AGRICULTURAL PRODUCTIVITY IN EASTERN INDIA

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VOLUME II

REPORT OF THE
COMMITTEE ON AGRICULTURAL
PRODUCTIVITY IN EASTERN INDIA
RESERVE BANK OF INDIA
1984

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ABBREVIATIONS

ADO	—	Agricultural Development Officer
AEO	—	Agricultural Extension Officer
AERC	—	Agro-Economic Research Centre
ARDC	—	Agricultural Refinance and Development Corporation
AVAW	—	Associate Village Level Agricultural Worker
AVRDC	—	Asian Vegetable Research and Development Centre, Taiwan
BAU	—	Birsa Agricultural University, Bihar
BCKV	—	Bihan Chandra Krishi Vishwa Vidyalaya, West Bengal
BENFED	—	West Bengal Co-operative Marketing Federation
BGA	—	Blue Green Algae
BISCOMAUN	—	Bihar Seed Co-operative Marketing Union
BRBN	—	Bihar Beej Nigam
CAD	—	Command Area Development
CADA	—	Command Area Development Authority
CADC	—	Comprehensive Area Development Corporation
CADP	—	Comprehensive Area Development Programme
CCB	—	Central Co-operative Bank
CRRI	—	Central Rice Research Institute, Cuttack
CWC	—	Central Warehousing Corporation
DAS	—	Days After Sowing
DPAP	—	Drought Prone Area Programme
DRDA	—	District Rural Development Agency
DVC	—	Damodar Valley Corporation
EARAS	—	Establishment of an Agency for Reporting of Agricultural Statistics
ERRP	—	Economic Rehabilitation of Rural Poor
FCI	—	Food Corporation of India
FES	—	Field Experiment Service
FSS	—	Farmers' Service Society
GIC	—	General Insurance Corporation
HSV	—	High Stability Varieties
HYV	—	High Yielding Varieties
IBRD	—	International Bank for Reconstruction and Development
ICAR	—	Indian Council of Agricultural Research
IFAD	—	International Fund for Agricultural Development
IIT	—	Indian Institute of Technology
IRDP	—	Integrated Rural Development Programme
IRRI	—	International Rice Research Institute, Philippines
JCI	—	Jute Corporation of India
KPS	—	Krishi Projukti Sahayaks
LAMPS	—	Large Sized Adivasi Multi Purpose Society
LDB	—	Land Development Bank
MIDC	—	Minor Irrigation Development Corporation

NABARD	—	National Bank for Agriculture and Rural Development
NARP	—	National Agricultural Research Project
NCA	—	National Commission on Agriculture
NPK	—	Nitrogenous, Phosphatic and Potassic
NREP	—	National Rural Employment Programme
NSC	—	National Seeds Corporation
OADP	—	Orissa Agricultural Development Project
OFD	—	On-Farm Development
OLIC	—	Orissa Lift Irrigation Corporation
OUAT	—	Orissa University of Agriculture and Technology
PACS	—	Primary Agricultural Co-operative Society
PLDB	—	Primary Land Development Bank
RAU	—	Rajendra Agricultural University, Bihar
RBI	—	Reserve Bank of India
RLEGP	—	Rural Landless Employment Guarantee Programme
RLI	—	River Lift Irrigation
RRB	—	Regional Rural Bank
RYI	—	Relative Yield Index
SDAO	—	Sub-Divisional Agricultural Officer
SMS	—	Subject Matter Specialist
SWC	—	State Warehousing Corporation
TDC	—	Terai Development Corporation
TRYSEM	—	Training of Rural Youth for Self Employment
T & V	—	Training and Visit
UP	—	Uttar Pradesh
USSR	—	Union of Soviet Socialist Republic
VAW	—	Village Level Agricultural Extension Worker
VLW	—	Village Level Worker
WBAIC	—	West Bengal Agro-Industries Corporation

PART II

WEST BENGAL

CHAPTER 1

INTRODUCTION

1.1.1 West Bengal is endowed with rich natural resources for agricultural development. It has large untapped surface and groundwater resources. Soil and climatic conditions are favourable for crop cultivation.

1.1.2 During the last two and a half decades, the State had made some noteworthy progress in the agricultural front. Foodgrains production went up by 55 per cent from 59 lakh tonnes in 1960-61 to 92 lakh tonnes in 1983-84, although there were variations from year to year. During 1983-84, West Bengal stood second in the country in terms of wheat yields, next to Punjab. It is the largest producer of jute in the country. In 1982-83, nearly 40 per cent of the rice area was covered by high yielding varieties. Fertilizer consumption increased more than three-fold from 14 kg/ha in 1970-71 to 44 kg/ha in 1983-84. T & V system has been introduced to provide the necessary extension service to farmers.

1.1.3 The progress achieved by the State, however, is not adequate considering its potential and the requirements of its increasing population. The growth in foodgrains production during the last one decade has been tardy; during 1971-81, the annual growth was barely 1 per cent, much less than the growth in population. The State continues to be seriously deficit in food supply.

1.1.4 Despite large surface and groundwater resources, only a little over 30 per cent of gross cropped area was irrigated in 1980-81. The exploitation of groundwater resources is low, being about 24 per cent of the potential. Provision of adequate drainage facilities, especially in the command areas of major irrigation systems, has not received due attention, affecting adversely productivity.

1.1.5 West Bengal can achieve a higher growth rate in agricultural production, if its potential could be fully exploited. But,

there are several constaints which need to be overcome before this can happen. In areas with good irrigation potential, expansion of irrigation, particularly from groundwater, and improvement in drainage facilities have to be accorded high priority. In other areas, emphasis should be on modern techniques of dry farming coupled with animal husbandry and other ancillary activities. These spearheads of development need to be supported by a better organization of farming operations, greater use of modern tools and implements, and strengthening of infrastructure for power supply, production and distribution of quality seeds and fertilizers, custom service network, research and extension, credit delivery and marketing and processing facilities. The improvements in these areas will have to be supported by a better organization and management of development programmes.

1.1.6 Before we outline the policy measures to overcome the constraints, we present below a brief description of the State's natural and human resource potential, which evidently is the basis for accelerated agricultural development of the State.

1.2 *Physical Features*

1.2.1 West Bengal has a total geographical area of 87,853 sq. kms., accounting for 3 per cent of the country's geographical area. It lies between 21° 25" and 27° 14" North Latitude and 85° 45' and 89° 53" East Longitude. Administratively, it is divided into 16 districts, 335 Community Development Blocks and 41,392 villages.

1.3 *Population*

1.3.1 The State has a total population of 55 million, according to 1981 Census, constituting about 8 per cent of the total population of the country. The population density is 621 per sq. km. The man-land ratio is high. The number of agricultural workers per 100 ha of net sown area during triennium ending 1980-81 was 155.

1.3.2 Nearly three-fourths of the State's population is rural. Scheduled Castes and Scheduled Tribes account for about 22 per cent and 6 per cent respectively of the State's population.

1.3.3 Some basic data relating to the State's population, along with that for the country as a whole are given in Annexure 1.1.

1.4 *Climate and Rainfall*

1.4.1 The climate is tropical, hot and humid except in the northern mountains. Minimum temperature ranges between 3°C and 27°C and maximum between 9°C and 40°C in the plains.

1.4.2 Average annual rainfall in the State is around 1750 mm with considerable inter-district variations ranging between 1295 mm (in Birbhum district) and 3945 mm (in Jalpaiguri district). Over 70 per cent of annual rainfall is recorded during south-west monsoon period.

1.5 *Soils*

1.5.1 Soils of the State may be classified into five main categories, viz., (i) Gangetic and Vindhyan alluvium in the central region (25 lakh ha), (ii) coastal alluvium in the districts of Midnapore, Howrah and 24-Parganas (10 lakh ha), (iii) laterite, gravelly and red soils of West Midnapore, Purulia and Western part of Burdwan and Birbhum (14 lakh ha), (iv) terai soil in Cooch Behar, Jalpaiguri, Islampur sub-division of West Dinajpur and part of Darjeeling (6 lakh ha) and (v) brown forest soil in hills of Darjeeling and Jalpaiguri (1 lakh ha).

1.5.2 Eight districts of the State have alluvial soils. Parts of coastal districts are affected by salinity. The brown forest soil, terai, red and lateritic soils are less fertile. These areas face problem of soil erosion.

1.5.3 About 50 per cent of red and lateritic soil areas are drought-prone. In terai, coastal and central alluviam plains, about 10 per cent of the area is flood-prone.

1.6 *Land-use Pattern*

1.6.1 In 1980-81, the net sown area was 56 lakh ha. This has remained practically unchanged over the last 20 years (Table 1.1).

1.7 *Agrarian Structure*

1.7.1 Seventy per cent of operational holdings are held by marginal farmers with one ha and less and 20 per cent by small farmers. Together, they account for 60 per cent of the operated area. On the other hand, medium and large farmers account for 10 per cent of the operational holdings but as much as 40 per cent of the cultivated area (Table 1.2). The average size of the holding is 0.95 ha.

Table 1.1. Land Utilisation Pattern

(Area in lakh ha)

	Classification	1960-61		1980-81	
		Area	Percentage	Area	Percentage
1.	Net sown area	54.4	61.4	55.7	62.9
2.	Current fallows	3.8	4.3	0.8	0.9
3.	Other fallow land			0.6	0.7
4.	Forests	11.0	12.5	11.9	13.4
5.	Area put to non-agricultural use	12.9	14.6	12.9	14.6
6.	Barren and uncultivable land	N.A.	N.A.	1.2	1.4
7.	Others	6.4	7.2	5.4	6.1
8.	Total	88.5	100.0	88.5	100.0

Table 1.2. Size-wise Distribution of Operational Holdings – 1980-81

Category	No of holdings (in lakhs)	Percentage of total	Area (lakh ha)	Percentage of total
1 ha and below	40.9	69.7	16.2	29.2
Between 1 and 2 ha	11.5	19.6	17.3	31.2
Between 2 and 4 ha	5.2	8.8	14.0	25.3
Between 4 and 10 ha	1.1	1.9	6.0	10.7
10 ha and above	0.1	Neg.	2.1	3.6
Total	58.8	100.0	55.6	100.0

1.7.2 The average holding is not only small but also highly fragmented. The field investigations conducted by AERC, Santiniketan reveal that the number of fragments per holding vary between 8 and 35 as shown in Table 1.3.

Table 1.3. Fragments per Holding

District	Village	No. of fragments per holding	Average area per fragment (ha)
Hooghly	Tinna	8	0.21
—do—	Keshabpur	10	0.17
Murshidabad	Gonanandapur	12	0.10
—do—	Rakhalpukur	35	0.06
Midnapore	Barar	13	0.17
—do—	Kumardanga	8	0.12
Jalpaiguri	Sahebbari	19	0.07

1.7.3 Although tenancy is prohibited in the State, concealed tenancy exists. Sharecropping is extensively practised in the State. The number of sharecroppers is estimated at 20 lakhs. With a view to providing legal status to sharecroppers, Government of West Bengal had initiated a programme of recording them. This is known as 'Operation Barga'. Nearly 14 lakh sharecroppers are reported to have been recorded by the end of 1983 under 'Operation Barga'.

1.8 *Irrigation*

1.8.1 The identified irrigation potential of the State is 61 lakh ha, comprising 23 lakh ha under major and medium irrigation and 38 lakh ha under minor irrigation (23 lakh ha from groundwater and 15 lakh ha from surface irrigation sources). As against this, gross irrigated area during triennium ending 1980-81 was 24 lakh ha accounting for 39 per cent of the potential and 32 per cent of gross cropped area.

1.8.2 In the north, the important rivers are the Teesta, Torsa, Jaldhaka and Mahananda. The Bhagirathy-Hooghly flows through the centre of the State in a north-south direction. The rivers Mayurakshi, Ajay, Damodar and Kangsabati rise in Chhotanagpur Hills of Bihar and flow through the western part of the State. The other important rivers are Subarnarekha, Rupnarayan, Haldi and Brahmani. The average annual flow of these rivers is estimated at around 37150 m. cu. m. Full exploitation of surface water resources is constrained by climatic and topographic factors and also by inter-state and international commitments. The existing major and multi-purpose irrigation pro-

jects in the State have been designed keeping these factors in view.

1.8.3 The irrigation potential created under major irrigation projects by 1982-83 was 11 lakh ha, as shown below.

	(Lakh ha)
DVC	4.4
Mayurakshi	2.5
Kangsabati	3.6
Total	10.5

1.8.4 Among new projects taken up, the Teesta Barrage Project is the largest and most important. It has an ultimate potential of 8.9 lakh ha. The first phase with a potential of 3.8 lakh ha is under implementation.

1.8.5 Besides the four major projects mentioned above, Subarnarekha and Upper Kangsabati Projects have also been taken up. In addition, there are a number of medium irrigation schemes.

1.8.6 There is considerable potential for utilization of surface water resources through minor irrigation schemes like river lifts, tanks, bunds and river diversion schemes. Potential identified under these schemes is around 13 lakh ha, of which 9 lakh ha (70 per cent) has been developed by 1982-83.

1.8.7 Although groundwater potential is high, its exploitation has been low (in the State). According to the latest assessment, only 24 per cent of this potential has been exploited by the end of 1982. Districts of Cooch Behar, Jalpaiguri, Midnapore, West Dinajpur, Burdwan, Murshidabad, Nadia and 24-Parganas have considerable groundwater potential. The State Government has completed groundwater assessment in 249 out of 335 blocks. According to this assessment, 7 blocks are identified as "dark", 16 as "grey" and 226 as "white".

1.8.8 It is estimated that 32 lakh ha (16 lakh ha under major and medium irrigation) and another 16 lakh ha under minor irrigation or 52 per cent of the potential would be created by the end of Sixth Plan.

1.9 *Waterlogging*

1.9.1 About 8 lakh ha in the State is waterlogged. Midnapore, 24-Parganas, Howrah and Hooghly districts face acute drainage problems.

1.10 *Infrastructural Facilities*

1.10.1 The State has 2100 primary and 120 secondary (wholesale) markets. On an average there is one primary market within a distance of 3 to 5 km from each village and one secondary market within a distance of 15 to 20 kms. Secondary markets are well linked with urban areas. There are 38 market yards and 282 sub-market yards.

1.10.2 Data for 1977 show that about 60 per cent of the villages are at a distance of 2 kms. or less from metalled roads (Annexure 1.2). Another 25 per cent of the villages are within the average distance of 3 to 5 kms. from metalled roads and the remaining at distance of 6 km or more.

Annexure 1.1

Basic Data on Population

(As per 1981 Census)

Particulars	West Bengal	All India
1. Population (million)	**54.6**	**685.2**
i) Rural population (million)	40.1	525.5
ii) Urban population (million)	14.5	159.7
2. Agricultural Workers (million)	**8.5**	**148.0**
i) Cultivators (million)	4.6	92.5
ii) Agricultural labourers (million)	3.9	55.5
3. Percentage of		
i) Rural population to total population	73.6	76.7
ii) Agricultural workers to rural population	20.9	28.2
4. Decennial population growth rates — 1971-1981 (%)		
i) Total	23.0	25.0
ii) Rural	20.4	19.7
5. Density of population (No. per sq. km.)	621	221

Annexure 1.2

Percentage Distribution of Villages According to Distance of Some Basic Amenities in West Bengal in 1977

Distance Group (km)	Transport and Communications		Supporting facilities for Agriculture and Animal Husbandry					Co-operative credit or Banking		Marketing facilities		
	Railway Station	Metalled Road	Fertiliser Depot	Seeds Store	Agricultural Pump repairing facility	Ware-House Storage facilities	Veterinary Dispensary	Credit Cooperative	Bank (Branch)	*Haat* (Village market)	Daily market	Fair price shop for grocery
0 — 2	9.4	52.6	21.0	13.2	8.3	8.0	15.4	43.9	23.2	39.2	21.8	37.6
3 — 5	16.2	24.7	26.5	20.7	12.6	10.3	29.3	25.8	27.7	35.3	27.9	18.4
6 — 10	20.0	18.9	26.7	27.1	20.7	17.0	33.4	16.2	28.0	19.5	26.8	15.1
Above 10	54.4	3.8	25.6	39.0	58.4	64.7	21.9	14.1	21.1	6.1	23.6	28.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

CHAPTER 2

REVIEW OF AGRICULTURAL DEVELOPMENT SINCE 1960

2.1 *Introduction*

2.1.1 Rice is the most important crop of West Bengal. During 1980-81, it accounted for nearly 70 per cent of the gross cropped area. Next in importance is jute. However, it accounted for only 8 per cent of the gross cropped area. The State also produces variety of other crops, e.g., wheat, maize, barley, pulses, oil-seeds, tea, fruits, potato, spices, vegetables ond medicinal plants. But the area sown to these crops is small. Over the years, there has been no significant change in the cropping pattern of the State (*vide* Annexure 2.1).

2.2 *Cropping Intensity*

2.2.1 In West Bengal, the scope for bringing more land under cultivation has been practically exhausted by early 1960s. This is evident from the fact that by 1960-81, nearly 90 per cent of culturable area was clutivated. As a result, net sown area did not show much variation over the last two decades. The improvement in agricultural production had, therefore, to be brought about through a more intensive use of available land. Cropping intensity, however, moved up slowly from 117 per cent during the triennium ending 1960-61 to 135 per cent during the triennium ending 1980-81.

2.3 *Foodgrains*

2.3.1 The State accounted for 6 per cent of the country's foodgrains production during the triennium ending 1980-81.

2.3.2 Foodgrains production registered a high growth rate of 3.3 per cent per annum during 1961-71*. However, this was not sustained thereafter. The growth rate decelerated to one per cent per annum during 1971-81. Production suffered a setback during 1981-82 and 1982-83 because of drought conditions. The drop in production in these two years was more than made good in 1983-84 when the State reaped a bumper harvest of 92 lakh tonnes, helped by favourable weather conditions (Annexure 2.2).

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* Based on triennium average. Growth rates given in this Chapter are compound growth rates computed from triennium averages.

Table 2.1. Production of Foodgrains

(Lakh tonnes)

Year	Production	Year	Production
1960-61	59.4	1978-79	80.4
1970-71	74.9	1979-80	70.6
1974-75	78.7	1980-81	82.8
1975-76	85.9	1981-82	65.5
1976-77	74.5	1982-83	58.5
1977-78	89.7	1983-84	91.6

2.4 *Rice*

2.4.1 Within the "foodgrains" group, rice is the most important crop of the State. It accounted for 87 per cent of the State's foodgrains production during 1983-84.

2.4.2 The annual growth rate in rice production was 2.7 per cent during 1961-71 due mainly to a larger increase (1.6 per cent) in yields than in area (1.1 per cent). During 1971-81, area under this crop did not show any increase. The increase in yield was however of a smaller order than in the preceding decade. As a result, the growth in rice production was smaller at 1.1 per cent per annum. During the 20 year period 1961-81, the annual growth in production was 1.9 per cent (Annexure 2.3).

2.4.3 As will be evident from the above, even this modest growth in rice output during 1961-81 was the result mainly of the increase in yields. During this period, average rice yield in the State improved from 1040 kg/ha to around 1350 kg/ha and further to 1480 kg/ha in 1983-84. This was mainly because of a significant increase in the yield of summer (*boro*) rice, adopting high yielding varieties (Table 2.2).

Table 2.2 : Yield of rice

(Kg/ha)

Period	Autumn rice	Winter rice	Summer rice	Average Yield
Triennium ending 1960-61	755	1083	1091	1040
Triennium ending 1970-71	930	1220	2799	1213
Treinnium ending 1980-81	865	1310	2695	1349
During 1981-82	960	1045	2534	1120*
During 1982-83	891	900	2591	1018*
During 1983-84	N.A.	N.A.	N.A.	1478

* The drop in yields was mainly due to drought conditions.

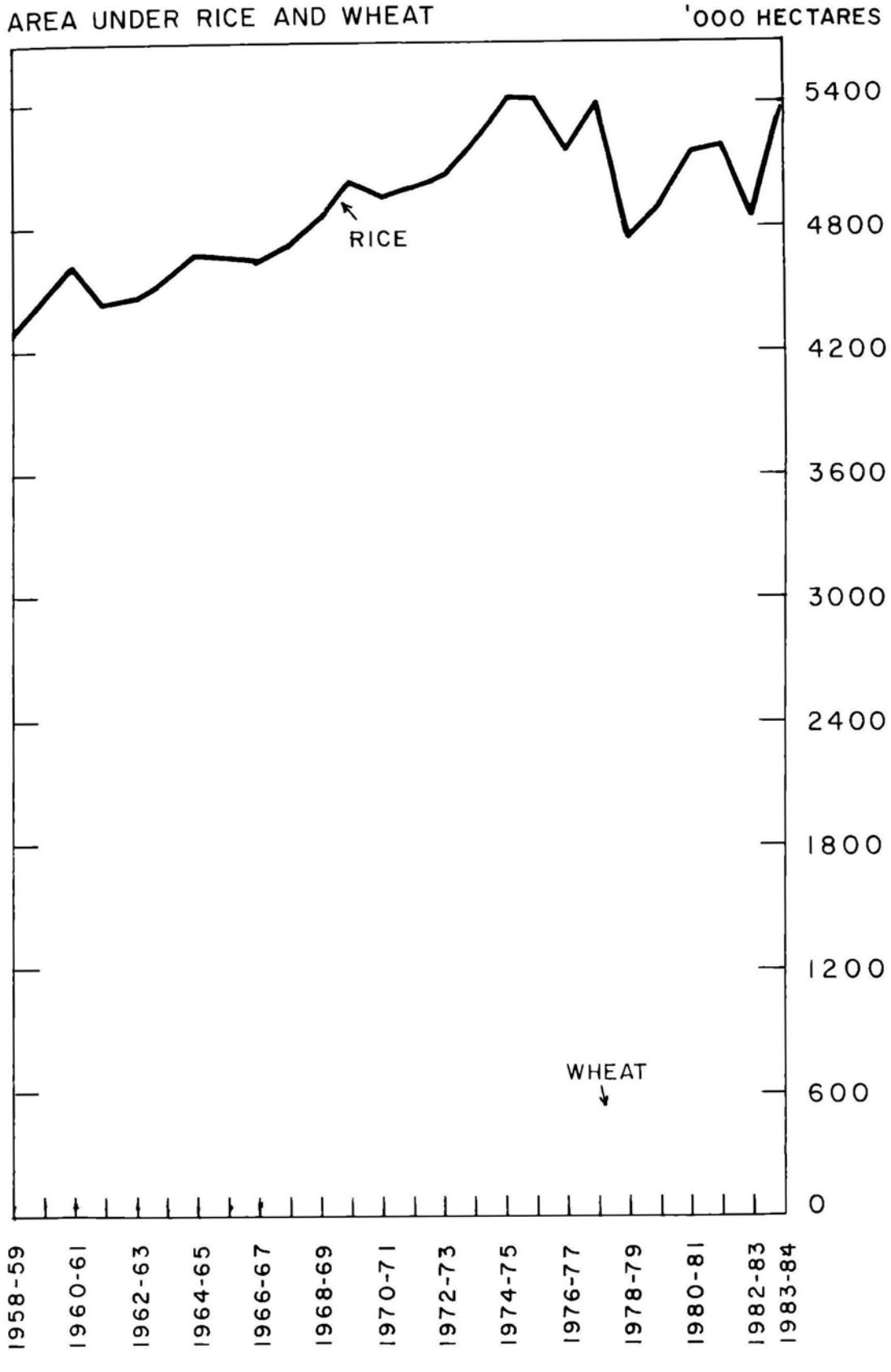
2.4.4 Although yield rates have registered a steady increase during 1961-81, these are still lower than the yields obtained in other leading rice producing States as may be seen from data for 1983-84 – Punjab (3063 kg/ha), Haryana (2486 kg/ha) and Andhra Pradesh (2106 kg/ha). Nevertheless, it is noteworthy that rice yields in West Bengal are the highest in Eastern India. With better water management practices and greater use of inputs, the State can further improve its rice yield.

2.5 *Wheat*

2.5.1 Output of wheat which was around 26,000 tonnes in 1960-61, shot up to 12 lakh tonnes in 1975-76, due to an increase in both area and yield. However, there was a steady decline in the production thereafter touching a low of 4 lakh tonnes in 1981-82. In recent years, however, a reversal of the declining trend has been noticed. In 1983-84, production increased to 8.5 lakh tonnes.

2.5.2 The increase in the yield of wheat noticed since 1981-82 is attributed to change in wheat seeds supplied by the Government. It was found that the Sonalika seed sown earlier had degenerated and was not suitable. The farmers were, therefore, not enthusiastic to go in for wheat cultivation and had switched over to *boro* rice.

