



**STATEMENT ON THE FLOOD SITUATION AND THE
FLOOD CONTROL PROGRAMME LAID ON THE
TABLE OF THE LOK SABHA BY SHRI
GULZARILAL NANDA, MINISTER
OF PLANNING AND
IRRIGATION AND POWER ON
THE 27th JULY, 1956**

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MINISTRY OF IRRIGATION & POWER**



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PART I
REVIEW OF THE FLOOD CONTROL PROGRAMME
AND THE FLOOD SITUATION IN INDIA

1 INTRODUCTORY

In September, 1954, a broad programme of flood protection works was drawn up. This was divided into three phases: Immediate, Short-term and Long term. The work to be done in these phases was described as under:

“Immediate—The first phase will extend over a period of two years. This period will be devoted to intensive investigation and collection of data. Comprehensive plans will also be drawn up and designs and estimates prepared for short-term measures of flood protection. Some measures such as revetments, construction of spurs and even embankments may be adopted immediately at selected sites.

Short-term—During the second phase, which may be taken to start with the second year and extend to the 6th or the 7th year, flood control measures such as embankments and channel improvements will be undertaken. This type of protection will be applicable to a major portion of the areas now subject to floods.

Long term—The third phase will relate to selecting long term measures such as the construction of storage reservoirs on tributaries of certain rivers and additional embankments wherever necessary. This may take 3 to 5 years.”

The immediate phase is drawing to a close. It is, therefore, appropriate to take stock of the progress so far achieved in the matter of surveys and investigations and execution of emergent works as we embark on the short-term phase, which practically covers the period of the Second Five Year Plan.

2 PROGRESS SO FAR ACHIEVED

(A) Progress on Surveys and Investigations

(a) Central Agencies

(1) *Survey of India*—The emphasis in the immediate phase of the flood control programme was on surveys and investigations because the lack of essential technical data was a serious bottleneck in the preparation of sound schemes for flood control.

An extensive programme of surveys by the Survey of India was accordingly undertaken. Details of the programme and the progress achieved in the different States and river basins in respect of aerial photography, semi controlled photomosaics and secondary and tertiary field levelling are indicated in Appendix I. It will be seen that, during the last two years, out of a total programmed area of 43,410 sq miles for 2" aerial photography, an area of 43,040 sq miles was surveyed by the Survey of India. Similarly, the progress achieved on photomosaics was 34,426 sq miles out of a programmed area of 50,000 sq miles. The whole of the work of secondary levelling programmed for 1954-55 and 1955-56 viz., 2,975 miles, was completed. Tertiary levelling was done in 16,128 sq miles against the target of 18,061 sq miles.

(1) *CW & PC*—To take up surveys and investigations on rivers in the States where adequate machinery for such work did not exist, the Central Water and Power Commission established field circles and conducted the necessary surveys.

Against a programme of longitudinal sections and cross sections of about 450 miles on the Brahmaputra and 1,719 miles on 41 of its tributaries for 1954-55 and 1955-56, the *CW & PC* completed 29 miles on the Brahmaputra and 2,027 miles on the tributaries up to the end of June, 1956. Progress along the Brahmaputra has been slow due to the very difficult terrain. In the case of the tributaries, however, the longitudinal and cross sections have exceeded the target figure. The slow progress on the Brahmaputra will not interfere with the immediate planning as enough work has been done on the tributaries from where the planning has to start. The programme of survey work on the Barak river has been completed.

In addition to the longitudinal and cross-sections, arrangements were made for the collection of hydrological data. In the Brahmaputra basin, the Central Water and Power Commission are conducting, on the main river gauge observations on 6 sites, discharge observations on 2 sites and silt observations on 1 site against the programme of 6 gauge sites, 3 discharge sites and 2 silt sites. Discharge and silt observations on the remaining sites will be started as soon as the launches, the procurement of which is being arranged through the TCM, have been received. In addition, the following gauge discharge and silt observation sites were set up on the tributaries of the Brahmaputra.

Description	Programme Progress	
Gauge & discharge observation sites	53	49
Silt observation sites	35	32

On the Central India and Deccan rivers, the Central Water & Power Commission have undertaken discharge observations at 6 sites (2 in Madhya Pradesh and 4 in Hyderabad), according to programme

In all, a programme of establishing about 200 gauge/discharge stations was drawn up for the several river systems in the country and this programme has been completely fulfilled in co-operation with the State Governments

The C W & P C have also completed preliminary investigations of the Kopilli and Nao Dihing Projects, and detailed investigations of the power aspect in respect of Kopilli Project are in hand. Similar investigations have also been taken up on two Schemes in Tripura, one on the Gumti river and the other on the Kohwai river

Collection of river and rainfall data in Bhutan—The programme for the installation of wireless stations, rain gauge, river gauge and silt discharge observation sites in Bhutan was framed for the pre-1955 and pre-1956 monsoon seasons and the work done so far *vis-a-vis* the programme is given below —

Programme and progress for pre 1955 monsoon season

S No	Description	Programme for pre-1955 monsoon season	Work done during pre-1955 monsoon season
1	Installation of Wireless Stations	6 Nos	6 Nos
2	Installation of River gauge stations	6 "	6 "
3	Installation of Rain gauge-stations	10 "	10 "

Programme and progress for pre 1956 monsoon season

S No	Description	Programme for pre-1956 monsoon season	Modified programme for pre-1956 monsoon season
1	Installation of Wireless Stations	2 Nos	2 Nos
2	Installation of River-gauge Stations	4 "	3 "
3	Installation of Rain gauge Stations	10 "	6 "
4	Installation of Silt Observation sites	7	

The parties are already in Bhutan to establish the stations indicated in the modified programme. So far information regarding the setting up of the wireless stations only has been received. The programme for pre-1956 monsoon season had to be curtailed.

on account of the difficulty experienced in finding technical personnel willing to work in Bhutan for the operation of the hydrological stations although very lucrative terms were offered to them

Model Experiments—In view of the technical complexities that cropped up in connection with the solution of flood control problems hydraulic experimentation was extensively employed. Models for detailed study were set up for Dibrugarh, Kosi, etc, on a scale far larger than those ever set up during the past several years

(11) *IMD*—Out of a total of 125 rain gauge stations to be established in the Himalayan catchment during 1955 to 1958, 59 rain gauges have so far been set up within Indian territory and in the bordering Himalayan countries of Nepal, Bhutan and Sikkim

(b) *State Governments*

In addition to the above-mentioned surveys and investigations undertaken by the Central Departments, considerable work has been undertaken by the State Governments in the matter of river surveys and investigations

The Assam Government has conducted double levelling in a length of 961 miles along the Brahmaputra and the Barak basin

Uttar Pradesh has completed 1 073 miles of spot-levelling 530 miles of single levelling and cross-sections have also been completed Investigations for locating detention reservoirs in the Rapti basin have also been taken up

In Bihar approximately 3 049 miles of double levelling and single levelling have been completed Storage reservoirs on the Bagmati, the Kamla and the Burhi Gandak are being investigated Survey work for a dam site on the Bagmati in Nepal has been completed.

In West Bengal about 123 miles of bank survey has been completed Investigations for the proposed barrage on the river Karala are in progress Investigations have also been taken up for long-term soil conservation measures The upper reaches of Lish the Gheesh, the Chel and the Ranjit have been surveyed. Detailed surveys on these rivers have been taken up

In Jammu and Kashmir, the first phase of the Kashmir valley flood protection scheme has been completed and investigations on the second phase of the scheme are in progress.

Investigations to open up drains to provide adequate drainage system are underway in the Punjab. Similarly, the area under *Choes* in Hoshiarpur District is receiving attention of the State authorities for the provision of specific protective and training works.

Survey for the proposed flood protection measures along the left bank of the Beas river in PEPSU have been completed as also for the diversion of the channel for the Patiala Nadi.

In Orissa investigations have been taken in hand on the Baitarni, Salandi and Brahmini rivers.

(B) Progress on works

(a) Progress

In regard to flood control works in the areas requiring immediate protection 333 schemes costing less than Rs 10 lakhs each, with a total estimated cost of Rs 4.60 crores have been so far approved for Central loan assistance, after they were sanctioned by the respective State Flood Control Boards. 69 major schemes, each costing more than Rs 10 lakhs and totalling Rs 32.22 crores, have been prepared by the States. Of these, 41 schemes costing Rs 14.44 crores have already been approved by the Centre for loan assistance, 1 during 1954-55, 36 during 1955-56 and 3 so far during 1956-57.

The expenditure incurred during 1954-55 amounted to Rs 2.42 crores and that during 1955-56 was of the order of Rs 8.40 crores. The above figures are indicative of the rising tempo of work. The progress of work against the targets laid down is given in Appendix II.

The emergent schemes which drew relatively more attention this year were the Shahdara marginal bund near Delhi; the Burhi Gandak embankments between Pusa and Angaraghat in North Bihar and the Dalaighai protection works in Orissa. Of these, the first is almost complete and the other two works are expected to be completed in all their essential features before the high floods of this season.

The dykes for the protection of Dibrugarh against inundation and the drainage system for the town have almost been completed.

No work has been left out which could have been executed by the various State Governments with the available resources in men, material and equipment supplemented by all possible assistance from the Central Government. The Central Government have spared no effort either in giving expert advice on technical questions or in placing funds at the disposal of the States. The Centre has sanctioned all the technically sound schemes submitted.

by the States. Moreover, the Centre has continuously helped the State Governments in the matter of works at all stages namely, investigations, design and sanction.

(b) Public Cooperation

In regard to the execution of emergent flood control works, public co-operation has been progressively on the increase. Such public participation on the Kosi Project has been a great success and has resulted not only in more economical but also in speedier execution. The experiment has also been tried with success on the construction of the Shahdara marginal bund and this method of actively associating the people of the affected areas with the execution of flood control works, will assume greater and greater significance in future.

(C) Organization

(a) Schemes sanctioned

Effective organizations have been set up both at the Centre and in the States to deal with the flood problem. In addition to the Central Flood Control Board, eleven States have formed State Flood Control Boards. There are ten Technical Advisory Committees and four River Commissions. The Central Flood Control Board has so far met five times, taken important decisions and approved of 41 schemes each estimated to cost Rs 10 lakhs and above aggregating to about 14.44 crores. The State Flood Control Boards also have sanctioned a number of schemes estimated to cost less than Rs 10 lakhs each. The River Commissions which have met from time to time have done valuable work especially in the settlement of issues affecting more than one State. The cooperation offered by the various Central Government Departments has been commendable.

(b) Exchange of experience

The experience of foreign countries in the matter of flood control has also been taken advantage of in the planning and execution of flood control schemes in India. In 1954, two senior Engineers of the Central Water and Power Commission were sent to China for a study of the flood problem there. Consultations were also held with British, Chinese and American experts from time to time. Exchange of ideas with other countries is a continuous process because there is no finality in the matter of knowledge and experience required for solving the flood problem. A team of young Indian engineers is proposed to be sent shortly to the United States to make a study of the various aspects of the flood control problem in that country.

Similarly, a proposal is also under the active consideration of Government to invite two American engineers for further consultations

The progress achieved so far would show that the tasks contemplated in the Immediate Phase of the programme have by and large been completed. Statewise information on the progress of surveys and investigations and works is given in Appendices I and II

3 FLOODS IN 1956

(a) *General description*

This year the floods have already affected parts of Assam, Bihar, Uttar Pradesh and Punjab. So far about 2500 sq miles have been affected and about 70 human lives reported lost. The damage caused in 1955 and 1956 is given in Appendices III and IV. The figures for 1956 pertain only to the first one or two months of the current season. A comparative study of the damage in 1954 and 1955 with that so far recorded this year, given in Appendix V, would reveal that the damage in 1956 has not been heavy. It may, however be pointed out that the flood season is still in the initial stage and extends upto the end of September.

Taking the country as a whole, the problem rivers have not yet exhibited the fury with which they are usually associated.

In the Brahmaputra basin, although most of the rivers were in spate at one time or the other during the current season, they are at present running low.

In the Ganga basin, the Burhi Gandak, the Bagmati, the Kamla and the Kosi had also swollen in June 1956, but the levels have since fallen. In eastern Uttar Pradesh, the Rapti and the Ghaghra have not so far caused much damage. Minor tributaries of the Yamuna like the Hindon in western U.P. were in floods in early July.

In the North-Western rivers no serious floods have been reported so far.

In Central India and Deccan, the Godavari and the Krishna, although in spate have not caused anxiety. The same is the situation with the Orissa rivers, Mahanadi, Brahmini and Baitarni.

Important gauge readings on the Brahmaputra in Assam, the Burhi Gandak, the Kamla and the Bagmati in Bihar, and gauge and discharge readings on the Kosi for the current season are given in Appendix VI.

(b) Peculiar features

This year, the floods have come earlier than usual. For instance, the rainy season in Orissa usually begins by the middle of June, but this year the rains came 3 weeks earlier. Similarly in Bihar, the rainy season commenced in the middle of May instead of June as usual.

Another feature this year, as in 1955 has been the occurrence of floods in relatively minor rivers which swell only occasionally. In 1955, smaller rivers like the Gomti, the Tons, the Sai etc., in eastern U.P. were in spate and caused extensive damage. Likewise in 1956, the Hindon in western U.P. and other minor rivers in the Punjab, like the Markanda, the Saraswati and the Tangri, have so far been responsible for heavy damage. These floods resulting from heavy local rain and inadequate natural drainage point to the importance of ensuring an efficient drainage system in flat areas like the Ganga basin.

(c) Effect of protective works already constructed

It is gratifying to note that all flood control works constructed in Assam, Bihar, Uttar Pradesh and West Bengal are standing up well and are protecting large areas usually liable to inundation.

The protection works at Dibrugarh have stood well. A strong oblique current struck stone spur No 6 on the 11th June, 1956 creating a vigorous back flow which started eroding the bank the same afternoon. The maintenance squad immediately began its operations to arrest the erosion. Stone spur No 1 was also affected but immediately maintained to its full length.

On the Kosi about 47½ miles of embankments out of 62 miles programmed for the last working season, were completed and they are giving protection to the people of the region. Careful vigil is being kept on the newly constructed embankments. The embankments on the Burhi Gandak and the Kamla are also standing well. Protection works at Samastipur are fast nearing completion to this season's target and will afford adequate protection to the town this year.

In Punjab all the cross-drainage works constructed during 1955 have been functioning satisfactorily. In the Midnapur District in West Bengal flood protection works were not affected by heavy rainfall this year.

4 PROGRAMME OF WORK**(a) Surveys and investigations**

The second phase of the flood control programme, namely, the short term phase, will commence after the current flood season

Survey and investigation work which was started in the earlier phase will be completed. The Central Flood Control Board at its fifth meeting held in June 1956 brought home this point to all the concerned State Governments.

(b) Detention reservoirs

During the last two years local town protection works were constructed in addition to embankments and raising the level of village sites. But in many rivers, the above measures alone will not provide adequate protection. Other measures will have to be adopted in combination. Detention reservoirs have to be constructed for the successful control of river systems like the Rapti, the Bagmati, the Kamla, etc. During the Second Phase some of such works will be undertaken.

(c) Importance of drainage

In many flat areas specially in the Ganga basin, there is no adequate natural drainage, with the result that intensive local precipitation causes immense damage. This has been the lesson of the 1955 floods and floods which have occurred during the current year so far. Efficient drainage systems including channel improvements will, therefore, have to be planned.

(d) Master Plans

Simultaneously, attention will be given to the preparation of comprehensive and integrated plans for each river basin as a unit, with due regard to the aspect of integration of control measures in one basin with those in the adjoining basin. The work could not be undertaken earlier for lack of requisite technical data. Now that some data have been collected as a result of the surveys and investigations carried out during the last two working seasons, a start will be made on the preparation of Master Plans.

(e) Programme for the current financial year

During the current financial year a provision of Rs 5 crores has been made in the Central Budget for loan assistance to States to finance their flood control schemes. Lack of funds, however, will not be allowed to stand in the way of execution of schemes already approved or any other emergent schemes which are technically sound. To enable the Central Government to examine this matter, the fullest details from the State Governments have been called for. The quantum of additional funds will be worked out after a scrutiny of these details.

The amounts allocated to the States for different years and the actual expenditure on flood control works are given in Appendix VII.

(f) *Programme for the Second Plan*

A draft plan for flood control projects under the Second Five Year Plan for Rs 117 crores was discussed in the Lok Sabha in September, 1955. In the context of the available resources *vis-a-vis* other development activities in the country, it has become necessary to curtail the programme to Rs 60 crores. Tentative allocations to various States based on the revised amount of Rs 60 crores have been formulated, but the exact allocations will be decided after the schemes have been worked out in greater detail and the full particulars including priorities called for from the States, have been examined.

The annual programme of expenditure in the Second Plan period will not be treated as inflexible. It is the Government's intention that, once the schemes have been finalised, all possible measures should be taken to execute them as soon as possible even if it involves more expenditure in the earlier years. This will ensure earlier realisation of benefits and consequent increase in human welfare and national wealth.

5 ULTIMATE NATURE OF THE FLOOD CONTROL PROBLEM

In assessing the flood control work done so far and the programme for the future it is important to bear in mind the ultimate nature of the flood control problem. As pointed out in the Note on flood control problems circulated in September 1955 absolute immunity from flood damage is not physically possible even in the distant future because of the unpredictability of several natural forces which might cause unprecedented situations. Even so the good though modest, beginning made in this country lends enough reason to look forward to an appreciable diminution in human distress with the implementation of the programme planned.

6 RELIEF

(a) *Relief measures in 1956*

While attempts are being made to provide flood protection to the various areas affected, the importance of relief measures and relief organisations cannot be minimised.

During 1956, for Tripura, a sum of Rs 55 000 has been sanctioned from the Prime Minister's National Relief Fund. The Ministry of Home Affairs have provided Rs. 4.5 lakhs for gratuitous relief, and the Ministry of Rehabilitation a sum of Rs 1 lakh. Five tons of milk powder, two tons of ghee sufficient clothing and large quantities of medicines have been provided by the Ministry of Health and the Indian Red Cross Society for distribution in this State.

In West Bengal, in addition to the relief organized by the State Government, a sum of Rs 15 000 has been sanctioned by the Food and Agriculture Ministry for relief

In Bihar, the State Government despatched more than 3,000 boats to the affected areas for the evacuation of the people. In addition to grants for rebuilding houses, loans for purchase of seeds, digging of wells, etc, nearly 11 000 maunds of foodgrains were distributed in the Darbhanga district alone

The UP Government have also organised relief to the flood-stricken people in Muzaffarnagar Saharanpur and Meerut districts. Similarly, other State Governments are doing their best in the matter of affording relief to the affected people

Details of the relief measures undertaken by the States during 1955 and 1956 (part) are shown in Appendices VIII and IV respectively

(b) *Emergency Relief Organisation*

The Government of India in the Ministry of Home Affairs have decided to set up an emergency Relief Organisation for rendering assistance to the people affected by such natural calamities as floods, famines, epidemics, etc. The Organisation, when set up, would provide for co ordination of relief work now being done by various official and non-official agencies on an *ad hoc* basis. The Government of India have recently liberalised the scope of Central financial assistance, *vide* Ministry of Finance letter No F 3(1)-P/53 dated the 2nd February 1955, to all State Governments, copy at Appendix X. The State Governments are eligible for a grant equal to half the total expenditure on gratuitous relief up to Rs 2 crores and three-fourths of the expenditure in excess thereof. Apart from this, expenditure on relief works undertaken as a preferable alternative to gratuitous relief, which does not create any asset or where the value of asset created is less than the expenditure incurred, is also eligible for inclusion as gratuitous relief. Distress loans given as a substitute for gratuitous relief with a view to generating some work will also be considered as an item of gratuitous relief in such cases where subsequent recovery proves impossible. Such comprehensive assistance will be given on a due consideration of the magnitude of the calamity involved.

