'other fibres', other drugs and narcotics', 'other dyes', miscellaneous food and non-food crops are lumped together as one group of 'other crops' and is valued using the mean value per acre of all other crops hitherto considered. This category of 'other crops' include some very costly items of condiments and spices and fruits and vegetables. The output of the area under fodder crops have not been valued, for want of a method appropriate to this category for the entire period.

13. The estimates of gross value of output of agriculture excluding fodder crops for the period 1900-01 to 1942-43 at prevalent prices are given below:-

Estimates of gross value of output of Agriculture

<u>Year</u>	<u>Value (million Rs.)</u>	<u>Year</u>	<u>Value (million Rs.)</u>
1900-01	6817	1922-23	14048
1901-02	6425	1923-24	12714
1902-03	6694	1924-25	15354
1903-04	6933	1925-26	15810
1904-05	7820	1926-27	14791
1905-06	8999	1927-28	14155
1906-07	9836	1928-29	14573
1907-08	9573	1929-30	13405
1908-09	8516	1930-31	8860
1909-10	9464		
1910-11	9630	1931-32	7835
1911-12	10158	1932-33	7513
1912-13	11009	1933-34	7026
1913-14	10670	1934-35	7221
1914-15	11409	1935-36	8201
1915-16	11443	1936-37	9119
1916-17	11740	1937-38	8433
1917-18	12421	1938-39	8440
1918-19	13515	1939-40	10873
1919-20	16507	1940-41	10033
1920-21	13309	1941-42	12473
1921-22	16227	1942-43	22737

14. It is interesting to compare the estimates with other available estimates. But the earlier estimates by Shani Khambata for 1900-01 to 1921-22, by Findlay Shirras for 1920-21 and 1921-22 and by Dr. V.K.R.V.Rao for 1925-29 and 1931-37 differ from the estimates given in the note in geographical coverage. Hence a comparison of these estimates, is not justified. Yet the different estimates relating to same period are given below just to indicate the dimensional magnitudes of

Gross value of output of agriculture

(Figures in crores of Rs.)

Year	Estimates by author for In-divided India*	Other available estimates		
		Source and Author	Coverage	Value
1900-23 (Average)	1053.8	Shah and Khambhat. 'Wealth and Taxable Capacity of India'	India including Burma and Native states	1357.1
1921-22	1622.7	Do Findlay Shirras 'Science of Public Finance'	Do Br. India including Burma	2153.8 1659.0
1924-26	1584.0	Dr. V.K.R.V.Rao 'An essay on India's National Income'	Br. India including Burma	1341.5
1926-27	1479.1			1311.1
1927-28	1415.5			1264.8
1928-29	1457.3			1329.6
1929-30	1343.5			1207.3
1931-32	783.5	Dr. V.K.R.V.Rao 'National Income of British India' 1931-32	Br. India including Burma	783.6

\* excludes Burma.

15. The estimates of gross value of output of agriculture given in this note are, as mentioned earlier, only tentative. All the possible refinements have not been incorporated in these estimates which limit their significance. The methods adopted for adjusting acreage for areas not reported and areas not included in the statistics of crop production of the earlier years, for estimating outputs, and for evaluation are open to many objections and improvements.

16. Necessary adjustments in acreage figures for each crop are brought about by using available statistics. It is to



be noted that the adjustments have been carried out at an aggregate level. The output corresponding to the adjusted area is estimated by increasing proportionally the yield figures available in 'Estimates'. Such an adjustment, without taking into account, the regional variations in yield rates is bound to be defective. It is possible to obtain more reliable estimates of area and yield under each crop by estimating for each province and state separately. This means that while estimating yield for the area not included in the 'Estimates' but included in 'Agricultural Statistics' or vice versa or otherwise accounted for as omissions in both due weight will be given to yield rates of individual provinces and States.

17. Another limitation of the estimates is regarding the use of a constant average yield per acre for crops like jowar, baara, barley, maize, gram etc., for the earlier years, when direct output estimates are not available. This is likely to introduce an element of error in the estimates.