2.5.3 Wheat yield which was 900 kg/ha in 1967-68 increased to 2410 kg/ha in 1970-71. By 1979-80, however, it declined


WEST BENGAL
AREA UNDER RICE AND WHEAT
'000 HECTARES
5400
4800
4200
3600
3000
2400
1800
1200
600
0
RICE
WHEAT
1958-59
1960-61
1962-63
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1966-67
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1970-71
1972-73
1974-75
1976-77
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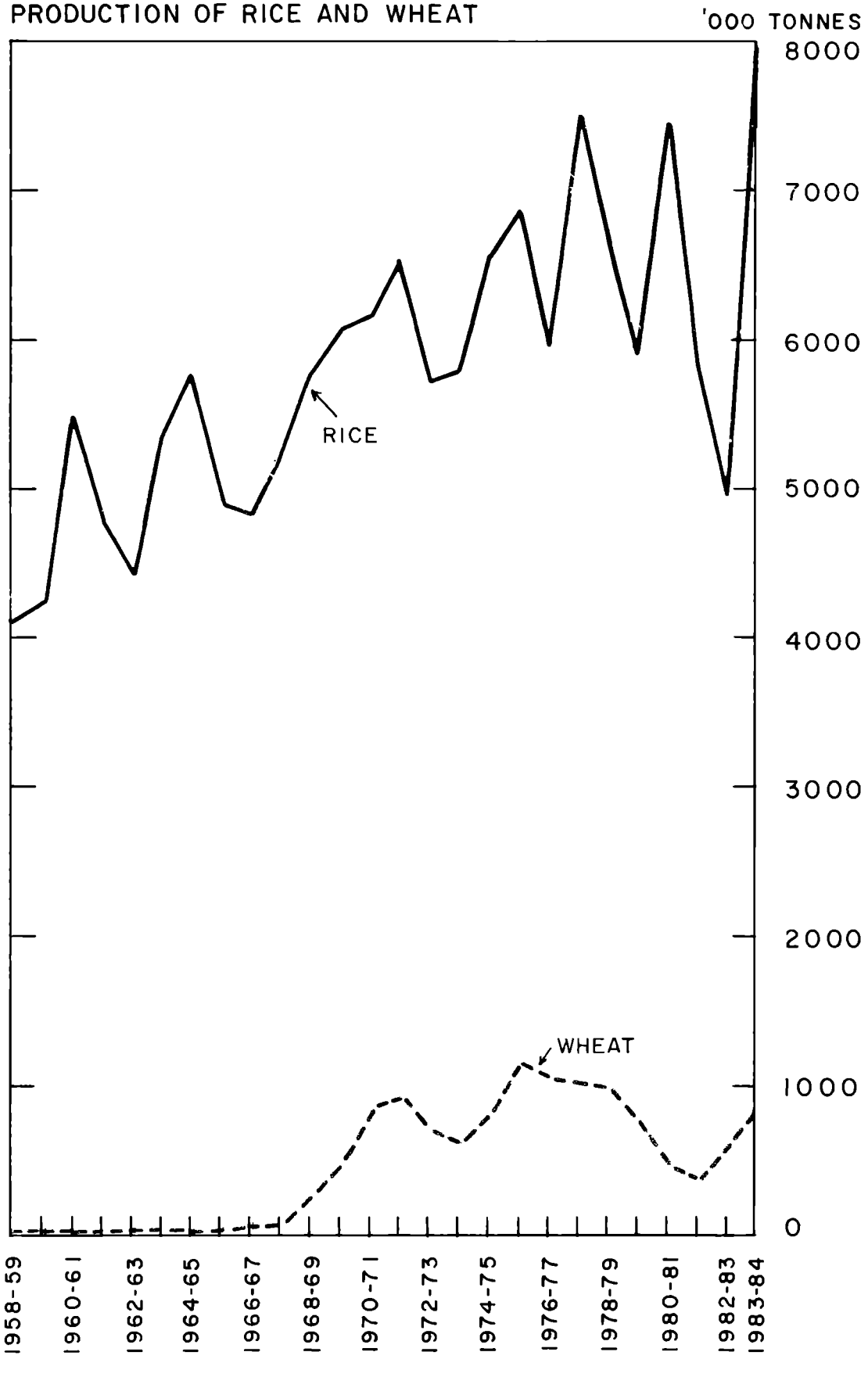
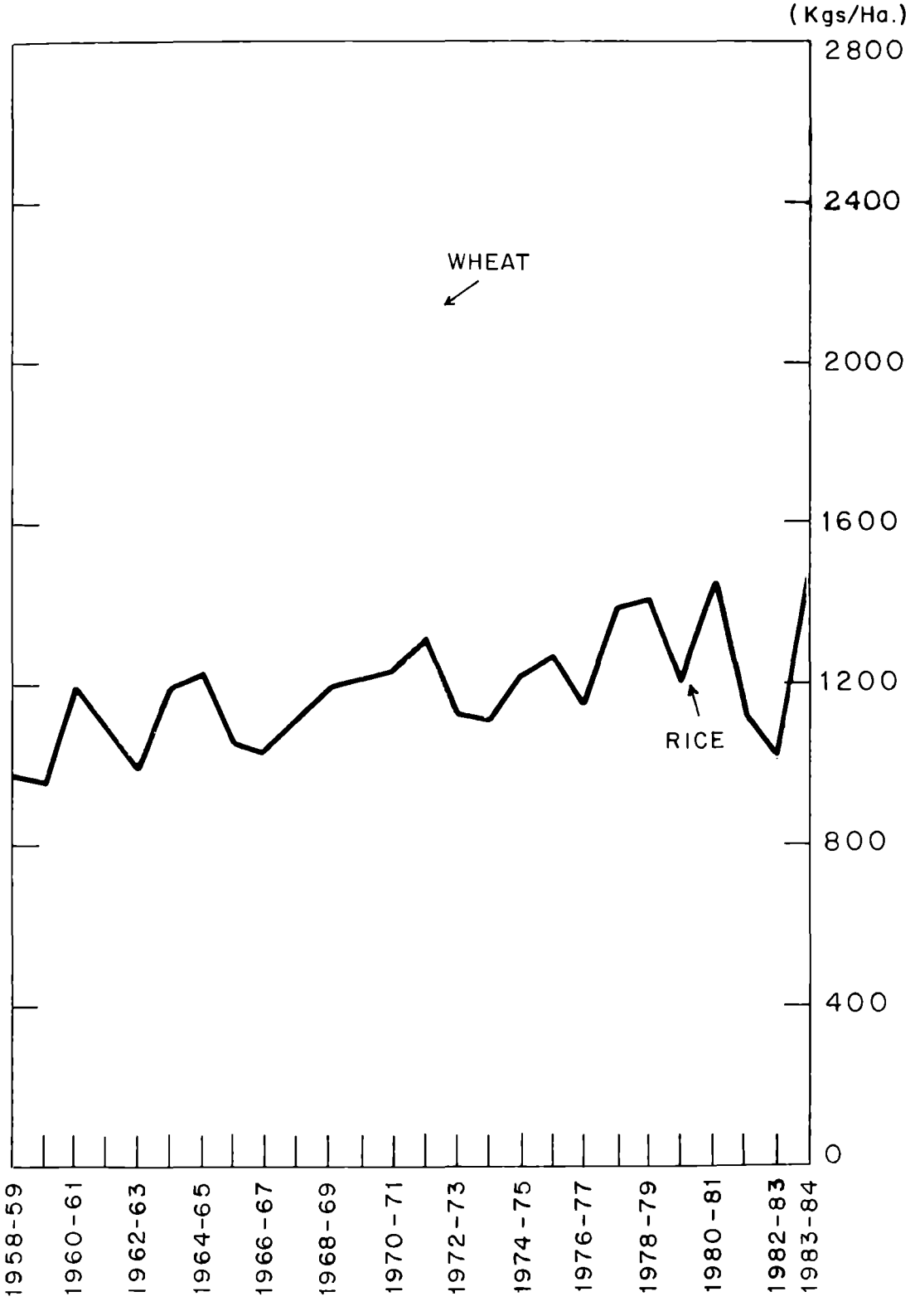

WEST BENGAL
PRODUCTION OF RICE AND WHEAT
'000 TONNES
8000
7000
6000
5000
4000
3000
2000
1000
0
RICE
WHEAT
1958-59
1960-61
1962-63
1964-65
1966-67
1968-69
1970-71
1972-73
1974-75
1976-77
1978-79
1980-81
1982-83
1983-84

WEST BENGAL

YIELD OF RICE AND WHEAT



to 1518 kg/ha. Commencing from 1981-82 an increase has been noticed due mainly to replacement of seeds like 'Sonalika' by better varieties. In 1983-84, the yield improved significantly to 2596 kg/ha.

2.6 *Other Cereals*

2.6.1 Other minor cereals grown in the State are maize, barley, bajra, jowar, ragi and small millets. Area under these crops is about one lakh ha and production one lakh tonnes. Area has remained more or less unchanged during 1961-71, but declined somewhat thereafter. However, production improved from 0.8 lakh tonnes during triennium ending 1960-61 to 1.2 lakh tonnes in 1983-84 due to an improvement in yield.

2.7 *Pulses*

2.7.1 Gram, tur and mung are the main pulses grown in the State. Area under pulses showed a steady declining trend since early 1960s. As a result their share in total foodgrains production declined from 7 per cent during triennium ending 1960-61 to 3 per cent during 1983-84. Yields which showed a declining trend during 1971-81 have shown some improvement in recent years.

2.8 *Non-foodgrains*

2.8.1 Jute and mesta, tea, oilseeds, and potato are the main non-foodgrain crops grown in the State.

2.8.2 *Jute and Mesta* : Jute and mesta are important cash crops of West Bengal. The State is the largest producer of jute in the country. In 1982-83, it accounted for over 60 per cent of the country's jute production. Production of jute registered an impressive growth between 1970-71 and 1981-82, but showed a decline in 1982-83. In the case of mesta, area and production recorded a steady decline during this period. However, both jute and mesta recorded some increases in 1983-84.

2.8.3 Yield of jute showed an increase between triennium ending 1970-71 and 1981-82 but declined marginally thereafter. Yield of mesta, however showed a steady increase from 1960-61 except for a decline in 1981-82 and 1982-83. The yield rates of both jute and mesta were significantly higher in 1983-84 than in 1960-61, as may be seen from Table 2.3.

Table 2.3. Yield of Jute and Mesta

(Kg/ha)

Period	Jute	Mesta
Triennium ending 1960-61	1253	979
Triennium ending 1970-71	1200	985
Triennium ending 1980-81	1344	1040
During 1981-82	1592	954
During 1982-83	1551	900
During 1983-84	1544	1040

2.8.4 *Tea*: Tea is a major cash crop grown in the State. Area under this crop has remained more or less stable since 1960. However production has shown an increase. This is due to some improvement in yield, as may be seen below (Table 2.4).

Table 2.4. Area, Production and Yield of Tea

Year	Area ('000 ha)	Production (Lakh Kgs.)	Yield (Kg/ha)
1960-61	83	815	982
1970-71	89	1012	1144
1979-80	91	1240	1363
1980-81	94*	1332	1417
1981-82	94*	1282	1374
1982-83	90*	1333	1478

* Provisional

2.8.5 *Oilseeds* : The major oilseed crops of the State are rapeseed and mustard, sesamum, linseed and groundnut. Oilseeds production in the state recorded a steady increase due both to an increase in area and productivity. However, total production is small - 2 lakh tonnes during 1983-84.

2.8.6 *Potato*: Potato is a major high value crop, the cultivation of which has been gaining in importance in the State. Major potato growing areas are Hooghly, Burdwan, Midnapore and

Murshidabad districts. Cultivation in these districts has benefited from irrigation facilities.

2.8.7 Area under potato went up from 58,600 ha during triennium ending 1960-61 to 1.5 lakh ha during 1983-84. Production during this period went up sharply from 5.7 lakh tonnes to 30.4 lakh tonnes, due to a significant increase in yield. The annual growth in potato production was 3.5 per cent during 1961-71 and 10 per cent during 1971-81.

2.8.8 Potato yield nearly doubled from about 10,330 kg/ha during triennium ending 1960-61 to 21,000 kg/ha in 1983-84. West Bengal now stands next to Gujarat in potato yield.

2.8.9 *Fruits and Vegetables* : The State is suitable for growing practically all principal fruits and vegetables. The main fruits grown are mandarine oranges, pineapple, banana and mango, particularly in Darjeeling district. The cultivation of vegetables is gaining in importance in areas with adequate irrigation and good transport facilities. Floriculture is yet another activity which is becoming popular around Calcutta and big towns.

2.9.1 As may be seen from the foregoing review, the performance of the non-foodgrain crops has been better than that of foodgrain crops, although the area under the former has been small (Annexure 2.3).

2.10 *Allied Activities*

2.10.1 *Dairy* : According to Livestock and Farm Equipment Census, 1977, West Bengal had a cattle population of 119 lakhs, and buffalo population of 8 lakhs (Table 2.5).

Table 2.5. Livestock Census (1977)

(In lakhs)

	Total males over 3 years	Total females over 3 years		Young stock	Grand total
		In milk	Total		
Cattle	47.4	16.7	38.1	33.3	118.8
Buffalo	5.2	1.1	2.0	1.0	8.2

Production of milk has shown a steady increase from 9 lakh tonnes in 1973-74 to 14 lakh tonnes in 1982-83. Yet, per capita milk production is only 25 kg as compared with all-India average of 50 kg.

2.10.2 *Poultry*: The number of poultry birds (including fowls and ducks) went up from 120 lakhs in 1966 to 155 lakhs in 1977. West Bengal is one of the largest producer of eggs in the eastern region. According to Livestock Census referred to earlier, the production of eggs was about 878 millions accounting for nearly 35 per cent of total production in the region.

2.10.3 *Sheep and Goats* : Sheep population increased from 6 lakhs in 1966 to 8 lakhs in 1977. During this period, the number of goats increased from 48 to 52 lakhs.

2.10.4 *Piggery*: Rearing of pigs is extensively taken up in the hilly and tribal areas. According to the Livestock Census, 1977, total number of pigs in the State was 4 lakhs.

2.10.5 *Fisheries*: West Bengal has rich aquatic potential in its lakes, tanks and reservoirs. Waterlogged areas provide good scope for fish farming. Pisciculture is gaining importance in the State. During 1982, production of inland fish amounted to 2.2 lakh tonnes. The coastline of the State provides ample scope for marine fishing. The output of marine fish during 1982 was 0.3 lakh tonnes.

2.10.6 *Forestry*: About 12 lakh ha (13 per cent of reporting area) in the State is covered by forests. The production of timber, firewood and plywood for the last three years is as indicated below.

Table 2.6. Forest Produce

(In lakh cubic metres)

Year	Timber	Firewood	Plywood*	Total
1980-81	2.3	4.5	0.2	7.0
1981-82	3.0	7.9	0.2	11.1
1982-83	2.9	6.4	0.2	9.5

* Figures relate to Forest Directorate only.

Source : Economic Survey, Government of West Bengal 1983-84.

2.10.7 *Mulberry Cultivation*: Several incentives have been provided by the Government to the small and marginal farmers for increasing the cultivation of mulberry. However, area under mulberry has shown only a marginal increase from 8,000 ha in 1971-72 to 10,000 ha in 1981-82. Production of raw silk went up from 4.6 lakh kg to 6.2 lakh kg during this period.

2.10.8 *Social Forestry*: Man-made forests are quick maturing. Therefore, benefits from them are high. They help in controlling soil erosion and maintence of ecological balance. The area covered by social forestry went up from 10,000 ha in 1978-79 to 17,000 ha in 1982-83.

2.11 *Inputs*

2.11.1 The use of HYV seeds and fertilizers has been steadily increasing in the State, particularly in irrigated areas. A large part of input distribution is handled by the private sector.

2.11.2 At present, arrangements for distribution of inputs are available upto block level only. The network of retail outlets to reach the farmers, particularly in hilly and interior areas, is not adequate. Facilities for storing inputs at village points are also not satisfactory.

2.11.3 *Seeds*: Demand for HYV seeds is high, but supply is not adequate. Major agencies engaged in the supply of certified seeds are (i) West Bengal State Seeds Corporation, (ii) National Seeds Corporation (NSC), (iii) Terai Development Corporation (TDC), (iv) West Bengal Agro-Industries Corporation (WBAIC), (v) West Bengal State Co-operative Marketing Federation (BENFED) and (vi) approved private seed growers. The State purchases seeds worth Rs. 30 crores annually from other States. The State Seeds Corporation was set up to make the State self sufficient in production and supply of seeds. This organisation purchases seeds from State Seeds Multiplication Farms and also undertakes on its own multiplication of selected seeds.

2.11.4 Seed renewal rate is 5 per cent as against the norm of 20 per cent. There is shortage of breeder and foundation seeds. For certified seeds of wheat, potato, jute and oilseeds, the State has to depend on agencies outside the State.

2.11.5 Area under high yielding varieties of rice has shown a steady increase from 19 per cent of the gross cropped area in 1975-76 to 36 per cent in 1982-83. Summer rice and wheat area is now fully sown to high yielding varieties. During 1982-83, about 35 per cent of autumn rice and 30 per cent of winter rice was sown to high yielding varieties.

2.11.6 The minikit programme is catching up. Between 1977-78 and 1982-83, 46 lakh free minikits were distributed.

2.11.7 *Fertilizers*: Use of fertilizers has increased significantly during the last two decades (Annexure 2.4). Consumption of fertilizer improved from 3 kg/ha in 1960-61 to 44 kg/ha in 1983-84 (Table 2.7).

Table 2.7. Consumption of Fertilizers

Year	NPK ('000 tonnes)	Kg/ha	Year	NPK ('000 tonnes)	Kg/ha
1960-61	18	2.9	1977-78	172	22.5
1970-71	73	13.6	1978-79	243	31.9
1971-72	96	14.3	1979-80	241	30.5
1972-73	92	13.0	1980-81	283	37.1
1973-74	99	13.6	1981-82	259	33.9
1974-75	125	17.7	1982-83	261	34.2
1975-76	130	18.3	1983-84	N.A.	43.6
1976-77	153	19.2			

2.11.8 In the consumption of fertilizers, West Bengal is now close to all-India consumption level (45 kg/ha). Consumption in the State, however, is still much lower than that in Punjab and Haryana.

2.11.9 There are considerable inter-district variations in the consumption of fertilizers. In 1980-81, while Jalpaiguri had a low consumption level of 12 kg/ha, it was as high as 105-117 kg/ha in the Hooghly and Howrah districts (Annexure 2.5).

2.11.10 Imported fertilizers are distributed through agents appointed by the State Government, viz., West Bengal State Co-operative Marketing Federation, Agro-Industries Corporation and licensed private dealers. Part of the fertilizers allotted to the State by the Fertilizer Corporation and Hindustan Steel is distributed through co-operatives and agencies such as Thana Co-operative Marketing Societies, Agro-Service centres and private dealers. Domestically produced fertilizers are handled by a network of 18,000 private dealers licensed by the State Government.

2.11.11 *Pesticides*: The State has made some progress in surveillance of pests and diseases. The Centrally Sponsored Scheme for eradication of pests and diseases is in operation in the State Malda has a field unit of the Central Surveillance Station for reporting on pest situation to the State authorities. For conducting roving surveys with a view to identifying diseases, a laboratory has been set up in each district.

2.11.12 Pesticides and insecticides are distributed commercially and in emergencies by the State Government. At present, the number of distribution points is a little over 7000.

2.11.13 *Electric Power*: Supply of electric power is not only inadequate, but also erratic. Sale of electric power for agriculture is about one per cent of the total.

Table 2.8. Sale of Electric Power

Year	Sale for Irrigation (Million KWH)	Percentage of total
1960-61	2.6	1.0
1970-71	21.1	0.4
1978-79	68.3	1.2
1979-80	77.7	1.4
1980-81	72.4	1.3

Source: Economic Survey, Government of West Bengal, 1983-84.

2.12 *Agricultural Credit*

2.12.1 *Institutional Set-up*: Institutional credit for agriculture is provided by (i) co-operatives, (ii) commercial banks and (iii)

RRBs. The short-term co-operative credit structure consists of the State Co-operative Bank at the apex level, 17 Central Co-operative Banks (CCBs) and 7515 Primary Agricultural Credit Societies (PACS) as at the end of June 1983. The long-term co-operative credit structure in the State consists of the Central Land Development Bank and 24 primary banks.

2.12.2 Commercial banks provide both short-term and long-term credit. They had 2625 branches at the end of June 1983 of which 1085 were rural and 538 semi-urban. Rural population served by a rural branch works out to 37,000 on an average. There are 8 Regional Rural Banks as on June 30, 1983. They cover all the 16 districts through 441 branches.

2.12.3 *Recent Trends in Agricultural Credit* : The membership of the primary societies increased from 10 lakhs in 1970-71 to 25 lakhs in 1982-83. The coverage of rural households which was around 13 per cent in 1970-71 increased to about 33 per cent in 1978-79, but declined to about 27 per cent in 1979-80. The percentage of borrowing members to total membership showed a decline from 49 in 1978-79 to 30 in 1981-82. Short-term loans disbursed were small in early 1970s. They improved thereafter, reaching a high level in 1978-79. The growth in lending was not maintained thereafter due to rising overdues. Medium-term loans disbursed by PACS were small (Table 2.9).

Table 2.9. Loans Disbursed by PACS

Year	Short-term loans (Rs. crores)	Medium-term loans (Rs. crores)	Loans advanced per borrowing member (Rs.)	Percentage of overdues to demand
1970-71	5.4	0.2	207	72
1978-79	51.6	12.4	583	49
1979-80	38.2	3.4	457	61
1980-81	38.6	2.5	452	61
1981-82	41.5	3.9	600	53
1982-83	32.1	0.6	433	69

2.12.4 Loans issued by LDB were negligible upto 1970-71. The position improved thereafter till about 1978-79. Since then, disbursements came down owing to rising overdues (Table 2.10).

Table 2.10. Loans Disbursed by LDB

Year	Loans disbursed (Rs. crores)	Percentage of overdues to demand (At primary level)
1970-71	1.2	56
1978-79	12.1	38
1979-80	7.8	37
1980-81	6.6	59
1981-82	6.6	66
1982-83	6.7	59

2.12.5 *Commercial Banks* : Loans disbursed by commercial banks were negligible till the middle of 1970s. Since then, there has been some increase in disbursements. Short-term credit disbursed by them amounted to Rs. 18 crores in 1980-81 and term-loans Rs. 13 crores (Table 2.11)

Table 2.11. Loans Disbursed by Commercial Banks

(Rs. crores)

Year	Short-term loans	Medium-term and long-term loans
1974-75	3.5	2.6
1975-76	4.9	5.4
1976-77	5.0	6.3
1977-78	15.2	11.7
1978-79	17.3	13.8
1979-80	12.2	9.3
1980-81	17.6	13.5

2.12.6 The percentage of overdues to demand at the end of 1981-82 was 73, which was even higher than that of PACS/LDB. The rising overdues both in co-operatives and commercial banks is a major constraint for the flow of credit to agriculture.

2.13 *Special Development Programmes*

2.13.1 A number of development programmes were taken up in the State to promote rural development. The main programmes are (i) Integrated Rural Development Programme, (ii) Special Programme for Assistance to Small and Marginal Farmers, (iii) Programme for boosting rice production, (iv) Comprehensive Area Development Programme, (v) Operation Barga, (vi) Command Area Development, (vii) Drought-Prone Area Development Programme, (viii) Development of Sunderbans and (ix) Rangabellia Project.

2.13.2 *IRDP*: IRDP was launched in the State in 1978-79 covering 169 blocks. With effect from October 2, 1980, coverage was extended to all the 335 blocks. Details of the subsidy released, credit disbursed and number of beneficiaries covered during 1980-81 to 1982-83 are given below.

Table 2.12. Progress of IRDP

Year	Subsidy released (Rs. crores)	Credit disbursed (Rs. crores)	No. of beneficiaries assisted	Per capita investment (Rs.)
1980-81	0.8	1.4	28,481	769
1981-82	1.9	3.6	54,116	1016
1982-83	6.2	11.0	96,616	1775

Source : Department of Development and Planning, Government of West Bengal.

2.13.3 Of the total number of beneficiaries covered in 1982-83, 25,542 (25 per cent) were provided assistance for development of agriculture, 24,118 (26 per cent) for animal husbandry, 4163 (4 per cent) for fisheries and 43,670 (45 per cent) for small industries and business.

2.13.4 *Special Programme for Assistance to Small and Marginal Farmers* : The programme was launched by the Government of India in 1983-84. It covers construction of dugwells and *rahat*, sinking of shallow tubewells and filter points, boring and deepening of wells, installation of pumpsets, cost of energisation of electric pumpsets, plantation, land development and supply of minikits of pulses, oilseeds and fertilizers. Beneficiaries are eligible for subsidy ranging between 25 per cent (for small farmers) and 50 per cent (for scheduled tribes) of the cost and the balance is to be provided by way of loans by co-operatives, commercial banks and RRBs. During 1983-84, the Budget provision for subsidy was Rs. 17 crores. The loan component was estimated at Rs. 34-45 crores.

2.13.5 *Special Programme for Boosting Rice Production* : Under this programme (for details, see Chapter 3, paragraph 3.11.9 of Part I), 67 blocks were identified in West Bengal for intensive rice production during the Seventh Plan. A pilot project was launched in 10 selected blocks during 1984-85.

2.13.6 *Comprehensive Area Development Programme* : The programme was formulated by the State Planning Board in 1974 under the West Bengal Comprehensive Area Development Act, 1974. In terms of this Act, the West Bengal Comprehensive Area Development Corporation (CADC) was set up in October 1974.

2.13.7 Under the programme, an area of 15,440 ha was brought under irrigation between 1975 and 1978, with the installation of 174 deep tubewells, 2121 shallow tubewells and 2 river lifts. About 80 per cent of the investment cost was met by way of loans from banks and balance by State Government as grants. CADP Service Centres distributed seeds, fertilizers and pesticides worth Rs. 1.6 crores between 1975-76 and 1977-78. Farmers who benefited from input distribution numbered 71,000. However, the Corporation could not bring about any marked improvement in expansion of marketing facilities.

2.13.8 From the middle of 1976, CADC did not take up any new project mainly due to paucity of resources.

2.13.9 *Operation Barga*: This was launched by the State Government with the objective of conferring on sharecroppers

legal status recording their rights on land cultivated by them. By the end of 1983, about 12 lakh sharecroppers (bargadars) have been recorded. The recording of rights has not only given them legal protection from eviction but also made them eligible to obtain bank loans for crop cultivation.