The details of the scheme are at present being worked out in consultation with the State Governments. The Relief Organisation, when set up, would be of immense help in organizing relief to flood stricken people in a more effective manner than has been possible so far

PART II

STATE-WISE DETAILS OF FLOOD SITUATION AND PROGRESS AND PROGRAMME OF WORKS

A review of the flood situation during the current flood season and of the progress of the flood control measures undertaken in various States is given in the following pages under the heads indicated below —

- 1 Progress of flood control measures
- 2 Floods of 1956 (i) General
 (ii) Damages caused
 (iii) Relief
- 3 Effect of protective works already constructed
- 4 Future programme

ANDHRA

1 PROGRESS OF FLOOD CONTROL MEASURES

(a) *Progress of Investigations*

Detailed investigations for the construction of a dam on the Godavari at Ippur and for a reservoir across the Budderugedda near Godigummi and two reservoirs across the Tandava near Gantavari Kathagudem and Rekhavaripalem have been completed. Detailed investigations for the Raivada Reservoir Scheme on the Sarada river, the Kalyana Pulova Reservoir Scheme on the Varaha river and a reservoir across the Yerrakalva near Appalajagudem have been in progress.

(b) *Progress of Works*

No specific flood protection work was undertaken by the State during the 1954-55 working season. Only some special repairs to the East Tungabhadra drain were carried out.

In the latter part of 1955-56 the State commenced the execution of the Budameru Diversion Scheme (estimated to cost Rs 34 lakhs). Earthwork to the extent of 15 per cent to 20 per cent costing Rs 28 lakhs was done up to the end of June, 1956.

Central loan assistance given to the State for 1955-56 amounted to Rs 125 lakhs and the expenditure incurred by the State was Rs 146 lakhs.

2 FLOODS OF 1956

During the first week of July, 1956, the Nagavalli, and the Vamsadhara rivers in Srikakulam district were in floods. The

Krishna river has been in floods since 5th July 1956. The river rose to the level of 14.3 ft on the 19th July 1956, the maximum so far recorded during this year. The Godavari has been in floods since the 6th July. The maximum flood level reached this year was 8.4 ft on the 14th July 1956.

Ten tanks in Pathapatnam taluks and twenty in Bobbili taluk and one irrigation channel were breached. Three villages were submerged in Srikakulam taluk. Seed beds of paddy and *ragi* crops in about 5,000 acres were submerged in Narasannapeta taluk. The anicut at Vijayawada is safe and there has been no damage to life and property so far. The condition of the existing flood banks is good.

3 EFFECT OF PROTECTIVE WORKS ALREADY CONSTRUCTED

As the flood control programme of the State is still in the initial stage and works are not yet complete, their effect will be evaluated at the appropriate time.

4 FUTURE PROGRAMME

The Budamearu Diversion Scheme will continue during the 1956-57 working season. According to funds available for flood control works during 1956-57, the probable allotment to Andhra will be Rs 0.25 crore as part of the Second Plan Programme. Tentative allocation for this State in the Second Plan is Rs 3.5 crores. The details of the schemes are being worked out.

ASSAM

1 PROGRESS OF FLOOD CONTROL MEASURES

(a) Progress of Surveys and Investigations—

Surveys by Survey of India

	Programme	Progress
2 Aerial photography	17,411 sq miles	17,346 sq miles
2 Semi-controlled photomosaics	19,450 "	9,909
(i) Field levelling		
(a) Secondary levelling	971 linear miles	971 linear miles
(b) Tertiary levelling	5,730 sq miles	5,519 sq miles
(ii) River Surveys		
Single levelling (Longitudinal) Section	2,169 miles	2,007.5 miles
Cross Section	6,219 ,	2,493.0 ,
Double levelling	3,608 miles	2,988.0 ,
(iii) Gauge Discharge and Silt Observation		
Gauge Sites	59	55
Discharge Sites	56	51
Silt Observation Sites	36	33

(iv) *Investigations*

Preliminary reconnaissance surveys for tentative dam sites selected on the Kopilli and the Nao Dihing rivers were completed. Detailed investigations of the power aspect for the Kopilli project and preliminary investigations on the Barak project are in hand.

Geological inspection of tentative dam sites selected on the Subansiri, Nampukh and Namchik rivers has been completed and preliminary investigations in these rivers will be taken up when the estimates are sanctioned

Co-operation from Bordering Himalayan Countries

The Government of China have been sending wireless messages on the flood discharges of the Brahmaputra from three hydrographic stations in Tibet. Four wireless stations, four river gauge stations and eight rain gauge stations were set up in the Manas Basin in Bhutan prior to 1955 monsoon season. Two more wireless stations in the Sankosh basin have been established recently. Parties deputed by West Bengal have already proceeded to Bhutan to instal four more rain gauges and two river gauge stations in the Sankosh basin.

(b) *Progress of Works—*

The progress of works undertaken before the 1955 floods was reviewed in the statements previously presented to the Parliament. The second phase of Dibrugarh Protection works, including works for preventing inundation of the town was taken up for execution and has since been completed.

Regarding Palasbari it was decided in 1955 to shift the town to a higher ground because it was considered that the cost of any permanent protective work would be prohibitive. But as there was not enough time to shift the population, bank protection works were done in a length of 13,000 feet to afford temporary protection till such time as the town could be shifted. The work consisted of providing bamboo mattresses. This year the population is being shifted to a new township. Major portion of the temporary revetment carried out last year is still standing intact.

Jamaguri, Goalpara, Dhubri, Bilasipara, Nowgong and other town protection schemes have also been under execution and are nearly completed.

About 250 miles of embankments were constructed during 1955-56, the total length during the First Plan period being 1150 miles. These were mostly financed from the funds earmarked under the State Plan, approved before the commencement of the Central Flood Control Programme.

Central loan assistance given to the State for executing the flood protection schemes during the year 1955 56 amounted to Rs 73 22 lakhs This was in addition to a grant of Rs 43 lakhs made for the Dibrugarh Protection works The expenditure incurred up to March 1956 amounted to about Rs 195 37 lakhs

2 FLOODS OF 1956

(i) General

The monsoon broke very early this year Apart from the major rivers, viz, the Brahmaputra, the Umtru the Dehang the Kopili, the Lohit, the Debang tributaries like the Sangla the Kathakal, the Baralia the Jhanji, the Pagladiya the Kullong, the Champa and the Saral Bhanga were in spate

Consequent on very heavy rains in the Shillong and Gauhati areas early in June 1956, the Umtru recorded a flood of 65 000 cusecs on the 5th June, this is the highest in living memory The rainfall was as much as 7 inches in 24 hours The Kopili valley was heavily inundated The Katathal and the Longeri in the Cochar valley were also in spate and Hailakanote and Patherkandi areas were flooded The Assam rivers are rising

(ii) Damage Caused

A few breaches in the embankments were reported to have occurred in Lakhimpur Kamrup and Sibsagar and Nowgong districts On Rangia Rangapara Section of the railway line, approaches to three bridges were heavily damaged and train service was suspended The Bolsivi road bridge near Tezpur in Darrang district was outflanked A timber bridge near Garampani on Shillong Silchar road was washed away Important roads like the Gauhati Shillong road the Grand Trunk Road etc were either submerged or breached and traffic was suspended Temporary bamboo bridge over Champa and Saral Bhanga on the Assam Trunk Road was washed away and the road had become impassable on 18 5 1956 Repairing of most of the damaged works was taken in hand The work on the Umtru Project was temporarily dislocated

At Palasbari the temporary protective works were disturbed at some places and the river eroded the bank Sloughing occurred in a length of 100 feet and a width of 40 feet below the Transport building at Palasbari Erosion has almost been ceaseless, though at a slow rate

Total population affected in the North Lakhimpur Division due to floods was 45 000 254 villages and 12 Mozas were affected Crops worth about Rs 14 lakhs were damaged in 3 100 bighas 14½ miles of Local Board roads were damaged The damages to the South Trunk Road were repaired and traffic resumed.

3 EFFECT OF PROTECTIVE WORKS ALREADY CONSTRUCTED

At Dibrugarh the first noticeable action of the river occurred on the 11th June when a strong oblique current developed at Stone Spur No 6 located at Panchali, creating a vigorous back-flow upstream of the spur, which started eroding the bank in the afternoon. The maintenance squad immediately began its operations and arrested the erosion before midnight. Similar trouble started at Stone Spur No 1 on the afternoon of the 16th June causing settlement at the nose of the spur which was made up quickly. On the 20th, however a very strong return flow developed upstream of Stone Spur No 1 which, at 11 P.M., started cutting the bank just beyond the end of the 300 ft long revetment. As a precaution, last year, a land apron of articulated concrete blocks had been built commencing from this point which served as a second line of defence. As a result of the erosion, 105 out of the 1737 blocks tipped into the river at the edge of the bank. The maintenance squads lost no time in tackling the situation. Dumping of stone-filled wire cages started at 2 A.M. and continued till the situation was brought under control. This position was further strengthened by putting in 60 cement concrete blocks, each weighing 4 tons. At other stone spurs there has been practically no action. All the spurs are now intact and are being maintained to their full length. Below the last Stone spur a big sand beach developed right up to the Steamer Ghat a mile downstream. The protection works withstood the test well. The drainage scheme costing Rs 12.25 lakhs designed to drain the urban area of the town is fast nearing completion.

Due to a landslide in the Lohit river in April this year a large lake was reported to have been formed in Tibet. This is a potential danger to areas along the Brahmaputra. Steps are being taken to get timely warning in case the block moves releasing the stored water of the lake.

4 FUTURE PROGRAMME

It is proposed to make substantial progress on the construction of dykes along the Brahmaputra and on remodelling the existing sub standard dykes, during the next working season. The essential work at Dibrugarh will also be completed during the current financial year. Major portion of the work on the new township of Palasbari will be carried out. According to the funds available for flood control work during 1956-57 the probable allotment of Assam will be Rs 75 lakhs which will form part of the Second Plan programme. Tentative allocation of funds for Assam in the Second Plan is Rs 8 crores. The details of the schemes are being worked out.

BIHAR

1 PROGRESS OF FLOOD CONTROL MEASURES

(a) Progress on Surveys and Investigations—

(1) Survey by Survey of India

	Programme	Progress
2 Aerial photography	7 885 sq miles	7 870 sq miles
2 Semi-controlled photomosaics	12,850 sq miles	10 505 sq miles
<i>Field Levelling</i>		
(a) Secondary levelling	1 058 linear miles	1 058 linear miles
(b) Tertiary levelling	7 925 sq miles	6 820 sq miles

(11) River Surveys []

(a) The Bagmati, Kamla and Burhi Gandak rivers

Longitudinal sections	1,441 miles	1 138 miles
Cross-sections	1 629 miles	1 392 miles

Surveys on the rivers Jamuarı Dhaurı and Dhanatı have been completed in lengths of 64 miles, 33 miles and 17 miles respectively

In addition 198 miles of longitudinal sections and 207 miles of cross sections have been completed in other rivers

(111) Gauge, Discharge and Silt Observations

42 river gauges, 18 discharge sites and 3 Silt observation sites have been set up

(iv) Investigations

Survey work for the proposed dam site on the Bagmati in Nepal has been completed Survey of dam site on the Kamla is being done Possibilities of reservoirs in the Burhi Gandak basin are being investigated

(b) Progress of Works—

The progress of works undertaken before the 1955 floods was reviewed in the statements previously presented to the Parliament Most of these works mainly consisting of embankments, have been continued Additional schemes for embankments along the Burhi Gandak and along the Kamla Balan have been undertaken. Work has been started on 558 miles out of which 440 miles have been completed Total earthwork to be done was 120 crores cft out of which 37 crores of cft were completed in 1954-55 and 43 crores cft. have been completed this year so far 235 miles were completed in 1954-55 working season and 205 miles have been completed this working season. Work on the remaining length is in progress

Specific mention may be made here about the embankment scheme along the Burhi Gandak for the protection of Samastipur town, which has been almost completed to a reduced but safe section. In all 114½ miles of embankments have been constructed in the Kosi, 50 miles during the current year.

The expenditure against the Central loan assistance of Rs 200 lakhs during 1955-56 (for works other than the Kosi Project) was about Rs 215.86 lakhs.

2 FLOODS OF 1956

(1) General—

Bihar experienced early monsoon this year. The problem rivers of Bihar are the Kosi, the Burhi Gandak, the Bagmati and the Kamla Balan. Nearly 10,000 sq miles of area are liable to submerision during floods.

The Kosi waters entered a few villages like Tardhiha and Matras, just inside the western embankment, during the first week of May, 1956. The maximum discharge this year of one lakh cusecs was recorded on 17th June, 1956 at Barakshetra.

The Burhi Gandak has been flowing well below the danger level throughout the current monsoon, the maximum water level this year at Chanpatia being 238.41 on 22nd June, 1956 against the danger level of 242.14. However it crossed the danger level at Rosera on a few occasions, the maximum being 143.82 on 30th June, 1956, against the danger level of 140.36.

The Bagmati at Dheng has remained at the danger level (228.46) for a few days continuously in June (20—24th June 1956). Earlier on the 17th June the river had reached the maximum for the season namely 229.16. From the fourth week of June, the river has been below the danger level. It was however, showing an upward trend during the second week of July.

The Kamla at Jainagar had its highest level for the season, of 229.22 on 22nd June 1956 against the danger level of 227.00 and the highest ever recorded level of 231.34 (1954). There was spilling from gaps on both sides and there was some over-topping at places where the embankment was low. The damage was however, not much as the duration of the flood was short.

The Gandak river at Bhaisalotan rose to 358.8 on 25th June 1956 against the danger level of 359.86. The discharge was about 2,73,200 cusecs. Some of the lower gauges on this river rose above the danger level but the flood waters were contained within the embankments. The river is steady now.

In addition to these major rivers, other rivers in Saharsa Purnea and Santhal Parganas were also in spate

The floods in North Bihar this year have been very different from the previous ones. Not only were the rivers in spate much earlier than usual but the discharges were also heavier in comparison to those during the corresponding periods in the previous years. In the Gandak the average discharge in June this year was 1 35 lakhs cusecs against the preceding 15 years' mean discharge of 60 000 cusecs during that month

(ii) *Damage caused—*

Heavy damage was reported to crops and communications in Darbhanga Saharsa and Champaran districts due to early floods. Some erosion near Dhemradhar crossing on the Kosi has taken place and remedial steps are being taken. No damage has occurred along the Burhi Gandak. Vast areas of Darbhanga Champaran and parts of Bhagalpur and Muzaffarpur districts were submerged by the flood waters of the Bagmati. Spilling has occurred on both sides of the valley principally in its upper reaches and on both banks above the Muzaffarpur Sitamarhi Road

Some cross bunds on Sugia-Pardesia spill channel of the Bagmati were out-flanked and the Minapur area in Muzaffarpur district was slightly inundated. A new channel is developing on the left bank above the Gomatai channel and new spills have formed on the right bank. The spill from the Kamla river caused inundation in the adjoining areas. 400 sq miles in Champaran and Muzaffarpur districts and 155 sq miles in Darbhanga districts were affected. 1 56 503 persons in Darbhanga district, 2 50 000 in Muzaffarpur and 1 lakh in Champaran districts were involved. Crops worth Rs 40 lakhs in Champaran about Rs 40 lakhs in Darbhanga and about Rs 8 lakhs in Muzaffarpur were damaged. Houses worth about Rs 5000 in Champaran and Rs 2 35 400 in Darbhanga were damaged. Besides, 280 sq miles in Saharsa and about 10 sq miles in Santhal Parganas were flooded. 1 50 000 persons in Saharsa and 1500 in Santhal Parganas were affected. 5 lakh maunds worth of crop was damaged in Santhal Parganas besides 93 houses and some bunds and culverts

(iii) *Relief—*

The State Government undertook relief measures promptly and despatched more than 3 000 boats to the affected areas for the evacuation of the people marooned therein. Other relief measures include grants for rebuilding houses loans for the purchase of seeds, disinfection of wells, distribution of cooked food opening of

fair price grain shops and provision of mobile hospitals and post offices. Nearly 11 000 maunds of food grains were distributed in Darbhanga district alone and 47 medical and 23 veterinary centres have been set up in the affected areas.

3 EFFECT OF PROTECTIVE WORKS ALREADY CONSTRUCTED

About 50 miles of the embankments along the Kosi were completed against the target of 62 miles for the season and they are giving protection from floods to the people of that region. Careful vigil is being kept on the newly constructed embankments. The progress on the construction of the embankments was very encouraging though there was a setback in the construction programme in the Madhopur-Gogardhia reach due to heavy floods in the river.

Embankments along the Burhi Gandak have so far protected 6 lakhs acres. The construction of the embankments along the Burhi Gandak was stopped at most places due to continuous heavy rains. The work of construction of embankments below Pusa was dislocated on account of high water level. The gap at Chakhnoor sluice on the Burhi Gandak has been connected with the existing sluices and the sluice ring bunds are being raised.

Another important work in North Bihar is the protection of Samastipur town situated on the right bank of the Burhi Gandak. A scheme for an embankment between Pusa and Angarghat was drawn up at an estimated cost of Rs 41 65 360 and has been under execution.

The total length of embankment is 29 miles and the estimated quantity of work 6 47 crores cubic ft. The programme for the current working season was to construct a continuous line of embankment in the entire reach with a free board of 3 feet above 1955 H.F.L. The work has been done through the Gram Panchayats as far as possible.

About 3 000 to 4 000 people have been working every day to strengthen the weaker points and to fill up the gaps in the embankments already constructed. Till the 15th July 1956 the total quantity of earthwork done was about 3 5 crore cubic feet against the target figure of 3 65 crore cubic feet. Most gaps have been filled. The protective work has been successful and the Samastipur town has been saved from floods so far. Rain water which had accumulated inside the town has been pumped out.

The Kamla Balan embankments have given protection above Darbhanga-Nirmali railway line to the extent of about a lakh of acres. Some water of the river Kamla that escaped through the gaps in the embankments which were left open for the purpose of

protecting the Jhajharpur railway bridge was welcomed by the local population, as the silt laden water had beneficial effect on the crop and the depth of inundation was not such as to cause any damage to standing crops or property

4 FUTURE PROGRAMME

The schemes in progress will be continued during the next working season. In addition, the construction of further embankments on both sides of the Burhi Gandak above Muzaffarpur is proposed. The State Government has also proposed the construction of embankments along the Bagmati

According to the funds available for flood control work during 1956-57, the probable allotment to Bihar will be Rs 75 lakhs (excluding the Kosi Project) which will form part of the Second Plan programme. Tentative allocation of funds for Bihar in the Second Plan is Rs 12 crores for flood control schemes (excluding Rs 5 crores for the Kosi Project). The details of the schemes are being worked out

The following is an account of the flood situation in the Kosi Basin —

1 DISCHARGE AT BARAHAKSHETRA

The discharge at Barahakshetra which is generally round about 15 000 cusecs in April rose to 58 000 on 4th May, 1956. On the 9th May it fell down to 27 000 cusecs but again rose to 64 092 cusecs on the 13th May, 1956. Compared to the corresponding discharge during May in previous years this years' discharges were unusual and the rise in the river was noticed about 5 weeks earlier due to excessive and early rainfall in the hill catchment. This caused accumulation of water in the big *chours* lying in the valley between the main Kosi and the Tiljuga Kamla and the Balan rivers. This area of about 150 sq miles which is thickly populated was thus inundated about a month earlier than usual. The *moong* crop, one of the few crops which can be raised in the area before it gets water logged for about 7 or 8 months in the year, has been destroyed

2 VILLAGES AFFECTED

Some of the villages, adversely affected due to the early rise of water in the Kosi are

(a) On the Western side

- (1) Rajpur near Tiljuga Marginal Embankment
- (2) Matras (3) Hatni (4) Bisunpur (5) Tardiha near main embankment below Ghoghardiha

(b) On the Eastern side

- (1) Sunree etc

Some other villages, like, Bath and Madhopur, have been partly affected due to the non-completion of embankment as a result of the early rains

The working season has been abruptly shortened by about 5 weeks on account of this early rise in the river. All borrow areas were inundated making it impossible to proceed with the work further

3 DAMAGE TO EMBANKMENTS

No damages to the eastern and the western embankments have been reported so far except the Tiljuga marginal embankment which has been cut by the villagers of Rajpur to relieve flood congestion. This embankment was also over-topped at several places causing some damage

The eastern embankment at the Dhemra mouth caused some anxiety, because a deep channel about 20 ft in depth had formed parallel to the embankment and very close to it, as the original mouth was entirely closed. This channel was allowed to form about 200 ft away, from the toe by the construction of an impermeable spur

This channel had wiped off the village Sumree, which was later rehabilitated in the protected zone. This diversion channel threatened to erode the nose of the impermeable spur

Action was taken to protect it by brick pitching and brick blocks in wire mattress to serve as a falling apron

The eastern embankment was also threatened near village Phulkaha, where it was cut last year. It was also threatened near village Babhan, where a deep channel had formed at the toe of the embankment. The embankment was being protected by bank piling and brush wood filling as well as by permeable spurs

The toe of the western embankment from Ghogardhia to Bath was being eroded to some extent due to wave-wash and parallel flow. An attempt was made to reduce the parallel flow by the construction of several permeable spurs at suitable points. The damage due to wave-wash was checked by bank piling and brush wood filling, wherever necessary

Loss of crops has been valued at Rs 20 lakhs. It has been found that in some places new channels have developed and the district officers have been asked to isolate the damages for such defined areas

4 ROADS AND RAILWAY COMMUNICATIONS AFFECTED

The road from Jhanjharpur to Madhepur breached at several places and that from Tamarra to Madhepur was over topped at places

The railway communication between Ghoghardhia to Nirmali remained suspended for a few days. Between Badlaghat and Koparla, traffic was suspended and the passengers going to Saharsa and Supaul were transhipped in boat.