18. The price statistics used for valuation are far from satisfactory. Annual all India average prices have been used for valuing the output. It is quite hazardous to use such all India average prices for valuing agricultural crops in view of the fact that prices are subject to wide variation from region to region. This limitation can be overcome by estimating on the basis of administrative subdivisions (i.e. provinces and states). Another limitation with regard to the price data is that prices from some sources could not be used for all crops due to inadequate data. Wholesale prices, harvest prices or average declared value per unit, have been used for different commodities and are drawn from various sources. It may be difficult to evolve a satisfactory solution for this problem. It may be possible to bring about some adjustment for the differences that are likely to arise due to

wholesale and harvest prices, and wholesale prices and average declared value per unit. The method of estimation adopted for 'other crops' which includes a number of categories like condiments and spices, fruits and vegetables, other fibres, other dyes etc., needs improvement. By a more detailed analysis of the data, it may be possible to do the valuation for crops in different groups separately. The main difficulty with respect to this group is that neither yield nor price statistics are available. It may be possible to arrive at more reliable estimates of value per acre for each group by using information contained in marketing reports and other similar studies. It is proposed to carry out such improvements in the estimates before they are finalised.

'AHUJA'

**A PRELIMINARY CONFERENCE ON RESEARCH IN NATIONAL INCOME**  
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LONG TERM GROWTH OF NATIONAL INCOME IN INDIA 1900-1955

H.C.Arora and K.R.R.Iyengar

1. Introduction

1.1 We have attempted in this paper to give quinquennial averages of national income over the first half of the twentieth century.

1.2 In arriving at the national income estimates use has been made, apart from other data, of indices of business activity and wholesale prices. These series also constructed by us, have been presented in the appendix.

1.3 It must be clearly understood that no claim can be made of the exactness of any particular figure given here. The methods used are admittedly very rough and the aim is only to arrive at some broad conclusions regarding the trend in the per capita income.

2. Main results

2.1 The estimates of national income at 1948-49 prices arrived at by us by two methods are presented in Table 1 as quinquennial averages along with the estimated populations at the centres of the quinquennia and the derived figures of per capita income.

3. Methods of calculation

3.1 The starting point for our series, constructed at 1948-49 prices, is Dr. Rao's\* estimate for 1931-32 which we have accepted. Dr. Rao's figure for 1931-32 for British India has been re-evaluated at 1948-49 prices using the wholesale price indices (vide appendix) prepared by us. On the

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\*The National Income of British India, 1931-32.

Table 1 : Quinquennial averages of national income estimates at 1948-49 prices. (1901-1955)

Year	population (lakhs)	first method		second method	
		national income (Rs. crores)	per capita (Rs)	national income (Rs. crores)	per capita (Rs)
1901-02 - 1905-06	2417	4384	181	3978	165
1906-07 - 1910-11	2488	4965	200	4668	188
1911-12 - 1915-16	2518	5870	233	5567	221
1916-17 - 1920-21	2514	6246	248	6141	244
1921-22 - 1925-26	2579	(6966)	(270)	(3955)	(270)
1926-27 - 1930-31	2718	(7378)	(271)	(7484)	(275)
1931-32 - 1935-36	2884	7546	262	7541	261
1936-37 - 1940-41	3083	(8900)	(289)	(8805)	(286)
1941-42 - 1945-46	3288	(9299)	(283)	(9131)	(278)
1946-47 - 1950-51	3504	8847	252	8771	250
1951-52 - 1954-55	3710	9692	261	9692	261

Note:- For implications of the figures within brackets, vide para 5.

basis of certain studies made in respect of the year 1948-49, the per capita income for the Indian Union has been found to be the same as that for British India. We have used this result to estimate the national income of Indian Union for 1931-32 using the population figures.

3.2 Starting from this figure, we have used two methods to arrive at our alternative estimates. In each method, the calculation has been made in two parts. The first part relates to the period 1931-32 to 1947-48, after which we accept the official estimates. The second part relates to the period from 1931-32 back to 1901-02.

3.3 First Method: In this method, we have used the average of the indices of agricultural production and business activity as our indicator. Indices of agricultural production have been taken from "The Agricultural Crops of India, 1893-1946 : A statistical study of output and trends" by George Blyn. After 1946, the "Eastern Economist" indices have been used.

Indices of business activity are from the appendix to this paper. Using this indicator and starting from 1931-32, it was found that the figure for 1948-49 was 5.7% lower than our official estimate. This difference was distributed over the period in proportion to the annual changes in the indicator, so as to match the figure for 1948-49 with the official estimate. For the period 1931-32 back to 1901-02 we have just used the averages of the two series of agricultural production and business activity indices.