2.13.10 *Command Area Development*: Command Area Development Authorities were set up for DVC, Mayurakshi and Kangsabati irrigation projects. An investment outlay of Rs. 8 crores was provided for the purpose in Sixth Plan. The actual expenditure during this Plan is likely to be lower at Rs. 6 crores. The progress in on-farm development works in these projects, particularly construction of field channels, is slow, attributed to shortage of funds. Conjunctive use of surface water with groundwater has not received due attention.

2.13.11 *Drought-Prone Area Programme*: This programme has been taken up in chronically drought-prone areas of Purulia district (all the 20 blocks), 7 blocks of Bankura district and Jhargram sub-division of Midnapore district (8 blocks). The projects under this programme cover development of minor irrigation, afforestation including social forestry and pasture development, soil and water conservation including dry farming and development of land on watershed basis and creation of infrastructure for animal husbandry, fishery, sericulture and lac development. As a result of the implementation of the programme, an area of 12,822 ha has been brought under irrigation. Two medium irrigation projects are also under implementation which will bring an additional area of 4450 ha under irrigation.

2.13.12 *Development of Sunderbans*: The Sunderbans region forms part of the delta between Hooghly and Padma-Meghna estuaries. The region consists of a number of isolated islands, surrounded by saline waters. It has a population of over 2 million. Scheduled Castes and Tribes account for 56 per cent of the population. Economic activities of the region are predominantly agrarian. Rice is the only crop grown in *kharif* season. Per capita income from agriculture is Rs. 170 only per annum. Roads and bridges are insufficient. Ferry ghats are in a dilapidated condition.

2.13.13 Root causes of backwardness of Sunderbans are : (i) poor drainage facilities, (ii) high groundwater level and high salt

concentration, (iii) ingress of saline water during tidal flows, (iv) high percentage of salt in the soil during dry months (January-May), (v) absence of border strips around cultivated fields, (vi) lack of proper maintenance of embankments, (vii) inadequacy of irrigation and credit facilities and (viii) lack of communication facilities.

2.13.14 The State Government set up an autonomous Sunderbans Development Board for implementation of special programmes for the development of this region. The Board is implementing integrated programmes for agricultural development through a number of rural growth centres. The Board is also the implementing authority for the IFAD (International Fund for Agricultural Development) sponsored Sunderbans Development Project, the major components of which are drainage, irrigation and diversification of cropping pattern for augmenting agricultural production.

2.13.15 The State Government and voluntary agencies provide nearly 80 per cent of the services and material assistance in this region. However, due to faulty distribution, such assistance reaches only upto the level of middle peasantry. Very little assistance percolates to the poor who constitute 80 per cent of the population. There is no participation of the people either in the process of decision making or in the implementation of the development programmes.

2.13.16 *Rangabellia Project.* Rangabellia Project is a noteworthy experiment in rural development in the Sunderbans region initiated by the Tagore Society for Rural Development.

2.13.17 Some of the activities undertaken by the project are : (i) economic programmes covering agriculture and allied activities, provision of agro-service assistance, extension of irrigation facilities, soil conservation, social forestry, pisciculture, etc., (ii) health care programmes such as supply of safe drinking water, mass scale immunisation, etc., (iii) programme for supply of nutritional food to about 4,000 children and expecting mothers, supply of cow milk, etc., (iv) programme for women covering the running of a training centre for deserted and destitute women, backyard poultry, etc., (v) educational activities and (vi) cultural activities.

2.13.18 Implementation of the programme was entrusted to young men and women. This led to the setting up of the following organisations over a period of time, viz., (i) Consumers' Co-operative Society, (ii) Agro-Services Centre, (iii) Comprehensive Health Project, (iv) Fishermen's Co-operative Society, (v) Weavers' Co-operative Society, (vi) Honey Collectors' Co-operative Society, (vii) Cultural Centre, and (viii) a non-formal education centre for non-school going children and dropouts.

2.13.19 The beneficiaries of the development programmes were organised into groups, each group consisting of 15 to 20 families. Each group formulated a comprehensive plan for every family at the beginning of each year. Resources mobilised from different sources were distributed among these groups of families on the basis of number of persons comprising each group and their special requirements. The group became the owner of the resources. These resources were allocated by the group according to the requirements of the plan implemented for the group. In case of defaults, the group brought social pressure on the defaulters. In this way repayment of loans was ensured.

2.13.20 A second-tier in the organisation is the fortnightly village meeting. These fortnightly meetings are held for discussing problems of a general nature concerning the group, as also inter-group problems. The third-tier in the organisational structure is the general meeting of all the groups. Matters of importance concerning the entire project are discussed and decided upon in such meetings.

2.13.21 Rangabellia Project with its diversified activities indicates that united and determined effort of the people working together could bring about significant improvement in all round social and economic development even in a very handicapped area and is worthy of emulation.

Annexure 2.1

Crop Pattern

(Area in lakh ha)

	1970-71		1980-81	
	Area	Percentage of total	Area	Percentage of total
I. Foodgrains				
1. Rice	4956	69.9	5176	67.9
2. Wheat	360	5.1	283	3.7
3. Maize	51	0.7	53	0.7
4. Barley	62	0.9	35	0.4
5. Other cereals	26	0.4	28	0.4
6. Pulses	669	9.4	524	6.9
Total I	**6124**	**86.4**	**6099**	**80.0**
II. Non-foodgrains				
1. Sugarcane	38	0.5	14	0.2
2. Tea	89	1.3	94	1.2
3. Tobacco	10	0.1	19	0.2
4. Oilseeds	168	2.4	317	4.2
5. Jute	407	5.7	610	8.1
6. Mesta	66	0.9	44	0.6
7. Other fibres	3	Neg.	2	Neg.
8. Potato	65	0.9	116	1.5
9. Others	122	2.8	305	4.0
Total II	**968**	**13.6**	**1521**	**20.0**
Grand Total	**7092**	**100.0**	**7620**	**100.0**

Annexure 2.2

Area, Production and Productivity of major crops

Crops	Area ('000 ha).						Production ('000 tonnes)						Productivity (Kg/ha.)					
	Triennium ending			During			Triennium ending			During			Triennium ending			During		
	1961	1971	1981	1981-82	1982-83	1983-84	1961	1971	1981	1981-82	1982-83	1983-84	1961	1971	1981	1981-82	1982-83	1983-84
Rice	4428	4939	4949	5210	4862	5373	4605	5992	6676	5833	4949	7940	1040	1213	1349	1120	1018	1478
Wheat	39	232	437	214	266	329	27	539	747	389	605	854	692	2323	1709	1819	2275	2596
Other cereals	128	136	109	112	105	108	77	106	103	103	100	118	602	779	945	920	952	1093
Pulses	751	707	548	420	376	373	366	397	270	225	198	245	487	561	493	535	525	655
Total food-grains	**5346**	**6014**	**6043**	**5956**	**5609**	**6183**	**5075**	**7034**	**7796**	**6550**	**5852**	**9157**	**949**	**1170**	**1290**	**1099**	**1043**	**1481**
Oilseeds	150	165	241	346	355	374	47	68	109	176	170	194	315	409	451	508	478	519
Jute*	326	371	551	506	439	464	2269	2474	4115	4473	3782	3977	1253	1200	1344	1592	1551	1544
Mesta*	102	57	45	28	21	23	555	312	260	149	103	134	979	985	1040	954	900	1040
Potato	55	65	128	120	116	146	568	798	2137	1985	2320	3036	10327	12277	16695	16496	20015	20988

* Jute and Mesta '000 bales of 180 kg. each

Annexure 2.3

Annual Compound Growth Rates

(Per cent per annum)

Crops	Area			Production			Yield		
	1961-71	1971-81	1961-81	1961-71	1971-81	1961-81	1961-71	1971-81	1961-81
Rice	1.1	—	0.6	2.7	1.1	1.9	1.6	1.1	1.3
Wheat	19.5	6.5	12.8	34.9	3.3	18.1	12.9	— 3.0	4.6
Other cereals	0.6	— 2.2	— 0.8	3.2	— 0.3	1.5	2.6	1.9	2.3
Pules	— 0.6	— 2.5	— 1.6	0.8	— 3.8	— 1.5	1.4	— 1.3	0.1
Total food-grains	**1.2**	**0.1**	**0.6**	**3.3**	**1.0**	**2.2**	**2.1**	**1.0**	**1.6**
Oilseeds	1.0	3.9	2.4	3.8	4.8	4.3	2.7	1.0	1.8
Jute	1.3	4.0	2.7	0.9	5.2	3.0	— 0.4	1.1	0.3
Mesta	— 5.7	— 2.3	— 4.0	— 5.6	— 1.8	— 3.7	0.1	0.5	0.3
Potato	1.7	7.0	4.3	3.5	10.3	6.8	1.7	3.1	2.4

— = Nil or negligible

Annexure 2.4

Trends in Consumption of Fertilizers

(In thousand tonnes)

Year	N	P	K	Total
1960-61	12	3	3	18
1965-66	32	8	8	48
1966-67	27	9	12	48
1967-68	29	8	7	44
1968-69	32	14	8	54
1969-70	34	11	11	56
1970-71	47	12	14	73
1971-72	56	18	22	96
1972-73	53	16	23	92
1973-74	54	18	27	99
1974-75	86	19	20	125
1975-76	86	24	20	130
1976-77	102	27	24	153
1977-78	114	29	29	172
1978-79	146	53	44	243
1979-80	145	63	33	241
1980-81	167	71	45	283
1981-82	157	63	39	259
1982-83	164	57	40	261

Annexure 2.5

Consumption of Fertilizers During Triennium Ending 1980-81

State average 37.1

Districts above State average	Fertilizer consumption (kg/ha)	Districts below State average	Fertilizer consumption (kg/ha)
Howrah	117.0	Murshidabad	34.6
Hooghly	104.5	24-Parganas	33.8
Burdwan	64.0	Midnapore	30.0
Nadia	48.4	Malda	28.5
Birbhum	42.4	Darjeeling	28.2
		Bankura	28.1
		West Dinajpur	22.2
		Purulia	19.2
		Cooch Behar	18.2
		Jalpaiguri	12.3

Source : Agro-Economic Research Centre, Santiniketan

CHAPTER 3

AGRO-CLIMATIC ZONES

3.1.1 The State Department of Agriculture has divided the State into agro-climatic zones with block as the lowest geographical unit (Annexure 3.4). However, as reliable block level data over a period of time are not readily available, we have, for the purpose of this Report, made some adjustments in the aforesaid classification by taking the district as the lowest geographical unit. This zonal classification along with the districts grouped under each zone is presented below.

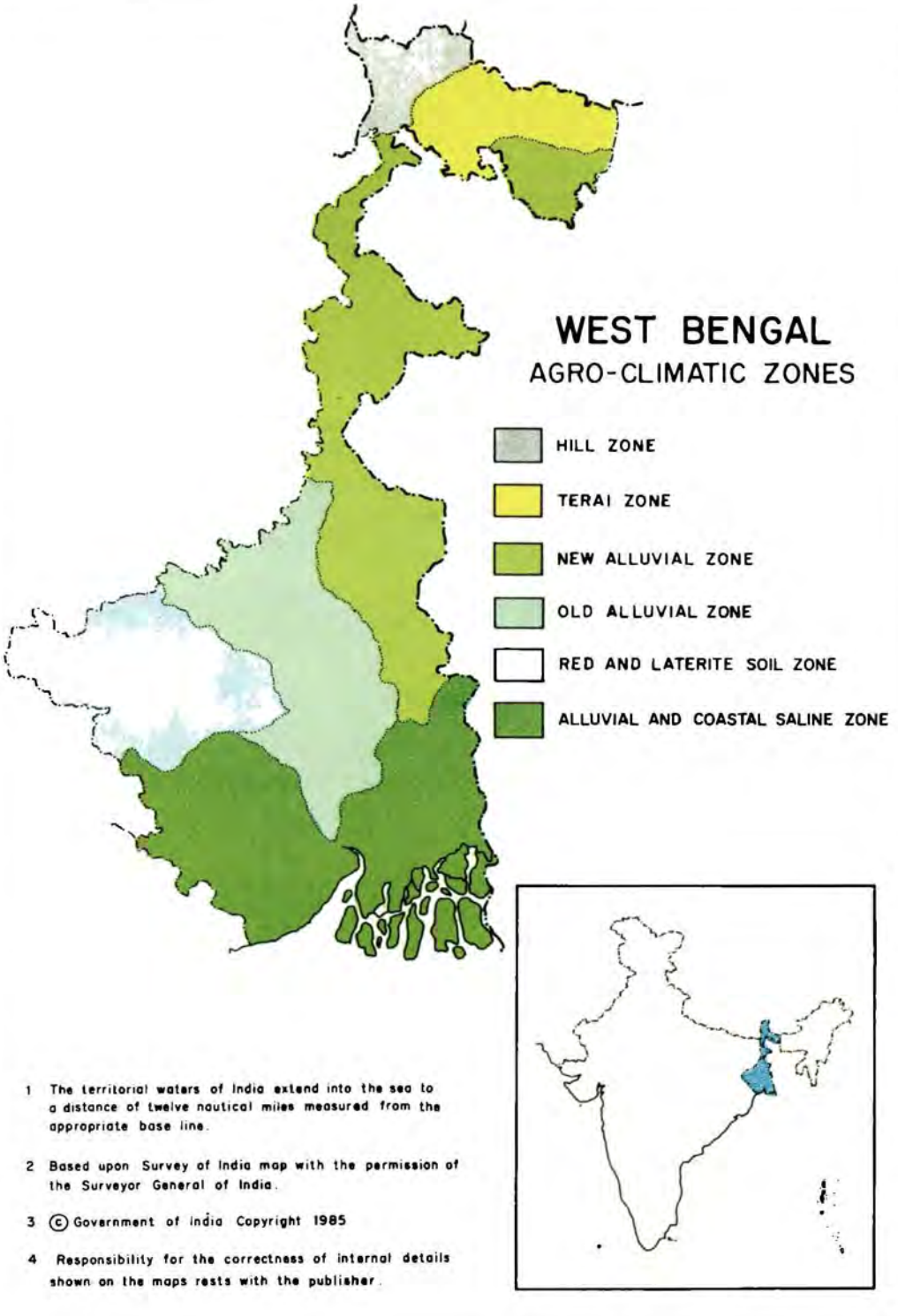
1.	Hill District	Darjeeling.
2.	Terai Districts	Jalpaiguri and Cooch Behar.
3.	Alluvial Districts (I)	West Dinajpur, Malda, Murshidabad and Nadia.
4.	Alluvial Districts (II)	Birbhum, Burdwan, Hooghly and Howrah.
5.	Red and Laterite Soil Districts	Purulia and Bankura.
6.	Alluvial-cum-Coastal Saline Districts	Midnapore and 24-Parganas.

3.2 *Hill District*

3.2.1 *General Features*: The total geographical area of the zone is 3075 sq. kms forming 3.5 per cent of the total area of the State. The zone is situated in the eastern region of Himalayas and is 60-90 metres above sea level. As a whole, the zone comprises mighty labyrinth of ridges and deep valleys with well carved out terraces.

3.2.2 *Soils* : By and large, the soil is loamy with high organic matter and is acidic. The soil depth is generally shallow.

3.2.3 *Rainfall*: The annual rainfall in this zone ranges between 2500 and 3000 mm of which around 80 per cent is received during June to September. The minimum and maximum temperatures vary between 2°C and 20°C. The humidity fluctuates from 78 to 95 per cent.



1 The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line.

2 Based upon Survey of India map with the permission of the Surveyor General of India.

4 Responsibility for the correctness of internal details shown on the maps rests with the publisher.

3.2.4 *Socio-Economic Characteristics*: According to 1981 Census, the total population of this district is estimated at 1 million, over 70 per cent of which reside in rural areas. The density of population in this zone is 333 per sq. km as against 621 for the State as a whole. Scheduled Castes and Scheduled Tribes comprise roughly 14 and 15 per cent, respectively of the zone's total population. The zone has a total work force of 3.6 lakhs, of which about 25 per cent are cultivators and nearly 10 per cent agricultural labourers. Literacy rate is 42 per cent as against the State average of 41 per cent.

3.2.5 *Pattern of Land Holdings*: Data on number and area of operational holdings according to size classes during 1970-71 and 1976-77 are given in Annexure 3.1. During this period, there was an increase in the number of marginal and small holdings. Marginal and small farmers taken together accounted for 76 per cent of the holdings, but 24 per cent of the operational area of the zone during 1976-77.

3.2.6 *Land-use Pattern*: The land-use pattern of the zone for the year 1973-74 (latest year for which data are available) is indicated below.

Table 3.1. Land Use Pattern – Hill District

Classification	Area ('000 ha)	Per cent of total reporting area	Col. 2 as per cent of State total
(1)	(2)	(3)	(4)
1. **Reporting area**	**325**	**100.0**	**3.6**
2. Forests	128	39.4	10.8
3. Not available for cultivation	76	23.4	5.5
4. Cultivable waste land including permanent pastures, etc.	16	5.0	4.1
5. Fallow lands	2	0.6	2.4
6. Net area sown	103	31.6	1.9

3.2.7 About 39 per cent of the reporting area of the zone is under forests. Cultivable area is only 37 per cent. Cultivated area is around 32 per cent of the reporting area.

3.2.8 *Cropping Pattern* : Cropping pattern of the zone, based on 1977-78 data is given in Annexure 3.2. The main crops grown in this zone are foodgrains. These account for 63 per cent of the cropped area of which rice accounts for about 33 per cent. Rice is cultivated mainly during the *kharif* season. Maize and ragi are the other two important crops sown during the season and account for another 25 per cent of gross cropped area. *Rabi* cultivation in the district is negligible. As a result the cropping intensity is very low, being around 116 per cent. Among non-foodgrain crops, tea is the main crop accounting for about 22 per cent of the cropped area.

3.2.9 *Irrigation Pattern*: Data on irrigation for the zone are presented below.

Table 3.2. Net Irrigated area – Hill District

('000 ha)

Source	1967-68	1975-76*
Government canals	1.3	3.2
	(6.2)	(14.0)
Other sources	19.6	19.6
	(93.8)	(86.0)
Total	20.9	22.8
	(100.0)	(100.0)

* Data compiled by AER Centre, Santiniketan.

Note : Figures in brackets represent percentage of total.

3.2.10 Around 20 per cent of net sown area in the district is irrigated. Increase in net irrigated area during the period 1967-68 to 1975-76 was marginal. Rice accounts for about 77 per cent of the gross irrigated area. The gross irrigated area constitutes around 17 per cent of the gross sown area.

3.2.11 *Fertilizer Consumption* : The consumption of fertilizer in the district went up significantly from 3 kg/ha during triennium ending1970-71 to 28 kg/ha during the corresponding period of 1980-81.

3.2.12 *High Yielding Varieties*: Data on area under high yielding varieties available for the triennium ending 1980-81, show that nearly 40 per cent of cropped area is covered by high yielding varieties.

Table 3.3. Area under High Yielding Varieties – Hill District

('000 ha)

Crop	Total area	Area under HYV*	Per cent of col. 3 to 2
(1)	(2)	(3)	(4)
Autumn rice	6.9	3.5	50.7
Winter rice	36.2	12.6	34.8
Total	43.1	16.1	37.4

* Data compiled by AER Centre, Santiniketan.

3.2.13 *Area, Production and Productivity* : This district accounts for only 1 per cent of State's foodgrains production. Estimates of area, production and yields of principal crops in the district during the triennia ending 1972-73 and 1980-81 and latest available figures for 1982-83 are given in Annexure 3.4. Yield of rice is around 5 per cent higher than its average yield for Eastern India. There has been no appreciable variation in its yield during the past decade. Yield of maize has recorded an increase of nearly 60 per cent over the decade. However, area under the crop has remained stagnant. Yield of wheat has recorded an appreciable increase of about 55 per cent. This district produces considerable quantities of the finest quality of tea.

3.3 *Terai Districts*

3.3.1 *General Features*: The total geographical area of the zone is 9631 sq. kms constituting 11.0 per cent of total area of

the State. It is situated in the north at the foot hills of Himalayas from where a vast stretch of gently sloping flat land extends towards the south. The lands are intersected by many rivers, viz., Teesta, Mahananda, Torsa, Jaldhaka, Karatoa and their innumerable tributaries. These rivers remain dry during summer months but receive water much more than their capacity during monsoon months resulting in frequent floods. About 20 per cent of the lands are subjected to inundation annually. Coarse sands are deposited on cultivated lands making them almost barren for the next few years.

3.3.2 *Soils*: The soils are mostly sandy to sandy loam, grey to black in colour with moderate to high organic matter, shallow and porous. The bases have been leached out due to heavy rainfall. The soils are acidic. The phosphate and potash status is moderate to low.

3.3.3 *Rainfall*: Average annual rainfall in the zone ranges between 2100 and 3300 mm of which about 75 per cent is received during the monsoon months. The minimum and maximum temperatures fluctuate between 10.5°C and 31°C. Humidity ranges between 43 and 90 per cent.

3.3.4 *Socio-Economic Characteristics*: Population of the zone, according to 1981 Census is 4 million, of which 89 per cent is rural. The density of population is 414 per sq. km. Scheduled Castes and Scheduled Tribes constitute 41 per cent and 13 per cent, respectively, of the population of the zone. It has a total work force of about 1.2 million of which 41 per cent are cultivators and 21 per cent agricultural labourers. Literacy rate is 30 per cent as against the State average of 41 per cent.

3.3.5 *Pattern of Land Holdings*: The classification of the operational holdings in the zone according to size groups for the years 1970-71 and 1976-77 is shown in Annexure 3.2. During 1976-77, around 82 per cent of the farmers were small and marginal but accounted only for 43 per cent of cultivated area.

3.3.6 *Land Use Pattern*: Land use pattern of the zone during 1980-81 is presented in the table below.

Table 3.4. Land Use Pattern – Terai Districts

Classification	Area ('000 ha)	Per cent of total reporting area	Col. 2 as per cent of State total
(1)	(2)	(3)	(4)
1. **Reporting area**	**956**	**100.0**	**10.8**
2. Forests	178	18.6	15.1
3. Not available for cultivation	132	13.8	9.4
4. Permanent pastures and other grazing land	Neg.	0.1	11.4
5. Land under miscellaneous tree crops and groves	16	1.7	10.0
6. Cultivable waste land	44	4.6	11.3
7. Fallow lands			
i) Current fallows	2	0.3	2.9
ii) Others	2	0.1	2.7
8. Net area sown	582	60.8	10.5

3.3.7 About 68 per cent of the total reporting area of the zone is cultivable. Cultivated area constitutes about 61 per cent.

3.3.8 *Cropping Pattern*: More than two-thirds of gross cropped area in this zone is sown to *Kharif* rice. Jute, urad and millets are the other crops grown during the *kharif* season. Major crops grown during the *rabi* season are wheat, potato and oilseeds. However, area sown to these crops is not large. The zone has a cropping intensity of around 155 per cent. Cropping pattern of the zone based on 1977-78 data is given in Annexure 3.2.

3.3.9 *Irrigation Pattern*: Data on irrigated area are available upto 1975-76. Data for 1967-68 and 1975-76 are given in the table below.

Table 3.5. Net Irrigated Area – Terai Districts
('000 ha)

Source	1967-68	1975-76*
Government canals	8.6	10.9
	(12.0)	(12.0)
Other sources	62.9	79.1
	(88.0)	(88.0)
Total	71.5	90.0
	(100.0)	(100.0)

* Data compiled by AER Centre, Santiniketan.

Note : Figures in brackets represent percentage of total.

3.3.10 Between 1967-68 and 1975-76, net irrigated area in this zone increased by only a little over 10 per cent. Availability of irrigation during *rabi* and summer seasons is inadequate.

3.3.11 *Fertilizer Consumption* : Data on fertilizer consumption in this zone during triennium ended 1970-71 and 1980-81 are presented below.

Table 3.6. Fertilizer Consumption* – Terai Districts
(kg/ha)

District	1970-71 NPK*	1980-81 NPK
Jalpaiguri	0.9	12.3
Cooch Behar	0.6	18.2
Average	0.8	15.3

* Data compiled by AER Centre, Santiniketan.

Consumption of fertilizers has recorded a significant increase during this period. Nevertheless the average consumption is much below the state average of 35 kg/ha.

3.3.12 *High Yielding Varieties*: Data on area under HYV of rice and wheat for the year 1980-81 are given below.

Table 3.7. Area under High Yielding Varieties – Terai Districts

('000 ha)

Crop	Total area	Area under HYV*	Per cent of col. (3) to (2)
(1)	(2)	(3)	(4)
Autumn rice	152	23.9	15.8
Winter rice	385	58.9	16.4
Total	537	82.8	15.4

* Data compiled by AER Centre, Santiniketan.

Progress in the adoption of HYV in this zone is slow, particularly in the case of winter rice crop which has the largest irrigated area.

3.3.13 *Area, Production and Productivity*: This zone accounts for 7.5 per cent of State's foodgrains production. Data on area, production and yield of principal crops in the zone during the triennia ending 1972-73 and 1980-81 and for the year 1982-83 (latest year for which data are available) are given in Annexure 3.3. These data show that area under rice, the major crop of the zone, has more or less remained stagnant during the period. Yield, particularly of autumn crop, showed a sharp decline. However, the present yield of rice in the zone is around 7 per cent higher than the average yield of rice in Eastern India. Between 1970-71 and 1980-81 wheat cultivation showed significant increase. However, during 1981-82 and 1982-83, area under the crop has declined by more than 50 per cent. Nevertheless, the crop holds good promise with its average yield

around 37 per cent higher than the yield in Eastern India. Tea is an important high value crop of this zone. Its yield is nearly 110 per cent of all-India average.