5 RELIEF MEASURES

Temporary sheds for about 6 to 8 thousand people have been provided. A large number of boats have been distributed and arrangements for communications and distribution of relief either gratuitous or sale of food grains at subsidised price is being undertaken.

6 THE BEHAVIOUR AND EFFECT OF FLOOD CONTROL WORKS EXECUTED SINCE 1954

The construction of the Kosi embankments started from 14th January 1954, and so far about 47½ miles of embankments have been constructed on the western side (including marginal embankments and ring bunds) and about 67 miles of embankments on the eastern side (including 8 miles of afflux bund and 12 miles of embankments above the afflux bund). As a result, 1½ million people of Kosi area in the districts of Darbhanga and Saharsa have been protected from the ravages of the Kosi. Four fifths of the Saharsa district and half of the Kosi affected area in the Darbhanga district are protected against floods. The people of the protected area have now a sense of security and are happy at the prospect of having bumper crops.

Out of a population of 42 lakhs in the Kosi area, about 2 lakhs live within the embankments. The question of giving as much protection as possible to these people through the construction of spurs and other devices is being examined. In the meantime, efforts are being made to accommodate the affected people in temporary huts outside the embankment and to arrange for other relief.

7 ASSESSMENT OF THE BENEFIT ACCRUING FROM FLOOD CONTROL WORKS

In addition to protecting vast areas from inundation, the Kosi embankments have benefited crops in the protected areas. The benefit on the eastern side is more pronounced as large sandy tracts of land of about 5 miles in width are being reclaimed for growing various crops both in Nepal as well as in India. On the western side, the benefit is not very pronounced upto Nirmali because in this tract, inundation still continues to some extent by the various streams flowing into the Kosi. The benefit is more pronounced on this side from Ghoghardiha to Madhepur, where large sandy tracts, which were practically engulfed by the river,

have now been reclaimed. The monetary value of paddy and jute grown in the protected areas is of the order of Rs 20 lakhs in Nepal and Rs 68 lakhs in India.

DELHI

1 PROGRESS ON FLOOD CONTROL WORKS

The Delhi-Shahdara marginal bund estimated to cost Rs 17.02 lakhs and the two parallel stone walls on Bela road are nearing completion. Both these works are intended to prevent the flood waters of the Yamuna from flowing towards Shahdara and Delhi City.

2 FLOODS OF 1956

There have so far been no floods in the Yamuna this year. However, the Hindon river, a tributary of the Yamuna, breached its bank on a point opposite Khichripur. As a result, the water flowed into the low lying areas of Khichripur, Ghazipur, Partabganj and Bhoroh. So far there has not been any loss of life. No *abadi* of any village has been affected by the Hindon waters. Two motor launches and 8 boats have been requisitioned to meet any emergency.

3 EFFECT OF WORKS ALREADY CONSTRUCTED

No flood protection works were undertaken during 1954-55.

4 FUTURE PROGRAMME

The construction of spurs and revetment on the right bank of the Yamuna from the Power House to Nala No 12 at an estimated cost of Rs 12.74 lakhs was taken up in April, 1956. 9 minor schemes consisting of protection works along the right bank of the Yamuna below the railway bridge, at an estimated cost of Rs 7.25 lakhs were also taken up and are in progress.

JAMMU AND KASHMIR

1 PROGRESS ON FLOOD CONTROL WORKS

The Kashmir Valley flood protection scheme (Phase I) which is estimated to cost Rs 100 lakhs and involves enlargement of the spill channel from Paushahi Bagh to the Wullar lake is nearing completion. Good progress was made on the strengthening and retirement of the Jhelum Bund. An expenditure of Rs 23.81 lakhs was incurred during the year 1955-56 ending March, 1956.

2 FLOODS OF 1956

No flood has so far occurred in the State.

3 FUTURE PROGRAMME

Work on the Kashmir Valley flood protection scheme (Phase I) will be continued. During 1956-57 the probable allotment will be

Rs 0 35 crores which will form part of Second Five Year Plan Tentative allocation for the State in the Second Plan is Rs 1 0 crore The details of the schemes are being worked out

MADHYA PRADESH

1 PROGRESS ON FLOOD CONTROL MEASURES

The State has taken up for execution one scheme, estimated to cost Rs 2 1 lakhs for the protection of Pusad town from floods in the Pus river in the Yeotmal district The work is nearing completion An amount of about Rs 56 000 has been spent up to the end of March 1956

2 FLOODS OF 1956

There have been heavy floods so far in the Indravati at Jagdalpur and in the Narmada at Jabalpur

The Indravati was in heavy floods from 3rd to 7th July, 1956, and the traffic was closed for three days No loss of human life has been reported, but several houses tumbled down and some cattle has been washed away

There were floods in the Narmada river and the nallahs in Jabalpur town were flooded Further details are awaited

3 EFFECT OF WORKS ALREADY CONSTRUCTED

No flood control works were constructed during 1954 55 working season So far no damage has been reported to the Pusad town where the protection work has been in progress

4 FUTURE PROGRAMME

The State Government have proposed 14 flood protection schemes under the Second Five Year Plan

According to funds available for flood control work during 1956-57 the probable allotment to this State will be Rs 0 01 crore which will form part of the Second Five Year Plan The tentative allocation for the State in the Second Plan is Rs 0 5 crore The details of the schemes are being worked out

ORISSA

1 PROGRESS OF FLOOD CONTROL MEASURES

During the 1955 floods there were large-scale breaches in the existing embankment system. These embankments were also overtopped at several places The worst breach occurred at Dalaihai The major work undertaken since then, is that at Dalaihai, where the breach has been closed and spurs are under construction (*vide*

para 5 below) The work is expected to be completed in essential features before any big flood comes this year Progress on the Dala ghai works (estimated to cost Rs 30 76 lakhs) is indicated in Appendix II

Detailed estimates were prepared for 57 other minor schemes (estimated to cost Rs 57 96 lakhs) for construction of new embankments, improvement of existing embankments and other protective works Most of these schemes were taken up for execution

Central loan assistance given to the State in 1955-56 amounted to Rs 15 lakhs and the State spent a sum of about Rs 27 54 lakhs on the above schemes

Investigations for the proposed multi purpose dams across the Baitarani (at Bhimkund) and the Salandi rivers have been undertaken Similar investigations are proposed to be undertaken on the Brahmini

2 FLOODS OF 1956

(1) *General* Generally the rainy season starts by the middle of June, but this year it began earlier by about 3 weeks There was heavy rainfall throughout the first week of June 1956 in North Orissa and the rivers Mahanadi, the Brahmini, the Baitarani and the Budha Balanga and their tributaries were in spate Water rose by 14 ft at Dalaighai in one day

(ii) *Damage Caused* The coastal districts of Cuttack and Balasore were affected Except for dislocation of communications in some places, no material damage was caused by the Mahanadi

On the Brahmini system, the water over topped one of the last year's breaches in the Aul ring bund but the damage has been slight.

A breach in the Baitarani embankment locally known as 'Gopaldas Ghai' was reported and about 300 acres of land were affected.

No serious damage was caused by the Budha Balanga and the Subernarekha in Balasore district The accidental death of an *adwasi* was reported In Balasore town, a man died due to collapse of an old house Some lands in North Balasore and a number of school buildings and old houses were reported to have been affected Some cattle was also reported to have been lost In the Balasore district, about 10 per cent of the fields had been sown all of which were damaged Due to early monsoons, it is feared that the initial progress of agricultural operations has received a setback Local officers have been touring the affected areas for assessing the extent of losses and giving relief where necessary ●

3 EFFECT OF PROTECTIVE WORKS ALREADY CONSTRUCTED

During the last years floods, a serious breach occurred in Dalaighai embankment on Katjuri river about 14 miles east of Cuttack City. This breach, which was the biggest in the season, gravely affected the canal fed and thickly populated region of Cuttack district. Repairs and other protective works were started on an emergent basis and in spite of the early monsoon and initial set backs the progress made up to-date is satisfactory. All essential features of the work have been completed and the works brought to a stage where the floods during this season are expected to be passed down with safety. So far, no damage to this work has been reported.

4 FUTURE PROGRAMME

The balance of the works mentioned in para (1) is proposed to be completed during 1956-57. Some further works are also proposed to be taken up. According to funds available for flood control work during 1956-57 the probable allotment to Orissa will be Rs 0.40 crores which will form part of the Second Plan Programme. The tentative allocation for flood control schemes in the State is Rs 3.5 crores in the Second Plan. The details of the schemes are being worked out.

5 DALAIGHAI PROTECTION WORKS

One of the important works under construction in Orissa is the Dalaighai Protection Works along the River Katjuri at an estimated cost of Rs 30.76 lakhs. It consists of closing of breaches along the embankments and provision of spurs. The work to be done was of the order of 52 lakh cft of earthwork for the embankment and 2 lakh cft of rubble. In addition 20 lakh cft of rubble collection and 9 lakh cft of earthwork was to be done for the construction of spurs.

Difficulty was reported in the transportation of rubble from the quarry to the work site due to short supply of railway wagons. Immediate steps were taken by the Centre for the allotment of the required number of wagons. The works are expected to be completed in essential features before any big flood comes this year.

The breaches have been closed. 17.75 lakhs cft of rubble have been collected against the target of 22 lakhs cft. Five lakhs cft of earthwork have been completed against a target of 9 lakhs cft for the construction of spurs. 21,000 Rft of ballast have been collected against a target of 23,000 Rft for the construction of permeable spurs. Due to the early monsoons all the works except the collection of rubble have been stopped since the 4th July 1956. There has been no damage to the works so far constructed during the current monsoon.

PEPSU

1 PROGRESS OF FLOOD CONTROL WORKS

The construction of bunds along the Ghaggar was continued during the current season and has been completed. Repairs to Dhahansu and Pachisadara bunds (at an estimated cost of Rs 1 lakh) necessitated by the 1955 floods have also been carried out. The work of raising and widening the Pachisadara bund was in progress. The work of protecting Teawana from the Jhalmar Nadi was taken up and has been completed.

2 FLOODS OF 1956

No floods have so far occurred in this State.

3 EFFECT OF WORKS ALREADY CONSTRUCTED

Minor training works (estimated cost Rs 1 lakh) on the Beas river were undertaken opposite village Bhutala, Dhilwan and Burewala during the 1955-56 working season and part of the work was done during the year. This has afforded protection to the concerned area.

4 FUTURE PROGRAMME

According to funds available for flood control work during 1956-57 the probable allotment will be Rs 0.1 crore, which will form part of the Second Five Year Plan. The tentative allocation for the State in the Second Plan is Rs 0.4 crore. The details of the scheme are being worked out.

PUNJAB

1 PROGRESS OF FLOOD CONTROL MEASURES

Some schemes such as flood embankment along the Ravi upstream of Dera Baba Nanak and canalising parts of Nasrala Group of Choes (as a full scale experiment) in Hoshiarpur district were undertaken during the 1954-55 working season. As a result of the abnormal floods last year, however both these works were damaged. The State Government was mainly occupied with repairing the damage and could not, therefore, make much headway in the execution of new flood control works. Some drainage works were, however executed.

Expenditure incurred against the loan assistance of Rs 7.0 lakhs given to Punjab during 1955-56 was Rs 2.71 lakhs upto 31.12.55.

2 FLOODS OF 1956

(1) Widespread rain occurred during the first week of July 1956. The Markanda river recorded a maximum level of 839.5 on 3rd July 1956 against the maximum recorded level of 841.3 during 1955. The

Ghaggar river recorded the maximum level of 851.43 on 4th July, 1956, against the danger level of 852.25. The Kurukshetra area was hit hard by the recent floods in the Markanda, the Saraswati and the Tangri Nadi, all tributaries of the Ghaggar. The flood water from the Markanda caused a breach in the Narwana branch and also a few breaches in the Markanda distributary. These breaches have been closed. The Saraswati canal system is now running normally.

(ii) *Chaupang and Rakshi Torrents*—Dadupur recorded heavy rainfall of 17.5" in 24 hours on the 2nd July, 1956. The rainfall in the vicinity of Dadupur in the catchment areas of Chaupang and Rakshi Nallas was of the same magnitude. This resulted in very heavy flood in the Chaupang and the Rakshi. Flood waters reached the Sirsa Branch syphon on 4th July at about noon. The level rose very rapidly and at about 3.15 P.M. flood waters breached the bank of Sirsa Branch at R.D. 31.000. The Sirsa Branch and Chaupang system were closed at the head.

The maximum flood discharge was observed to be 2,200 cusecs in the Sirsa Branch and 600 cusecs in the Chaupang. On account of this flow of 2,800 cusecs about 64 villages on the right side of the Sirsa Branch were flooded. All channels of the Chaupang system were overflowing at many places due to this. Several breaches occurred and six villages were flooded. No loss of life has been reported. Most of the area is still under water. The first reports do not show the submersion of any irrigated area. The damage to crops has not so far been assessed.

(iii) During 1956 no damage is reported in Amritsar, Hissar, Ferozepur districts and Rupar Division.

There has however been some damage in the Ambala and Karnal districts in the Western Yamuna canal area and also in the area under the 1st Bhakra main line.

150 sq miles in Ambala and 100 sq miles in Karnal districts were affected. About 150 villages and 3,000 people in each of these districts were affected. Damage to roads was about Rs. 25,000 and to canal works at Dadupur Rs. 50,000.

Some damage has been reported in a few villages of Jullundur district. An area of 1,746 acres was inundated on 5-7 1956. The damage to crops is of the order of Rs. 15,000 and approximately 1,500 people have been affected. In addition there has been a breakdown of road traffic and certain bridges on important roads have been damaged. Due to the accumulation of rain water the damage to roads is approximately Rs. 1 lakh.

Under the 1st Bhakra main line circle an area of about 82 sq miles was flooded. There was some damage to houses and property. There was slight damage to the Narwana branch where the flood water of the Markanda overtopped the banks and flowed into the canal. The Markanda attacked also the downstream flood banks and breached them 4 miles below the Jalbera regulator.

3 EFFECT OF PROTECTIVE WORKS ALREADY CONSTRUCTED

All the drainage works constructed during 1955 functioned satisfactorily. The new drainage works constructed under the Narwana branch satisfactorily discharged the flood waters and there was no damage to the banks. The cross drainage works on the Narwana branch have also functioned well.

About 40 cross drainage works have already been constructed on the Bist Doab Canal system and these have worked satisfactorily.

4 FUTURE PROGRAMME

The work of training *choes* in Hoshiarpur district and the construction of the Bem Bund will continue during the 1956-57 working season. Additional drainage works such as on the Bist Doab Canal and Eastern Canal system, are also proposed to be undertaken. According to funds available for flood control work during 1956-57 the probable allocation to Punjab will be Rs 19 lakhs which will form part of Second Plan programme. The tentative allocation for the State in the Second Plan is Rs 3.5 crores. The details of the schemes are being worked out.

SAURASHTRA

1 PROGRESS OF FLOOD CONTROL MEASURES

The programme of works for the 1955-56 working season consisted of 107 minor schemes like retaining walls etc for protecting towns.

An amount of about Rs 9.29 lakhs was given as loan to Local Bodies upto the end of March 1956 for flood protection works and a further amount of Rs 2.57 lakhs as loan upto June 1956.

44 small and large schemes for flood protection works were surveyed and plans and estimates prepared.

2 FLOODS OF 1956

(1) *General*—Saurashtra had very heavy rains in the last week of June and in three weeks most of the districts except part of north-eastern portion of Zalawad and south eastern portion of Gohilwad, had more than average annual rainfall (from 20 to 40 inches). At places the rainfall has already been more than double the average annual rainfall.

(ii) *Damage caused*—During the last three years there have been no floods in Saurashtra. This year all the reservoirs (20 in number), except two located in the north-eastern and south-eastern parts, namely, Brahmani and Ranghola constructed as part of the First Five Year Plan, have filled and overflowed. It is gratifying to note that there has been no damage to the reservoirs, though there has been some damage to the recently constructed canals and banks. Vast areas were inundated by floods in the rivers Bhadar, Ozat, Rangamati, Nagmati, Aji and Shetrunji. It has been reported that so far two human lives have been lost and cattle worth Rs 30 000. About 15 000 acres of cultivable area is reported to have been affected. Damage to property is estimated at Rs 15 lakhs and to the reclamation bunds at Rs 90 000. There has been damage to private enterprises like salt industry along the coast where there was coincidence of tides and floods. Details are awaited.

3 EFFECT OF WORKS ALREADY CONSTRUCTED

As the flood control works are not yet complete the works could not afford the necessary protection.

4 FUTURE PROGRAMME

Schemes in hand will be continued and work on most of the 44 schemes for which estimates have been prepared and approved by the State Flood Control Board will commence after the current flood season.

According to funds available for flood control works during 1956-57 the probable allotment to the State will be Rs 6 lakhs which will form part of Second Five Year Plan. The tentative allocation for the State in the Second Five Year Plan is Rs 0.5 crores. The details of the schemes are being worked out.

TRIPURA

1 PROGRESS OF FLOOD CONTROL MEASURES

The only major work which has been in progress in this State since the 1954 floods is the construction of new embankments and the raising of the old embankments around Agartala town for protection against floods at an estimated cost of Rs 13.93 lakhs. Vigorous steps are being taken for completion of this work. Five other minor works estimated to cost Rs 1.48 lakhs have been completed.

2 FLOODS OF 1956

(i) *General*—The monsoon this year started about three weeks earlier than usual when the bunds for the protection of Agartala

town had not been fully constructed. The Haora river rose on 2nd June, 1956 to a level never attained before in living memory. In addition to Haora, other rivers like the Khowai, the Gunti, the Muhuri and their tributaries in the central and southern regions of the state were in spate. There was no flood after June 15th in Tripura.

(ii) *Damage Caused*—Bunds for the protection of Agartala town were overtopped and gave way at some places about the midnight of 2nd/3rd June 1956. The happening was so unexpected and sudden that there was not adequate time to issue warnings to all those who were likely to be affected. Every effort was, however, made to warn the people by word of mouth as far as possible. A majority of them took shelter in safer quarters. About 11 lives were however reported to have been lost. The town remained inundated for two days. At places the depth of water was as much as five feet submerging all the roads. Loss of property was considerable. Most of the mud-wall houses which were directly in the way of the onrushing waters, and about 150 cattle were swept away.

Reports on flood were received from Khowai, Sonamura, Belonia, Kamalpur and certain portions of Kailasahar and Sabroo. There were however no casualties and the loss of property was not much.

Emergency steps were taken for repairing the damaged embankments. Patrolling the embankments and other precautionary measures were given effect to. The situation has now improved much.

(iii) *Relief*—The Government took early relief measures. Food was distributed free. 20 relief centres were opened in the town and rice given free in 60 villages. More than Rs 40,000 was distributed for immediate relief and the assessment of actual damage to property was taken in hand for further relief. Precautions were taken to keep the population safe against any outbreak of epidemics and a constant watch was maintained by a mobile medical team. 6,000 maunds of rice were distributed free. Public bodies were also active in giving relief to the distressed persons by way of cloth, powdered milk etc. Steps were being taken for bringing cloth, salt, gur etc., from Calcutta. The Sub-Division Officers were allotted a sum of Rs 20,500 for gratuitous relief and necessary arrangements were made for stocking sufficient quantity of rice.