3.4 Second Method : This method is a little more rough than the first. By comparison of the indices of business activity and the figures of national income for the period 1948-49 to 1954-55 we find that the increase shown by national income is 0.56 times the increase in business activity. This is a very short period and the relationship may not be very correct but we have ventured to use the annual changes arrived at by this method to calculate our second series. This way we arrived at a figure for 1948-49 which was 4.0% lower than the official estimate. Again distributing this difference proportionately as before, we arrived at our estimates. For the period prior to 1931-32 also, we used the same indicator to get our figures.

4. On comparison of the two sets, we find that the figures are almost identical in the period after 1931-32. Prior to 1931-32, the amplitudes in the figures obtained by the first method are smaller than those in the second set of figures but the trend shown by the two methods are clearly identical. To this extent we feel that the trends as shown by our series may not be far from truth.

5. We consider it necessary to draw attention to one particular shortcoming of our method of estimation. In periods of expansion, the rise in the business activity index is so large that inspite of our adjustments, its use may lead to a considerable overestimation of national income. We therefore feel that our figures for the quinquennia 1921-26, 1926-31, 1936-41 and 1941-46 are much less reliable than the

APPENDIX

Index of Business Activity in India, 1900-50

Table A.1 gives the various series of business activity indices available for different periods between 1900 and 1950. We have prepared a single series for 1900 to 1950 based on some of the above data and this is presented in column 6 of the table.

2. The sources of the data presented in the table are listed below:-

2.1 K.L.Datta in his "Enquiry into the rise of prices in India", Vol. I, gives a series of 'general index number of growth of business' for 1890 to 1911 with 1890-94 as base. This we have presented in column (2).

2.2 G. Findlay Shirras in his book "Indian Finance & Banking" gives a series of 'index number of growth of business' for the period 1890-1918 (base 1890-94). This is given in column (3). Another series with base 1921-22 given for the period 1921-22 to 1932-33 in his book "Poverty and kindred economic problems in India" is also given in the same column.

2.3 The "Capital" has been publishing figures of 'index of Indian industrial activity' since 1932-33 (base 1935 = 100). Column (4) contains this.

2.4 The "Eastern Economist" publishes figures of 'index of Indian business activity' (with the year ending August 1939 as base) from 1938-39 onwards. This has been given in column (5).

3. The method adopted to construct the final series for 1900 to 1950 with base 1900 = 100 given in column (6)

is described below :

3.1 For the period 1900-1911 we have used the averages of the annual percentage changes as shown by K.L.Datta and G.F.Shirras (in columns 2 & 3) to construct our series, starting from 100 for the year 1900. From 1912 to 1918 we have used the percentage increases as indicated by G.F.Shirras (in column 3) to calculate our indices.

3.2 In the absence of any figures being available for the years 1919, 1920 and 1921, we have used the average annual rate of increase as shown by the series under construction between 1900 and 1918 which when applied to the figure for 1918 successively gives us the figures for the next three years.

3.3 From 1922 to 1932, we have again used the annual changes as shown by Shirras's second series for 1921 to 1932.

3.4 From 1933 to 1950 we have extended our series by using the annual changes as shown by Capital's indices (column 4).

Table A.1. Trend of Indian business activity  
1900-1950  
(1900 = 100)

Year	I.L.Datta (1890-94 = 100)	G.F.Shirras (1890-94 = 100)	"Capital" (1935 = 100)	"Eastern Economist" (Aug, 1939 = 100)	Index adopted.
1	2	3	4	5	6
1900	128	146			100
1901	136	155			106
1902	140	169			112
1903	148	184			120
1904	150	198			129
1905	163	217			136
1906	179	230			147
1907	188	237			153
1908	185	246			157
1909	193	278			171
1910	202	278			175
1911	222	316			196
1912		339			229
1913		362			225
1914		360			224
1915		376			234
1916		397			247
1917		403			251
1918		417			260
1919					274
1920					289
1921		*@			305
1922		100			323
1923		106			326
1924		107			354
1925		116			351
1926		115			330
1927		118			372
1928		122			375
1929		123			393
1930		129			392
1931		117			
1931		103			345
1932		102	81.4		342
1933			87.7		338
1934			97.3		408
1935			100.7		423
1936			105.0		441
1937			111.5		468
1938			111.1		466
1939			114.0	105.2	479
1940			117.3	105.7	492
1941			122.7	113.5	515
1942			108.8	108.0	457
1943			103.2	111.5	459
1944			120.7	117.0	507
1945			127.5	119.7	535
1946			115.0	111.9	483
1947			107.0	104.0	449
1948			107.6	107.3	452
1949			109.4	106.3	459
1950			110.8	104.9	465

@Figures against 1920 is for 1920-21 and so on  
the base is 1921-22 = 100.