3.4 *Alluvial Districts (I)*

3.4.1 *General Features*: The total geographical area of the zone is 18186 sq. kms constituting 20.7 per cent of the total area of the State. The zone is divided into north plain and south plain by the river Ganga.

3.4.2 *Soils* : The soils are mostly greyish in colour. The texture of soils ranges from light to heavy and all kinds of field crops can be grown in different soils. These soils have moderate fertility.

3.4.3 *Rainfall*: The average annual rainfall ranges between 1200 and 1600 mm of which more than 80 per cent occurs during June to October. The minimum and maximum temperatures vary between 12°C and 38°C. Humidity ranges between 36 and 85 per cent.

3.4.4 *Socio-Economic Characteristics*: The population of the zone, according to 1981 Census, is around 11 million, of which 88 per cent is rural. The density of population is 610 per sq. km. Scheduled Castes and Scheduled Tribes constitute around 20 and 5 per cent, respectively, of the total population. The Scheduled Tribes are mostly concentrated in Malda and West Dinajpur districts. The zone has a total work force of 3.1 million, of which around 38 per cent are cultivators and 33 per cent are agricultural labourers. The literacy rate is 28 per cent.

3.4.5 *Pattern of Land Holdings*: The distribution of operational holdings in the zone, according to size groups, for the years 1970-71 and 1976-77 is presented in Annexure 3.2. In 1976-77, around 85 per cent of the farmers in this zone were small and marginal holders, but operated about 54 per cent of the cultivated area.

3.4.6 *Land Use Pattern*: The land use pattern of the zone for 1980-81 is indicated in the table below.

Table 3.8. Land Use Pattern – Alluvial Districts (I)

Classification	Area ('000 ha)	Per cent of total reporting area	Col. 2 as per cent of State total
(1)	(2)	(3)	(4)
1. **Reporting area**	**1822**	**100.0**	**20.6**
2. Forests	5	0.4	0.4
3. Not available for cultivation	246	13.5	17.4
4. Permanent pastures and other grazing land	Neg.	—	5.7
5. Land under miscellaneous tree crops and groves	32	1.7	21.9
6. Cultivable waste land	26	1.4	6.7
7. Fallow lands			
i) Current fallows	7	0.4	8.1
ii) Others	7	0.3	10.9
8. Net area sown	1499	82.3	26.0

3.4.7 Around 86 per cent of reporting area in this zone is culturable. Cultivated area constitutes about 83 per cent of the reporting area of the zone and 35 per cent of the State total. Area under forests is negligible.

3.4.8 *Cropping Pattern*: Rice is the main *kharif* crop grown in the zone. This accounts for about 52 per cent of gross sown area. *Rabi* crops like wheat, pulses and oilseeds account for about 25 per cent and jute and mesta for about 24 per cent of gross cropped area. Cropping intensity in this zone is about 160 per cent. The cropping pattern in the zone during 1977-78 is indicated in Annexure 3.2.

3.4.9 *Irrigation Pattern*: Data on net irrigated area of the zone are presented in Table 3.9 below.

Table 3.9. Net Irrigated Area – Alluvial Districts (I)

('000 ha)

Source	1967-68	1975-76*
Government canals	44.5	50.2
	(30.1)	(13.1)
Other sources	103.3	334.2
	(69.9)	(86.9)
Total	147.8	384.4
	(100.0)	(100.0)

* Data compiled by AER Centre, Santiniketan.

Note : Figures in brackets represent percentage of total.

3.4.10 Between 1967-68 and 1975-76, net irrigated area in this zone increased by more than two and a half times. Minor irrigation sources like deep tubewells, shallow tubewells and river lift irrigation projects mainly contributed to this increase. Despite this significant increase, area irrigated is only one-fourth of the total net sown area. More than three-fourth of the irrigation is provided during the *kharif* season. Irrigation facilities during the *rabi* season are inadequate.

3.4.11 *Fertilizer Consumption*: Fertilizer offtake in the zone during the years 1970-71 and 1980-81 is indicated below in Table 3.10.

Table 3.10. Fertilizer Consumption* – Alluvial Districts (I)

(kg/ha)

District	1970-71 NPK	1980-81 NPK
West Dinajpur	2.2	22.2
Malda	4.3	28.5
Murshidabad	5.3	34.6
Nadia	6.5	48.4
Average	4.5	33.4

* Data compiled by AER Centre, Santiniketan.

3.4.12 Average fertilizer consumption has recorded a significant increase in the zone. However, as between districts, there were considerable variations.

3.4.13 *High Yielding Varieties*: Data on area under HYV for the triennium ending 1980-81 are presented in Table 3.11 below.

Table 3.11. Area under High Yielding Varieties – Alluvial Districts (I)

('000 ha.)

Crop	Total area	Area under HYV*	Per cent of Col. 3 to 2
(1)	(2)	(3)	(4)
Autumn rice	303	76	25.1
Winter rice	791	153	19.3
Total	1094	229	20.9

* Data compiled by AER Centre, Santiniketan.

Although this zone contributes significantly to the total rice production of the State, progress in adoption of HYV seeds has been slow.

3.4.14 *Area, Production and Productivity*: This zone contributes about 25 per cent to the overall production of foodgrains in the State. Data on area, production and productivity of principal crops in the zone during the triennia ending 1972-73 and 1980-81 and for the year 1982-83 (latest year for which data are available) are presented in Annexure 3.4. Over the period 1972-73 to 1980-81, yield of rice recorded an increase from 869 to 1300 kg/ha. Its yield is around 28 per cent higher than average yield of rice in Eastern India. Among cash crops jute and mesta account for about 50 per cent, both in terms of area and production of the State's total jute production.

3.5 *Alluvial Districts (II)*

3.5.1 *General Features*: Keeping in view the limitations of data mentioned earlier, the entire districts of Birbhum, Burdwan, Hooghly and Howrah have been included in this zone even though parts of Birbhum and Burdwan have red and laterite soils. The total geographical area of this zone is 16197 sq. km constituting about 18 per cent of the total area of the State. The zone con-

sists of flat and undulated alluvial plains. Numerous rivulets and rivers either pass through or originate in this tract.

3.5.2 *Soils*: The soils are low in nitrogen and organic matter. Phosphate and potash status is medium. The soils do not respond to phosphate except in clay soils in flat land. Lime status of the soils is low to moderate. The soils are mostly clay and get hard when dry.

3.5.3 *Rainfall*: The average annual rainfall in this zone ranges between 1100 - 1500 mm, about 80 per cent of which is received during the monsoon months. Some of the areas are subject to flooding, practically every year due to river overflows and impeded drainage. Late commencement and earlier retreat of monsoon or prolonged breaks in rain during the monsoon are some other abnormalities. The minimum and maximum temperature range between 11°C and 40°C. Humidity varies from 38 to 85 per cent.

3.5.4 *Socio-Economic Characteristics*: Population of the zone according to 1981 Census is 13.5 million, of which about 70 per cent is rural. The population density of the zone is 834 per sq. km against the State average of 621 per sq. km. (The density is particularly high in Hooghly and Howrah districts being 1131 and 2013 per sq. km. respectively). Scheduled castes and Scheduled Tribes constitute around 23 per cent and 4 per cent respectively of the total population of the zone. The Scheduled Tribes are mostly found in Birbhum and Burdwan districts. The zone has a total work force of about 3.8 million of which about 23 per cent are cultivators and 28 per cent agricultural labourers. The literacy rate is 45 per cent.

3.5.5 *Pattern of Land Holdings*: The number and area of operational holdings in the zone according to size classes are presented in Annexure 3.2 for the years 1970-71 and 1976-77. The marginal and small holdings accounted for a little over 86 per cent of total holdings in 1976-77.

3.5.6 *Land Use Pattern*: Data on land use pattern of the zone for 1980-81 are presented in Table 3.12.

Table 3.12. Land Use Pattern – Alluvial Districts (II)

Classification	Area ('000 ha)	Per cent of total reporting area	Col. 2 as per cent of State total
(1)	(2)	(3)	(4)
1. **Reporting area**	**1612**	**100.0**	**18.2**
2. Forests	47	2.9	4.0
3. Not available for cultivation	277	17.2	19.6
4. Permanent pastures and other grazing land	Neg.	Neg.	11.4
5. Land under Miscellaneous tree crops and groves	23	1.4	15.8
6. Cultivable waste land	95	5.9	24.3
7. Fallow lands			
i) Current fallows	18	1.1	21.3
ii) Others	8	0.5	12.0
8. Net area sown	1144	71.0	20.6

3.5.7 Around 80 per cent of the reporting area of this zone is culturable. Actual cultivated area is about 72 per cent. Area under forests is about 3 per cent.

3.5.8 *Cropping Pattern*: This is a predominantly rice producing zone. Nearly three-fourths of gross area is sown to this crop. Over 65 per cent of gross cropped area is accounted for by *aus* and *aman* crops. *Rabi* crops, namely, summer rice, wheat, pulses, potato and oilseeds together account for another 25 per cent of gross area sown. The cropping intensity is 144 per cent. Data on cropping pattern of this zone for the year 1977-78 (latest year for which these data are available) are presented in Annexure 3.2.

3.5.9 *Irrigation Pattern*: Data on irrigated area for the years 1967-68 and 1975-76 are presented in Table 3.13.

Table 3.13. Net Irrigated Area – Alluvial Districts (II)

('000 ha)

Source	1967-68	1975-76*
Government canals	455.9 (65.8)	593.7 (62.6)
Other sources	237.5 (34.2)	355.0 (37.4)
Total	693.4 (100.0)	948.7 (100.0)

* Data compiled by AER Centre, Santiniketan.

Note : Figures in brackets represent percentage of total.

3.5.10 Over the period 1967-68 to 1975-76, net irrigated area recorded an increase of 37 per cent. During 1975-76 around 80 per cent of net sown area benefited from irrigation.

3.5.11 *Fertiliser Consumption*: Data on fertiliser offtake in the zone during the triennia ending 1970-71 and 1980-81 are presented in Table 3.14.

Table 3.14. Fertilizer Consumption – Alluvial Districts (II)

(Kg/ha)

District	1970-71 NPK	1980-81 NPK
Birbhum	16.7	42.4
Burdwan	18.7	64.0
Hooghly	38.9	104.5
Howrah	17.5	117.0
Average	23.0	82.0

The data indicate that fertilizer consumption in the zone increased significantly during the period. Highest NPK use per ha of gross cropped area in the State is reported in this zone.

3.5.12 *High Yielding Varieties*: Data on area covered under high yielding varieties of crops for the year 1980-81 are presented in the table below.

Table 3.15. Area under High Yielding Varieties - Alluvial Districts (II)

('000 ha)

Crop	Total area	Area under HYV	Per cent of col. 3 to 2
(1)	(2)	(3)	(4)
Winter rice	1020	337	33.0
Summer rice	181	157	87.1
Total	1201	494	41.2

Although about 60 per cent of the area sown to winter rice benefits from irrigation and consumption of fertilizer is relatively high in this zone, coverage of area under HYV is low.

3.5.13 *Area, Production and Productivity* : This zone accounts for about 30 per cent of total foodgrains production in the State. Data on area, production and yield of principal crops during triennia ending 1972-73 and 1980-81 and for the year 1982-83 are presented in Annexure 3.3. The productivity of important crops, viz., rice, oilseeds, jute and potato is high in this zone. In the case of wheat, which is an important *rabi* crop, the productivity is around 107 per cent of the average level in Eastern India. However, there has been shrinkage in area sown to wheat during the past decade.

3.6 *Red and Laterite Soil Districts*

3.6.1 *General Features*: The districts of Purulia and Bankura have been included in this zone. Even though parts of Birbhum, Burdwan and Midnapore have also red and laterite soils, these have not been included in this zone due to non-availability of data over a period of time below district level. The total

geographical area of this zone is 13140 sq. kms., constituting 15.0 per cent of total area of the State. The zone is situated in the western part of the State. The topography is undulating with numerous rivulets and rivers either passing through or originating in this tract. The gradually descending table lands of Chhotanagpur and the hills of Santhal Parganas appear in this zone.

3.6.2 *Soils*: Two major groups of soils, namely, red and laterite are found in this zone. They vary in depth. They are gravelly and shallow in some areas. They are coarse textured, acidic and poor in organic matter, phosphates, potash and lime. The lands in lower situations are rich in fertility whereas those under higher situations are deficient in plant nutrients. The upland soils are highly susceptible to erosion hazards.

3.6.3 *Rainfall*: The annual precipitation in this zone ranges between 1100 and 1300 mm. About 80 per cent is received during the four monsoon months of June to September. It is erratic with prolonged breaks during July to October. These abnormalities affect agricultural productivity of the zone. The minimum and maximum temperature fluctuate between 11°C and 40°C. Humidity ranges between 24 and 85 per cent.

3.6.4 *Socio-Economic Characteristics*: Population of the zone according to 1981 Census is 4 million, of which about 90 per cent is rural. The density of population of the zone is 320 per sq. km. Scheduled Castes and Scheduled Tribes constitute 24.5 per cent and 14.2 per cent respectively of the zone's population. The zone has a total work force of 1.3 million out of which nearly 45 per cent are cultivators and 30 per cent agricultural labourers. Literacy rate is 35 per cent as against the State average of 41 per cent.

3.6.5 *Pattern of Land Holdings*: Annexure 3.2 presents the number and size of operational holdings in the zone, according to size classes, during 1970-71 and 1976-77. During the period, the number of marginal holdings increased by 1.3 lakhs to 3.7 lakhs. In 1976-77, the number of marginal and small holdings in this zone constituted 85 per cent of the total holdings. Area operated by them constituted 56 per cent.

3.6.6 *Land Use Pattern*: Data on land use pattern in the zone during 1980-81 are presented in Table 3.16.

Table 3.16. Land Use Pattern – Red and Laterite Soil Districts

Classification	Area ('000 ha)	Per cent of total reporting area	Col. 2 as per cent of State total
(1)	(2)	(3)	(4)
1. **Reporting area**	**1309**	**100.0**	**14.8**
2. Forests	227	17.4	19.2
3. Not available for cultivation	169	12.9	12.0
4. Permanent pastures and other grazing land	Neg.	Neg.	5.7
5. Land under miscellaneous tree crops and groves	23	1.7	15.5
6. Cultivable waste land	146	11.1	37.3
7. Fallow Land			
i) Current fallows	37	2.8	43.5
ii) Others	26	2.0	44.4
8. Net area sown	681	52.1	12.2

3.6.7 In this zone around 70 per cent of total reporting area is culturable. However, area under cultivation is only around 55 per cent. Cultivable waste land, fallow land, etc., cover a sizeable area of about 18 per cent of the total reporting area.

3.6.8 *Cropping Pattern*: In this zone, rice accounts for more than 80 per cent of the gross area sown. Wheat, pulses (mung, gram, urd, *kulthi*) and oilseeds (sesamum, rapeseed and mustard, niger) grown during the *rabi* season account for only about 10 per cent to total cropped area. Almost 80 to 85 per cent of area remains fallow during this season. The intensity of cropping is quite low being around 118 per cent only. Data on cropping pattern in the zone during 1980-81 are presented in Annexure 3.2.

3.6.9 *Irrigation Pattern*: Data on net irrigated area for the years 1967-68 and 1975-76 are presented in Table 3.17.

Table 3.17. Net Irrigated Area - Red and Laterite Soil Districts

('000 ha)

Source	1967-68	1975-76*
Government canals	57.3	155.4
	(27.2)	(48.4)
Other sources	153.2	165.4
	(72.8)	(51.6)
Total	210.5	320.8
	(100.0)	(100.0)

* Data compiled by AER Centre, Santiniketan.

Note : Figures in brackets represent percentage of total.

3.6.10 Over the period 1967-68 to 1975-76, the net irrigated area in this zone recorded an increase of 50 per cent. Roughly around 50 per cent of net sown area benefited from irrigation. Irrigation facilities are available mainly during the *kharif* season. Area irrigated during the *rabi* season is insignificant.

3.6.11 *Fertilizer Consumption* : Data on fertilizer consumption in the zone during 1970-71 and 1980-81 are presented in the table below :

Table 3.18. Fertilizer Consumption - Red and Laterite Soil Districts

(kg/ha)

District	1970-71 NPK	1980-81 NPK
Bankura	11.6	28.1
Purulia	3.0	19.2
Average	7.3	23.7

3.6.12 *High Yielding Varieties*: Data on area under high yielding varieties of rice during 1980-81 are presented in Table 3.19.

Table 3.19. Area under High Yielding Varieties – Red and Laterite Soil Districts

('000 ha)

Crop	Total area	Area under HYV	Percent of Col. 3 to 2
(1)	(2)	(3)	(4)
Autumn rice	32	20	61.7
Winter rice	594	91	15.3
Total	616	111	17.7

3.6.13 *Area, Production and Productivity*: This zone accounts for about 10 per cent of the total foodgrains production in the State. Data on area, production and productivity of principal crops in the zone during the triennia ending 1972-73 and 1980-81 and for the year 1982-83 are given in Annexure 3.3. The average yield of rice in this zone is around 25 per cent higher as compared to that in Eastern India. Nevertheless, during the past decade there has been hardly any improvement in its yield. Multiple cropping has not been introduced in the farming system. Area sown to *rabi* crops is insignificant. Some breakthrough was made in wheat cultivation but during recent years area sown to the crop has declined considerably. *Rabi* oilseeds, namely rapeseed and mustard and sesamum are promising crops of the zone. The yields of both these crops, particularly sesamum, are much higher than average yields of the crops for Eastern India as a whole. Substantial progress has been made in extending the cultivation of sesamum.

3.7 *Alluvial-Cum-Coastal Saline Districts*

3.7.1 *General Features*: The entire districts of Midnapore and 24-Parganas have been included in this zone, although large

parts of these districts resemble the neighbouring red and laterite and alluvial soil zones. It has not been possible to sub-divide these districts due to lack of data over a period of time below district level. On the other hand, a small portion of Howrah district also has saline soils but since the major part has alluvial soils, it has been included in Alluvial Districts (II) zone. The total geographical area of this zone is 27520 sq. kms. constituting 31 per cent of State total. The zone is situated in the coastal region of the State.

3.7.2 *Soils*: The coastal soils are alluvial and generally saline with sporadic patches of saline alkali, non-saline alkali and degraded alkali soils. The soils are rich in sodium, calcium, magnesium and organic matter. The fertility status is medium to high.

3.7.3 *Rainfall*: The zone receives fairly heavy rainfall. The annual average precipitation ranges between 1500 and 1900 mm. Of this about 80 per cent is received during May to October. The minimum and maximum temperatures vary between 20.5°C and 32.5°C. Humidity ranges between 65 per cent and 80 per cent.

3.7.4 *Socio-Economic Characteristics*: The total population of the zone according to 1981 Census is 17.5 million, of which 73 per cent is rural. The density of population is 635 per sq. km. Scheduled Castes and Scheduled Tribes constitute 21 per cent and 4 per cent respectively of the total population. The zone has a total work force of 4.6 million of which 30 per cent are cultivators and 25.5 per cent agricultural labourers. The literacy rate is 45 per cent as against the State average of 41 per cent.

3.7.5 *Pattern of Land Holding*: Data on number and area of operational holdings according to size classes during 1970-71 and 1976-77 are presented in Annexure 3.2. Between 1970-71 and 1976-77 the number of marginal holdings in the zone increased by nearly 3.5 lakhs. During 1976-77 the marginal and small holdings constituted 91 per cent of the total holdings operating 65 per cent of the total area. Both the number and area of semi-medium, medium and large holdings have recorded a decline.

3.7.6 *Land Use Pattern*: Data on land use pattern of the zone during 1980-81 are indicated in Table 3.20.

Table 3.20. Land Use Pattern – Alluvial-Cum Coastal Saline Districts

Classification	Area ('000ha)	Per cent of total reporting area	Col. 2 as per cent of State total
(1)	(2)	(3)	(4)
1. **Reporting area**	**2821**	**100.0**	**31.9**
2. Forests	598	21.2	50.5
3. Not available for cultivation	514	18.2	36.3
4. Permanent pastures and other grazing land	2	0.1	65.7
5. Land under misc. tree crops and groves	52	1.8	35.8
6. Cultivable waste land	64	2.3	16.3
7. Fallow land			
i) Current fallows	19	0.7	21.9
ii) Others	17	0.6	29.0
8. Net area sown	1555	55.1	27.9

3.7.7 Around 60 per cent of reporting area in this zone is calturable. However, cultivated area is around 55 per cent. About 20 per cent of reporting area is covered under forests.

3.7.8 *Cropping Pattern*: Main crop grown in this zone is rice. During the *kharif* season, rice is cultivated in more than three fourths of the gross cropped area. Cultivation of other crops such as Jute, millets, etc. during the *kharif* season is insignificant. Summer rice, wheat, *rabi* pulses, *rabi* oilseeds and vegetables are the main crops grown during *rabi* season. The cropping intensity is around 125 per cent. Recently, cultivation of new crops like groundnut, barley, sunflower, safflower, cotton, chillies,

sweet potato, etc., has been taken up in this zone. These have large potential. Cropping pattern of the zone in 1980-81 is indicated in Annexure 3.3.

3.7.9 *Irrigation Pattern*: Data relating to net and gross irrigated areas for the years 1967-68 and 1975-76 are presented in the table below.

Table 3.21. Net Irrigated Area – Alluvial-Cum-Coastal Saline Districts

('000 ha)

Source	1967-68	1975-76*
Government canals	61.8	178.3
	(17.9)	(35.4)
Other sources	282.9	326.3
	(82.1)	(64.1)
Total	344.7	504.6
	(100.0)	(100.0)

* Data compiled by AER Centre, Santiniketan.

Note : Figures in brackets represent percentage of total.

3.7.10 Although between 1967-68 and 1975-76 the net irrigated area in this zone increased significantly, only one-third of net sown area benefited from irrigation. Besides, irrigation facilities are available during the *kharif* season only.

3.7.11 *Feriliser Consumption*: Data on fertiliser consumption in the zone during 1970-71 and 1980-81 are presented in Table 3.22.

Table 3.22. Fertilizer Consumption – Alluvial-Cum-Coastal Saline Districts

(kg/ha)

District	1970-71	1980-81
	NPK	NPK
Midnapore	5.7	30.0
24-Parganas	8.7	33.8
Average	7.2	31.9

Consumption of fertilizers in this zone has registered a four fold increase between 1970-71 and 1980-81. However, it is lower than the State average viz. 35 kg/ha.

3.7.12 *High Yielding Varieties*: Data on area under HYV of rice during 1980-81 (latest year for which these data are available) are presented in Table 3.23.

Table 3.23. Area under High Yielding Varieties – Alluvial-Cum-Coastal Saline Districts

('000 ha)

Crop	Total area	Area under HYV	Percent of Col. 3 to 2
(1)	(2)	(3)	(4)
Autumn rice	73	41	56.4
Winter rice	1388	236	17.0
Total	1461	277	18.9

Area under HYV of winter rice crop is still relatively small in this zone.

3.7.13 *Area, Production and Productivity*: This zone contributes nearly 30 per cent to total foodgrains production in the State. Data on area, production and yield of principal crops in this zone during the triennia ending 1972-73 and 1980-81 and for the year 1982-83 are presented in Annexure 3.4. During the past decade, area under rice, which is the main crop of this zone, has remained stagnant. However, there has been some improvement in its yield (particularly of winter crop). The overall average yield of rice is around 30 per cent higher than that in Eastern India. Wheat has the potential for developing as a major crop in this zone. However, there has been practically no increase in area sown to this crop over the past decade. There has been some increase in area sown to jute crop presumably replacing *aus* rice crop. There has also been some increase in area sown to sesamum and potato.

Annexure 3.1

Number and Area of Operational Holding – Zonewise

(in '000)

Size Class	1970-71		1976-77	
(ha)	Number	Area (ha)	Number	Area (ha)
I. **Hill Zone**				
Below 1.0 (Marginal)	20 (38.1)	11 (6.7)	28 (47.9)	14 (9.2)
1.0 — 2.0 (Small)	15 (27.9)	21 (13.0)	16 (27.9)	22 (15.1)
2.0 — 4.0 (Semi-medium)	12 (23.3)	32 (20.3)	10 (16.2)	26 (16.4)
4.0 —10.0 (Medium)	5 (10.1)	29 (18.0)	4 (7.5)	25 (15.8)
10.0 and above (Large)	Neg (0.6)	67 (42.0)	Neg (0.5)	68 (43.5)
Total	52 (100.0)	160 (100.0)	58 (100.0)	155 (100.0)
II. **Terai Zone**				
Below 1.0 (Marginal)	146 (48.2)	76 (14.7)	204 (55.4)	106 (18.9)
1.0 — 2.0 (Small)	89 (29.6)	122 (23.6)	98 (26.7)	134 (24.0)
2.0 — 4.0 (Semi-medium)	55 (18.0)	138 (26.6)	53 (14.4)	135 (24.2)
4.0 —10.0 (Medium)	13 (4.1)	62 (11.9)	13 (3.4)	63 (11.3)
10.0 and above (Large)	Neg (0.1)	121 (23.2)	Neg (0.1)	120 (21.6)
Total	303 (100.0)	519 (100.0)	368 (100.0)	558 (100.0)

Annexure 3.1 (Contd.)