A sum of Rs 55,000 has been sanctioned from the Prime Minister's National Relief Fund. The Ministry of Home Affairs have provided Rs 4.5 lakhs for expenditure on gratuitous relief and construction of and repairs to roads, bunds etc. The Ministry of

Rehabilitation have separately made available a sum of Rs 1 lakh. The Ministry of Health and Indian Red Cross Society have arranged for the supply of 5 tons of milk powder 2 tons of ghee clothing and large quantities of medicines for distribution to the people in distress. The Ministry of Food and Agriculture have arranged for the supply of 500 tons of rice from Calcutta to Agartala and 2 000 maunds of seed paddy for distribution to cultivators at subsidised rates. The seed paddy will be distributed entirely free of cost in deserving cases.

UTTAR PRADESH

1 PROGRESS OF FLOOD CONTROL MEASURES

(a) Progress of Surveys and investigations

(1) Surveys by Survey of India

	Programme	Progress
2 aerial photography	10570 sq miles	10570 sq miles
2 semi controlled photo-mosaics	12110 sq miles	89599 sq miles

Field Levelling

(a) Secondary levelling	157 linear miles	157 linear miles
(b) Tertiary levelling	1245 sq miles	1245 sq miles

(ii) River Surveys

102 miles of longitudinal-sections, 428 miles of cross-sections and 1073 sq miles of spot levelling in the Ghaghra and the Rapti basins were completed. Surveys have also been done over an area of 300 sq miles in Nepal for marginal embankments.

Reconnaissance surveys of small rivers are being carried out for improving the drainage of these channels.

(iii) Hydrological Observations

50 gauge/discharge stations have been fixed on the Ghaghra Rapti, Ganga and their tributaries. 17 more are being set up.

(iv) Investigations

For the location of flood detention reservoir sites in the Rapti Basin an area of 550 sq miles has been surveyed. Another 150 sq miles have been surveyed in connection with a dam site on the Rapti at Jalkundi.

(b) Progress of works

The progress of works undertaken before 1955 floods was reviewed in the statement previously presented to the Parliament. Almost all the schemes continued during the working season of 1955-56. Bondi Bahrauli Dohra Bondi, Paraspur Dharamra Bund along the Ghaghra river and similar other major works, in addition to the

raising of village sites in Ballia Bahriach and other eastern districts of the State, were under execution upto the end of May, 1956 About 710 villages sites have been raised and work on another 690 villages was almost complete

This work has become popular with the people of the rural areas in that it affords protection from inundation to the village sites, without taking away the benefit accruing to the land from the fine silt in flood waters There is no basis for the criticism that the work is being done in a haphazard manner The villagers in these areas are in separate bits and the work is therefore being done in several bits

Another criticism has been that only the plinths are being raised and not the walls of the houses Actually the U P Irrigation Department is constructing raised platforms and the walls are raised and houses reconstructed by the people themselves for which Taccavi loans are granted by the District Magistrates in deserving cases

There is still another criticism that the wells in the inundated areas are not being simultaneously attended to and that, being on lower land, these wells are causing accidents As a matter of fact the U P Government are also raising the plinths of wells which are liable to submersion

Central loan assistance given to the State for 1955 56 amounted to Rs 180 lakhs and the expenditure incurred by the State was about Rs 340 0 lakhs

2 (1) FLOODS OF 1956

During the previous years the eastern districts of Uttar Pradesh were the first victims of floods this year on the other hand, heavy rainfall occurred in the Western districts in the first week of July and caused excessive flooding, and consequent misery and suffering Muzaffarnagar and Meerut experienced heavy rains on July 2nd and 3rd the former receiving in these two days as much as 30 inches of rainfall which is its average for the whole year This resulted in extensive water-logging in the area and floods in the Hindon river There was practically no rain in the area after July 3 1956

(11) *Damage Caused*

The total area severely affected in Muzaffarnagar district was 120 square miles in 43 villages, 6000 houses collapsed rendering 35 000 persons homeless A large quantity of grains was destroyed. The Muzaffarpur Meerut road was breached. Loss of human lives was five

Damage occurred to the downstream pitching on the right side and the earthen bund on the left side of the Hindon Dam, which has

been breached in a length of 400'. The gangway over the dam was also washed away in 37 bays (out of a total of 40) due to floating trees etc. coming down the river. The Grand Trunk Road above the Hindon Dam was breached in portions during the first week of July 1956 which caused stoppage of road traffic for a few days. 75 houses collapsed. No loss of life was reported.

Considerable damage was caused in Saharanpur district. All the houses of the Chaman Mirza village completely collapsed and the village was under waist deep waters. Three lives were lost.

16 human lives and 125 cattle were lost in Almora District on account of the excessive rains and landslides on the 27th June, 1956. 15 houses were destroyed rendering 150 families homeless.

Heavy damage occurred on the railway embankments also. A breach 350' wide occurred between Muzaffarnagar and Mansarpur on the Delhi-Saharanpur line during the first week of July 1956 and the railway bridge in this reach 300 feet long was also damaged. There was another hundred-foot-wide breach between Nangal and Tapri railway stations. Train service was temporarily suspended. The damaged railway bridge in this reach has since been repaired.

(iii) Relief Measures Undertaken

The UP Government have arranged for food grains and other essential articles such as salt, gur, kerosene oil, blankets, sarkies, etc., to the people in distress. They have also sanctioned a sum of Rs. 1 lakh for expenditure on gratuitous relief and flood relief operations in Muzaffarnagar district. In addition, a sum of Rs. 2.5 lakhs has been placed at the disposal of the District Magistrate for distribution as *taccavi* loans to the affected persons for rebuilding their houses. Arrangements have also been made for the despatch of 100 wagons of *bhusa* to Muzaffarnagar from places outside.

The military authorities have rendered considerable help in meeting the flood situation in Muzaffarnagar and Meerut districts by providing motor boats, ducks, pumping sets and man power.

In Almora district a sum of Rs. 5,000 has been sanctioned by the State Government for distribution of gratuitous relief and another sum of Rs. 5,000 for granting subsidies to poor persons for reconstruction of their houses. In Saharanpur district, the entire population of village Chaman Mirza, referred to earlier, have been given shelter and food. The State Government have sanctioned a sum of Rs. 8,000 for expenditure on gratuitous relief to the flood affected people.

3 EFFECT OF PROTECTIVE WORKS ALREADY CONSTRUCTED

The Chitauni bund constructed on the right bank of the Gandak in Deoria District is affording protection to an area of 1,21 600 acres. Similarly the Ballia Baria bund is affording protection to an area of 60 800 acres. 1400 villages which have been raised during the last two working seasons are having protection from inundation.

4 FUTURE PROGRAMME

Schemes that have already been undertaken and are not yet completed will continue during the next working season. They are shown in Appendix II.

The State Government have also had under consideration the problem of arresting the erosion by the river Ghaghra. The erosion can be checked by the construction of spurs. Since such protective work is very costly, amounting to Rs 1 crore per mile approximately, the State Government have prepared a scheme for the protection of the worst affected reaches by the construction of spurs. It has tentatively been included in the State proposals for the Second Five Year Plan.

Similarly a scheme for the protection of the Barhaj town has also been included by the State in their proposals for the Second Five Year Plan at an estimated cost of Rs 30 lakhs.

A scheme was prepared for the construction of a bund, namely Chher Maniram Bund along the river Rohin at an estimated cost of Rs 19 lakhs to protect 16 000 acres of land, but the Technical Sub Committee of the State Flood Control Board considered that the marginal bund proposed to be constructed on the right bank of the river Naraini would prevent the spilling of water into the Rohin and did not, therefore sanction the scheme.

Regarding construction of the bund on the right bank of the Naraini in Nepal territory, efforts are being made to obtain the permission of the Government of Nepal for undertaking the work.

The State Government have also examined the proposals for multi purpose river valley projects for regulating the river systems in eastern UP. On a rough calculation, the State Government estimate that the cost of construction of flood detention reservoirs on the Ghaghra and Gandak would come to Rs 45 crores in each and on the Rapti to Rs. 15 crores. The State Government consider that the detention reservoirs may be constructed on the river Rapti at a cost of Rs 15 crores. Provision for such reservoirs has been made by the State in their proposals for inclusion in the Second Five Year Plan. 13 small detention reservoirs on the tributaries of the Rapti are also proposed to be constructed at a total cost of Rs 46 crores.

These proposals are under the consideration of the State and the Central Governments

A scheme has also been prepared for the construction of a multi-purpose dam on the Rapti at Jalkundi in Nepal. Besides controlling floods the reservoir will be able to generate 27,000 Kw of power and help to irrigate 45 lakhs acres of land in Uttar Pradesh and Nepal.

According to the funds available for flood control work during 1956-57, the probable allotment to U.P. will be Rs 15 crores, which will form part of the Second Plan programme. The tentative allocation of funds to the State for flood control schemes in the Second Plan is Rs 10 crores. Details of the schemes are being worked out.

WEST BENGAL

1 PROGRESS OF FLOOD CONTROL MEASURES

(a) Progress on surveys and investigations—

(i) Surveys by Survey of India

	Programme	Progress
2 Aerial photography	4,139 sq miles	3,849 sq miles
2 Semi controlled photo-mosaics	4,200	3,922
Field Levelling		
(a) Secondary lines	313 linear miles	313 linear miles
(b) Tertiary net work	1,500 sq miles	1,455 sq miles

(ii) River Surveys

123 miles of bank survey and 131 cross-sections have been completed along the Mech, Mahananda, Teesta, Jaldhaka, Torsa and Kaljani rivers. Surveys in respect of the short-term flood protection measures has mostly been completed.

(iii) Investigations

Investigations for long term schemes for soil conservation (including construction of check dams etc) have been undertaken. Reconnaissance surveys have been made in the upper catchments of the Teesta basin and in the valley of Great Ranjit. Detailed surveys of hill catchments of Great Ranjit, Lish Ghish and Chel have been taken up.

(iv) Co-operation of Bordering Himalayan Countries.

Two wireless stations, two river-gauge stations and two rain gauge stations have been set up in Bhutan in the Torsa and Raidak basins. Parties have since proceeded to Bhutan to set up two more rain gauges and one river-gauge in these river basins. In addition four rain gauges, two river-gauges and two wireless stations are to be installed by these parties on the Sankosh river which flows along the border of Assam and West Bengal.

(b) Progress of Flood Control Measures

The progress of works undertaken before the 1955 floods was reviewed in the statements previously presented to the Parliament. Siliguri and Mathabhanga town protection works have since been completed. Jalpaiguri (1st phase), Cooch Behar (1st phase) and Alipurduar town protection works have almost been completed. Protection works for Barnes-Domohani area are in progress. New schemes for the protection of Sovaganj (Alipurduar) and Toofanganj towns as well as protection works on the Balson, the Chel and the Mahananda rivers were undertaken. The construction of the retired Dharaikuri embankment along the Jalahaka has been taken up.

Loan assistance given to the State by the Centre during 1955-56 amounted to Rs 110 lakhs and the amount spent by the State was Rs 116.06 lakhs.

2 FLOODS OF 1956**(1) General**

There were early rains this year in Bhutan and North Bengal. All the rivers in Jalpaiguri and Cooch Behar Districts were in spate during the latter half of June. The Torsa touched the highest recorded level of 74.69 on 28th June. According to the reports from Bhutan, the water levels in all the rivers passing through Jalpaiguri District have since been maintaining normal levels. The Rangathi River between Goirakati and Nathara was in spate during the last week of June. The Sunderban area and the Midnapur District were struck by a cyclone on 29th of May 1956 accompanied by heavy rainfall.

All the rivers have been below danger level during the first fortnight of July.

(11) Damage Caused

As early as in May 1956 fair weather bridges in Jalpaiguri district over the Teesta, the Diana, the Char Torsa, the Sil Torsa, the Kaljani and the Raidak, were washed away. The Teesta revived a channel through a breach in the Barnes-Domchani embankment. The national highway was submerged at the Mora Horsa bridge. The eastern approach of the new Kaljani bridge at Alipurduar was washed away. Alipurduar-Samuktala road was over-topped by the Kaljani. The suburbs of Alipurduar were flooded.

In Cooch Behar, road communications were dislocated at many points and railway communication between Cooch Behar and Dimhata was disrupted. Many fields were submerged and the *aus* and jute crops damaged. Mail motors could not ply between Goirakata

and Dhupguri due to flooding of the road near Thakurpur bridge. The Bamanhat road was washed away by the Barriadha. The Nizamnagar colony was affected. Some of the culverts and bridges on the Malda were threatened and paddy cultivation in low lying areas was submerged.

At Barnes ghat, a private boat with 15 persons on board capsized on 20th June. Nine persons were rescued while 6 could not be traced.

The eastern approach of the upper Jaldhaka road bridge near Nagrakata was partly washed away and the road communication was disrupted.

(iii) Relief

Adequate relief measures have been undertaken by the State Government. In addition, a sum of Rs 15,000 has been sanctioned by the Food and Agriculture Ministry from the Indian People's Famine Fund.

3 EFFECT OF WORKS ALREADY UNDERTAKEN

In Midnapur district, the flood protection works were not affected despite heavy rainfall this year. Suitable arrangements were made to pump out the water that had collected within the protected area. No damage is reported to the flood protection works carried out during 1955-56.

4 PROGRAMME OF WORK

Works under execution will be continued during 1956-57. Some new schemes such as protection of Jalpaiguri town (2nd phase), Barnes-Domohani embankment (2nd Phase) and protection works above Ramshai and the embankment from Anguri Road to Ramshai on the right bank of the Jaldhaka are proposed to be taken up in the next working season. According to the funds available for flood control work during 1956-57, the probable allotment to West Bengal will be Rs 0.64 crore, which will form a part of the Second Plan Programme. The tentative allocation of funds for West Bengal in the Second Plan is Rs 5 crores. The details of the schemes are being worked out.

PART III—APPENDICES

APPENDIX I

[vide para 2(A) of Part I of the Statement]

PROGRESS ON SURVEYS AND INVESTIGATIONS

A. SURVEYS

(I) Surveys by Survey of India (Up to 30th June, 1956)

The programme of aerial photography and spot-levelling for the year 1955 56 was drawn up by Central Water & Power Commission in consultation with the Survey of India Department towards the end of June, 1955 This programme was later approved by the concerned River Commissions with slight modifications The programme included the balance work left over from the previous year's programme as well as further work proposed for the current year The progress achieved so far in respect of the flood control surveys being carried out by Survey of India Department for the years 1954 55 and 1955-56 *vis-a-vis* the programme laid down for these years is detailed below —

Brahmaputra Basin

Particulars of work	Season	W Bengal & Bhutan		Assam	
		Programme	Progress	Programme	Progress
2' Aerial photography by Air Survey Co of India (in sq miles)	1954 55	3 684	3,404	15 711	15,646
	1955 56			1 700	1 700
2 Semi controlled photo-mosaics (in sq miles)	1954 55	3 800	3 522	17 800	9 909
	1955 56			1 650	
<i>Field Levelling —</i>					
(a) Secondary levelling (in linear miles)	1954 55	313	313	448	448
	1955 56			523	523
(b) Tertiary levelling (in sq miles)	1954-55	1,470	1,425	3,800	3 589
	1955 56			1 930	1,927

Ganga Basin

Particulars of work	Season	Uttar Pradesh		Bihar and Nepal		West Bengal	
		Programme	Progress	Programme	Progress	Programme	Progress
2 Aerial photography by Air Survey Co of India (in sq miles)	1954 55	7 020	7,020	7 535	7 520	330	320
	1955 56	3 550	3 550	350	350	125	125
a Semi-controlled photomosaics (in sq miles)	1954 55	8 560	7 656	12,500	10,155	400	400
	1955 56	3 550	1,303	350	350		
<i>Field Levelling —</i>							
(a) Secondary levelling (in linear miles)	1954 55			401	401		
	1955 56	157	157	657	657		
(b) Tertiary levelling (in sq miles)	1954 55			3 420	3,250	30	30
	1955 56	1 245	1,245	4 505	3 570		

North West Rivers Basins

Particulars of work	Season	Punjab		Pepsu		Jammu & Kashmir	
		Programme	Progress	Programme	Progress	Programme	Progress
						Over 500	Completed by IAF on 1/25000 Scale
2' Aerial photography by Air Survey Co of India (in sq miles)	1954 55						
	1955-56	1,370	1,370	360	360		
2" Semi controlled photomosaics]	1954 55						
	1955 56	1 050	741	390	390		
Field Levelling							
(a) Secondary levelling (Linear miles)	1954 55						
	1955 56	209	209	69	69	198	198
(b) Tertiary levelling (sq miles)	1954 55						
	1955 56	925	798	291	291	445	

1.43

In addition to the progress tabulated above, photography of about 1175 sq miles in Orissa has been completed during 1955 56 as per programme. About 170 sq miles of repetition photography of the course of the Brahmaputra river in Palasbari area has also been completed this year. The Survey of India Department have also carried out planimetric control for the preparation of 4"=1 mile maps of Wular Lake and Upper Jhelum Basin areas. The progress of flood control Surveys completed by the Survey of India Department during the last two years can be summed up as under

1 2 *Aerial photography*—Area to the extent of 43,040 sq miles has been covered against the target figure of 43,410 sq miles for the years 1954 55 & 1955 56

2 *Preparation of Photomosaics*—Photomosaics were planned to be prepared for an area of about 50 050 sq miles out of which the area covered during the last two years is 34 426 sq miles

3 *Field Levelling*—Field levelling programmed to be completed during the last and the current year involves secondary levelling operations extending to about 2975 linear miles and the tertiary levelling network covering approximately 18061 sq miles. While secondary levelling has been done in its entirety the upto-date progress in respect of tertiary levelling is 16 128 sq miles

(II) Surveys by C W & P C

Assam has a network of rivers running into Brahmaputra from their hilly catchments on either banks flooding extensive areas in the valley. Practically whole river system there is being surveyed by C W & P C. This comprises topographical surveys covering about 450 miles of Brahmaputra and 1719 miles on 41 of its tributaries. The work of topographical surveys was commenced in January 1955. These include (a) double levelling along the banks of the rivers (b) cross sections one mile apart and (c) longitudinal sections of the rivers. The progress on the surveys up to the end of June 1955 has been as detailed below —

		Programme	Progress
(a) <i>Main Brahmaputra</i>			
Single levelling —	Longitudinal sections	450 miles	29 miles
	Cross-sections	4500	301
(b) <i>Tributaries</i>			
Single levelling —	Longitudinal sections	1719	1979
	Cross-sections	1719	2192
Double levelling —		1719	2027

(III) Surveys by the States**Assam**

The progress on river surveys undertaken by the State is as follows

		Programme	Progress
Double Levelling along Brahmaputra		915	549
Tributaries	13 Nos	754	299
Barak & its tributaries		220	113

W Bengal

Bank survey	219 miles completed
Cross Sections	220 Nos

Bihar

Longitudinal Sections	1441 miles	1138 miles
Cross sections	16292 miles	1329 miles

In addition 519 miles of river surveys along January, Dhauri, Dhanauti Adhwara and other remaining channels have been completed

Uttar Pradesh

	Programme	Progress
Longitudinal sections	118 miles	102 miles
Cross-sections	1922 "	421 "

1073 miles of spot levelling in the Ghaghra, Rapti and Ganga Basins has also been completed. Surveys have also been done in Nepal over an area of 300 sq miles

B INVESTIGATIONS**(I) INVESTIGATIONS BY C W & P C**

The floods in the Himalayan rivers flowing through Assam and West Bengal are due to heavy rainfall in Bhutan and other neighbouring Himalayan countries. In order to devise suitable measures to secure relief from floods it was decided to collect basic river and rainfall data in the catchment areas of some of the rivers flowing through Bhutan before entering into the Indian territory. It was necessary to secure co-operation of the Bhutan Government before this work could be undertaken. Accordingly a meeting between the representatives of Bhutan Government and the Government of India was arranged towards the end of April 1955 when a programme of the work to be done in Bhutan was drawn up. The programme was divided into three phases as under —

Phase I—Collection of rainfall and river data and transmission of advance intimation about the approach of the floods so that bordering areas in Assam and West Bengal could take timely action to prevent heavy losses to life and property

Phase II—Collection of data regarding the volume of water carried by the rivers and their silt content etc, for the purpose of locating zones of excessive soil erosion. Aerial surveys were also planned to be started in this phase

Phase III—Continuation of aerial surveys to completion and also supplementing these surveys by ground visits for locating areas of potential land-slides, presence of gullies, etc with the object of formulating soil conservation schemes. Investigations for flood detention basins etc were also proposed to be carried out in the third and final phase

In accordance with the above phased programme, the details of the work to be done before the monsoon of 1955 were drawn up and the West Bengal Government was requested to depute the personnel required to man the various hydrological and meteorological stations in Bhutan. The work done in Bhutan before the 1955 monsoon is given below —

	<i>No of stations programmed to be installed</i>	<i>No of stations actually installed</i>
(i) Installation of wireless stations	6	6
(ii) „ „ rain gauge stations	10	10
(iii) „ „ river gauge stations	6	6

It has not been possible, due to shortage of technical personnel willing to work in Bhutan to implement fully the programme drawn up for the pre-1956 monsoon season. The details of the work being done this year are given below —

	<i>No of stations programmed to be installed</i>	<i>No of stations being installed</i>
(i) Installation of wireless stations	2	2
(ii) „ rain gauge stations	10	6
(iii) „ river gauge stations	4	3
(iv) „ discharge and silt observation sites	7	Nil

The difficulty due to shortage of staff is being overcome by imparting training to seven Bhutanese boys in the overseers course. They will ultimately man the discharge and silt observation sites in Bhutan. Twelve Bhutanese nationals who are being trained as wireless operators cum-mechanics who will take over from Indian personnel after the completion of their training.