Movement of Prices in India, 1900-1950

Table A.2 gives the important long series of index numbers of prices available for India. We have not given here some other series which are also available, as they are mostly short ones and are not useful for our purposes. We have also given a series covering the entire period 1900-1950.

2. The sources of data presented in the tables are given below:

2.1 The index numbers of wholesale prices at Calcutta given in column (2) were obtained from the old issues of the "Statistical Abstract". The base is 1914 = 100.

2.2 The series given in column (3) is for India and was obtained from "Index Number of Indian Prices - 1861-1931" and some issues of the "Statistical Abstract". Here the series available is with 1875 = 100 and the index numbers are for wholesale prices except in the case of foodgrains - jowar, bajra, barley, ragi and gram; wholesale prices of these articles not being available before 1927. In the series given in our table, we have changed the base to 1914 = 100 for the sake of comparability.

2.3 Atkinson gives a series of weighted index numbers from 1881-1908 (quoted in "Index numbers of Indian Prices, 1861-1931") with 1875=100. The latter publication gives Atkinson's series upto 1908 together with its own from 1909 to 1931 with base shifted to 1875=100. We have given this series with the base shifted for our purposes to 1914=100 in column (4).

2.4 K.T.Shah in his "Consequences of Post War Price Changes" has given a series of wholesale price indices for Calcutta for the period 1913-14 to 1929-30 with base 1913-14 = 100 and for 1929-34 with base 1939 = 100. We have corrected the former to get the figures for calendar years and spliced it with the latter to get series for 1914 - 34 with base 1914=100. These are given in column (5)

2.5 Column (6) gives, from 1939 onwards, the latest series of the Government of India with base August 1939 = 100, obtainable from the "Statistical Abstract".

3. The method adopted for construction of our series (column 7 of the table) is as follows:

3.1 The series of index numbers we have adopted is given in column (7). After careful consideration of all the series presented in the table, we decided to accept the Government of India series from 1900 - 1914 as given in column (3) and for the period 1914 - 1940 we have taken the Calcutta series as given in column (2). We thought it better not to use the series in column (3) for the latter period since it does not cover some items under cereals. From 1940 onwards, the annual percentage change is taken from the latest Government of India series.



Table A.2. Movement of prices in India, 1900-1960  
(Base 1914)\*

Year	Calcutta wholesale price index	Index no. of Indian prices	Atkinson's index no.	K.T.Shah's index no.	Index no. of wholesale prices (current series)	Index adopted
	2	3	4	5	6	7
1900		79	77			79
1901		75	75			75
1902		72	69			72
1903		67	66			67
1904		69	65			69
1905		75	72			75
1906		88	85			88
1907		93	90			93
1908		94	96			94
1909		84	86			84
1910		83	81			83
1911		88	83			88
1912		93	93			93
1913		97	97			97
1914	100	100	100	100		100
1915	112	103	98	113		112
1916	128	125	99	116		128
1917	145	133	100	132		145
1918	176	153	115	153		176
1919	196	188	161	183		196
1920	202	191	162	197		202
1921	179	161	146	195		179
1922	176	158	143	178		176
1923	172	146	139	175		172
1924	173	150	138	172		173
1925	159	154	142	170		159
1926	148	147	139	156		148
1927	148	137	138	148		148
1928	145	137	140	147		145
1929	141	138	136	144		141
1930	116	116	114	126		116
1931	96	86	84	101		96
1932	91	86		95		91
1933	87	82		83		87
1934	89	81		89		89
1935	91	86				91
1936	91	85				91
1937	102	93				102
1938	95	90				95
1939	108	91			119@	108
1940	120	114			118	120
1941	139				130	139
1942	185				159	185
1943	307				218	307
1944	298				241	298
1945	289				244	289
1946	324				267	324
1947	382				297	382
1948	408				367	408
1949	438				381	438
1950	511				401	511

\*except in column (6) where the base is 19th Aug. 1959.

@average for five months ending December.