Size Class (ha)	1970-71		1976-77	
	Number	Area (ha)	Number	Area (ha)
III. **Alluvial Zone-I**				
Below 1.0 (Marginal)	553 (55.6)	239 (18.5)	855 (64.1)	347 (25.4)
1.0 — 2.0 (Small)	223 (22.5)	311 (24.0)	279 (20.9)	385 (28.1)
2.0 — 4.0 (Semi-medium)	156 (15.7)	408 (31.6)	156 (11.7)	407 (29.8)
4.0 — 10.0 (Medium)	62 (6.1)	322 (24.9)	44 (3.3)	223 (16.3)
10.0 and above (Large)	Neg (0.1)	13 (1.0)	Neg (0.0)	5 (0.4)
Total	994 (100.0)	1293 (100.0)	1334 (100.0)	1367 (100.0)
IV. **Alluvial Zone-II**				
Below 1.0 (Marginal)	559 (62.7)	226 (22.9)	695 (65.3)	274 (26.6)
1.0 — 2.0 (Small)	181 20.3)	253 (25.5)	223 (21.0)	310 (30.1)
2.0 — 4.0 (Semi-medium)	114 (12.8)	305 (30.9)	220 (11.2)	309 (30.0)
4.0 — 10.0 (Medium)	37 (4.1)	199 (19.6)	26 (2.4)	130 (12.7)
10.0 and above (Large)	1 (0.1)	10 (1.1)	Neg (0.1)	6 (0.6)
Total	892 (100.0)	989 (100.0)	1064 (100.0)	1029 (100.0)

Annexure 3.1 (Concluded)

Size Class (ha)	1970-71		1976-77	
	Number	Area (ha)	Number	Area (ha)
V. Red and Laterite Soil Zone				
Below 1.0 (Marginal)	244 (52.3)	120 (19.1)	369 (60.4)	165 (24.9)
1.0 — 2.0 (Small)	124 (26.5)	167 (27.0)	150 (24.5)	207 (31.2)
2.0 — 4.0 (Semi-medium)	72 (15.5)	189 (30.0)	73 (11.9)	187 (28.2)
4.0 — 10.0 (Medium)	26 (5.5)	139 (22.2)	19 (3.1)	101 (15.2)
10.0 and above (Large)	Neg (0.2)	10 (1.7)	Neg (0.1)	3 (0.5)
Total	466 (100.0)	625 (100.0)	611 (100.0)	663 (100.0)
VI. Alluvial Cum Coastal Saline Zone				
Below 1.0 (Marginal)	1007 (66.7)	418 (28.3)	1351 (73.7)	511 (35.3)
1.0 — 2.0 (Small)	310 (20.6)	427 (28.9)	316 (17.3)	431 (29.7)
2.0 — 4.0 (Semi-medium)	149 (9.9)	394 (26.7)	136 (7.4)	351 (24.2)
4.0 — 10.0 (Medium)	43 (2.8)	228 (15.4)	29 (1.6)	150 (10.4)
10.0 and above (Large)	Neg	10 (0.7)	Neg	5 (0.4)
Total	1509 (100.0)	1477 (100.0)	1832 (100.0)	1448 (100.0)

Note : i) Figures within brackets denote percentage to total
ii) Neg = Negligible

Annexure 3.2

Cropping Pattern – 1977-78 Zonewise

Crop	Area ('000 ha.)	Per cent of gross cropped area	Crop	Area ('000 ha.)	Per cent of gross cropped area
I-Hill Zone					
Rice			Fruits	6.0	4.5
Autumn	9.3	6.9	Potato	4.0	3.0
Winter	35.4	26.4	Total food crops	99.1	74.0
Total	44.7	33.3			
Maize	23.4	17.5	Jute	2.7	2.0
Ragi	9.9	7.4	Tea	28.9	21.6
Wheat	3.3	2.5	Total non-food crops	34.9	26.0
Total cereals and millets	82.9	61.9	Gross area sown	134.0	100.0
Total pulses	1.5	1.1			
Total foodgrains	84.4	63.0			
II-Terai Zone					
Rice			Total fruits and vegetables	22.8	2.5
Autumn	197.0	22.0	Total food crops	729.3	81.5
Winter	407.2	45.5			
Total	605.0	67.6	Rapeseed and mustard	10.3	1.2
Wheat	71.9	8.0	Total oil seeds	11.4	1.3
Total cereals and millets	685.6	76.6			
Total pulses	17.6	1.9	Jute	74.4	8.3
Total foodgrains	703.2	78.5	Tea	60.7	6.8
			Total non-food crops	166.0	18.5
			Gross area sown	895.3	100.0

Annexure 3.2 (Contd.)

Crop	Area ('000 ha.)	Per cent of gross cropped area	Crop	Area ('000 ha.)	Per cent of gross cropped area
III-Alluvial Zone					
Rice			Fruits	31.3	1.3
Autumn	422.0	17.3	Potatoes	20.5	0.8
Winter	783.3	32.2	**Total**		
Summer	70.5	2.9	food crops	2009.5	82.6
Total	1275.8	52.4	Rapeseed and		
Wheat	229.4	9.4	mustard	61.9	2.5
Total cereals			Linseed	50.7	2.1
and millets	1555.5	63.9	Total oil		
Gram	70.4	2.9	seeds	118.4	4.9
Total pulses	327.0	13.4	Jute	270.1	11.1
Total			Mesta	23.8	1.0
foodgrains	1882.5	77.4	Total non-		
Sugarcane	16.9	0.7	food crops	423.4	17.4
			Gross area		
			sown	2432.9	100.0
IV-Alluvial Zone (II)					
Rice			Potatoes	64.1	3.9
Autumn	51.6	3.1	Total food		
Winter	1042.1	63.2	crops	1544.1	93.7
Summer	142.3	8.6	Rapeseed		
Total	1236.0	74.9	and mustard	10.9	0.7
Wheat	108.5	6.6	Total oil-		
Total Cereals			seeds	39.8	2.4
and millets	1347.2	81.7	Jute	61.1	3.7
Gram	12.0	0.7	Total fibres	64.0	3.9
Total pulses	82.2	5.0	Total non-		
Total			food crops	104.4	6.3
foodgrains	1429.4	86.7	Gross area		
			sown	1648.5	100.0

Annexure 3.2 (Concluded)

Crop	Area ('000 ha.)	Per cent of gross cropped area	Crop	Area ('000 ha.)	Per cent of gross cropped area
V-Red and Laterite Soil Zone					
Rice			Sugarcane	3.1	0.4
Autumn	35.5	4.4	Total food crops	773.9	96.3
Winter	626.1	77.9	Sesamum	14.7	1.8
Summer	5.0	0.6	Rapeseed and mustard	4.1	0.5
Total	666.6	82.9	Total oil seeds	21.6	2.7
Wheat	35.0	4.4	Mesta	5.7	0.7
Total cereals and millets	706.3	87.9	Total fibres	7.7	1.0
Total pulses	32.5	4.0	Total non-food crops	29.5	3.7
Total foodgrains	738.8	91.9	Gross area sown	803.4	100.0
Fruits	1.3	0.2			
Potato	7.0	0.9			
Other vegetables	22.5	2.7			
VI-Alluvial Cum Coastal Saline Zone					
Rice			Fruits	22.9	1.1
Autumn	92.1	4.7	Potato	21.4	1.1
Winter	1414.4	72.0	Other vegetables	67.0	3.4
Summer	90.1	4.6	Total food crops	1867.2	95.1
Total	1596.6	81.3	Rapeseed and mustard	8.9	0.4
Wheat	36.3	1.8	Sesamum	9.8	0.5
Total cereals and millets	1635.4	83.4	Total oil-seeds	22.9	1.1
Pulses			Jute	86.6	3.4
Kharif	4.3	0.2	Total non-food crops	96.5	4.9
Rabi	99.2	5.1	Gross area sown	1963.7	100.0
Total pulses	103.5	5.3			
Total foodgrains	1738.9	88.7			
Condiments and spices	11.9	0.6			
Sugarcane	3.9	0.1			

Area, Production and Yield of Principal Crops – Zonewise

Area = '000 hectares
Production = '000 tonnes
Yield = Kg/ha

CROP	Area			Production			Yield		
	Tri. ending '72-73	Tri. ending '80-81	'82-83	Tri. ending '72-73	Tri. ending 80-81	'82-83	Tri. ending '72-73	Tri. ending '80-81	'82-83
I. Hill Zone									
Rice									
Autumn	5.7	7.8	7.3@	6.9	5.0	4.3@	1211	641	589
Winter	36.0	32.9	35.5@	38.6	38.6	45.8@	1072	1173	1290@
Total	41.7	40.7	42.8@	45.5	43.6	50.1@	1091	1071 (105.7)	1171@
Maize	26.5	24.4	26.9	24.5	35.9	39.9	925	1471 (154.0)	1483
Wheat	0.4	2.9	3.2	0.4	4.5	7.1	1000	1552 (111.7)	2219
Jute*	3.3	4.0	2.7	19.3	22.4	18.5	1053	1008 (79.5)	1233
Potato	2.2	3.9	3.6@	10.0	26.8	35.9@	4545	6872 (55.3)	9972@
Tea	N.A.	29.4	N.A.	N.A.	27.0	N.A.	N.A.	918 (60.9)	N.A.

Annexure 3.3 (Contd.)

CROP	Area			Production			Yield		
	Tri. ending '72-73	Tri. ending '80-81	'82-83	Tri. ending '72-73	Tri. ending '80-81	'82-83	Tri. ending '72-73	Tri. ending '80-81	'82-83
II. Tarai Zone									
Autumn	152.5	141.7	174.6@	144.8	105.5	105.3@	950	745	603@
Winter	368.7	352.7	397.6@	433.3	427.8	428.0@	1175	1213	1076@
Total	521.2	494.4	572.2@	578.1	533.3	533.0@	1109	1079 (106.5)	932@
Rapseed and Mustard	19.4	16.2	18.1	5.9	4.8	5.8	304	296 (69.5)	320
Jute*	97.8	112.4	102.0	618.8	791.8	715.8	1139	1268 (100.0)	1263
Mesta*	6.6	7.9	7.4	42.2	52.1	33.7	1151	1187 (122.5)	820
Potato	2.7	2.5	3.5@	10.7	39.4	21.6@	3963	15760 (126.9)	6171@
Tobacco	9.9	13.0	14.6	7.8	9.9	14.6	788	762 (99.7)	1000
Tea	N.A.	61.0	N.A.	N.A.	100.6	N.A.	N.A.	1649 (109.4)	N.A.

Annexure 3.3 (Contd.)

CROP	Area			Production			Yield		
	Tri. ending '72-73	Tri. ending '80-81	'82-83	Tri. ending '72-73	Tri. ending '80-81	'82-83	Tri. ending '72-73	Tri. ending '80-81	'82-83
III. Alluvial Zone (I)									
Rice									
Autumn	385.6	324.7	368.8@	376.3	266.2	361.1@	976	820	979@
Winter	988.0	709.6	816.9@	733.1	1023.9	644.1@	742	1443	788@
Summer	40.1	76.3	92.9@	118.5	154.0	236.7@	2955	2018	2548@
Total	1413.7	1110.6	1278.6@	1227.9	1444.1	1241.9@	869	1300 (128.3)	971
Wheat	219.3	218.6	181.4	448.5	397.1	435.2	2045	1817 (130.7)	2403
Maize	8.2	9.5	10.1	6.2	9.7	10.9	756	1021 (111.0)	1079
Barley	72.3	30.9	28.0	32.9	27.2	23.7	455	880 (94.6)	846
Gram	109.3	81.7	60.0	72.7	52.8	41.2	665	646 (92.8)	687
Tur	8.3	13.9	20.1	8.7	13.6	20.1	1048	978 (96.4)	1000
Sugarcane (Gur)	18.9	13.9	22.1	95.0	78.5	113.7	5026	5647 (68.2)	5145
Rapeseed and mustard	64.4	61.9	90.9	24.6	27.6	51.8	382	446 (104.7)	570
Jute*	221.3	296.5	236.4	1468.6	1977.5	1938.0	1195	1201 (94.7)	1476
Mesta*	35.0	14.7	7.9	157.4	122.5	37.6	809	1500 (154.8)	857
Potato	9.0	17.8	16.3@	72.4	182.3	157.8@	8044	10242 (82.4)	9681@

Annexure 3.3 (Contd.)

CROP	Area			Production			Yield		
	Tri. ending '72-73	Tri. ending '80-81	'82-83	Tri. ending '72-73	Tri. ending '80-81	'82-83	Tri. ending '72-73	Tri. ending '80-81	'82-83
IV. Alluvial Zone (II)									
Rice									
Autumn	105.7	48.0	46.7@	174.0	76.6	84.4@	1646	1596	1807@
Winter	917.5	954.2	1026.7@	1218.6	1540.6	1344.0@	1328	1615	1309@
Summer	122.9	130.8	92.3@	348.7	320.2	220.6@	2837	2448	2390@
Total	1146.1	1133.0	1165.7@	1741.3	1830.7	1649.0@	1519	1616 (159.6)	1415@
Wheat	113.0	71.8	33.0	235.7	106.9	66.8	2086	1489 (96.4)	2024
Gram	14.5	12.2	11.1	7.0	7.9	8.3	483	648 (92.6)	748
Sugarcane (Gur)	9.0	5.7	4.7	47.1	30.0	24.4	5233	5265 (63.6)	5291
Rapeseed and mustard	6.1	24.0	41.5	2.2	18.9	24.8	361	788 (185.0)	598
Sesamum	4.4	22.0	62.5	2.6	17.4	33.0	591	791 (195.3)	528
Jute*	37.9	55.4	41.1	400.1	576.2	501.9	1900	1872 (147.6)	2198
Potato	42.7	71.3	70.6@	589.2	426.0	1377.8@	13799	19992 (160.9)	516

Annexure 3.3 (Contd.)

CROP	Area			Production			Yield		
	Tri. ending '72-73	Tri. ending '80-81	'82-83	Tri. ending '72-73	Tri. ending '80-81	'82-83	Tri. ending '72-73	Tri. ending '80-81	'82-83
V. Red and Laterite Soil Zone									
Rice									
Autumn	53.6	31.7	25.9@	58.0	33.3	28.8@	1082	1050	1112@
Winter	583.5	556.7	579.0@	740.9	694.6	596.5@	1270	1248	1030@
Summer	3.5	4.0	5.0@	8.9	6.7	7.8@	2543	1675	1560@
Total	640.6	592.4	609.9@	807.8	734.6	633.1@	1261	1240 (122.4)	1038@
Wheat	19.4	25.6	8.6	34.8	42.1	16.3	1794	1645 (118.3)	1895
Maize	7.2	9.5	8.6	3.9	7.2	3.2	542	758 (82.4)	372
Gram	2.8	1.5	0.4	1.3	0.9	0.3	464	600 (85.7)	750
Tur	3.7	1.6	2.2	1.6	1.3	2.3	432	813 (80.1)	1045
Rapeseed and mustard	3.7	4.3	4.2	1.2	2.7	2.4	324	628 (147.4)	571
Sesamum	2.1	10.9	15.4	0.8	7.5	7.4	381	688 (169.9)	481
Jute*	6.1	4.9	3.2	45.5	14.8	15.3	1343	544 (56.1)	861
Potato	3.5	7.2	5.7@	46.3	121.1	82.9@	13229	16819 (135.4)	14544@
Sugarcane (Gur)	3.0	2.3	0.9	11.3	12.2	4.3	3767	5304 (64.1)	4778

CROP	Area			Production			Yield		
	Tri. ending '72-73	Tri. ending '80-81	'82-83	Tri. ending '72-73	Tri. ending '80-81	'82-83	Tri. ending '72-73	Tri. ending '80-81 @	'82-83
VI. Alluvial Cum Coastal Saline Zone									
Rice									
Autumn	104.8	71.0	71.8@	130.0	73.4	83.6@	1240	1034	1164@
Winter	1338.8	1349.7	1360.5@	1374.4	1651.4	1139.9@	1026	1224	838@
Summer	92.7	88.4	108.5@	265.8	250.7	291.7@	2867	2836	2688@
Total	1536.3	1509.1	1540.8@	1770.2	1975.5	1515.2@	1152	1309 (129.2)	983@
Wheat	35.5	30.9	18.2	73.3	62.7	38.3	2065	2029 (146.0)	2104
Gram	8.7	4.9	1.4	5.1	2.7	0.8	586	551 (78.7)	571
Sugarcane (Gur)	4.9	3.1	3.2	30.6	17.7	16.8	6245	5710 (69.0)	5250
Rapeseed and mustard	10.4	12.3	15.7	3.4	5.5	5.9	327	447 (104.9)	376
Sesamum	2.2	9.8	16.0	1.2	5.9	9.2	545	602 (148.6)	575
Jute*	50.1	80.7	55.9	436.6	729.9	599.3	1569	1628 (128.4)	1930
Mesta*	7.9	4.2	1.5	48.8	28.1	13.5	1112	1204 (124.2)	1620
Chillies	3.5	13.9	12.8	3.7	9.5	9.3	1057	683 (91.3)	727
Potato	15.1	22.6	21.4@	155.5	339.3	320.0@	10298	15013 (120.9)	14953

N.A. — Not available

@ — Relates to the year 1981-82.

* — Production in thousand bales of 180 Kgs. each

Note : Figures in brackets denote the relative yield index (RYI)

Annexure 3.4

Agro-Climatic Regions of West Bengal According to State Government

I. HILL REGION

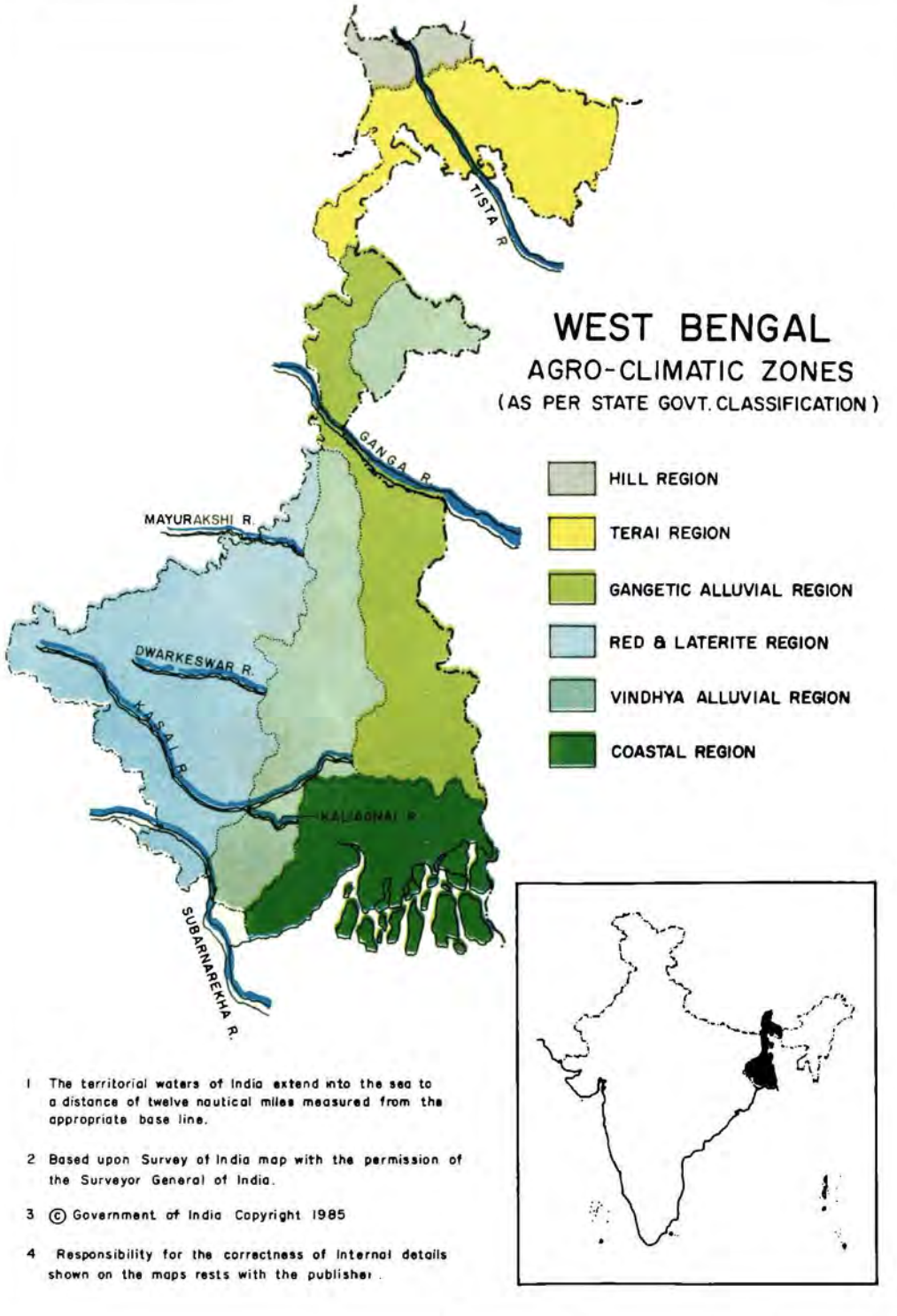
District	Block
Darjeeling	Darjeeling Pulbazar
	Rangli Rangliot
	Jorbanglo Sukhiapukri
	Kalimpong — I
	Kalimpong — II
	Gurubathan
	Mirik
	Karseong

II. TERAI REGION

Darjeeling	Siliguri Nakaalbari
	Kheribari
West Dinajpur	Islampur
	Karandighi
	Chopra
	Goalpukur — I
	Goalpukur — II
Jalpaiguri	(Entire)
Cooch Behar	(Entire)

III. COASTAL REGION

Howrah	Shyampur — I
	Shyampur — II
	Bagnan — I
	Bagnan — II
	Uluberia — I
	Uluberia — II
24-Parganas (North)	Rajarhat
	Harea
	Minekhan
	Hasnabad



1 The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line.

2 Based upon Survey of India map with the permission of the Surveyor General of India.

3 © Government of India Copyright 1985

4 Responsibility for the correctness of internal details shown on the maps rests with the publisher.

Annexure 3.4 (Contd.)

District	Block
	Hingalganj
	Sandeshkhali — I
	Sandeshkhali — II
	Gosaba
	Basirhat — I
	Basirhat — II
24-Paraganas (South)	(Entire)
Midnapore (East)	Ramnagar — I
	Ramnagar — II
	Contai — I
	Contai — II
	Contai — III
	Tamluk — I
	Tamluk — II
	Mahishadal — I
	Mahishadal — II
	Nandigram — I
	Nandigram — II
	Nandigram — III
	Sutahata — I
	Sutahata — II
IV. GANGETIC ALLUVIAL REGION	
West Dinajpur	Raiganj
	Kaliaganj
	Hemtabad
	Itahar
Malda	Raina — I
	Raina — II
	Harischandrapur — I
	Harischandrapur — II
	Kharba — I
	Kharba — II
	Manikchak

Annexure 3.4 (Contd.)

District	Block
	Englishbazar
	Kaliachak — I
	Kaliachak — II
	Kaliachak — III
Murshidabad	Beldanga — I
	Beldanga — II
	Naoda
	Hariharpara
	Damkal
	Behrampur
	Jalangi
	Murshidabad-(Giaganj)
	Lalgola
	Raninagar — I
	Raninagar — II
	Bhagwangola — I
	Bhagwangola — II
	Farakka
	Samsherganj
	Suti — II
Nadia	(Entire)
Hooghly	Chanditala — I
	Chanditala — II
	Polbadapur
	Balagarh
	Singur
	Sirampore-Uttarpara
	Chinsurah-Mogra
Howrah	Domjur
	Bally Jagacha
24-Paraganas (North)	Habra — I
	Habra — II
	Barasat — I
	Barasat — II
	Amdanga
	Deganga

Annexure 3.4 (Contd.)

District	Block
	Bagdah
	Bongaon
	Gaighata
	Baduria
	Swarupnagar
	Barrackpore
Burdwan	Purbathali (Purbasthali) — I
	Purbasthali — II
	Kalna — I
	Kalna — II
V. VINDHYA ALLUVIAL REGION	
West Dinajpur	Bansihari
	Kusmandi
	Gangarampur
	Kumarganj
	Tapan
	Balurghat
	Hili
Malda	Gazole
	Habibpur
	Bamangola
	Malda Old
Murshidabad	Kandi
	Bharatpur — I
	Bharatpur — II
	Burwan
	Kumargram
	Nabagram
	Sagardhighi
	Suti — I
	Raghunathganj — I
	Raghunathganj — II

Annexure 3.4 (Contd.)

District	Block
Burdwan	Burdwan
	Bhatar
	Memari — I
	Memari — II
	Jamalpur
	Raina — I
	Raina — II
	Khandaghosh
	Galsi — I
	Galsi — II
	Kalna — II
	Manteswar
	Mangolkote
	Ketugram — I
	Ketugram — II
	Katwa — I
Hooghly	Arambagh
	Kanakul — I
	Kanakul — II
	Pursura
	Goghat
	Jangipara
	Pandua
	Dhaniakhali
	Haripal
	Tarekeswar
Howrah	Udainarayanpur
	Umpta —I
	Umpta — II
	Jagathallapur
	Sankrail
	Panchala
Midnapore (East)	Patashpur
	Kheajuri
	Bhaganpur — I
	Bhaganpur — II
	Egra — I

Annexure 3.4 (Contd.)