Arrangements are being made to start aerial photography in the catchment areas of the rivers in Bhutan.

Four Circles have been opened under the administration of C W & P Commission, viz Assam Investigation Circle, Ganga Basin Circle, Central India & Deccan Rivers Circle and Investigation Circle to take up investigations in the States where adequate machinery for collection of data does not exist. These

Investigation Circles are further responsible for collating and analysing the data collected by the States and for supplementing the same wherever necessary to prepare basin-wise reports.

Scope and extent of investigations by C.W. & P. Commission organisations in the various States is reviewed below:—

1. Assam Investigation Circle

(States of Assam, Manipur & Tripura)

The investigations being under taken by C.W. & P.C. in Assam comprise hydrological and silt observations on the Brahmaputra and its 53 tributaries and preliminary reconnaissance for selection of suitable sites for storage and detention reservoirs in the valley.

The hydrological data of the Brahmaputra and Barak rivers including their tributaries are being collected by taking regular observations at gauge and discharge sites established on these rivers. In addition to these observations silt data is also being collected.

The progress on above surveys up to June, 1956, has been as detailed below:—

(i) Main Brahmaputra River

(a) Hydrological observation	Programme	Progress
(i) Discharge site	3	2
(ii) Gauge sites	6	6
(iii) Silt sites	3	1

Tributaries :

(a) Hydrological observations on 53 tributaries

(i) Discharge sites	53	49
(ii) Gauge sites	158	135
(iii) Silt sites	35	32

A. Kopilli Basin.

(i) *Kopilli River*: A dam site was tentatively selected near Umkyrpong and a preliminary reconnaissance report prepared. Finally as a result of further investigations a canyon site downstream of the original site was finally selected for detailed investigations. These investigations are expected to be completed by 1958.

(ii) *Diyung River*: Preliminary investigations of a tentative dam site selected were carried out but the site was rejected by the Geologist. Later on the river was reconneitered again and a few more sites selected which have been inspected by the Geologist.

(iii) *Killing River* Preliminary investigations for a dam site selected on this river were carried out Further sub surface explorations are in progress

(iv) *Borpani Rwer* Preliminary reconnaissance surveys for the dam site have been carried out The Geologist has also inspected the site

B Dihing Basin

(1) *Nao Dihing River* Preliminary report in respect of the proposed dam site at Miao has been prepared and is under examination

(ii) *Burhi Dihing and its Tributaries viz, Namphuk, Namchik and Tirap* Geological investigations of tentative dam site on Namphuk and Namchik have been completed Preliminary investigations at these sites will be started shortly

C Barak Basin

Geological inspection of the proposed dam site near Maniadhar on Barak river has been completed and sub surface explorations are in progress on the recommendations of the Geologist

D Subansiri Basin

Preliminary Geological inspection of the dam site proposed at Dolungmuk has been completed The site appears satisfactory but as the area lies in the Seismic Zones the Geologist has sounded a note of warning against the construction of high dams in this area

In addition to the above, Geological investigations have been carried out for the proposed dam sites on Lohit Dehang Debang and Jai Bhorelli rivers

Investigations are also in progress in Tripura State for preparing schemes for flood erosion control of rivers in the State Gauge observations are in progress on 6 rivers and discharge and silt observations on 5 of them. Investigations of Gumti and Khowai rivers schemes have also been taken up in hand.

2 Ganga Basin Circle

The Circle deals with the problems of the Ganga Basin and is primarily devoted to the work of coordination in the collection of data between the Centre and the States of U.P, Bihar and West Bengal. In addition it carries out the analysis of the data so collected for the preparation of basin wise reports

3 *Central India and Deccan Rivers Circle*

This Circle carries out work similar to that of the Ganga Basin Circle, in respect of the River Basins of Krishna and Pennar Godavari Tapti and Narbada including their tributaries. The Basin wise reports of Girna and Waghur and Purna in Tapti Basin Manjra in Godavari Basin and Musi in Krishna Basin have already been prepared. The hydrological observations on Godavari in Madhya Pradesh and silt observations on 42 discharge sites in the jurisdiction of this Circle are proposed to be taken up. Discharge observations at six sites and silt observations at four sites are already in progress.

4 *Investigation Circle*

This Circle carries out liaison work for the States of Jammu and Kashmir Punjab and Pepsu. These States are being given all technical assistance in the matter of surveys investigations, planning and execution of flood control schemes. Some small storage schemes in Jammu and Kashmir are being investigated by the Circle.

Investigation for River Valley Projects in Bhopal and Vindhya Pradesh are also being carried out by this Circle.

(II) INVESTIGATIONS BY THE STATES

Andhra

Collection of data and other investigations in respect of many schemes (including the Budameru Reservoir) to be undertaken have already been completed. Detailed investigations for the construction of a dam on the Godavari at Ippur and for a reservoir across the Bodderuggedda near Godigummi and two reservoirs across the Tandava near Gantavari Kathagudam and Rekhavani Palem have been completed. Detailed investigations for the Raivada Reservoir Scheme on the Sarda river, Kalyana Pulova Reservoir Scheme on the Varaha river and a reservoir across the Yerrakalva near Appalarajagudem have been in progress.

Bihar

In Bihar collection of necessary data in respect of the Bagmati, the Kamla and the Burhi Gandak have been in progress.

Surveys of two diversion cuts for the Burhi Gandak and of Shanti Nala (a spill channel of the Bagmati) have been undertaken. Survey of Harha Nala upto 38½ miles has been completed.

Village survey of the Kosi below Jhamta between the Kosi embankment and the Bagmati upto Mansi Saharsa Railway line has been completed. Contour survey of the Bagmati Basin from Dheng to Hayaghat has been completed. Regime survey of the Kamla Balan from Jhanjharpur Railway bridge upto Bhakua has been done to ascertain the extension of the channel in 1955. In respect of the Kamla, through the Balan, survey work is being done.

Geological inspection of the possible dam sites in the upper regions of the Bagmati and the Kamla, in Nepal, has been done. Survey work for dam sites in Nepal territory on the Bagmati has been completed. Surveys in the Chisapani Gorge (in Nepal) for the proposed reservoir on the Kamla are in hand. Possibilities of storage reservoirs on the tributaries of the Burhi Gandak are also being investigated.

Jammu and Kashmir

Investigations for the second phase of the Kashmir Valley flood protection scheme are in progress.

Cross sections of the Jhelum from Sangam to Padshahi Bagh (a distance of 48 miles) has been taken up by the State in February, 1956.

The survey of the river from Sopore to Khandyar has been completed and sections prepared.

Orissa

Investigations for the proposed multi-purpose dams across the Baitarani (at Bhimkund) and the Salandi rivers have been undertaken. Similar investigations are proposed for controlling floods in the Brahmani.

Punjab

Surveys have been carried out for specific protective and training works including those for *choes* that are responsible for a good deal of damage in the State. Detailed survey of the tract lying between the Ravi and Naumni *Nallah* near Kamla Kaunta, contour survey of area under *Choes* in Hoshiarpur district and detailed surveys for protecting Indora town from the erosive action of Beas river were done.

Last year (1955) there was extensive damage on account of water-logging in many parts of the State. Necessary investigations to formulate adequate drainage system in the areas have been taken up. Final investigations for Sehna drain (18 miles long) and Wadhni drain (31 miles long) are completed.

Pepsu

Surveys of the proposed protection bund along the left bank of Beas river from Tahili to Alukalan has been completed. Surveys in connection with the proposals for the diversion of the channel for Patiala Nadi has also been completed and survey work for the construction of a protection bund along the right bank of Tangri Nadi in PEPSU for the protection of the area proposed to be irrigated by Bakhra has been completed.

Tripura

The work of investigations in this State has been entrusted to Assam Investigation Circle (C W & P C). Gauges have been fixed and gauge observations are being made on the rivers Gumti, Haora, Khowai, Manu, Deo and Ghoramarachara while discharge observations are being made on the former five. Surveys for specific schemes such as protection works for Agartala, Durgapur, Amarpur, Sonamura and reclamation of areas of Sukhsagar, Rudrasagar and Khowra Beels have been conducted. Investigations for the Gumti and the Khowai Dam Projects have also been undertaken.

Uttar Pradesh

The chief flood affected areas in Uttar Pradesh lie in the Ghaghra basin. Surveys and investigations for the Ghagra, the Rapti and their tributaries and also for River Ganga and its tributaries for construction of marginal bunds have been mostly completed. Spot-levelling in this connection has been done for 1,073 miles. Surveys have been undertaken in Ghagra, Rapti and Ganga basins also for investigation of marooned villages, which require raising.

Hydrological surveys in relation to the longitudinal and bed slopes and the flow of cold weather stream, pertaining to the Ghagra and the Rapti and their tributaries have been in hand.

Investigations in the basins of rivers like the Gomti and the Sai whose special problems came to light during last year's (i.e., 1955) floods, have been taken up. Extensive surveys have also been carried out for improvement of drainage.

In addition, about 550 square miles have been surveyed for location of flood detention reservoir sites on the tributaries of the Rapti. Besides this, survey parties were sent to Nepal for location

of possible sites. They have located one site on the main river (i.e. the Rapti) at Jalkundi. An area of 150 sq miles has been spot-levelled in this connection and a skeleton project of multi-purpose nature, has been prepared.

West Bengal

Most of the survey and investigation work done has been in respect of the short term flood protection measures already undertaken or proposed to be undertaken. Investigations for the proposed barrage on river Karala (in connection with Jalpaiguri Town Protection Scheme) are in progress. Survey of river Jaldhaka for the scheme of protecting Ramshai-Managuri area has been done, further investigations are being taken up. Survey and investigation of river Diana was done for formulating a scheme for protecting the areas in Dhuguri Thana from inundation.

Investigations for long term schemes for soil conservation (including construction of check dams etc), have been undertaken. The reconnaissance surveys have been done in the upper catchments of the tributaries (namely Leesh, Ghish, Chel Noora and Relh) of the river Teesta lying within the district of Darjeeling and of the Teesta in Upper Sikkim. Reconnaissance survey has also been made in the valley of the River Great Rangit. Detailed surveys of the hill catchments of the rivers Great Rangit, Lish Ghish and Chel have been taken up.

APPENDIX II

(*vide para 2(B)* of part 1 of the Statement)

PROGRESS OF FLOOD CONTROL WORKS UNDERTAKEN BY THE STATES

State-wise Review

ANDHRA

1954-55 Working Season

No major flood protection scheme was carried out during 1954-55 working season

Floods of 1955

There were no high floods in this State during 1955

1955 56 Working Season

During this working season the state started work on "Diversion of half the flood discharge of the Budameru river into Krishna" The progress so far made is about 15 per cent which is below target for the season 4 more major schemes have been prepared by the State on the basis of previous experience of floods These are expected to be taken up during the next working season

ASSAM

1954 55 Working Season

As a result of 1954 and earlier floods three major schemes for protection of Dibrugarh, protection of Palasbari town and for construction of embankment from Silghat to Dihing were prepared and taken up for execution Minor schemes for protection of Sualkochi, Goalpara, Bamundi towns etc were also taken up Besides there were several other minor schemes of embankments along Brahmaputra, Barak, and their tributaries which were already under execution by the State authorities themselves before the present flood organization was set up The progress on town protection schemes was almost according to the targets fixed for the season of 1954-55

1955 Floods

In 1955 Water level in Brahmaputra was higher than ever before but due to construction of flood protection works in the previous season, damages during 1955 were comparatively less i.e., Rs 1 70 crores against Rs 3 43 crores in 1954.

1955-56 Working Season

During this working season 250 miles of embankment along Brahmaputra, Barak and its tributaries were completed. Uptil now 1150 miles of embankments have been constructed.

In some cases raising and strengthening of the old dykes was also considered necessary and this work was taken up during this season. Progress on most of the works had been satisfactory and targets were achieved.

There were some damages to the temporary protection works at Palasbari during 1955 floods. But since it was already decided to shift the town to a safer place so no further work was carried out over there.

During 1955 floods it was noticed that Dibrugarh town suffered from defective natural drainage for draining rain water and the water which overflowed the banks. Earthen dykes 6 miles and drains 14 miles long and additional two stone spurs and 5 permeable spurs were constructed at Dibrugarh.

BIHAR*1954-55 Working Season*

North Bihar has always been suffering from floods. The main rivers causing damage are Kosi, Kamla Bagmati, Burhi Gandak and Gandak. About 30 lakh acres of area was inundated in 1954. As a result of these floods an overall programme of flood protection works was drawn up by the State. Schemes of highest priority, embankment along Kosi, embankment along Burhi Gandak (in worst reaches), old Bagmati and repairing of the old embankments on Ghagra were taken up during 1954-55 working season.

In all 12 major schemes at an estimated cost of Rs 337 crores and 8 minor schemes costing Rs 2436 lakhs were taken up. In seven major schemes the targets fixed for the season were nearly achieved whereas for remaining five schemes the progress was below the target. The 8 minor schemes were however almost completed to the target. Four of the minor schemes were of town protection.

Floods of 1955

During 1955, there were heavy rains and large areas were inundated but the extent of damage was 21 62 crores of rupees against 50 crores in 1954. This decrease was partly due to works already completed in the last working season

1955-56 Working Season

During this Season 18 major and 10 minor schemes were taken up. Progress on five major schemes is quite upto the target whereas for the remaining schemes is below target. For minor schemes, five have already been completed and progress on others is satisfactory. 1955 floods showed that the protection of Samastipur and adjoining area was of a very high priority. Consequently embankment in the reach Angaraghat and Pusa along Burhi Gandak was started and completed to reduced target during this working season

Similarly it was found that Kamla is making rapid avulsion into Balan and the situation was expected to become serious unless immediate action was taken. A scheme at a cost of Rs 306 lakhs consisting of embankment along Kamla upto Jhanjarpur and a weir near Jamnagar was prepared. Work on this scheme was also started. 21 miles of embankment have already been completed to reduced section. During 1954 floods Bagmati water started going through Sugia Pardeshia channel with increased discharge. This meant likelihood of change in the course of Burhi Gandak. Although some permeable spurs were put in during 1954-55 to stop this development but there were breaches in these during 1955. This year efforts were made by closing these channels by earthen bunds. These bunds have been noticed to be effective but there may be some developments when higher floods occur this flood season.

The main works undertaken this year as a result of 1955 floods in the State can be briefly given as below

- 1 Embankment on right bank of Burhi Gandak from Angaraghat to Pusa.
- 2 Embankment from Angaraghat to point opposite Pusa along left bank of Burhi Gandak.
- 3 Embankment along left bank of Burhi Gandak from a point opposite Pusa to Bachauli.
- 4 Kamla Balan embankment.

DELHI

1954-55 Working Season

No work was taken up during this year But 5 schemes at a total cost of Rs 25 68 lakhs were prepared during this year Out of the above only Protection of Shahdara and adjoining villages costing Rs 17 02 lakhs was a major scheme

Floods of 1955

During 1955 monsoon, the Jamuna rose very high and was 5 feet above the danger level at the Railway Bridge and 1 ft lower than the highest ever recorded (1924) As a result large amount of area on the Shahdara side and out skirts of Delhi were submerged

1955-56 Working Season

Work on the Shahdara embankment along with the other 4 minor schemes was taken up and is nearly completed

The following works were started as a result of 1955 floods

Sl No	Name of the scheme	Estimated cost (Rs)
<i>Major Scheme</i>		
1	Construction of spurs and revetment on right bank of river Jamuna from Power House (Delhi Gate) to Nallah No 12	12 73 775
<i>Minor Schemes</i>		
1	Raising of bund along Jumna river from Nallah No 12 to No 14	24 150
2	Providing needle regulator for the outfall of the Inderprastha drain below National Highway Bridge	8 000
3	Providing needle regulator on Nallah No 14	2,450
4	Providing needle regulator on the city ditch Nallah	3,450
5	Raising of Railway siding bund	2,46 375
6	Raising banks of Nallah No 12	73 037
7	Raising of Power House Bund	60 370

The work on these schemes is in progress though they were scheduled to be completed before the flood season of 1956

JAMMU & KASHMIR

1954-55 Working Season

As a result of previous floods and that of 1954 one major scheme in Kashmir valley costing about Rs 100 lakhs 'Enlarging and

Excavating supplementary channel from Padshahi Bagh to Wular lake and constructing marginal bunds along river Jhelum and its tributaries was taken up in the working season of 1954-55. The progress was only about 50 per cent of the target for the season. Area which is expected to be benefited from this scheme is 60 000 acres.

1955 Floods

There were high floods in 1955 in river Jhelum. The work as formulated in 1954 which formed Phase I of Jhelum Protection Work, was still considered adequate. Some investigations, however, were carried out for finding out reservoir sites on the tributaries of river Jhelum. Results of these investigations are still awaited.

Similarly detailed investigations are going on in Jammu Province for flood protection works.

ORISSA

1954-55 Working Season

There were 120 minor schemes in progress. These schemes were mostly for repairing and strengthening existing embankments. The progress of these was below the target fixed for the season.

Floods of 1955

There was heavy rainfall in the upper catchments of the rivers and in coastal areas. The rivers were in spate. Vast amount of area near sea coast was submerged due to rain water and bank overflow from rivers. Number of works were damaged. Several villages were submerged. Programme were drawn out for carrying out works in the affected areas.

1955-56 Working Season

During this season the minor schemes which were taken up in the last season were continued. The progress on these was about 25 per cent of the target.

As a result of 1955 floods the following works were started —

- 1 Repairing the damaged minor works
- 2 Closing of breach of Machgoan canal at Dalaighai.
- 3 Construction of spurs at Dalaighai

Progress on these works during the season was only 60 per cent of the target.

Detailed estimates were prepared for 57 minor schemes estimated to cost 57.96 lakhs for construction of new embankments, improvement of existing embankments and other protective works.

PEPSU

1954-55 Working Season

No flood protection work was carried out during 1954-55 working season

Floods of 1955

In 1955 there was a heavy rainfall in Pepsu. The drainage of the country was found very defective and vast amount of area was submerged.

1955-56 Working Season

The Pepsu Government prepared 6 minor schemes costing about Rs 115 lakhs. They were programmed to be completed during 1955-56. But the progress so far made is 60 per cent only. Also construction of a bund along the Ghager river and raising and widening of the Dhakansu and Pachisdara bunds were taken up.

As a result of 1955 floods, the State had carried out surveys for 2 major schemes for providing flood protection works for Beas and Patiala Nadi.

PUNJAB

1954-55 Working Season

There was no major scheme carried out during this working season. However, 8 minor schemes at an estimated cost of Rs 31.76 lakhs were taken up. About 60 per cent of the work was completed in this working season though they were programmed to be completed during that season.

Floods of 1955

During 1955, heavy rains occurred in whole of the Punjab and there were heavy damages to works, crops, houses, cattle and even to human life.

1955-56 Working Season

* The programme of the year was to complete 8 schemes of the previous year, repair works damaged during 1955 flood and prepare schemes on the experience of 1955 floods. The State authorities remained busy in carrying out these repairs and constructing cross drainage works. Some surveys were also carried out for preparing the flood protection schemes.

(b and c) The following schemes were prepared by the Punjab State as a result of 1955 floods but could not be started

Sl No	Name of the scheme	Estimated cost (Rs in lakhs)
<i>Major Schemes</i>		
1	Construction of dam on January-di khad	14 25
2	Canalising Kasur Nallah	70 00
3	Drainage schemes in Eastern canal	16 96
<i>Minor Schemes</i>		
1	Constructing armoured spur near Sikandri Sub-minor of Mauzam minor opposite Fazilka	8 00
2	Constructing flood protection embankment along right bank of river Beas	6 00
3	Additional cross drainage works on Bist Doab Canal System	9 00
4	Improving outfall of drainage works syphon in tail reach of Jullundur Branch	3 70
5	Excavating cunnette D/S of Adampur Air field embankment, raising and strengthening embankment along Nasraia Choe and making high level boundary Section in Adampur Air field bund	5 20
6	Remodelling Nai Nallah Drain (Karna Division) ¹	1 02
7	Remodelling New Sardana drain	0 13
8	Constructing drain No G to P	2 88
9	Debeta drain	3 05
10	Karnand drain	0 32
11	East or white Bein reconditioning	5 00
12	Constructing Sehna Drain	2 25
13	Constructing Wadhni drain	4 65
14	Adding bays to 7 V R. Bridge on Budha Nalla	0 30
15	Talwandi Naipalan Drain	5 10
TOTAL		157 81

SAURASHTRA.

1954-55 Working Season

No major flood protection work was carried out by the State during 1954-55

Floods of 1955

There were no heavy floods in this State during 1955

1955-56 Working Season

On the basis of the experience of previous floods the State prepared 107 minor schemes costing Rs 56.1 lakhs. On these works carried out so far amount to Rs 12 lakhs. The schemes are expected to be completed during the next working season i.e. 1956-57.

UTTAR PRADESH

1954-55 Working Season

During the past years, north eastern districts of UP used to suffer from floods in river Ghagra, Rapti, Gandak and also Ganga. In 1954-55 working season five major schemes each costing more than Rs. 10 lakhs total costing 183.16 lakhs and 12 minor schemes total costing Rs 48.65 lakhs were taken up. The progress achieved on these schemes was according to the targets fixed. None of the schemes were completed. Out of these five schemes, one was for protection of Banaras Ghats on the Ganga and the other was for raising 300 villages. The other three were for providing embankment along the river Gandak, Ganga and Ghagra respectively. The minor schemes were mainly for providing bunds along Choti Sarai, Rohin and Rapti. About 2.72 lakhs acres of areas were expected to be benefited on the completion of the embankment schemes.

Floods of 1955

During 1955 there were heavy rains in the plains. Consequently small rivers like Gomti, Tons and Sai were in spate. Water overflowed their banks and submerged vast areas. The drainage of the country was found very defective and water remained standing for long time. A large number of villages were marooned. Schemes were therefore drawn up for raising the marooned villages above the flood level, and also improving the drainages of the country. On the basis of behaviour of Gandak river during the floods further extension of Chautani bund on either side and further protection works of the old Chautani bund by means of spurs was found necessary. Model experiments were also carried out at UP Irrigation Research Station for this work.

1955-56 Working Season

The five major schemes which were commenced in working season of 1954-55 were continued and in addition seven more new schemes were taken up. Two of these schemes were completed this year. In the case of one other, the target fixed was achieved whereas for the rest the targets were not achieved. Four of the new schemes consisted of constructing bunds along river Ghagra and remaining three were for raising 2770 villages in Ballia Baria.

and other Eastern districts The progress on the embankment schemes was about 50 per cent of the target As regards raising of villages, 85 villages were raised against programme of 155 Out of the 25 minor schemes, 12 were completed and the remaining were in progress

The area expected to be benefited from the new embankment schemes was about 4 lakh acres thus bringing the total for works in progress to 7 2 lakhs of acres

On Rapti and its tributaries further investigations have been made 14 reservoir schemes have been prepared. Details of these schemes are being worked out Most outstanding of these schemes is Jalkhudi costing about Rs 1400 lakhs This appears to be very attractive scheme In addition to flood protection it provides for irrigation of 5 0 lakhs acres and 27000 k.w power

The following works were started as a result of 1955 floods —

- 1 Raising of 2500 villages in Eastern Districts of U.P
- 2 Extension of Chautani bund towards north (minor works)
- 3 Extension of Chautani bund towards south (minor work)
4. Protection of marooned villages along Ghagra and the Ganga in Azamgarh and Ballia districts (270 Nos)

In addition to above survey work is going on in the catchment area of the Tons and other small rivers for ascertaining the necessary flood protection works

Three major drainage schemes namely Kadrabad Kairon Nadi and Ikhu drain were prepared as a result of 1955 flood but were not started during 1955-56

WEST BENGAL

1954-55 Working Season

During 1954-55 protection works for i.e Jalpaiguri Cooch Behar Alipurduar and Mathabhanga towns at an estimated cost of about 161 lakhs were undertaken In addition to these another major work of embankment in Barnes Domohani costing about Rs 14 74 lakhs was taken up to protect 32000 acres of land Besides two minor schemes for protection of Siliguri town and Phansideva village were undertaken The progress on all these was almost to the target fixed for the season.

1955 Floods

The floods in 1955 were not as high as of 1954. The Barnes Domohani Embankment constructed during 1954-55 was, however breached.

1955-56 Working Season.

Works which were started during last season were continued and were completed. In addition to these five major schemes of last year, one more major scheme for protecting "Alipurduas town below the Railway Bridge" was taken up. Besides the above major schemes 8 minor town protection works were taken up.

The progress during this working season was almost to the targets fixed of the season.

As a result of the 1955 floods the Barnes Domohan which was breached was repaired and modified scheme was carried out.

APPENDIX II—contd

ANDHRA

Progress of Works taken up during 1955-56 (working season)

Sl No	Name of Scheme	Estimated cost in rupees lakhs	Area to be benefited in acres	Total estimated quantity of work	Target of work for the working season	Progress to the end of working season	Percentage ¹ progress to the target	Remarks Whether continued in 1956-57
1	2	3	4	5	6	7	8	9
A. Major Schemes costing more than 10 lakhs each.								
1	Diversion of half the flood discharge of Budameru into Krishna river	33.81	No details available, 15% work has been completed					Yes
B. Minor Schemes costing less than Rs 10 lakhs each.								
2	Minor Schemes costing Rs. 12.32 lakhs—Progress not available		—Nil—					Yes

APPENDIX II—contd.

ASSAM

Progress of Works taken up during 1954-55 working season

Sl No	Name of Scheme	Estimated cost in rupees lakhs	Area to be benefited in acres	Total estimated quantity of work	Target of work for the working season	Progress to the end of working season of the target	Percentage Progress of the target to season col. 7 to 9	Remarks Whether continued in 1955-56
1	2	3	4	5	6	7	8	9
A Major Schemes costing more than Rs 10 lakhs each								
1	Dibrugarh Protection Works	160	Dibrugarh Town protection	5 stone spurs & 21 timber spurs and re-vestment	100%	Complete	100	Further protection works are to be undertaken
2	Palasbari Town Protection Works	12.25	Palasbari Town protection	(a) Temporary Protection and (b) construction of bund behind the town	100%	Complete	100	To be taken in 1955-56
3	Construction of an embankment from Silghat to Dhung	41.85	75,000 acres	5,80,000 lakhs cu ft	100%	415 lakhs cft	72	Scheme continued in 1955-56
	Total	214.10						

B Schemes costing less than Rs 10 lakhs each

Four town protection and 12 Embankment Schemes were taken up at an estimated cost of Rs 39.79 lakhs [Of these two town protection schemes were completed and two were partly completed. The embankment schemes are in progress.]

APPENDIX II—contd

ASSAM

Progress of Works taken up during 1955-56 Working Season

Sl. No	Name of Scheme	Estimated cost in Rs lakhs	Area to be benefitted in acres	Total estimated quantity of Work	Target for the working season	Progress during working season	Percentage of Target for the season	Up-to-date		Remarks Whether to be continued during 1956-57	
								Progress of work done	Percentage of total estimated quantity		
1	2	3	4	5	6	7	8	9	10	11	
A Major schemes costing more than Rs 10 lakhs each											
1	Dibrugarh Works	Protection	259 8	Dibrugarh town	(a) Impermeable spurs 13 50 lacks cft	13 5 lakh cft	10 10 lakh cft	74 9	10 1 lakhs cft	74 9	Phase I was completed during 1954-55
					(b) Permeable spurs (Driving of piles) 585 Nos	585 Nos	585 Nos	100	585 Nos	100	Progress on Phase II is shown in this Statement
					(c) Construction of dyke—91 34 Earthwork	91 34 lakh cft	93 9 lakh cft	103 2	93 9 lakh cft	103 3	
					(d) Construction of drains—Earthwork 130 83	130 86 lakh cft	111 35 lakh cft	88 7	111 35	88 7	

1	2	3	4	5	6	7	8	9	10	11
2	Construction of a dyke from Silghat to Dhing	41 85	Culturable land	(a) Earthwork 58 00 lakh cft	165 00	132 0	80	547 0 lakh cft	97	To be continued in 1956-57
				(b) Turfing 105 33 lakh sft	105 33	Nil	Nil	Nil	Nil	
				(c) Const of single Bamboo Muhri 1000 rft	1000 rft	Nil	Nil	Nil	Nil	
				(d) Timber bridge 200 rft	200 rft	Nil	Nil	Nil	Nil	
				(e) Collection of stone metal 36800 cft	36800 cft	Nil	Nil	Nil	Nil	

3 Palasbari town protection A bund behind the town was taken up in 1955 56 Details of progress etc , not yet available

B Minor schemes costing less than Rs 10 lakhs each

(1) Ten town protection works costing less than Rs 10 lakhs each were taken up for total estimated cost of Rs 43 07 lakhs Out of these 2 town protection works, Sual Kuchu and Bamundi protection works were completed during 1954 55 working season

(2) A number of embankments on the Brahmaputra and other rivers and drainage schemes have been under execution About 1150 miles of embankments were constructed during the 1st Plan period out of which 250 miles were constructed during 1955 56 For 1955 56 the State Flood Control Board has approved 36 embankment schemes costing less than Rs 10 lakhs, out of which 22 schemes cost Rs 109 77 lakhs

APPENDIX II—*contd*
 BIHAR (NORTH) (EXCLUDING KOSI)
 Progress of Works for 1954-55 Working Season

Sl No	Name of Scheme	Estimated cost in lakhs of rupees	Area to be benefited in acres	Total Estimated quantity of earth-work in lakhs cft.	Target of work for the working season in lakhs cft.	Progress to end of working season	% of Target to the season	Remarks Whether included in 1955-56
1	2	3	4	5	6	7	8	9
<i>A Major schemes costing more than Rs 10 lakhs each</i>								
1	Embankments on the Burhi Gandak							
	(a) Along Right bank from Akharaghat (Muzaffarpur) to Darbhanga district boundary (Muzaffarpur district)	35 97	2 51 620	539 7	539 7	438 0	81 2	Yes
	(b) Along left bank from Rosera to Parihara (Darbhanga and Monghyr Distt.)	66 08	1 12 600	1111 9	947	917 0	97	Yes
	(c) Along right bank from Rosera to Nima (Darbhanga and Monghyr districts)	61 32	1,02,400	1046 4	950	758 0	79 5	Yes
2	Embankment on the old Bagmau and the Burhi Gandak from Hathauri to Rosera.	43 54	36,000	830 4	500	486 0	97 3	Yes.

1	2	3	4	5	6	7	8	9
3	Kirohi Scheme Desilting & forming embankments on Kirohi river (Darbhanga and Muzaffarpur Districts)	50 43	68 500	731 3	731 3	62 1	8 5	Yes
4	Embankment from confluence of Mahi with the Ganga up to the end of 8 No bund with river Mahi, in Saran district	16 35		278 1	278 1	15 6	5 6	Yes
5	Repairing and strengthening bunds (7 Nos) along the Gogra (Called the Ghaghra in U P) river in Saran District.	19 46	14 000	389 7	211	137 0	65	Yes
6	Improvement of Kharika bund on the right bank of the Burhi Gandak	10 47		169	80	76 8	96	Yes
7	Rosera Angarghat embankment on the Right bank of the Burhi Gandak	18 01		324 3	200	198 0	99 2	Yes
8	Balan river embankment	24 91		411 3	230	126 5	55	Yes
9	Bainty river embankment	16 62		250 4	139	84 0	60 4	Yes
10	Embankment on the right bank of the Burhi Gandak from Darbhanga district border to Pusa	10 08		187 5	36	29 4	81 7	Yes
	TOTAL	373 24						

B Minor schemes costing less than Rs 10 lakhs each

8 Minor schemes costing Rs 24.36 lakhs were taken up, out of which 4 were embankment schemes and 4 were town protection works

4 schemes have been completed and progress on others was near the targets

APPENDIX II—contd

BIHAR (NORTH) (EXCLUDING KOSI)

Progress of Works for 1955-56 Working Season

Serial No	Name of Scheme	Estimated cost in lakhs of Rs	Area to be benefited in acres	Total estimated quantity of Earth work crores cft	Target for the working season crores cft	Progress during working season crores cft	Percentage of Target to the season	Up-to-date		Remarks whether to be continued during 1956-67
								Progress of work done crores cft	Percentage of total estimated quantity	
1	2	3	4	5	6	7	8	9	10	11
<i>A. Major Schemes costing more than Rs 10 lakhs each</i>										
1	Embankments on the Burhi Gandak.									
	(a) Along right bank from Akhara ghat (Muzaffarpur) to Darbanga Distt boundary	35 97	Six lakh acres of land have been benefited so far by carrying out the embankment works in North Bihar	5 32	0 94	0 85	90 4	5 23	98 5	
	(b) Along left bank from Rosera to Parihara	66 08		11 12	2 05	1 52	74 2	10 59	95	
	(c) Along right bank from Rosera to Nima	61 32		10 46	3 48			9 0	86	
2	Embankment on the old Bagmati and the Burhi Gandak from Hathauri to Rosera.	43 52		8 30	3 43	2 45	71 4	5 25	63 3	
3	Kirohi Scheme Desilting and forming embankments on Kirohi river	50 43		7 31	3 08	2 35	76 3	3 07	42	

1	2	3	4	5	6	7	8	9	10	11
4	Embankment from confluence of Mahu with the Ganga up to the end of 8 Nos bund along river Mahu, in Saran Distt	16 35	After completion of all the schemes nine lakhs acres of land will be protected.	2 79	2 63	1 48	56 3	1 64	59	
5	Repairing and strengthening bunds (7 Nos) along the Gogra in Saran District	19 46		3 47	2 10	1 16	55 2	2 53	74	
6	Improvement of Kharika bund on the right bank of the Burhi Gandak.	10 47		1 69	0 92	0 87	94 7	1 64	97	
7	Rosera Angaraghat embankment on the right bank of Burhi Gandak.	18 01		3 19	1 2	0 1	8 3	2 09	65 5	
8	Balan river embankment	24 91		4 20	3 27	2 8	85 6	4 06	96 8	
9	Bainty river embankment	16 62		2 5	1 66	1 6	96 4	2 44	97 5	
10	Embankment on the Right bank of Burhi Gandak from Darbhanga district border to Pusa.	10 08		1 5	1 21	0 9	74 4	1 19	79 5	
11	Embankment on the right bank of Burhi Gandak from Khagaria to Nima.	42 15		10 5	6 38	3 23	50 6	3 23	30 8	
12	Embankment on the left bank of Burhu Gandak from Khagaria to Parihara	30 35		6 37	4 78	3 42	71 6	3 42	53 7	

1	2	3	4	5	6	7	8	9	10	11
13	Embankment on the right bank of Burhi Gandak from Pusa to Angar Ghat.	41 65		8 09	4 42	3 36	78 3	3 36	42 8	
14	Embankment on the left bank of Burhi Gandak from a point opposite Pusa to Bachauli	52 0		9 73	7 12	4 91	69 0	4 91	50 6	
15	Akharasghat to point opposite Pusa along left bank of Burhi Gandak.	39 12		6 48	5 0	2 89	57 8	2 89	44 6	
16	Kamla Balan embankment	400 0		17 41	10 0	8 42	84 2	8 42	48 4	
	TOTAL	<u>884 49</u>								

B. Minor Schemes costing less than Rs 10 lakhs each

10 minor schemes costing Rs 38 84 lakhs of which five have been completed and 4 are in progress

APPENDIX II—contd.

KOSI PROJECT

Progress of Work in Embankment in 1955 & 1956

Name of Embankment	Lengths in miles		Quantity of works to be done in lakh cft			Work done in 1955 in lakh cft.		Total work done in 1955 in lakh cft.	Work done in 56 in lakh cft.		Total work done in 56 in lakh cft.	Total work done in lakh cft upto 30th June and its percentage			
	Public Co-operation	Contractor	Public Co-opn	Contractor	Total men	Public Co opn	Contractor		Public co-opn	Contractor		Public Co-opn.	Percentage Contractor	Percentage	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1 Western Embankment—															
Bharda to Kanauli	9½	Nil	298 41	Nil	298 41	43 65	Nil	43 65	74 1	Nil	74 1	117 75	39 5%	Nil	
Kanauli to Nirmali	8	8	300 0	631 50	931 50	195 49	417 10	612 59	89 01	210 49	299 50	284 50	94 8%	627 59	99 5
Ring Bundhs	Nil	7½	Nil	404 50	404 50	Nil	311 30	321 30	Nil	61 99	61 99	Nil	x	373 29	92 5%
Tiljuga Marginal Embankment	Nil	2	Nil	179 00	170	Nil	39 00	39 00	Nil	22 02	22 02	Nil	x	61 02	36 05
Ghoghardiha—Madhopur	7	3	360 00	295 00	655	Nil	Nil	Nil	254 50	132 71	387 21	254 50	70 70%	132 71	45 0%
Balan Marginal Embt.	2	Nil	100 00	Nil	100 0	Nil	Nil	Nil	81 25	Nil	81 25	81 25	81 2%	Nil	x
TOTAL	27	20½	1058 41	1501 00	2559 4	239 14	767 40	1006 54	498 86	427 21	926 07	738 00	70 0%	1194 61	79 6%
2 Eastern Embankment—															
Above Afflux Bund and upto Jitpur	Nil	12	Nil	800 00	800 00	Nil	294 00	294 00	Nil	405 14	405 14	Nil	x	699 1	87 5%
Bhimnagar to Rajpur	Nil	8	Nil	200 00	200	Nil	Nil	Nil	Nil	183 50	183 50	Nil	x	183 50	91 7%
Rajpur to one mile north of Tharbita	Nil	20	Nil	1000 00	1000	Nil	Nil	Nil	Nil	911 00	911 00	Nil	x	911 00	91 1 %
One mile north of Tharbita to Pipra	10	Nil	567 89	Nil	567 89	310 43	Nil	310 43	248 94	Nil	248 94	559 37	98 4%	Nil	x
Pipra to Brahi	9	Nil	424 94	Nil	424 94	Nil	Nil	Nil	360 35	Nil	360 35	360 35	85 0%	Nil	x
TOTAL	19	40	992 83	2000 00	2992 83	310 43	294 00	604 43	609 29	1499 64	2108 93	919 72	92 6%	1793 64	89 6%
3 Eastern Afflux Bundh	Nil	8	Nil	589 00	589 00	Nil	236 15	236 35	Nil	319 26	319 26	Nil	x	555 61	94 5%
GRAND TOTAL	46	68½	2051 24	4090 00	6141 24	549 57	1297 75	1847 32	1108 15	2246 11	3354 26	1657 72	80 7%	3543 86	86 6%

APPENDIX II—contd

DELHI

Progress of Works taken up during 1955-56 Working Season

Sl No	Name of Scheme	Estimated cost in lakhs of Rs	Area to be benefited in acres	Total estimated quantity of earthwork (lakh cft)	Target for the working season in lakh cft.	Progress during working season in lakh cft.	% age of Target for the season	UP TO DATE		Remarks (Whether to be continued during 1956-57)
								Progress of work done	%age of total estimated quantity	
1	2	3	4	5	6	7	8	9	10	11
<i>A Major Schemes costing more than Rs 10 lakhs each</i>										
1	Constructing marginal bund on left bank of Jumna river upstream of Railway bridge up to Pabbi village in U P State	17 02	N.A.	225 0	225 0	225	100	Earthwork completed		Yes some masonry works only
2	Construction of spurs and revetment on right bank of river Jumna - from Power House (DELHI GATE) to nallah No 12	12 74	N.A.	Work in progress,			details not available			Yes
	TOTAL	29 76								
<i>B Minor Schemes costing less than Rs 10 lakhs each.</i>										
In all about 13 schemes costing Rs. 13 0 lakhs were taken up Work in progress, details are not available										

APPENDIX II—contd

JAMMU & KASHMIR

Progress of Works taken up during 1954-55 Working Season

Sl No	Name of Scheme	Estimated cost in lakhs of Rs	Area to be benefited in acres	Total estimated quantity of earthwork in lakhs cft.	Target for the working season earth work in lakhs cft	Progress during the season earthwork in lakhs cft	Percentage of target	Remarks whether to be continued during 1955-56 season	
1	2	3	4	5	6	7	8	9	
<i>A/ Major schemes costing more than Rs 10 lakhs each</i>									
1	Kashmir Valley Flood Protection Scheme Phase I (Work actually commenced during 1953-54)								
	(a) Enlargement of spill channel from Padshahi Bagh to Wular								
	(i) Supplementary channel				700	225	131	58	Yes
	(ii) Marginal bunds (Spill channel)	100 00 for whole Project	60 000 acres Srinagar town and several other villages in Kashmir Valley	600	220	97	44	Yes	
	(iii) Marginal bunds (Lasjan Haigam Wular etc)			250	100	41	41	Yes	
	(b) Strengthening and retiring river Jhelum bunds								
<i>B Minor schemes costing less than Rs 10 lakhs each</i>									
									Nil.