District	Block
	Egra — II
	Panskura — I
	Panskura — II
	Moina
	Ghatal
	Daspur — I
	Daspur — II
Midnapore (West)	Debon
	Pingla
	Dantan — I
	Dantan — II
	Narayangarh
	Mohanpur
	Sabang
Bankura	Kotalpur
	Indus
	Patrasayer
Birbhum	Nalhati — II
	Murarai — II
	Mayureswar — II
	Rampurhat — II
	Nanoor
VI. RED AND LATERITE REGION	
Midnapore (East)	Chandrakona — I
	Chandrakona — II
Midnapore (West)	Jhargram
	Binpur — I
	Binpur — II
	Jambari
	Nayagram
	Gopiballavpur — I
	Gopiballavpur — II
	Sankariel
	Keshiary

Annexure 3.4 (Contd.)

District	Block
	Salboni
	Keshpur
	Garbeta — I
	Garbeta — II
	Garbeta — III
	Midnapore
	Kharagpur — I
	Kharagpur — II
Bankura	Sonamukhi
	Jaipur
	Bishnupur
	Ranibandh
	Gangalghati
	Barjora
	Saltora
	Onda
	Taldanga
	Simlapal
	Mejhia
	Rajpur — I
	Rajpur — II
	Chatna
	Iudpur
	Bankura — I
	Bankura — II
	Khetra — I
	Khetra — II
Birbhum	Nalhati — I
	Murarai
	Mayureswar — I
	Rampurhat — I
	Mohammadbazar
	Sainthia
	Bolpur-Srineketan
	Labpur
	Dubrajpur
	Ilambazar

Annexure 3.4 (Concluded)

District	Block
	Rajnagar
	Suri — I
	Suri — II
	Khayrasol
Burdwan	Ausgram — I
	Ausgram — II
	Faridpur
	Kaksa
	Hirapur
	Andal
	Salampur
	Barabari
	Raniganj
	Kulti
	Asansol
	Jamuria — I
	Jamuria — II
Purulia	(Entire)

CHAPTER 4

CONSTRAINTS TO GROWTH

4.1 *Dimensions of the Problem*

4.1.1 The performance of agriculture in West Bengal, especially in foodgrains production, during the last decade has been sluggish. The annual growth rate in foodgrains production was just one per cent and in productivity about one per cent. It is true that in 1983-84, the State had a good harvest. But this was fortuitous, due to favourable weather conditions.

4.1.2 Foodgrains production has not kept pace with the population growth. As a result, the State is deficient in food supply. Its purchases of rice and wheat from the Central Government more than doubled from 14.5 lakh tonnes in 1978-79 to 29.5 lakh tonnes in 1982-83. Even in a normal year like 1980-81, the shortfall in foodgrains production in the State was about 20 per cent. The target of 118 lakh tonnes for the terminal year of the Sixth Plan is unlikely to be achieved. Given the expected increase in population, the demand for foodgrains will considerably outstrip the supply, if the current production trends are not improved.

4.1.3 The sheer need to increase food production to meet the requirements of its growing population calls for special efforts to improve production. As there is no further scope for expansion in area, such improvement in production can be accomplished only through double and multiple cropping and stepping up yields.

4.1.4 Even in regard to non-foodgrain crops such as jute and oilseeds, the improvement in production during the last decade has occurred mainly because of increase in area, the increase in yields being modest. It will be necessary to improve their yields and also resort to multiple cropping to enable the farmers to get better returns from the cultivation of these crops.

4.1.5 Two more dimensions of the problem of West Bengal's agriculture need to be recognized. First is the vagaries of the monsoon which cause considerable instability in agricultural pro-

duction, as nearly 70 per cent of the cropped area is rainfed. Second is the incidence of poverty which is very high, particularly in rural areas. In abnormal years of production, the population below the poverty line suffers severely. Unless special efforts are made to stabilize agricultural production at higher growth levels, it is unlikely that the State can make a dent on the problem of poverty.

4.1.6 Clearly, a significant departure from the past production strategy will be necessary if the objectives of increase in agricultural productivity and a rise in the standard of living of the rural poor are to be attained. The development strategy should aim at not only raising land productivity through land-saving measures and yield-augmenting inputs, but also labour productivity so as to improve the incomes of agricultural workers. These could not be achieved so far because of several constraints.

4.1.7 Before outlining the strategy for accelerated development, it is first necessary to identify the main constraints which impeded intensification of agriculture so far. The constraints may be broadly classified under three heads, viz., (i) social and structural, (ii) organizational and (iii) technological. These are common to Eastern India as a whole and are indicated in detail in Chapter 4, Part I of this Report. However, they are briefly summarised below to facilitate the adoption of appropriate remedial measures by the concerned authorities.

4.2 *Social and Structural Constraints*

4.2.1 *Agrarian Structure* : The average size of holding is very small, around 1 ha on an average. For bulk of the farmers (70 per cent) with an operational holding of one ha and less, the average size is as small as 0.4 ha. Besides, the holdings are highly fragmented, ranging between 10 and 25 pieces per holding. Progress in land consolidation which could have helped mitigate the constraints caused by fragmentation has been very slow.

4.2.2 A large number of sharecroppers (*bargadars*) are yet to be recorded. Oral tenancy arrangements are widespread in large areas. The small and fragmented nature of holdings and existence of a large number of unrecorded sharecroppers make agricultural development difficult.

4.2.3 *Erratic rainfall* : Even though the average annual rainfall is around 1750 mm and is generally adequate, its uneven distribution, particularly long dry spells between rains, often cause serious instability in agricultural production and affects productivity adversely.

4.2.4 *Natural Calamities* : Parts of the State are often affected by drought, cyclone and flood. About 50 per cent of the area in the western tract is vulnerable to drought. Coastal areas are frequently affected by cyclones. These areas are also flood-prone. Contingency planning against such calamities is practically absent in the State. Relief is provided after occurrence of flood/cyclone. Programmes for flood control and advance warning system against cyclones are not adequate. In drought-prone areas such as Purulia and Bankura districts, expansion of irrigation facilities and propagation of dry farming technology have not received adequate attention.

4.2.5 *Problem Soil Areas* : Brown forest soil of hill areas, terai soil of Jalpaiguri and laterite soil of Bankura and Purulia have low fertility. They are susceptible to erosion hazards too. Some of the coastal soils in Midnapore and 24-Parganas are affected by salinity. Continuous silting of river beds is another problem. Rivers are silted and choked up with sand and gravel. This has made river basin areas more susceptible to floods. Investment for soil amelioration/development has not been adequate. Progress in afforestation programmes in hill areas is slow.

4.3 *Organizational Constraints*

4.3.1 *Inputs* : There is a shortage of certified seeds in the State. Seed renewal rate is low. Arrangements for distribution of seeds, fertilizers, etc., particularly in hilly and interior areas, are not satisfactory. There are no agencies for supply of inputs below the block level. As a result, inputs do not reach the farmers on time. Adulteration of seeds, fertilizers and pesticides is another serious problem.

4.3.2 Besides seeds, there is also a shortage of horticultural planting materials such as vegetables, spices, coconuts, bananas and other fruits.

4.3.3. *Credit* : Financing of inputs and on-farm investments have been adversely affected by the constraints in the flow of institutional credit. The main problems in this sphere are : rising overdues which are choking the capabilities of credit institutions, especially co-operatives, in their loaning operations, managerial weaknesses and inefficiency in the working of PACS, PLDBs and LAMPS, inadequate branch network of commercial banks and RRBs particularly in interior areas, shortage of rural-biased, skilled and trained manpower in bank offices, lack of adequate supervision over the end-use of credit and lack of coordination between the lending activities of credit institutions on the one hand and development programmes of the State Government, input supply and extension agencies on the other.

4.3.4 *Electric Power* : Another major constraint is the inadequate and erratic supply of electric power. This has adversely affected optimum utilisation of tubewells and pumpsets. Further, this has discouraged private investments in tubewells. Rural electrification has received a lower priority in West Bengal, as compared to Punjab, Haryana and Tamilnadu. This is partly responsible for the relatively poor performance of the State in agriculture.

4.3.5 *Extension* : The State introduced the T&V system of extension in 1978. A number of posts of VAWs (locally known as Krishi Projukti Sahayaks) are lying vacant. As a result, field visits by VAWs are not adequate, particularly in hilly and less accessible areas. Extension service, therefore, has not made the desired impact.

4.3.6 *Marketing Facilities* : Marketing facilities particularly for perishable goods are inadequate. Traders continue to exploit the farmers. Post harvest handling arrangements, rural godowns, transport, cold storage facilities, refrigerated vans, processing facilities, etc., are not satisfactory. Though some of these facilities are available at district level, they are grossly inadequate at lower levels.

4.3.7 *Coordination* : There is inadequate coordination between the several departments involved in agriculture, irrigation and other allied activities both at the State level and district level. As a result, implementation of agricultural development programmes is adversely affected.

4.4 *Technological Constraints*

4.4.1 *Water Management* : Despite large surface and groundwater potential, only a little over 30 per cent of cropped area is irrigated. Three-fifths of the existing irrigation coverage is in the form of protective irrigation during the *kharif* season. Irrigation during the *rabi* season, which could help farmers raise an assured second crop, is small.

4.4.2 The potential created in major irrigation projects is not fully utilised due to the absence of field channels. The practice of field to field irrigation has led to overwatering in upper reaches and denial of water in the lower reaches of the canal system. This has affected agricultural productivity. Unauthorised use of water by cutting embankments in canal irrigated areas is reported to have become a major law and order problem.

4.4.3 Maintenance of canal system is poor due to lack of funds. Water rates are unduly low. They do not cover even the maintenance cost of the irrigation system. It has not been possible to collect from users of water fully even the low water charges.

4.4.4 Groundwater utilised is only about one-fourth of the potential. Working of deep tubewells is unsatisfactory due to inefficient management. Progress in private investments in shallow tubewells is slow, *inter alia,* due to inadequate flow of credit and erratic power supply.

4.4.5 Drainage facilities in the command areas of major irrigation systems are most inadequate. The obsession for creation of new irrigation potential has led to the neglect of drainage. It is estimated that about 8 lakh ha of fertile land is affected by lack of drainage facilities. As the State is geographically located at the tail-end of the Ganga Basin, the DVC system has aggravated the drainage problem, although one of its objectives was flood control. Two of the main reasons are that it has not been implemented in full according to the original plan and many of the field channels or field drains needed have not been constructed. Conjunctive use of surface and groundwater could have helped in controlling the drainage problem. However, this has not received adequate attention. Projects for improved

drainage facilities need at this stage even greater priority than irrigation.

4.4.6 *Mechanisation* : There is very little mechanisation of farm operations. The use of improved tools and implements like seed-cum-fertilizer drills, sprayers, tillers, threshers, improved ploughs and modern gardening tools which can considerably improve labour productivity is low. This is partly due to their non-availability in proximate locations and partly to lack of adequate extension to encourage farmers to switch over from primitive tools and implements and absence of custom service agencies to provide these services.

4.5 *Problems of Tribal Agriculture*

4.5.1 Agricultural development programmes implemented in tribal areas have not produced the desired results due to the non-involvement of village community and the failure to design programmes suited to their specific needs. Inadequate research and extension efforts particularly in regard to (i) improved varieties of crops suitable to tribal areas, (ii) improved soil and water management techniques, and (iii) absence of effective marketing facilities, particularly for disposal of minor forest products, are some of the main problems faced in tribal areas. Further, LAMPS, specially organized to meet the needs of tribal areas, have not been functioning effectively. This is due to lack of committed staff and unduly large area of their operations.

4.6 *Research*

4.6.1 The main gaps in agricultural research are the following : (i) research on cultivation under flood conditions has not made sufficient progress;

(ii) paddy seeds suitable for deep water conditions (50 cm or more) have not been developed;

(iii) large areas in the coastal region suffer from salinity and waterlogging. Evolution of salt tolerant crop varieties, development of techniques for reclamation of alkaline soils and productive use of saline water have not been developed;

(iv) research on prevention of soil erosion in hilly areas has not received adequate attention;

(v) no research has been conducted for developing/promoting cropping systems based on high value crops; and

(vi) the progress of research in devising suitable control measures and surveillance system against pests and diseases in conditions of high humidity, cloudy weather and high temperature is slow.

4.7 *Specific problems of Agro-climatic Zones*

4.7.1 The foregoing paragraphs have described the general constraints affecting agricultural productivity in the State as a whole. However, constraints vary from zone to zone, district to district, block to block and even village to village. Hence it is important to recognise this fact in the corrective measures to be taken. We indicate below by way of example some location specific constraints at the zonal level.

4.7.2 *Hill Zone*

(i) Soils in this zone are deficient in lime and micro-nutrients. Soil erosion is yet another major problem.

(ii) Irrigation facilities are not adequate and water management techniques are lacking.

(iii) Varieties of rice, maize and potato suitable for cultivation in varying altitudes are inadequate.

(iv) The orange orchards in hill areas are infested with pests and diseases.

(v) Transport is very costly and slow.

4.7.3 *Terai Zone*

(i) The zone is flood-prone. Large areas are waterlogged.

(ii) There is excess moisture in the fields during sowing time, but in the growing season there is lack of moisture.

(iii) Irrigation facilities are lacking for *rabi* and summer cultivation.

(iv) Soils are highly acidic in many areas.

(v) Soils lack lime and micro-nutrients.

(vi) Light texture of soil and high leaching of nutrients lead to low response of crops to moderate doses of phosphate application.

(vii) Suitable short duration high yielding varieties of rice and other crops are lacking.

4.7.4 Alluvial Zone (I)

(i) About 2 lakh ha in this zone is waterlogged. Lack of drainage facilities in these areas pose serious problems for cultivation.

(ii) Overflowing of canals in river valleys result in submergence of rice crop leading to delayed maturity and reduction in yields.

(iii) Suitable location specific, high yielding, disease and drought tolerant varieties of seeds of crops are lacking.

(iv) Irrigation facilities are not adequate during *rabi* season.

(v) Incidence of pests and diseases is high.

(vi) Lack of cold storage facilities stands in the way of expansion of area under potato.

4.7.5 *Alluvial Zone (II)*

(i) Around 10 per cent of the area under cultivation in this zone is flood-prone as a result of impeded drainage and river overflow during rainy season.

(ii) Parts of the area are affected by waterlogging.

(iii) Irrigation facilities are not adequate during *rabi* season.

(iv) High yielding short duration varieties of crops are lacking.

(v) Incidence of pests and diseases is high.

4.7.6 *Red and Laterite Soil Zone*

(i) Rainfed agriculture in this zone is affected by erratic rainfall. Irrigation facilities are not adequate for cultivation in *rabi* season.

(ii) As a result of high precipitation in a relatively short monsoon period, run-off and erosion problems are serious. This has affected fertility of soil.

(iii) Dry farming techniques have not been adapted to this zone and are not adequate. High yielding short duration varieties of major crops are not in use.

(iv) Soils are gravelly and shallow in many places. Therefore, land remains barren and unsuited for cultivation.

4.7.7 *Alluvial-Cum-Coastal Saline Zone*

(i) Soils are highly saline due to spilling over of salt water in the embanked areas which are below sea level or high tide level.

(ii) Inadequate drainage facilities have contributed to drainage congestion and consequent waterlogging.

(iii) Irrigation facilities are not adequate particularly during the dry season. In coastal areas, water in rivers, channels and creeks is brackish.

(iv) Short duration, high yielding and salt-tolerant varieties of crops suitable to the zone are not available.

4.8 *Monitoring*

4.8.1 The weakest link in all developmental efforts is poor monitoring. Machinery for feedback of achievements and failures of programme implementation is not effective.

CHAPTER 5

POLICY MEASURES FOR ACCELERATING AGRICULTURAL DEVELOPMENT

5.1 *Introduction*

5.1.1 West Bengal, as stated earlier, has the necessary potential to achieve a higher level of agricultural productivity and production than in the past if suitable steps are taken to utilise intensively its land and water resources. However, special efforts are needed to overcome the constraints spelt out in the previous chapter. The main policy measures needed in this context are the pursuance of suitable land and water management policies, improvement in drainage, and strengthening of infrastructure on irrigation, inputs, credit, cutom services, rural industries, extension, processing and marketing supported by improvements in organization and management of development programmes. These policy prescriptions are applicable to Eastern India as a whole and are described in Part I of our Report. A summary of these along with specific measures for overcoming constraints at the zonal level are given below.

5.2 *Land Policy*

5.2.1 Consolidation of holdings needs to be accorded high priority in view of the small size and fragmented nature of holdings. To begin with, pilot projects on land consolidation along with OFD works should be taken up in the Seventh Plan in each district to convince the farmers of the advantage of consolidation. Necessary financial provision should be made by the Planning Commission in the Plan for such pilot projects and a phased programme of land consolidation.

5.2.2 Besides, to overcome the constraints caused by smallness of holdings, the following steps will be helpful :

i) encouraging farmers to form small Groups or Associations to deal with common problems;

ii) leasing in and out land by small and marginal farmers; and

iii) fixation of a "floor" limit for operational holdings.

5.2.3 Our recommendations in regard to the above are given in Chapter 8 of Part I.

5.3 *Irrigation and Water Management*

5.3.1 As pointed out in the previous chapter, a major constraint to agricultural development in the State is erratic nature of rainfall and lack of adequate irrigation and drainage facilities. Therefore, the spearhead of the development strategy has to be in the domain of irrigation, drainage and water management.

5.3.2 *Groundwater* : Despite large groundwater resources, only about one-fourth of it has been exploited so far. Hence, exploitation of groundwater resources has to be given the highest priority. Our recommendations in this regard are set out in Chapter 9, Part I. Some of the most important recommendations are briefly given below.

i) Compact areas with good groundwater potential (white and grey areas) should be saturated with a battery of tubewells and pumpsets, electric or diesel operated. This will help (a) provide supplementary irrigation in *kharif* season and productive irrigation during *rabi* season and (b) drain out excess water during *kharif* season.

ii) To start with, in selected compact areas where tubewell irrigation has made some progress (e.g., Nadia, Murshidabad, Malda, 24-Parganas, Howrah, Burdwan and West Dinajpur), batteries of tubewell bores (and power connections in the case of electric pumpsets), with appropriate spacing on a grid basis should be provided free of cost by the Government under a 100 per cent Centrally Sponsored Scheme. On the basis of experience gained, all other suitable areas in the State should be covered, step by step, by this programme.

iii) Pumpsets may be acquired by farmers individually or shared within a group or on a lease basis from leasing agencies/companies. If, however, farmers/Farmer Groups and private entrepreneurs do not come forward, Government may provide the pumpsets and recover lease rent from beneficiary farmers.

iv) For installing electric pumps in compact areas, dedicated lines may be laid. If, however, these cannot be provided, a rotational system of power supply, as in Tamil Nadu, (*vide* Chapter 9, Part I) may be introduced.

v) The rural electrification programme should be given very high priority.

vi) In unelectrified villages and villages where interruptions and uncertainty of power supply are serious, installation of diesel pumpsets should be encouraged. These pumpsets and PVC pipes for water conveyance can be easily transported by carts. Banks should finance farmers for purchase of carts as well as pumpsets and pipes.

vii) For encouraging use of diesel pumpsets, oil companies should set up properly equipped diesel sale and service stations in rural areas on a 'franchise' basis, as is being done at present for selling of petrol and servicing of vehicles in urban and semi-urban areas.

viii) For small and marginal farmers, ownership of tubewells and pumpsets may cause financial hardship. Therefore, facilities for hiring of pumpsets to these categories of farmers should be promoted by setting up leasing agencies/companies.

ix) In suitable areas, a 100 per cent Centrally Sponsored Scheme for construction of dugwells should be taken up. In the selection of such areas, tribal villages may be given special consideration. Pumpsets may be provided, if necessary, as indicated under (iii) above.

x) NABARD should, in consultation with the Government of India and the State Government, introduce a failed well compensation scheme for shallow tubewells/dugwells.

xi) Working of most of the deep tubewells in the State is unsatisfactory due to poor management and lack of proper maintenance. The operation and maintenance of such tubewells should be entrusted to Beneficiary Farmers' Groups or Associations or a Committee of beneficiaries, voluntary organizations or private entrepreneurs as may be appropriate, on a contract basis.

xii) It may not be possible to introduce the above contractual arrangements in all areas. In such areas, therefore, Minor Irrigation Development Corporation (MIDC) should continue to operate the deep tubewells and one of the following alternatives may be adopted.

(a) The State Government may meet the shortfall in the resources of the Corporation out of the Budget subject to the condition that within a prescribed period, it will meet the operation and maintenance cost from the revenues generated through higher water rates.

(b) The State Government may purchase water from the Corporation and sell them to farmers so that the Corporation will not incur any loss on sale of water due to charging of subsidised rates.

xiii) In areas where there is scope for deep tubewells but not shallow tubewells, their construction (including field channels) should be undertaken by MIDC, but operation and maintenance should be entrusted on a contractual basis to Farmer Groups, private entrepreneurs or voluntary organizations.

xiv) In deep tubewell areas, the prevailing water rates may be reviewed and restructured. Rates may be fixed on the basis of hours of supply or volume of water released. The State Government may also consider introduction of differential rates — a basic rate for the *kharif* season and the basic plus additional rate for the *rabi* season. These rates may be fixed per acre inch of water supplied or on crop basis.

xv) Water and electricity charges for irrigation and power should relate to actual consumption. In the case of water, this can be done by charging rates on a per hour/crop basis. The use of electricity can be regulated through a meter charging the consumer on the basis of actual power consumed and not on the basis of HP of motors.

5.3.3 *Surface Irrigation* : The practice of field to field irrigation should be discouraged through construction of field channels. Release of water and closure of canals should be timed according to the requirements of the crops. Canals should remain open when nurseries need water.

5.3.4 In canal irrigated areas, water rates should be raised step by step to the level of economic water rates. This will help better maintenance of the canal system.

5.3.5 The prospects for conjunctive use of surface and groundwater are good in the State. There is a need to encourage this in the command areas of major and medium irrigation projects through a programme of sinking tubewells. This will help control drainage problem.

5.3.6 The State Government should identify areas suitable for setting up floating or static river lift irrigation schemes. Where they have already been taken up, adequate funds should be allotted for completion of distribution channels.

5.3.7 *Water harvestors and other minor structures*: In rainfed and drought-prone areas, water harvesting should be developed by bringing all suitable areas under the coverage of the Centrally Sponsored Scheme for Micro-Watershed Development. In areas not covered by the Centrally Sponsored Scheme, the State Government should take up similar schemes.

5.3.8 Minor irrigation structures such as Kolhapur weirs/Mandi type pipe systems and hydrams should be taken up in hilly areas. Hydrams are particularly suited to hilly areas and therefore, these should be encouraged in such areas, as in Darjeeling.

5.3.9 Farmers are not making full use of tanks as they are not maintained properly. Their maintenance should, therefore, be improved. Wherever potential exists, new tanks should be constructed.

5.3.10 *Waterlogging and drainage*: In a number of districts waterlogging is acute. In these areas a number of anti-waterlogging measures such as desilting of drainage channels, construction of embankments, etc., have been taken up. As financial resources earmarked for these purposes are limited, their progress has been slow. There is, therefore, need for stepping up financial allocations for these purposes. Also, crops which can withstand waterlogging and flooding in the initial stages of plant growth need to be encouraged in these areas. West Bengal could

take advantage of research work already done in this field in other States.

5.3.11 A Master Plan for drainage on district/basin basis should be prepared. Three types of drainage channels are needed, viz., (i) big drainage channels, (ii) intermediate drainage channels and (iii) field drains. Big drainage channels should be constructed in a phased manner in the command areas of major irrigation projects. Government of India should provide the required funds for this purpose. Construction of intermediate drainage channels should be the responsibility of the State Government, for which NREP and RLEGP could be utilised. As regards field drains, construction may be taken up by CADA and cost recovered from beneficiaries in suitable instalments.

5.3.12 The possible directions of irrigation/drainage development in different agro-climatic zones are indicated below.

(i) In the Hill Zone, the main source of irrigation will be by use of water from rivers and streams, through flow and lift irrigation and hydrams.

(ii) In Terai Zone, shallow tubewells, some deep tubewells as also dugwells could be taken up.

(iii) In the districts of Nadia, Malda, parts of Dinajpur and Murshidabad (Alluvial Zone I), Burdwan and Hoogly (Alluvial Zone II), and 24-Parganas (Alluvial-cum-Coastal Saline Zone), there is good scope for exploitation of groundwater by installing shallow tubewells, and in some places construction of deep tubewells. In some areas, tanks and dugwells may be constructed. Possibility of installing windmill pumps in suitable areas should be explored.

(iv) Irrigation development in Bankura (Red and Laterite Zone) and central part of Midnapore (Alluvial-cum-Coastal Saline Zone) has been mostly by construction of storage reservoirs and canal systems. A number of medium irrigation schemes also are being taken up in these areas. The scope for groundwater development is limited in this region. Therefore, steps should be taken to undertake medium irrigation projects and better utilisation of existing water resources through dugwells, tanks, pumpsets, etc.

(v) The southern part of 24-Parganas and Midnapore (Alluvial-cum-Coastal Saline Zone), and southern part of Howrah (Alluvial Zone II) are suited for river lift irrigation schemes, tanks and dugwells. Main effort in these areas has to be on flood control measures. A number of measures have already been taken up. These are to be completed as early as possible.

5.4 *Crop Planning* : Our recommendations on crop planning are set out in Chapter 8, Part I, more important of which are enumerated below.

5.4.1 To meet situations arising out of uncertainty of rainfall, district-wise contingency plans should be prepared. Rainfall data presented in Part VI will be helpful in this regard.