APPENDIX II—contd

JAMMU & KASHMIR—contd

Progress of Flood Control Works taken up during 1955-56

Sl No	Name of Scheme	Estimat ed cost in lakhs of Rs	Area to be bene fited in acres	Total es timated quantity in lakhs cft	Target for the working season E/W in lakhs cft.	Progress during working season E/W in lakhs cft.	Percentage of target for the sea son col 7/6	Up-to-date		Remarks (Whether to be continued during 1956-57)
								Progress of work done E/W in lakhs cft	Percentage of total estimated quantity	
1	2	3	4	5	6	7	8	9	10	11
A. Major schemes costing more than 3 Rs 10 lakhs each										
1 Kashmir Valley Flood Protection Scheme Phase I										
(a) Enlarging and excavation of spillway channel from Pad shahi Bagh to Wullar										
	(i) Supplementary channel			700	225	223	99	568	80	Yes
	(ii) Marginal bunds (spill channel)			600	220	139	63	384	64	Yes
	(iii) Other marginal bunds (Lasjan Naugam Haigam Wullar)	100 00	60,000 acres.	250	100	80	80	174	70	Yes
	(iv) Other miscellaneous bunds etc.			295	128	32	25	32	11	Yes
	(b) Strengthening and retire- ment of river Jhelum bund			250	100 Nil	162	162	242	97	Yes
B Minor schemes costing less than Rs 10 lakhs each.										

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APPENDIX II—contd.

ORISSA

Progress of Works taken up during 1954-55 Working Season

Sl No	Name of Scheme	Estimated cost in lakhs of Rs	Area to be benefited in acres	Total estimated quantity of work	Target of work for the working season	Progress to the end of working season	Percentage to the Target to season	Remarks (Whether to be continued in 1955-56)
1	2	3	4	5	6	7	8	9
A.	Major scheme costing more than Rs 10 lakhs each							
		Nil						
B.	Minor Schemes costing less than Rs 10 lakhs each							
	120 Minor schemes	93.15					10.9%	Rs. 10.25 lakhs spent Schemes are being continued

APPENDIX II—contd

ORISSA

Progress of Works taken up during 1955 56 Working Season

Sl No	Name of Scheme	Estimated cost in lakhs of Rs	Area to be benefited in acres	Total estimated quantity of work	Target of work for the working season	Progress during working season	Percentage of the Target for the season	Remarks (Whether to be continued in 1956 57)
1	2	3	4	5	6	7	8	9
A Major schemes costing more than Rs 10 lakhs each								
1	Construction of spurs at Dalaighai	30 03						
	(i) Rubble collected and dumped							75
	(ii) Earthwork done							16
	(iii) Bullah collected for permeable spur							60
2	Breach closing work of Machgaon canal at Dalaighai and Baradaghai							Work completed and the newly completed embankment is standing against 55.4 ft, the present level in the river
B Minor schemes costing less than Rs 10 lakhs each								
	120 minor schemes	93 15						3 schemes completed. 40 schemes in progress. Average percentage of progress 25 %

APPENDIX II—contd

PRPSU

Progress of Works taken up during 1955-56 Working Season

Sl No	Name of Scheme	Estimated cost in lakhs of Rs	Area to be benefited in acres	Total estimated quantity of Earthwork lakhs cft	Target for the working season	Progress during working season	Percentage of target for the season	Remarks (Whether to be continued during 1956-57)
1	2	3	4	5	6	7	8	9
<i>A Major schemes costing more than Rs 10 lakhs each</i>								
Nil								
<i>B Minor schemes costing less than Rs 10 lakhs each</i>								
Total 6 schemes costing Rs 11.50 lakhs were taken up and work to the extent of 60% was completed								Yes

APPENDIX II—contd

PUNJAB

Progress of Works taken up during 1954-55 Working Season

Sl No	Name of Scheme	Estimated cost in lakhs of Rs.	Area to be benefited in acres	Total estimated quantity of Earthwork in lakhs cft	Target for the working season	Progress during working season	Percentage of target for the season	Remarks (Whether to be continued during 1955-56)
1	2	3	4	5	6	7	8	9
<i>A. Major schemes costing more than Rs 10 lakhs each</i>								
Nil								
<i>B. Minor schemes costing less than Rs 10 lakhs each</i>								
Total 8 Schemes costing Rs. 31.76 lakhs were taken up and about 60 % of work was completed								Yes

APPENDIX II—contd

PUNJAB—contd

Progress of Works taken up during 1955-56 Working Season

Sl No	Name of Scheme	Estimated cost in lakhs of Rs	Area to be benefited in acres	Total estimated quantity of Earthwork lakh cft	Target for the working season	Progress during working season	Percentage of target for the season	Remarks (Whether to be continued during 1956-57)
1	2	3	4	5	6	7	8	9

A Major schemes costing more than Rs 10 lakhs each

Nil

B Minor schemes costing less than Rs 10 lakhs each

In addition to 8 schemes (costing Rs 31.76 lakhs) carried over from last year 6 more schemes were taken up during this year costing Rs 10.36 lakhs. Also repairs to breaches in 5 existing embankments caused by floods of 1955 were carried out and 7 new cross drainages were constructed.

APPENDIX II—contd.

SAURASHTRA

Progress of Works taken up during 1955-56 Working Season

Sl No	Name of Scheme	Estimated cost in lakhs of Rs	Area to be benefited in acres	Total estimated quantity of earthwork (lakh cft)	Target for the working season	Progress during working season	Percentage of target for the season	Remarks (Whether to be continued during 1956-57)
1	2	3	4	5	6	7	8	9

A Major Schemes costing more than Rs 10 lakhs each

Nil

B Minor Schemes costing less than Rs 10 lakhs each

Total 107 schemes costing Rs 56 10 lakhs—Out of these Rs 9 28 lakhs were spent up to March 1956 These schemes are expected to be completed shortly

APPENDIX II—contd

UTTAR PRADESH

Progress of Works taken up during 1954-55 Working Season

Sl No	Name of Scheme	Estimated cost in lakhs of rupees	Area to be benefited in acres	Total estimated quantity of work E/W in lakhs cft	Target for the working season E/W in lakhs cft	Progress during working season E/W in lakhs cft	percentage of target to the season col 7/6	Remarks (Whether to be continued during 1955-56 season)
1	2	3	4	5	6	7	8	9
A Major schemes costing more than Rs 10 lakhs each								
1	Chitauri Bund on River Gandak in Deoria district. (length 3½ miles)	21 12	1,21 600	159	80	83	104	Yes
2	Ballia Bariá Bund along Ganga river in Ballia district (length 25 miles)	16 28	60 800	452	130	130	100	Yes
3	Raising of marooned villages (300) Nos in districts of Basti, Gorakhpur and Deoria (Rapti basin)	66 00		(300 villages)	300	400	133	Yes
4	Protection of Banaras Ghats (9 Nos) (Ganga river)	49 16	Banaras town	9 ghats	Not known	(one ghat completed and 8 in progress,		Yes
5	Turtipur Srinagar Bund along right bank of Ghagra river in Ballia district (length 51 miles)	30 60	89 600	944		Alignment marked Works in progress		Yes
TOTAL		183 16						
B Minor schemes costing less than Rs 10 lakhs each								
Total 12 schemes = 48 65 lakhs—one scheme completed others in progress								

APPENDIX II—contd

UTTAR PARDESH—contd

Progress of Works taken up during 1955-56 Working Season

Serial No	Name of Scheme	Estimated cost in lakhs of Rs	Area to be benefited in acres	Total estimated quantity of E/W in lakhs cft	Target for the working season E/W in lakhs cft	Progress during working season E/W in lakhs cft	% of Target for the season col 7/6	Up-to-date		Remarks ^s (Whether to be continued during 1956-57)
								Progress of work done E/W in lakhs cft	% of total estimated quantity col 9/5	
1	2	3	4	5	6	7	8	9	10	11
'A) Major Schemes costing more than Rs 10 lakhs each										
1	Chitauni Bund on river Gandak in Deoria district (length 3½ miles)	21 12	121 600	159	76	76	100	159	100	
2	Ballia Baria Bund along Ganga river in Ballia district (length 25 miles)	16 28	60 800	452	322	220	68	350	80	Yes
3	Protection of Banaras Ghats (Ganga river)	67 89	Work in progress				Details not available			Yes
4	Turtipur-Srinagar Bund along right bank of Ghagra river in Ballia district (length 51 miles)	30 60	89,600	944	500	530	106	530	56	Yes
5	Mahola Garhwal Bund along right bank of Ghagra river in Azamgarh district (length 36 miles)	30 09	88 160	710	500	365	73	365	51	Yes

APPENDIX II—contd

UTTAR PRADESH—contd.

I	2	3	4	5	6	7	8	9	10	11
6	Behra Bondi Bund along left bank of Ghagra river in Bahraich district (length 26 miles)	16 60	1 60 000	500	450	405	90	405	81	Yes
7	Bondi Bahrauli Bund along Ghagra river in Bahraich district	16 30	1 50 000	450	425	335	78	335	78	Yes
8	Paraspur Dharamra Bund along left bank of Ghagra river in Gonda district (length 31 miles)	27 00	51 000	1 000	600	110	19	110	11	Yes
9	<i>Raising Marooned Villages</i>									
	(i) 300 village projects in districts of Basti Gorakhpur and Deoria (Rapti basin)	66 00		300 (Villages)	225 (Villages)	225 (Villages)	100	625 (Villages)	100	
	(ii) 120 villages in Ballia district (Ganga river)	16 13		120 (Villages)	60 (Villages)	22 (Villages)	37	22 (Villages)	19	Yes
	(iii) 150 villages in Bahraich district (Ghagra)	16 20		150 (Villages)	40 (Villages)	28 (Villages)	70	28 (Villages)	19	Yes
	(iv) 2,500 villages in eastern U P	301 00		2 500 (Villages)	55 (Villages)	35 (Villages)	64	35 (Villages)	1 4	Yes
	TOTAL		625 41							

B Minor Schemes costing less than Rs 10 lakhs each

Total 25 Schemes 113 64

Out of this 12 Schemes are completed and remaining are in progress

APPENDIX II—contd.

WEST BENGAL

Progress of Works taken up during 1954-55 Working Season

Sl. No.	Name of Scheme	Estimated cost in lakhs of rupees	Area to be benefited in acres	Total estimated quantity of work	Target of work for the working season	Progress to the end of working season	% of the target to season	Remarks Whether continued in 1955-56
1	2	3	4	5	6	7	8	9
A. Major Schemes costing more than Rs. 10 lakhs each								
1	Protection of Jalpaiguri town (on Teesta river)	66.4	Town protection	(E.W.) 190 (B) 10 (P) 12,450	190 8.5 12,450	190 8.25 12,450	100 97 100	Yes
2	Protection of Aliparduars town (on Kaljani river)	18.74	Do.	(E.W.) 30 (B) 6 (P) 4,000	25 5.7 3,700	21 5.7 3,478	84 100 94	Yes
3	Protection of Cooch-Bihar town (on Torsa river)	61.25	Do.	(E.W.) 136.37 (B) 25 (P) 10,500	98 15 11,970	96 14.5 11,970	98 98 100	Yes
4	Protection of Mathabhanga town (on Jaldhaka river)	15.18	Do.	(E.W.) 25 (B) 0.3 (P) 2,000	12.5 0.3 2,033	12.0 0.15 2,033	98 54 100	Yes

1	2	3	4	5	6	7	8	9	
5	Embankments (on left bank) of river Teesta in Barnes—Mainaguri—Domohani Area, in Jalpaiguri District.	14.74	32,000	(E.W.) (B)	67 0.55	54 0.55	80% 100%	80 100	Yes
	TOTAL	<u>176.31</u>							
B.	Minor Schemes costing less than Rs. 10 lakhs each								
	Two town protection schemes costing Rs. 9.82 lakhs were taken up and completed.								

E. W. = Earthwork in lakhs cft.
 B = Boulder Pitching and Dumping in 1 lakh cft.
 P = Pile Driving (Nos.).

APPENDIX II—contd.

WEST BENGAL

Progress of Works taken up during 1955-56 Working Season

Serial No.	Name of Scheme	Estimated cost in lakhs of Rs.	Area to be benefited in acres	Total estimated quantity of earth-work (lakh cft.)	Target for the working season	Progress during working season	% age of Target for the season	Up-to-date		Remarks (Whether to be continued during 1956-57)
								Progress of work done lakhs cft.	% age of total estimated quantity	
I	2	3	4	5	6	7	8	9	10	11.

A. Major Schemes costing more than Rs. 10 lakhs each.

I	Jalpaiguri town protection works	66.4	Jalpaiguri Town	(i) Collection of Boulders=21	9.5	9.5	100%	21 lakh cft.	100	} Completed
				(ii) Earthwork =210	30	30	100%	210	100	
				(iii) Sal Ballis= 13650 Nos.	1200 Nos.	1200	100%	13650 Nos.	100	
				(iv) Dumping and laying boulders =19	8.6	6.4	75%	16.7	88	
				(v) Construction of Drainage sluices =7 Nos.	5 Nos.	5	100%	7 Nos.	100	
				(vi) Short spurs =8 Nos.	Nos.	8	100%	8 Nos.	100	

1	2	3	4	5	6	7	8	9	10	11	
2	Cooch-Bihar town protection works	61.25	Cooch-Bihar Town	(i) E/W—136.37 (ii) Boulder Pitching=25 (iii) Pile Driving=10,500 Nos.	21 lakh cft. 4.5 Nil	21 4.5 ..	100% 100% Nil	122 25 12,000	89% 99% 114%	} Completed	
3	Alipurduar town protection works	18.74	Alipurduar Town	(i) E/W=30 (ii) Boulder pitching=6 (iii) Pile driving=4000 Nos.	6.5 1 ..	6.5 1 ..	100% 100% ..	30 7.7 3480	98% 128% 87%		} Completed
4	Mathabhange town protection works	15.18	Mathabhange Town	(i) E/W=129 (ii) Boulder pitching=1.1 (iii) Pile driving=2000 Nos.	24.1	24.1	100%	129 1.1 2,000	100% 100% 100%			} Completed
5	Protection on left bank of Kaljani below Railway bridge near Alipurduar	10.79	Alipurduar	(i) E/W=14 (ii) Boulder pitching=8.20 lakhs cft.	14 8.20	14 8.2	100% 100%	14 8.20	100% 100%	} Completed	
6	Protection of Barnes-Damohani area on left bank of Teesta river	14.74	32,000	(i) E/W=20 (ii) Stone work (iii) Pitching and dumping=2	20 7 2	20 7 1.6 lakhs	100% 100% 80%	20 7 1.6	100% 100% 80%		} Will be continued.
	Total	187.10									

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B. Minor Schemes costing less than Rs. 10 lakhs each.

8 Schemes costing Rs. 46.64 lakhs, were taken up in 1955-56. Of these two were completed and other six are in progress.

APPENDIX III
 [Vide para 3(a) of Part I of the statement]
 Statement of flood damage during 1955

Sl. No.	Name of State	Area affected Sq. miles	Popula- tion affected in lakhs	Damage to Crops		Damage to houses and property		Cattle lost Nos.	Human lives lost Nos.	Damage to public utilities Rs. lakhs	Remarks
				Area Acres	Value Rs. crores,	Nos.	Value Rs. Lakhs.				
1	2	3	4	5	6	7	8	9	10	11	12
1.	Andhra . . .	792	Not available	4.85 lakhs	1.26	3569	6.51	1358	18	10.75	
2.	Assam . . .	5400	8.44	..	2.47	..	53.00	3558	Nil	131	
3.	Bihar . . .	6,840	71.08	24.98 lakhs	20.3	111856	112.0	57	44	20.46	
4.	Delhi . . .	125	0.37	..	0.15	..	13.95	24	7	2.64	
5.	Madhya Pradesh . . .	130	Not available	8,10,51	0.025	1196	3.68	266	5	1.1	
6.	Orissa . . .	2361	19.77	10.09 lakhs	7.68	129591	176.0	4641	79	75.00	
7.	Pepsu . . .	5972	18.24	12.26 lakhs	9.21	1.93 lakhs.	412.0	16503	133	47	
8.	Punjab . . .	3947	51.17	..	11.86	..	1827.0	51279	462	*350	*Information incomplete.
9.	Tripura . . .	6	Not available	..	0.05	..	0.07	Nil	Nil	0.09	
10.	U. P. . . .	9275	88.63	Not available	..	4.71 lakhs	..	3244	179	*60	*Information incomplete.
11.	W. Bengal . . .	1330	Not available	..	0.5	600	..	20	2	100	
TOTAL		6179	257.7		535.05		2604.21	800.50	929	798.04	

APPENDIX IV

[Vide para 3 (a) of Part I of the Statement]
Statement of flood damage during 1956 (part)

S.I No.	Name of State.	Area affected sq. miles	Population affected (lakhs)	Damage to crops		Damage to houses and property		Cattle lost Nos.	Human lives lost Nos.	Damage to public utilities in Rs. lakhs	Remarks
				Area in acres	Value in Rs. crores	Nos.	Value in Rs. lakhs				
1	2	3	4	5	6	7	8	9	10	11	12
1	Andhra	3 villages submerged.	.	15,000	..	1,468	..	..	..	..	Approximate value of damage is Rs. 3,79,000.
2	Assam	126.44 sq. miles and 12 muzas.	1.29	66,500	1.54	600	1.92	90	18	1.12	14.5 miles of road damaged. 7,600 families in 254 vill- ages were affected.-
3	Bihar	844	6.57	..	2.10	..	2.40	1	9	..	..
4	Delhi . . . .		..	..	..	..	..	..	..	..	..
5	Madhya Pradesh . .	..	..	..	..	..	..	..	..	..	Due to floods in Indravati River traffic closed for 3 days, several houses collapsed and several cattle washed away.