5.4.2 In crop planning, the most crucial factor is the pattern and reliability of rainfall. Areas prone to erratic rainfall should be identified. In such areas, it may be worthwhile to shift from rice to other low duty crops which require less water and are less affected by fluctuations in rainfall.

5.4.3 To economise water, even in irrigated areas, preference may be given to wheat over *boro* rice.

5.4.4 Some areas are not suitable for rice cultivation. In such areas, growing of pulses/oilseeds/millets would be more profitable and less risky. Marginal/sub-marginal lands should not be used for rice cultivation.

5.4.5 For raising a second crop during *rabi* season, short duration crops should be introduced in the crop rotation.

5.4.6 The Agriculture University and State Agriculture Department should develop suitable crop patterns and crop rotations for each agro-climatic region.

5.4.7 To control soil erosion, afforestation programme, agro-forestry/contour planting, contour bunding and other soil conservation measures should be taken up.

5.5 *Development Strategy for Small and Marginal Farmers*

5.5.1 Small and marginal farmers cannot improve their incomes significantly if they grow only staple crops. Therefore, in small farms with assured irrigation and having access to motorable roads to marketing centres, farmers should be encouraged to raise, on a part of their holding, high value crops such as vegetables, spices, medicinal plants, flowers, fruits and/or high yielding varieties of staple crops. The area devoted to high value crops/ HYV crops may be initially small to be increased step by step in subsequent years.

5.5.2 In small farms, the gardening type of agriculture needs to be promoted. Even a tiny piece of land with very careful and intensive cultural practices and supported by adequate application of water, fertilizers and other inputs can generate very high profits from fruit and vegetable cultivation. The choice of such high value crops will, however, vary from area to area depending on the soil and agro-climatic conditions.

5.5.3 Along with cultivation of high value crops, small and marginal farmers should be encouraged to take up ancillary activities such as animal husbandry, fisheries, etc. Detailed recommendations in this regard are given in Chapters 8 and 14 of Part I.

5.6 *Farm Machinery and Implements* : For improving labour efficiency in small and marginal farms, use of modern machinery and implements (manually operated and other water-lifts, seed-cum-fertilizer drills, sprayers, improved ploughs, winnowers, threshers, wheel hoes and paddy weeders, etc.) should be encouraged. Leasing agencies/companies should provide the necessary custom service facilities to enable the farmers to obtain these tools and implements on hire (for details, see Chapter 8 of Part I).

5.7 *Rural Industry Centres*

5.7.1 Secondary markets and other potential growth centres should be developed as rural industry centres for growth of service, supply, marketing and processing industries/enterprises.

5.7.2 The setting up of medium scale industries in particular should be encouraged in "no-industry" blocks, say, 50 km or

more distant from an existing industrial centre. The State Government should indentify suitable areas in each district for setting up such industries and enterprises (for details, see Chapter 8, Part I).

5.8 *Input supply*

5.8.7 *Seeds* : There is shortage of HYV/improved varieties of seeds in the State. To improve the supply position, therefore, the State Seed Corporation should strengthen its production capacity of certified seeds of rice, wheat, jute, potato, pulses and oilseeds in its own farm as well as through "registered growers". At the same time, the production of foundation seeds and breeder seeds by Agricultural University should be augmented.

5.8.2 A phased programme of setting up seed distribution points at panchayat level in the public, co-operative or private sector, should be taken up. By the end of the Seventh Plan, every Panchayat should have a seed distribution centre.

5.8.3 *Fertilizers* : To suit requirements of small and marginal farmers, supply of fertilizers in packets of 10 to 20 kgs should be arranged. Loose sales of fertilizer increase the risk of adulteration. Steps should therefore be taken to prevent loose sales. In predominantly vegetable growing areas, packets of 5 kgs should be made available.

5.8.4 Distribution network should be strengthened, particularly in hilly and interior areas. The State Government should ensure that by the end of the Seventh Plan every Panchayat is served by a distribution centre.

5.8.5 In tribal areas, certain villages in each tribal block may be declared by the Union Ministry of Agriculture as "Block Head quarters" for the purpose of issue at the pool price.

5.8.6 *Bio-fertilizers* : Bio-fertilizers like blue green algae (BGA) supplement the nitrogen content of the soil. The State Government has taken up a scheme for producing BGA culture for distribution to farmers for multiplication and use by them. To popularise the use of organic manures, production and multiplication of BGA and similar other cultures should be taken up additionally under

a Centrally Sponsored Scheme in suitable locations selected by the State Government, in consultation with the Government of India.

5.8.7 Organic farming approach deserves favourable consideration as against concentration on the use of chemical fertilizers. This will be particularly useful for tribals and other resource-poor farmers.

5.8.8 *Pesticides* : A Centrally Sponsored Scheme for eradication of pests and diseases is in operation in the State. Pesticides and insecticides are mostly sold by private dealers, who also hire out sprayers to farmers. The State Government should periodically check the stocks of pesticides maintained by private dealers to deter possible adulteration. It should also ensure that the dealers charge only the stipulated prices.

5.8.9 The State Department of Agriculture should nominate the District Agricultural Officer as Vigilance Officer to exercise check on private dealers.

5.8.10 Details of our recommendations in regard to input supply are given in Chapter 10 of Part I.

5.9 *Credit and Insurance*

5.9.1 The strategy for accelerated agricultural development would necessitate a considerable step-up in the use of inputs and on-farm investments for which a larger flow of credit is essential. This would call for reorganization and considerable strengthening of the credit structure, particularly co-operatives. Improving overdues climate should receive highest priority. Our recommendations in regard to credit policy are given in Chapter 15 of Part I. RBI, NABARD and State Governments should implement these programmes early and effectively, so as to ensure that credit does not pose a stumbling block to accelerated progress.

5.9.2 The present system of investment subsidy should be replaced by performance-linked subsidy as soon as possible.

5.9.3 The State Government should introduce an insurance scheme to cover important productive investments such as tube-wells, pumpsets, machinery, etc. Insurance should be made compulsory in all bank-financed schemes and Government programmes.

5.9.4 The State Government has introduced crop insurance in selected areas for *aus, aman* and *boro* paddy and potato. Insurance cover is available under the scheme for all farmers taking crop loans against losses sustained by them on account of vagaries of weather, attack of pests and diseases and other calamities. For small and marginal farmers and sharecroppers, 50 per cent premium subsidy is made available. The scheme is voluntary and is linked with short-term loans disbursed by co-operatives and commercial banks.

5.9.5 There is a need to introduce crop insurance to cover both borrowers and non-borrowers. The premium should be low enough to induce farmers to avail of insurance facility. The GIC, in consultation with the State Government, should work out the details of the scheme.

5.10 *Agricultural Research, Training and Extension*

5.10.1 Improvements needed in the sphere of agricultural research, training and extension are given in Chapter 11 of Part I. Specific recommedations in respect of West Bengal are given below.

5.10.2 The research activity of the State Department of Agriculture is mostly adaptive in nature. The State Government has set up 6 Zonal Research Stations, one in each zone. Besides, there are five research stations on different crops (e.g. rice, wheat, pulses, oilseeds, sugarcane and horticulture) and one on water management. There are 45 sub-divisional adaptive research stations in the State where verification trials for location specific problems are carried out. There are 17 seed farms where varietal trials are conducted. However, adequate irrigation facilities are not available in these farms. They are generally ill-equipped, under-staffed and lack proper field and laboratory facilities for useful research. About 30 per cent of sanctioned research staff

are not in position. These shortcomings should be removed. Adequate funds should be made available for this purpose.

5.10.3 Barring the alluvial districts, research set-up is very inadequate in the rest of the State. Almost the entire research staff of BCKV are stationed at the main campus. This has an adverse impact on the quality and usefulness of research. There is a need for better distribution of research effort to cover all the agro-climatic zones.

5.10.4 The Research Review Committee under the National Agricultural Research Project (NARP) of ICAR was entrusted with the task of identifying research gaps and constraints in each agro-climatic zone and suggest remedies. The recommendations of the Committee regarding location of six regional research stations and the six substations, as also the important crops which deserve attention in research are given in Annexure 5.1. We urge that their recommendations are implemented in full at the earliest.

5.10.5 Programme planning for rice research in West Bengal might emphasize development of high stability varieties (HSVs) and low cost inputs and cultural practices based on regional or location specific agro-ecological requirements. Several short duration high yielding varieties (e.g. Ratna, IR 36, Kshitish) have been identified which can be grown almost throughout the year, except September – October. These have a fairly stable average yield of 3.5 tonnes with potential of over 5 tonnes, irrespective of when they are sown. These varieties are, however, suitable for medium high lands under irrigated and transplanted conditions. Efforts are going on to develop similar HSVs for rainfed low lands. Varieties released in the State are compulsorily screened for pests and diseases under artificially inoculated conditions and are also subject to natural screening in endemic locations, e.g., for blast at Kalimpong and for RTV at Malda. Screening against other environmental stresses like submergence, salinity, etc., is also undertaken. More intensive efforts in this direction with additional manpower and facilities should form the basis of a long range strategy for stabilising rice production with high stability varieties.

5.10.6 *Results of Research Available on Shelf* : Significant achievements in agricultural research have been reported by various ICAR institutes, agricultural universities and the State Departments of Agriculture in raising the yield potential of crops, attainment of stability in agricultural production, irrigation scheduling of crops, post-harvest technology and similar other areas. Illustrative list of latest research findings in respect of improved varieties of staple crops and improved agricultural practices are given in Annexures 5.2 to 5.4. For a similar list in regard to agricultural implements, Annexure 8.1, Chapter 8 of Part I may be seen.

5.10.7 The BCKV should, in collaboration with the concerned State Departments, prepare an exhaustive list of research findings available on the shelf suitable for field application in various zones of the State and include these in the extension package in a phased manner.

5.10.8 *Recommendations of CRRI for Increasing Rice Productivity*: The CRRI has made some useful suggestions for increasing rice production. These are given in Annexure 5.5. The State Government should examine these suggestions and take steps to implement them as may be appropriate.

5.10.9 *Agricultural extension and Training* : West Bengal is one of the few States which pioneered the adoption of the T & V system. The effectiveness of the system is hampered in many areas *inter alia* by lack of staff. During 1984-85 more than 3700 Village Level Workers known as Krishi Projukti Sahayaks (KPS) out of the total of 4000 are expected to be in position. However, there is need for creation of 94 posts of Agricultural Extension Development Officers (AEOs/ADOs). The posts of Subject Matter Specialists have also not been filled up. It is necessary to draw up a programme for early recruitment and training of full complement of staff. Spervision of the work of KPS by ADOs/ AEOs and SDAOs continues to be irregular and infrequent due mainly to their pre-occupation with non-extension functions. This needs to be remedied.

5.10.10 There is need for including a specialist on Water Management in the complement of the SMS.

5.10.11 Extension service is weak in the sphere of animal husbandry, dairying, poultry, fisheries and agro-forestry. These deficiencies should be remedied as early as possible.

5.10.12 Adequate career advancement opportunities are not available to the KPS. We feel that avenues for promotion should be built into the system to boost the morale of field functionaries. To develop the professional competence of field staff and to provide incentives for improving their academic qualifications for future prospects, meritorious KPSs should be offered facilities for higher education leading to a degree in agriculture.

5.10.13 The Compact Area Programme in Orissa (*vide* Chapter 9, Part III) under which VAWs closely supervise production plans of farmers has met with good success. It is worthwhile considering the introduction of such a programme in West Bengal.

5.10.14 VAWs in whose jurisdiction considerable productivity and production increases have taken place should be suitably rewarded.

5.10.15 The practice of rotating SMS as between different disciplines should be discontinued. The staff of SMS, AEO and VAW should be considered as a State Pool and rotated among the blocks as per local needs and requirements.

5.10.16 The departmental extension service needs to be augmented by creation of a supplementary extension service. The following steps are recommended in this regard.

i) Appointment of some selected contact farmers as Associate Village Level Agricultural Workers (AVAW);

ii) Encouraging retired technical officials to take up consultancy work in agriculture, horticulture, animal husbandry, etc; and

iii) Greater involvement of voluntary agencies in extension work.

5.10.17 Pilot programmes should be taken up for carrying extension message to farmers with the help of films or video-tapes. Video cassette players may be utilised in villages not having TV

coverage. The State Government may set up a Centre to prepare video cassettes or films for each agro-climatic zone based on fortnightly/weekly extension messages for wider publicity.

5.10.18 Special courses on operation and maintenance of simple mechanical and electrical devices commonly used in villages may be introduced by IITs, craftsmen training centres and selected rural schools.

5.10.19 Steps may be taken to make available inputs in time and in adequate quantities to farmers. For this purpose, if necessary, the staff at the block level may be augmented. This is an essential prerequisite for the success of the T & V system.

5.10.20 Details of the various measures are given in Chapter 11, Part I.

5.11 *Specific Recommendations for Agro-Climatic Zones*

(i) *Hill Zone* : In this zone, suitable plant coverage, e.g., fruit trees or fodder crops, should be taken up for controlling soil erosion. The research stations at Pedong and Rangbul should attend to this work. To improve the income of hill people, attention needs to be paid to rejuvenating orange orchards as also for development of soyabean and mushroom cultivation. Cultivation of wheat should be extended to more areas during *rabi* season. Feasibility of extending maize cultivation during summer season and introduction of pulses in the farming system should be explored. Suitable programmes for exploiting perennial streams known as '*Jhora*' for irrigation purposes should be taken up. To overcome deficiency in lime and micro-nutrients in soils, optimum doses of fertilizers and manures should be applied.

(ii) *Terai Zone* : In this zone a thorough survey of micro-nutrients and lime deficiency should be conducted as an essential prerequisite for cultivation of HYV cereals, pulses, etc. Organic manures should be developed and popularised. Balanced fertilization programme including use of lime and micro-nutrients should be taken up. In sand laden areas, soil conservation and forestry development need to be taken up. Private shallow tubewells and dugwells with pumpsets shoud be taken up in this zone. There is scope for installing a few deep tubewells also. In view of the high cost of chemical fertilizers, use of bio-fertilizers should be

popularised. Agro-based industries utilising jute sticks, bamboo and other raw materials for manufacture of card-board, news-print, etc., also need to be encouraged.

(iii) *Alluvial Zone (I)* : In this zone, there is considerable scope for multiple cropping through optimum utilisation of ground and surface water. Groundwater potential is high in this zone. Priority has to be given for installation of private tubewells as well as deep tubewells. Dugwells and pumpsets should also be encouraged. As this zone has great potential for growing wheat, its cultivation should be stepped up by providing adequate irrigation facilities. A thorough survey of surface and groundwater resources should be undertaken for exploring possibility of conjunctive use of water from various sources. As overflow of canals in river valleys causes submergence of rice crop, leading to delayed maturity and reduction of yields, flood control measures need to be stepped up on the lines recommended by the National Committee on Development of Backward Areas[1]. To reduce waterlogging, there is need for simultaneous development of drainage facilities and groundwater resources. There should be a grid system by which water drained from these areas may be utilised for irrigation on the top land and mid-lands. For speedy adoption of HYV rice, seed banks may be set up for buffer stocking of such seeds. This should form part of contingency planning in areas prone to drought and flood. In this zone, there is scope for extending potato cultivation. Production of coconut and other fruits should also be taken up.

(iv) *Alluvial Zone (II)* : In this zone, apart from storage reservoirs and canal systems of irrigation already developed, scope exists for taking up a number of new medium irrigation schemes. There is also scope for installation of shallow tubewells and dugwells. Available irrigation facilities should be utilised adequately through appropriate water management techniques. Cultivation of rice during summer exerts pressure on the limited irrigation facilities available during the season. Therefore, land under summer rice should be gradually shifted to wheat, pulses, etc., requiring less water as compared to rice. In Hooghly, potato cultivation needs to be extended further with adequate support-

1 *Vide* Report on Development of Chronically Flood Affected Areas. November 1981.

ing facilities for transport, marketing, storage, etc. Measures should be taken for development of drainage. Small and marginal farmers should be helped to grow high value crops like fruits, vegetables, etc., in order to enable them to raise their income. Rice straw and rice bran should be used for manufacture of straw board and rice bran oil.

(v) *Red and Laterite Soils Zone* : For improving soil fertility, soil conservation and soil amelicration measures, water harvesting techniques, application of organic manures and balanced fertilization need to be undertaken. Other measures such as afforestation, contour planting of trees and agro-forestry also have to be taken for improving fertility of soil. To overcome the problem of erratic rainfall, medium and minor irrigation schemes have to be undertaken. Cultivation of crops requiring less water such as maize, small millets, groundnt, etc., needs to be encouraged. In small and marginal farms cultivation of high value crops may be encouraged. The adaptability of new crops like *guava,* pomegranate, custard apple and cashewnut needs to be tested in this zone. In the uplands, rice may be replaced by short duration and high yielding varieties of maize, sorghum, soyabean, etc.

(vi) *Alluvial-cum-Coastal Saline Zone* : In southern parts of this zone, it is necessary to undertake soil amelioration measures by removing salinity and alkalinity of the soils, wherever necessary. Application of gypsum before rains, and green manuring with *sesbania* crop can improve rice yields to a great extent. In order to prevent the ingress of saline water, flood control measures along with embankments should be taken up. For protection of embankments, a programme of social forestry including strip planting on roadsides, canal banks and embankments with fast growing species of *casuarina, babla,* etc., should be encouraged. Measures for drainage have to be initiated to reduce the impact of waterlogging. Suitable implements for tilling soils while they are wet, as also a ridger for sowing crops in furrows to evade the effect of salinity are to be developed. Sinking of deep tubewells and diesel pumpsets and tapping perennial rivers and rivulets by installation of lift irrigation devices require immedate attention. In saline areas, short duration and salinity tolerant varieties of crops should be developed. Keeping in view the scarcity of water, cultivation of cash crops such as coconut, requiring less watter should be taken up. For developing Sunderbans

area, a special programme of development may be launched on the lines of Rangabellia project. In saline and alkaline lands, cultivation of sugarbeet, watermelon, etc., may be encouraged. The existing mono-cropping pattern (rice) should be replaced by multiple cropping with introduction of short duration varieties of rice, followed by a second crop like barley, chillies, sunflower, etc.

5.12 *Ancillary Activities*

5.12.1 Recommendations on ancillary activities such as animal husbandry, dairy development and fisheries are set out in detail in Chapter 14, Part I. The State Government should identify suitable areas for different types of activities, select compact areas for development and provide adequate arrangements for marketing of products.

5.13. *Processing*

5.13.1 In hilly areas, Darjeeling Fruit and Vegetable Processing Co-operative Ltd., has made considerable strides in processing of fruits. Such fruit processing activities should be taken up by the State Government, co-operatives and the private sector. Concentrates, juices, jams, marmalades, etc., will have a very good market within the country. Prospects for export, particularly to Singapore, USSR and Middle East may also be explored. For inducing private sector companies to set up such activities, Government should provide liberal incentives such as tax exemptions allowed to industries in no-industry and backward areas, provision of land, power supply, etc. The State Government may consider setting up a Fruit Processing Company either on its own or in collaboration with private sector.

5.14 *Marketing and Transport*

5.14.1 Agricultural trade in West Bengal is traditionally dominated by rice among food crops and jute among cash crops. Wheat and potato have gained importance in recent years. Other important crops are pulses, fruits, vegetables and spices.

5.14.2 There are about 2100 primary and 265 wholesale assembling markets in the State. On an average, there is a primary

market within 3 km. distance of each village and a secondary market within 15 to 20 km. Direct sales by farmers in primary markets are small. This is due to the wide prevalence of the practice of purchases of farm produce by traders or their agents at farm gate.

5.14.3 Wholesale markets are generally located in areas with good transport links and other infrastructure. Traders and their agents, commission agents, trader-cum-commission agents, processors, brokers and marketing societies operate in these markets. The direct participation of primary producers is negligible. Commission agents constitute the most influential group operating in these markets.

5.14.4 The number of markets regulated in the State (as on March 31, 1984) under the West Bengal Agricultural Produce Marketing (Regulation) Act, 1972, was 320 comprising 38 principal markets and 282 sub-market yards. A few cold storages have also been declared as regulated markets. This indicates that a sizeable part of market network is outside the fold of regulation.

5.14.5 Facilities available even in the regulated markets are generally inadequate and unsatisfactory. An attempt is being made to improve faclilities in the regulated markets under two central sector schemes. Under one scheme, 12 regulated markets have been taken up for development. The scheme envisages provision of financial assistance for development of infrastructural facilities. Assistance is given in two phases, the second instalment being released after a specified propcrtion of the allocation in the first phase has been utilised. Out of the 12 markets taken up for development under this scheme, 6 have entered the second phase. Under the second scheme, one wholesale rural market and 30 rural primary markets have been taken up for development. None of them have yet entered the second phase of development.

5.14.6 All assembling, wholesale and terminal markets should be regulated. A time bound programme should be drawn up. The facilities and services at these markets should be in accordance with the norms recommended by NCA. Adequate representation should be given to small farmers in the market

committees. The coverage under the Central Schemes for market development should be increased.

5.14.7 During years of bumper crop, arrangements should be made to siphon off excess crop so as to minimise effects of demand constraints.

5.14.8 Improvement of marketing facilities and strengthening of infrastructure is of crucial importance in agricultural development. Our recommendations for improving the network of transport and regulated markets and the facilities for institutional marketing and marketing of perishable crops are set out in Chapter 12, Part I.

5.14.9 Food Corporation of India (FCI), State Government's Food and Civil Supplies Department and the Jute Corporation of India (JCI) are the three public sector agencies participating directly in marketing. Procurement agencies should be active and play a crucial role so that producers can get a remunerative price for their produce.

5.14.10 Instability in jute acreage and production is largely due to wide fluctuations in price of the commodity. For stability in jute cultivation it is necessary to ensure reasonably stable and remunerative prices. Raw jute price should bear a reasonable parity with price of rice.

5.15 *Transport*

5.15.1 There is only one national highway in the State. Whereas the network of roads is satisfactory down to the town level, it is generally inadequate beyond urban limits and even more scarce in interior areas. The length of unsurfaced roads in the State in 1979-80 was about 1700 kms.

5.15.2 We recommend that the existing network of roads should be extended further so as to link not only one village to another, but with assembling market centres and with towns. This link-up as well as development of suitable transport vehicles is an essential prerequisite for effective marketing as recommended by us in Part I of this Report.

5.16 *Storage*

5.16.1 At present storage facilities in the State are not adequate. As a result farmers who bring their produce to the market have to dispose it off at the prevailing market price.

5.16.2 The State Warehousing Corporation's godowns, as well as co-operative storages are mostly utilised for storing agricultural inputs. The storage facilities available with the State Warehousing Corporation are utilised to the extent of 72 per cent by Government. Traders make use of these facilities to the extent of 22 per cent. Therefore, very little of SWC storage facility is available to farmers for storing their agricultural products.

5.16.3 Special measures are, therefore, necessary to build up adequate storage facility for the use of farmers. Such measures should be accompanied by simplification of procedures for credit delivery to them against hypothecation of their stocks.

5.17 *Perishable and Semi-Perishable Commodities*

5.17.1 Private trade plays a predominant role in the marketing of perishable commodities such as fruits, vegetables, fish, eggs, etc. Mostly they manage to procure the produce at the farm gate at prices often unremunerative to the producers. Further, they combine in rigging operations to exploit the producers who bring their produce to primary and secondary markets.

5.17.2 To protect the producers from the malpractices of private traders, quick transport and adequate cold storage facilities have to be provided. Adequate packing and container facilities also will have to be ensured. Other facilities needed for efficient marketing of perishables are grading, processing, quality control and market information services. Access to alternative markets is also important.

5.17.3 Possibilities for export of perishable items have to be explored. For this purpose production of standardised commercial varieties in demand has to be promoted. Strict enforcement of quality standards and grading is necessary. Further, processing, packaging and marketing for export purposes has to

be organised on institutional basis and not left entirely to the initiative of the trade. The State Government should promote one public sector organization and encourage one or two private sector organizations to enter export trade in these commodities on competitive basis.

5.18 *Agriculture in Tribal Areas*

5.18.1 Tribal areas need special attention. In designing the programmes for tribal areas, involvement of village community is essential. Our recommendations in regard to agricultural development in tribal areas are given in Chapter 13, Part I.

5.19 *Management and Organizational Reforms*

5.19.1 Management of the various agricultural development programmes is looked after by a large number of administrative departments and agencies. These departments and agencies need a reorientation to the requirements and objectives of development. They should be geared to the task of achieving the objectives and goals of development in a coordinated and efficient manner. In implementation of the programmes, it is important to ensure proper sequencing of actions by the concerned departments. The keyword in this context is innovative management. This should replace conventional administration. The main areas where improvements are needed are given in Chapter 7, Part I.

5.19.2 *Monitoring and Evaluation* : The monitoring and evaluation cell of the State Government should be strengthened to undertake periodic monitoring of development programmes. The Union Ministry of Agriculture should, in consultation with Planning Commission and NABARD, help in evolving guidelines for monitoring. Evaluation may be entrusted to competent research bodies.

5.20 *Appointment of Standing Committees*

5.20.1 We recommend the appointment of two Committees, viz., (i) Ministerial Committee headed by the Chief Minister and (ii) the Committee of Secretaries headed by the Chief Secretary.

Their composition and functions are described in Chapter 7, Part I.

5.21 *Other Follow-up Action*

5.21.1 A study of productivity differentials in various agro-climatic zones should be undertaken by the State Government. This will facilitate initiation of appropriate strategies for different zones with a view to maximising agricultural production.