6 Orissa											
7 PEPSU . . . . .	..	..	..	..	..	..	..	..	..	..
8 Punjab	334.7	0.50								1.73	364 villages and 1,500 persons were affected. Damage to crops not yet assessed.
9 Saurashtra	1000 to 1200	..	15,000	..	..	15			2	0.90	Cattle valued at Rs. 30,000 lost. Damage to private enterprise like salt industry.
10 Tripura . . . . .	..	..	..	..	..			150	11		Total damage less than Rs. 1 crore.
11 Uttar Pradesh	120.00	0.35	*	..	[6,593	..	126		24		79 villages inundated. *Reported very high.
12 West Bengal	60	0.5	..	..	..	..	..	..	6		500 houses completely lost and 500 severely damaged.]
TOTAL	2484 to 2684	9.21	96,500	2.25	8,661	18.32	367	70	3.77		

APPENDIX V

[Vide para 3 (a) of Part I of the Statement]

Comparative statement of flood damage in 1954, 1955 and 1956 (part)

Sl. No.	Name of State	Area affected in sq. miles	Popula- tion affected (lakhs)	Damage to crops		Damage to Houses and Property		Cattle lost (Nos.)	Human lives lost (Nos.)	Damage to public utilities (Rs. lakhs)	Remarks
				Area (acres)	Value (Rs. crores)	No.	Value in (Rs. lakhs)				
1	2	3	4	5	6	7	8	9	10	11	12
1	Andhra	1954	..	..	..	..	..	..	..	..	..
		1955	792	..	4.85 lakhs	1.26	3,569	6.51	1,358	18	10.75
		1956	3 Villages submerged	..	5,000	..	1,468
2	Assam	1954	11,470	..	..	11.73	..	590	8,845	17	85.00
		1955	5400	8.44	..	2.47	..	53.00	3,558	Nil	131.00
		1956	126.44 sq. miles and 12 muzas	1.29	66,500	..	0.15	600	1.92	90	18	1.12	14.5 miles of roads damaged, 7,600 families in 254 villages were affected.
3	Bihar	1954	10,000	..	..	15.00	..	500	608	42	150
		1955	6,841	71.08	24.91 lakh	20.30	1,11,856	112.0	57	44	20.46
		1956	844	6.57	..	2.10	..	2.4	1	9	..

2

4 Delhi	1954	..	..	..	..	..	..	..	..	..	..
	1955	125	0.37	..	0.15	..	13.95	24	..	7	2.64
	1956	..	..	..	..	..	..	..	..	..	..
5 Madhya Pradesh	1954	..	..	..	..	..	..	..	..	..	..
	1955	130	..	81,051	0.025	1,196	3.68	266	..	5	1.10
	1956	..	..	..	..	..	..	..	..	..	..
6 Orissa	1954	..	..	..	..	..	..	..	..	..	..
	1955	2,561	19.77	10.09 lakhs	7.88	1,29,591	176.0	4,641	79	75.00	..
	1956	..	..	..	..	..	..	..	..	..	..
7 PEPSU	1954	..	..	..	..	..	..	..	..	..	..
	1955	5,972	18.24	12.26 lakhs	9.21	1.93 lakhs	412.0	16,503	133	0.47	..
	1956	..	..	..	..	..	..	..	..	..	..
8 Punjab	1954	373 villages & 3500 acres	..	..	0.75	..	..	..	..	..	..
	1955	3,947	51.17	..	11.86	..	1,827	51,279	462	*350	*Information incomplete ;
	1956	334	0.50	..	..	..	..	..	..	1.75	364 villages and 1500 persons affected. Damage to crops not assessed.
9 Saurashtra	1956	1000 to 1200	..	15,000	..	..	15	..	2	0.9	Cattle valued at Rs. 30,000 lost. Damage to private enterprise like salt industry.

Due to flood in Indravati river traffic closed for 3 days and several houses collapsed and several cattle washed away.

*Information incomplete ; 364 villages and 1500 persons affected. Damage to crops not assessed.

Cattle valued at Rs. 30,000 lost. Damage to private enterprise like salt industry.

1	2	3	4	5	6	7	8	9	10	11	12	
10 Tripura	1954	Nil	Total damage less than Rs. 1 crore.
	1955	6	..	..	0.05	..	0.07	Nil	Nil	0.09	..
	1956	..	..	..	..	..	..	150	11	..	..
11 Uttar Pradesh	1954	5210	..	..	6.81	19,650	..	1,553	27	150	*Information incomplete.
	1955	9275	86.63	..	..	4.71 lakhs	..	3,244	179	*60	
	1956	120	0.35	..	..	6,593	..	126 (actually more)	24	..	
12 West Bengal	1954	1640	..	..	7.50	..	100	1,500	142	200	500 houses completely lost and 500 severely damaged.
	1955	1330	..	..	0.5	600	..	20	2	100	
	1956	60	0.50	..	..	..	..	..	6	..	

APPENDIX VI

[Vide para 3(a) of Part I of the Statement]

Gauge levels of some of the important rivers during the 1956 flood season (Part)

ASSAM

Gauge Data of Brahmaputra River for the month of June and July, 1956

Site Dibrugarh Max. Level ever attained—344·10 (1955).

Danger Level—342·00

Maximum Level attained in 1954—343·00—(24-8-1954).

Maximum Level attained in 1955—344·10—(25-7-1955).

Date	Morning	Mid-day	Evening
14-6-56	341·00		
15-6-56	342·50		
20-6-56			340·70
27-6-56		340·4	
1-7-56		342·00	
2-7-56		340·90	
3-7-56		340·00	
4-7-56		339·50	
5-7-56		339·50	
6-7-56		339·50	
7-7-56		339·30	
8-7-56		339·30	
9-7-56		339·00	
10-7-56		338·90	
11-7-56		338·70	

BIHAR

Gauge Data of Kamla River for the month of June and July, 1956

Site Jainagar Max. Level ever attained—231·34 (1954).

Danger Level—227·0

Max. Level attained in 1954—231·34 (30-11-54).

Max. Level attained in 1955—229·15 (26-7-55).

Date	Morning	Mid-day	Evening
18-6-56		228·47	
21-6-56	226·07		225·47
22-6-56	227·52		229·22
23-6-56	227·17		227·42
24-6-56	226·70		226·12
25-6-56	225·02		"
26-6-56	225·78		225·58

BIHAR—contd.

Date	Morning	Mid-day	Evening
27-6-56	225.66		225.56
28-6-56	225.59		225.54
29-6-56	225.44		226.57
30-6-56	225.47		
5-7-56		225.18	
6-7-56	225.12		
9-7-56	224.89		
10-7-56	224.82		
11-7-56	(228.80)		
	227.82	227.32	
12-7-56	227.30		
13-7-56	225.20		225.12
14-7-56	225.00		
16-7-56	225.50		
17-7-56	225.10		

BIHAR

Gauge Data of Bagmati River for June and July, 1956

Site Dhing Max. Level ever attained=233.26 (1902).
 Danger Level =228.46
 Max. Level attained in 1954=231.21
 Max. Level attained in 1955=229.04

Date	Morning	Mid-day	Evening
17-6-56		229.16	
20-6-56	228.46		228.21
21-6-56	228.63	228.46	228.13
22-6-56	228.46	228.46	228.21
23-6-56	228.46	228.46	
24-6-56	228.41	228.63	228.46
			226.63
25-6-56	227.79	227.79	227.63
26-6-56	227.21		227.06
27-6-56	226.79		226.71
28-6-56	226.63		226.36
29-6-56	226.36		
30-6-56	226.79		
5-7-56		226.29	
6-7-56	225.96		
9-7-56	226.21		
10-7-56	226.46		
11-7-56	227.60		
12-7-56	226.70		
13-7-56	226.50		
16-7-56	226.90		
17-7-56	227.20		
18-7-56	227.00		

BIHAR—contd.

Gauge Data of Barhi Gandak River for the month of June and July, 1956.

Site Chanpatia Max. Level ever attained=248.78 (1936).
 Danger Level = 243.14

Max. Level attained in 1954 = 246.92
 Max. level attained in 1955 = 247.30

Date	Morning	Mid-day	Evening
20-6-56	232.06	233.40	
21-6-56	233.10		233.35
22-6-56	234.14		238.41
23-6-56	237.49		238.16
24-6-56	236.64		{ 235.14 233.56
25-6-56			231.20
26-6-56	232.39		232.72
27-6-56	230.50		229.89
28-6-56	229.52		229.14
29-6-56	228.91		
30-6-56	228.66		
1-7-56			232.68
2-7-56	232.64		
5-7-56		229.14	
6-7-56	228.60		
9-7-56	227.83		
10-7-56	227.71		
11-7-56	227.60		
12-7-56	227.50		
13-7-56	227.40		
14-7-56	227.39		
16-7-56	227.90		
17-7-56	228.10		
18-7-56	227.90		

BIHAR

Gauge and Discharge Data of River Kosi for May to July, 1956

Site Barahakshetra

Max. discharge in 1954 (24-8-54)=8.50 lakhs cusecs Danger discharge 3 lakhs cusecs
 Max. discharge in 1955 (26-7-55)=2.10 lakhs cusecs Max discharge ever attained 8.50 lakhs cusecs

Max. discharge in 1956 (17-6-56)=1.17 lakhs cusecs

Date	Gauge level in ft.	Discharge in cusecs	Rainfall in inches
1-5-56	23.45	31,702	0.47
2-5-56	23.00	29,418	Nil
3-5-56	26.50	41,965	0.88
4-5-56	28.15	57,778	Nil
5-5-56	25.30	32,970	Nil
6-5-56	26.70	44,592	0.84
7-5-56	23.25	31,424	Nil
8-5-56	22.80	28,779	Nil
9-5-56	23.10	26,817	Nil
10-5-56	23.65	29,888	Nil
11-5-56	23.90	27,336	Nil
12-5-56	24.90	37,311	Nil
13-5-56	30.30	64,692	0.42
14-5-56	26.95	38,218	Nil

BIHAR—contd.

Date	Gauge level in ft.	Discharge in cusecs	Rainfall in inches
15-5-56	25.45	33,508	Nil
16-5-56	27.30	44,270	1.13
17-5-56	28.30	48,222	0.02
18-5-56	27.00	40,355	Nil
19-5-56	26.50	38,056	Nil
20-5-56	25.60	29,877	0.95
21-5-56	24.30	30,790	0.90
22-5-56	23.50	23,437	Nil
23-5-56	22.85	24,534	Nil
24-5-56	22.75	22,423	Nil
25-5-56	29.10	52,521	2.04
26-5-56	24.35	28,687	0.34
27-5-56	27.10	39,704	0.02
28-5-56	25.80	37,854	0.66
29-5-56	24.75	37,331	0.03
30-5-56	26.40	37,454	0.02
31-5-56	26.20	37,889	Nil
1-6-56	25.15	33,834	Nil
2-6-56	25.50	34,003	Nil
3-6-56	26.85	39,835	Nil
4-6-56	33.90	66,829	3.51
5-6-56	33.60	70,407	0.14
6-6-56	32.60	70,056	0.41
7-6-56	32.55	67,902	0.07
8-6-56	31.35	59,711	0.26
9-6-56	34.80	72,525	2.65
10-6-56	31.25	58,844	0.26
11-6-56	31.40	56,519	Nil
12-6-56	30.10	52,387	Nil
13-6-56	29.60	59,156	0.11
14-6-56	33.00	72,325	0.25
15-6-56	34.25	69,197	1.07
16-6-56	37.50	84,911	0.25
17-6-56	42.20	1,16,638	2.05
18-6-56	38.08	88,147	0.77
19-6-56	37.15	79,083	0.72
20-6-56	39.50	95,303	0.32
21-6-56	41.80	1,13,879	2.73
22-6-56	42.20	1,15,953	0.81
23-6-56	40.70	99,967	1.88
24-6-56	41.90	1,05,313	1.51
25-6-56	40.35	98,374	0.78
26-6-56	40.30	98,392	0.88
27-6-56	39.30	90,110	0.04
28-6-56	36.70	78,197	0.02
29-6-56	37.60	88,252	0.45
30-6-56	40.40	99,338	5.97
1-7-56	40.50	99,448	0.45
2-7-56	37.90	89,060	0.28
3-7-56	36.80	77,990	0.04
4-7-56	36.00	76,735	Nil
5-7-56	34.00	64,316	Nil
6-7-56	35.75	72,733	0.02
7-7-56	37.80	87,650	0.03
8-7-56	34.90	71,813	0.01
9-7-56	36.70	79,589	Nil

APPENDIX VII

(Vide para 4 (e) of Part I of the Statement)

§ Allocation of funds to different States and actual expenditure on flood control works

States	1954-55		1955-56		1956-57	
	Allocation	Expenditure	Allocation	Expenditure	Textative Allocation	Expenditure to the end of June, 1956 (In lakhs of rupees)
1. Assam	100.0	*79.96	73.22 + 43.0 (Grant)	**195.37	75.00	not available
2. West Bengal	50.0	43.96	110.00	116.06	64.00	15.97 (end of April)
3. Bihar†	35.00	48.01	200.00	215.86	75.00	not available
4. Uttar Pradesh	35.00	38.9	180.00	240.00	150.00	50.00
5. Andhra	Nil	Nil	1.25	1.46	25.00	0.17 (end of May 1956)
6. Punjab	1.00	1.52	7.00	2.71 (end of Dec. 1955)	19.00	2.9
7. PEPSU . . . . .	..	0.2	6.0	6.45	10.00	0.05
8. Jammu and Kashmir	10.00	19.53	15.00	23.81	35.00	6.00
9. Orissa . . . . .	..	10.25	15.00	27.54	40.00	40.00
10. Saurashtra . . . . .	..	Nil	9.0	††9.29	6.00	††2.57
11. Madhya Pradesh . . . . .	..	..	0.5	0.56	1.00	0.21
12. Delhi . . . . .	..	..	..	1.0	..	5.0
13. Himachal Pradesh . . . . .	..	..	..	0.34	..	..
TOTAL	231.0	242.33	616.97	840.45	7500.00	122.87

*This includes Rs. 72.42 lakhs expenditure on Dibrugarh.

**This includes Rs. 150 lakhs expenditure on Dibrugarh.

†Excludes Kosi.

††Loan advanced by the State to local bodies.

§Allocation means loan assistance.

‡ Review of provision will be made in August 1956.

APPENDIX VIII

[Vide para 6 (a) of Part I of the Statement]
Relief measures undertaken by the States during 1955

Sl. No.	Name of State	Gratuitous Relief in Rs. lakhs	Agriculture & other loans in Rs. lakhs	Test relief in Rs. lakhs	Rehabilitation & house building grants in Rs. lakhs	Non-Govt. Relief in Rs. lakhs	General in Rs. lakhs	Gratuitous relief given by the Centre to States during 1955-56 in Rs. lakhs	Remarks
1	2	3	4	5	6	7	8	9	10
1.	Assam	13.72	12.95	2.75	19.22	..	..	85.66	
2.	Bihar	82.75	103.19	42.87	Nil	..	8.70	100.00	Public organisations such as the Ramakrishna Mission, Bharat Sevak Samaj, The Marwadi Relief Society etc. rendered relief.
3.	Delhi	..	3.00	..	..	..	..	..
4.	Orissa	18.79	19.54	15.25	21.37	..	3.87	227.00	Cost of food grains supplied to the flood affected areas. Rs. 65.18 lakhs.
5.	Pepau	13.00	25.00	..	..	..	..	59.00	

6.	Punjab	305.0	171.00	59.0	..	4.45*	62.5	80.00	(1) 2,500 tons of wheat has been received from U. S. Govt. as free gift. (2) Relief has also been granted in the form of remission of land revenue & Abiana. *P. M.'s & C. M.'s Relief Funds.
7.	U. P.	40.09	144.65	9.3	..	3.26*	..	86.58	1. Remission in outstanding <i>taqwasi</i> dues Rs. 24.43 lakhs. 2. Remission of land revenue likely to exceed Rs. 1 crores. * P. M.'s. & C. M.'s Relief Funds.
8.	West Bengal	4.820	6.86	1.50	1.41	0.10†	..	162.77	† In addition, 600 maunds of atta from M/s Wallace & Co.
TOTAL		478.17	486.19	130.67	42.00	7.81	75.07	801.01**	

**In addition a loan of Rs. 378.17 lakhs was given to States and the Ministry of Food & Agriculture sanctioned a sum of Rs. 1,58,000/ from the Indian People's Famine Trust Fund.

APPENDIX IX

[Vide para 6(a) of Part I of the Statement]

Relief measures undertaken by the States during 1956 (part)

Sl. No.	Name of State	Gratuitous Relief in Rs. lakhs	Agriculture and other loans in Rs. lakhs	Test Relief in Rs. lakhs	Rehabilitation and house building grants in Rs. lakhs	Non-Govt. Relief in Rs. lakhs	General in Rs. lakhs	Remarks
1	2	3	4	5	6	7	8	9
1	Andhra . . . . .	..	..	..	..	..	..
2	Assam	1.65	1.80	0.20	0.62	..	..
3	Bihar . . . . .	..	0.31	..	..	..	..	(1) 47 medical centres opened. (2) 23 veterinary centres arranged. (3) 2612 boats arranged. (4) 11,220 mds. of grain distributed. (5) Hutments being constructed. (6) Agriculturists loan given. (7) Floating post offices provided. (8) Mobile hospitals provided.
4	Delhi . . . . .	..	..	..	..	..	..
5	Madhya Pradesh . . . . .	..	..	..	..	..	..
6	Orissa . . . . .	..	..	..	..	..	..
7	PEPSU . . . . .	..	..	..	..	..	..

8	Punjab . . . . .	..	4.05	..	3.29	..	..
9	Tripura	4.705	..	0.40	..	0.55	..	(1) Rs. 1 lakh distributed in cash and more than Rs. 1 lakh in kind. (2) From Prime Minister's fund 5,000 mds. biscuits distributed.
10	Uttar Pradesh	1.0	2.5	..	..	..	..	Arrangement to send 100 wagons of Bhusa made.
11	West Bengal . . . . .	..	..	..	..	0.15	..	
TOTAL		7.35	8.66	0.60	3.91	0.70	..	

NOTE.—A sum of Rs. 2,68,000 has been disbursed from the Prime Minister's National Relief Fund and the Indian Red Cross Society have been distributing large quantities of medicines and clothing and some cash doles.

APPENDIX X
[vide para 6(b) of Part I of the Statement]
**CENTRAL FINANCIAL ASSISTANCE ON ACCOUNT OF
NATURAL CALAMITIES**

No. F.3(1)-P/53

Government of India
MINISTRY OF FINANCE
(Department of Economic Affairs)

New Delhi, the 2nd February, 1955.

FROM

Shri C. S. Krishna Moorthi, I.A.S.;
Deputy Secretary to the Government of India.

TO

The Finance Secretary,
All parts 'A', 'B' & 'C' States.

Sir,

I am directed to say that the question of liberalising the Central assistance on account of natural calamities has been engaging the attention of the Government of India for some time past. As is known, the policy so far has been to meet half the cost of gratuitous relief including loss incurred in issuing foodgrains at a concessional rate and to provide loans, where the ways and means position of the State required it, to share half the expenditure on relief works. The Government of India have now reconsidered the policy and decided to liberalize the scope of Central assistance as detailed below:—

- (a) The State Government will be eligible to a grant of half the total expenditure on gratuitous relief up to Rs. 2 crores and three-fourths of the expenditure in excess thereof. The following items will constitute gratuitous relief:—
 - (i) Concessional supply (free or at subsidised rates) of food, either cooked or otherwise.
 - (ii) Weekly cash payments for purchase of necessaries of indigent persons including food where (a) above is not done.
 - (iii) Cash doles to the disabled.
 - (iv) Free or concessional supply of seeds.

- (v) Free or concessional supply of fodder.
 - (vi) Free or concessional supply of medicines.
 - (vii) Measures for prevention of cattle epidemics.
 - (viii) Provision of drinking water where necessary.
 - (ix) Provision of transport facilities for goods to be moved on relief account.
 - (x) Repair of houses where damaged by floods.
- (b) Apart from these, expenditure on relief works undertaken as a preferable alternative to gratuitous relief which does not create any asset, or where the value of asset created is less than the expenditure incurred, will also be eligible for inclusion as gratuitous relief. Distress loans given as a substitute for gratuitous relief with a view to generate some work will also be considered as an item of gratuitous relief in such cases where subsequent recovery proves impossible.
- (c) In addition, the Government of India will be prepared to render the following assistance as a part of flood relief measures:—
- (i) A grant equal to half the expenditure on the repairs of Government roads, bridges, embankments, etc. damaged by floods in case where such expenditure does not produce any new assets to the State.
 - (ii) A grant equal to half the cost of such repairs to administrative and other government buildings.
 - (iii) In the case of roads and buildings of local bodies whose resources are exiguous and to whom the State Government cannot give the whole of the necessary additional assistance, a grant equal to 37½ per cent of the cost of such repairs.
- (d) For the rest, loans will be given only to the extent that the ways and means position of the State requires. If the State Government has, as a result of the expenditure occasioned by the famine or flood, been compelled to divert existing resources from the implementation of the Plan, development loans will be provided as necessary. The Central Government will not, however, share in any loss of revenues that the State Government may be put to.

2. Such comprehensive assistance will naturally be on a due consideration of the magnitude of the calamity involved.

Yours faithfully,

C. S. KRISHNA MOORTHY, Dy. Secy.