5.21.2 For the success of improved weather forecasting facilities through remote sensing, a matching improvement in administrative efficiency and alertness is necessary, so that timely action can be initiated whenever natural calamities are predicted.

5.22 *Improvements Needed in Agricultural Statistics*

5.22.1 For a proper understanding of the current trends in agricultural production and the technological, ecological and other constraints hampering agricultural growth, up-to-date information on various aspects of agriculture at micro-level is necessary. However, reliable agricultural statistics, particularly below district level, are lacking.

5.22.2 We recommend that the scheme for "Establishment of an Agency for Reporting of Agricultural Satistics" (EARAS) on complete enumeration basis should be extended to cover 20 per cent mouzas each year (*vide*. Annexure 5.6). Pending availability of data based on EARAS, the estimates of area and production built up by the Bureau of Economics and Statistics through objective sample surveys should be adopted by the State Government.

Annexure 5.1

Locations of Regional Research Stations and Sub-Stations

Zone*	Suggested Locations of		Main crops requiring research attention		
	Regional Station	Sub-Station	*Kharif*	*Rabi*	Horticulture
I. Hill	Rangbul	Pedong	Rice, maize, pulses	Pulses, potato, wheat	Mandarin, oranges, peach, cardamom, tea, ginger, orchids, vegetables
II. Terai	Pundi Bari (Cooch Behar)	Khari	Rice, maize, pulses	Wheat, rice, pulses, potato, mustard	Tea, pineapple, spices, vegetables
III. Old Alluvium	Randia (Panagarh)	Ratua, Manikchak	Rice, maize, pulses, millets, sugarcane	Wheat, rice, pulses, potato, mustard.	Mango, vegetables
IV. New Alluvium	Mohanpur	Chinsura Bethudahari	Rice jute, pulses, sugarcane, maize.	Pulses, wheat, rice, potato, mustard	Mango, banana, lichi, papaya, vegetables

Annexure 5.1 (Concluded)

Zone*	Suggested Locations of		Main crops requiring research attention		
	Regional Station	Sub-Station	*Kharif*	*Rabi*	Horticulture
V. Red and Laterite	Jhargram	Jaipur (Purulia) Sriniketan	Rice, sugar-cane, maize, pulses, jute	Wheat, pulses, potato, rice	Citrus, guava, cashew, ber, pomagranate, vegetables
VI. Coastal Saline	Canning	Mathurapur	Rice jute, pulses	Rice, wheat, pulses, chillies, mustard, potato	Watermelon, jackfruit, vegetables

* As demarcated by the ICAR's Research Review Committee under National Agricultural Research Project.

Annexure 5.2

Improved Varieties of Staple Crops

Staple crops of the State are rice, wheat, maize, barley, jute and rapeseed and mustard. Together they account for more than 90 per cent of State's gross cropped area. A large number of crop varieties comprising cereals, oilseeds, forage crops, and jute have been tested and identified as suitable for propagation in the State. List of recommended varieties for different crops is given below.

I. Rice	
(i) Early duration	Bala, Cauvery, Ratna, Akasi Rasi, IET 826, Pusa 33, Kalimpong-T, IET 222, IET 2815, Khitish, Sattari (for direct-seeded upland rainfed areas).
(ii) Medium duration	IR 8, Jaya, IR 20, Vijaya, Jayanthi, Pusa 2-21, Vani Shakti, Vikas.
(iii) Long duration	Pankaj (for low lying situation), Jagannath, Jaladhi-1, Jaladhi-CR-1014, Mahsuri, Savitri (for low lying and waterlogged areas), Biraj, Suresh, Kunti.
(iv) For Sunderban Area	Mut-1 (matures 20 to 25 days earlier than the parent).
2. Wheat	Janak, U.P. 262, Malaviya 55 (timely sown), HUW (timely sown), HUW 213 (late sown), K 8020 (late sown).
3. Maize	'Diara' and 'Improved Diara' – early maturing for plains. 'Kissan' and 'Vijay' composite – late maturing for plains and hills for both *kharif* and *rabi* seasons. 'Deccan 103, yellow seeded, full season, double cross hybrid for *kharif*.

Annexure 5.2 (Concluded)

4.	Barley	'K-25' and 'Ratna' give high yield in saline soils and under rainfed condition.
		BHS – 46 : Having wide adaptability, resistance to rust, loose smut, powdery mildew and helminth osporium.
5.	Jute	Rupali : An olitorius variety, fibre quality and yield better than 'JR 0632', requires less nitrogen and has tolerance of diseases and insect pests.
		'JRC 212' : White jute (*Coachrus Capsularies*), fibre yield ranging from 22 to 27 Q/ha.
6.	Rapeseed and Mustard	'Varuna' (T-59)
		'RW 351' : Early maturing (105-112 days), suitable for mixed cropping and irrigated areas.
		'RH 30' : Early maturing (129 days), bold seeded, suitable for mixed cropping, late sowing, and irrigated areas.
		'RH 781' : Early maturing (121 days) suitable for irrigated areas.
		'RH 785' : Early maturing (128 days), suitable for irrigated areas.
		'RW 85' : Early maturing (116 days), suitable for irrigated areas.

Annexure 5.3

Improved Varieties of High Value Crops

Vegetables, fruits, flowers and plantation crops are the high value crops. List of some of the varieties evolved during recent years for cultivation in the State are given below.

1.	Potato	'Kufri Jyoti', 'Kufri Chandramukh' and 'Kufri Lauvkan'.
2.	Sweet Potato	Hybrid-12 and 'Cross-4', Yield 20-30 tonnes/ ha. in about 200 days when planted in August-September.
3.	Tomato	'Pusa Ruby', 'HS-101', 'SL No. 120' 'Pusa Ruby', staple both for early and late planting.
4.	Brinjal	'Pusa Kranti' : Can be grown throughout the year but gives better yield in autumn-winter season.
5.	Rose	Montezuma : Planting at a distance of 30 cms x 20 cms with a plant population 1,66,666/ha.
6.	Radish	'Kalyani White' : Early maturing and requires 40-45 days for harvesting except during summer months. Can be profitably grown in the plains of West Bengal.
7.	Pineapple	'Kew' variety can be grown on commercially profitable basis in South Bengal.
8.	Watermelon	'Sugar baby' variety is getting popular in Sunderban.

Besides research findings in India and other countries, on mushrooms, European table vegetables, cauliflower, cabbage, peas among vegetables, tuberose and gladioli among flowers and cardamom, chillies, turmeric, ginger and tamarind among other crops need to be studied since these crops are apparently suitable for cultivation in the region.

Annexure 5.4

New Practices in Crop Production

For better utilisation of existing resources for attaining higher yields, the following improved agricultural practices have been evolved by research scientists and are found suitable for application in farmers' fields.

(a) Root-zone placement of urea supergranules coated with *carbofuran* (WP), Coaltar or neem oil results in considerable reduction in the incidence of gallmidge and stemborer in paddy.

(b) Urea supergranules placed 8 cm. below the soil surface increase the root spread, root volume and total grain yield of rice.

(c) Stomp @ 1 kg. ai/ha as a pre-emergence application is found very effective in controlling the troublesome weed *phalaris minor* in wheat fields.

(d) In rice-wheat rotations, the seed rate of wheat should be increased by 25 per cent over the normal when wheat is broadcast amidst *kharif* stubbles. After harvesting rice, 2 ploughings should be given, followed by seeding within the shortest possible time to avoid excessive moisture losses.

(e) Methods of establishment of wheat with minimum tillage after rice have been standardised to minimise the ill effects of late sowing of wheat.

(f) Intercropping of soyabean with rice and maize, *Dinanath* grass with cowpea and rice bean, potato with sugarcane have been found to be economical.

(g) Crops having high yield potential under rainfed conditions are field beans, sunflower, gram and yellow sarson, which get established with minimum tillage.

(h) Mulching with straw can help increase the yield of custard apple.

Annexure 5.4 (Contd.)

(i) Application of 80 kg. nitrogen, 50 kg. phosphate and 50 kg. potash per ha. can give maximum flower yield in tuberose (*rajnigandha*).

(j) Commercial cultivation technology of a few edible mushrooms has been standardised along with production of their spawn.

(k) Rice responds positively to phosphate manuring in winter and low lying situations.

(l) In high yielding maize varieties, application of organic manures @ 10 tonnes/ha. in conjunction with inorganic fertilizers, can minimise the requirement of nitrogenous fertilizer to the tune of 40 kg/ha.

(m) On the basis of physiological stages of crop growth, dwarf wheat should be irrigated at crown root initiation, maximum tillering or late jointing, flowering and dough stages.

(n) Mustard should be irrigated at branching and flowering stages.

(o) Gram should be irrigated at vegetative and pod formation stages.

(p) Effective control of weeds in direct seeded rice can be achieved by spraying 1 to 1.5 litres of Butachlor Commercial (*Macheta liquid*) or 3 litres of Nirofen commercial (Tok E-25) mixed with 600 litres of water per hectare, 1 to 2 days after sowing.

(q) Effective weed control in transplanted paddy can be achieved by spreading 45 kg Butachlor Commercial (*Macheta granules*) or 25 kg Nitrogen Commercial (*Tok granular*) on standing water within 4 to 6 days after transplanting.

(r) Gall midge incidence in paddy can be significantly reduced by dipping paddy seedlings in 0.2 per cent dursban solution (a i) for 6 hours immediately before transplanting.

(s) Under irrigated conditions, the most promising crop sequence in terms of biological productivity and economic profitability has been identified as rice – wheat – greengram.

Annexure 5.4 (Concluded)

(t) Supplementing nitrogen to rice crop through application of *Azolla Anabena* complex which fixes atmospheric nitrogen in rice fields.

(u) Package of practices for cultivation of rice in rainfed areas.

(i) *Preparatory cultivation*: Hot weather cultivation by soil inverting plough during the pre-monsoon period (April – May). Adoption of stale seedbed practice after the break of monsoon to help conserve rain water and control of weeds. This consists of allowing weeds to come up after the first rains and then giving a shallow ploughing followed by perfect levelling.

(ii) *Time of seeding* : Seeding when a minimum of 60 mm rainfall is received over a period of fortnight in June ensuring uniform and satisfactory level of crop stand as against that of seeding ahead of rains.

(iii) *Use of quality seeds* : It involves elimination of unfilled and partially filled grains by screening in brine solution of 100 gm. common salt/litre of water.

(iv) *Row seeding/drilling* : Optimum distance between row to row in a drilled crop is 20-30 cms. This facilitates uniform germination besides protection against bird, rodent and ant damages.

(v) *Seed rate* : A seed rate of 75-80 kg/ha (300 viable seed/m^2) provides optimum stand.

(vi) *Fertilizer management* : Basal application of 10-15 kg. each of P_2O_5 and K_2O/ha for plains and 20-30 kh/ha. for hilly terrain. Top dressing with 20 kg/N/ha after first weeding 15-20 days after sowing (DAS) followed by 8-10 kg. N/ha each at 35-40 DAS and at bore leaf stage. Rice belt normally experiencing drought spell in September should prefer application of entire N in two splits while in case of drought spells both in August and September through single application at 20 DAS.

(vii) *Gladiolus* : Application of 50 g N and 10 g P/m^2 gives the largest yield of flowers and corns.

Annexure 5.5

Package of Practices Recommended for Transplated Rice in Medium and Low Lands by the Central Rice Research Institute

(i) Selection of suitable high yielding varieties of different durations (early, medium or long) propagated by the State Extension Agency/Agricultural University.

(ii) Seed treatment.

(iii) For seed nursery 800 sq.m. are required in *kharif* and 1000 sq.m. in *rabi* for one hectare of land.

For dry nursery, light soils are preferable to obtain fine tilth. Long beds of one metre depth are necessary to facilitate weeding and to provide channels to 30 cm. width between beds for drainage and irrigation.

Selected seed should be sown 10 cm. apart from and 2 cm. deep in dry nursery to facilitate weeding, prevent bird damage and to ensure good germination. In wet nursery, which can be raised with assured irrigation, sprouted seed should be broadcast on the surface without standing water. Nursery should be manured with 40 kg. N/ha, 20 kg. P_2O_5/ ha and 20 kg. K_2O/ha in *kharif* and 60 kg N/ha, 30 kg. P_2O_5/ha and 30 kg. K_2O/ha in *rabi* to obtain healthy and well grown seedlings and to enable seedlings to establish quickly and withstand adverse climatic conditions after planting. Compost can also be used and the chemical fertilizer reduced proportionately.

Seedlings should be uprooted at the age of 3 weeks in case of early varieties and 4 weeks in case of medium and late duration varieties. Seedlings with leaves are ready for planting.

(iv) Land should be prepared with thorough puddling at least upto 15 cm. depth followed by perfect levelling. Seedlings should be planted using 2-3 per hill with a spacing of 15 x 10 cm. (*rabi*) to get 66 hills/sq.m. and 15 x 15 cm. (*Kharif*)

Annexure 5.5 (Concluded)

to obtain 44 hills/sq.m. Early planting can help escaping from pests like stem borer and gallmidge.

Applications of all phosphate and potash as basal at planting; 75 per cent when the crop is three weeks old — 50 per cent as basal, 25 per cent when the crop is three weeks old. Rest 25 per cent nitrogen should be applied any time between elongation of stem and leaf stage. Incorporate the fertilizers into soil by a rake after application. Keep minimum water at the time of fertilizer application.

(v) In the absence of control over water, a level of 3-5 cm. of water should be maintained throughout.

When there is good control of water as well as source of irrigation, 3-5 cm. of water should be kept at transplanting. As soon as this is soaked, re-irrigate to 5 cm. depth. Follow this cycle till the stem elongation is noticed. Drain off water about a week before harvest. In areas where cutworm is prevalent, water should not be drained.

(vi) Control of weeds — Remove the weeds when crop is 3-4 weeks old by hand or running a mechanical weeder in areas where weed incidence is low under transplanted conditions. In areas prone to heavy weed incidence, herbicides like Butachlor (*Macheta*) should be used at the rate of 30 kg. of 5 per cent granules/ha. within 5-7 days after transplanting. Keep standing water for 10 days after application. Other herbicides like TOK-G at the rate of 1.5 kg. a.i./ha or 24-D ethyl ester at the rate of 800 gm a.i./ha. can also be used.

(vii) Crop should be harvested when 80 per cent grains are ripe. The crop is usually ready for harvest 30 days after flowering in case of early varieties and 35 days in case of medium.

Annexure 5.6

Collection of Basic Agricultural Statistics in West Bengal – Improvements needed

Before Independence, West Bengal was permanently settled and no reporting agency existed for collection of agricultural statistics on complete field to field enumeration basis. Even at present area statistics in West Bengal are collected on the basis of sample surveys conducted by the State Bureau of Applied Economics and Statistics (BAES). The surveys are conducted in about 56500 grids. These grids are spread over the entire State and each grid has an average area of 2.25 acres (0.91 ha) which covers about 10 to 12 cadastral lots either wholly or partially. The sample is drawn at a uniform density of two grids per square mile (2.59 sq. km.) from each stratum which is a police station.

2. The BAES collects area statistics in respect of 17 principal crops, namely, rice (*aus, aman, boro*), jute, mesta, wheat, barley, gram, *maskalai*, khesari, mung, matar, tur, rapeseed and mustard, linseed, potato and sugarcane on a regular basis. The Bureau is also responsible for building up estimates of yield rates and production for all the aforesaid principal crops on the basis of random sample crop cutting surveys. The estimates of area and production prepared by the Bureau are forwarded to the State Department of Agriculture.

3. In addition to the estimates of area and production formulated by the Bureau, the Directorate of Agriculture also collects and prepares independently estimates of area and production of all the crops covered by the Bureau as also in respect of other crops. These estimates are collected by the Directorate through their Extension staff. Agricultural Extension Workers (AEW's), who are the primary agencies collect basic data on notional basis. No scientific procedure is involved in their collection. The estimates prepared by AEW's are consolidated and scrutinised at the sub-division and district levels and forwarded to the Directorate of Agriculture. For some of the major crops, namely, *aus, aman* and *boro* rice, paddy, wheat, crop-cutting experiments are conducted to obtain yield estimates. Thus, for all the principal crops two sets of estimates i.e. (i) based on

Annexure 5.6 (Contd.)

sample surveys and (ii) built up on notional basis become available and are forwarded by the Directorate of Agriculture to the State Government for approval. The estimates finally approved by the State Government are utilised as official estimates.

4. The main drawbacks of the present system of collection of area statistics in West Bengal are that it provides precise estimates upto District level only. Area estimates for lower geographical levels such as a sub-division or a village are not available. The system also does not provide reliable estimates in respect of minor crops and needed statistics relating to source-wise and crop-wise irrigated areas. It may be mentioned that latest available irrigation statistics in respect of West Bengal relate to the year 1967-68.

5. Recognising the need for precise estimates of area at lower geographical levels and also in respect of minor crops, for policy and planning purposes, it was decided that the system of collection of agricultural statistics on complete enumeration basis needs to be introduced in West Bengal and in the other two permanently settled States of Kerala and Orissa. This was sought to be done through a Centrally sponsored scheme, namely, 'Establishment of an Agency for Reporting of Agricultural Statistics', (EARAS), on complete enumeration basis included in the Ffth Five Year Plan. It may be mentioned that National Commission on Agriculture in its final Report also recommended that "the method of complete enumeration for collection of basic agricultural statistics should be introduced in the States of West Bengal, Orissa and Kerala in a phased manner".

6. The main objective of the EARAS Scheme was to set up regular reporting agencies in the States of Kerala, Orissa and West Bengal so that arrangements could be made for collection of agricultural statistics on complete field to field enumeration basis in non-overlapping samples of 20 per cent villages each year. Thus, over a period of 5 years area statistics on complete enumeration basis could be built up for the State as a whole. The other objectives of the scheme included collection of data on :

(i) All seasonal annual and perennial crops;

Annexure 5.6 (Contd.)

(ii) area under different land uses;

(iii) sourcewise and cropwise irrigated areas;

(iv) area benefited by HYV of paddy and wheat; and

(v) conduct of crop-cutting experiments on all major crops in a sample of mouzas in each CD block to provide reliable estimates of yield rates at district and State level. In order to improve the quality of field work, besides administrative supervision by the staff of Directorate of Land Records and Settlement, the scheme also envisages statistical supervision by the staff of NSSO and BAES on area enumeration and crop-cutting experiments in 10 per cent of sample mouzas to be shared equally by the two agencies.

7. The EARAS scheme was taken up for implementation in West Bengal in the year 1981-82. According to the pattern approved by the Standing Technical Committee on Crop Surveys in West Bengal, the Department of Agriculture will be responsible for implementation of area enumeration programme. Estimation of Yield rates on the basis of crop-cutting experiments will continue to be the responsibility of BAES. It was envisaged that even during the first year of its implementation, arrangements would be made for collection of agricultural statistics on complete enumeration basis in 20 per cent mouzas in the State. However, the scheme covered only 6 per cent mouzas during that year. During 1982-83, the scheme was extended to cover 10 per cent mouzas for collection of agricultural statistics on complete enumeration basis. No further progress has been made in the extension of this Scheme in the State.

8. This Committee is strongly of the view that :

(a) system of collection of agricultural statistics in West Bengal needs to be placed on a sound footing so as to improve the content, timeliness and reliability of these statistics. In this connection, it is essential that the coverage of EARAS scheme is extended expeditiously so as to achieve its targeted level of 20 per cent mouzas each year. This will ensure the availability of reliable estimates of land utilisation, area

Annexure 5.6 (Concluded)

under crops, source-wise and crop-wise irrigation on complete enumeration basis which will replace the present survey estimates built up by BAES and the notional estimates built up by the Department of Agriculture.

(b) Pending the availability of the aforesaid data, estimates of area and production presently built up by BAES through the objective procedure of sample surveys should be adopted without any modification by the State Government.

CHAPTER 6

INVESTMENT AND CREDIT REQUIREMENT

6.1 *Introduction*

6.1.1 During the Seventh and Eighth Plan periods, public investments on agriculture, irrigation and allied sectors as well as flow of bank credit would have to be significantly higher than hitherto for successful implementation of the strategy for accelerated agricultural development in the State as envisaged in this Report. A rough estimate of the investment and credit requirements during the next two Plan periods is given below.

6.2 *Investments*

6.2.1 The outlay on agriculture and allied services during the Seventh Plan is estimated by us at Rs. 780 crores as against Rs. 373 crores anticipated during the Sixth Plan. This is based on the assumption that a sizeable increase in public expenditure will be necessary to support the various agricultural productivity improvement programmes. Our estimate of the outlay for the Eighth Plan is Rs. 1600 crores.

6.2.2 *Major and Medium Irrigation Projects* : During the Seventh and Eighth Plan periods, no new major irrigation projects are envisaged. However, efforts will be made to complete on-going projects. A few new medium irrigation projects may be taken up. On these assumptions, additional irrigation potential that would be created during the Seventh and the Eighth Plans would be 3 and 4 lakh ha, respectively.

6.2.3 *Minor Irrigation* : The identified minor irrigation potential is 38 lakh ha, of which 16 lakh ha is expected to be utilised by the end of Sixth Plan. Additional area that could be brought under minor irrigation is estimated at 7 lakh ha and 12 lakh ha during the Seventh and the Eighth Plans, respectively.

6.2.4 For achieving the above targets, substantial investment is called for in sinking of tubewells, installation of pumpsets, etc. We have prepared two estimates (i) Estimate I which we consider necessary and (ii) Estimate II based on past performance. These are indicated in Table 6.1 below.

Table 6.1 : Minor Irrigation Structures

(In '000 units)

Type of Structure	Estimates			
	Seventh Plan		Eighth Plan	
	Estimate I	Estimate II	Estimate I	Estimate II
1. Shallow tubewell bores	200	150	400	270
2. Shallow tubewells with pumpsets	10	5	25	15
3. Deep tubewells	1	0.5	1	0.5
4. Dugwells	15	10	30	20
5. Pumpsets	165	100	350	235

6.2.5 Investments on minor irrigation schemes would be financed partly by Government and partly by co-operatives, commercial banks and RRBs.

6.2.6 The additional area that would be brought under major, medium and minor irrigation during the Seventh and Eighth Plan periods would be about 10 lakh ha and 16 lakh ha, respectively. We have also prepared another Estimate (Estimate II) according to which the additional irrigated area would be 7 lakh ha and 11 lakh ha during the Seventh and Eighth Plan periods, respectively. Thus, by the end of Eighth Plan, 75-87 per cent of irrigation potential would be utilised.

6.2.7 *Investment cost* : The improvements in irrigation envisaged above would call for a substantial increase in public investment in minor irrigation. The Government outlays consist of expenditure on sinking of tubewell bores and construction of dugwells under Centrally Sponsored Schemes in selected areas, sub-

sidies to small and marginal farmers and contribution to the construction of deep tubewells. Provision has also to be made for extension of electric lines in the case of electric pumpsets needed to be utilised for bores and dugwells in compact areas under Centrally Sponsored Schemes. The cost for these two purposes during the two Plan periods is estimated as under :

Table 6.2 : Investment Cost of Centrally Sponsored Schemes

(Rs. crores)

	Seventh Plan	Eighth Plan
For tubewell bores and dugwells	80	130
For energisation	60	100
Total	140	230

6.2.8 As drainage has been given a high priority in our strategy, Government investment on this account has been estimated to be of the order of Rs. 130 crores during the Seventh Plan and Rs. 150 crores during the Eighth Plan.

6.2.9 Increased provision has also been made for command area development for taking up on-farm development works.

6.2.10 Our estimate of total public investment cost on drainage, command area development, and minor irrigation during the Seventh and Eighth Plan periods is given below.

Table 6.3. Public Investment on Drainage, CAD and Minor Irrigation

(Rs. crores)

	Seventh Plan	Eighth Plan
Drainage	130	150
CAD	20	40
Minor Irrigation	250*	350*

* Excluding the investment cost of energisation of pumpsets shown under "Rural Electrification".

6.2.11 *Rural Electrification* : On the basis of certain assumptions (see paragraph 16.3.1, Chapter 16 of Part I) our estimate of investment cost of rural electrification (including energisation of pumpsets for the Centrally Sponsored Scheme) is Rs. 170

crores during the Seventh Plan and Rs. 260 crores during the Eighth Plan.

6.2.12 *Rural Industry Centres* : Provision has also been made by us for setting up rural industry centres. The investment cost and recurring cost for maintenance, etc., for these rural industry centres are estimated at Rs. 70 crores during the Seventh Plan and Rs. 140 crores during the Eighth Plan.

6.3 *Short-term Credit*

6.3.1 The assumptions on which short-term credit requirements have been estimated are given in Chapter 16 Part I. Based on these assumptions, the State's short-term credit requirements would be Rs. 650 crores during the terminal year of the Seventh Plan and Rs. 740 crores during the terminal year of the Eighth Plan. Our lower estimate of short-term credit requirements is Rs. 370 crores and Rs. 530 crores, respectively.

6.4 *Medium and Long-term Loans*

6.4.1 Our estimates of medium and long-term loans are given below.

(Rs. crores)

	Seventh Plan	Eighth Plan
Minor Irrigation*	200	300
Other purposes@	140	170
Total	340	470

* Including loans to State Electricity Board for energisation of pumpsets.
@ Including land development, soil conservation, dry farming, animal husbandry, fisheries, forestry, farm machinery, storage and rural industry centres, etc.

6.5.1 In our view, the above estimates are rather modest. Therefore, it should be the endeavour of credit institutions to exceed the above programme. The efficiency of these institutions must be improved considerably for this purpose.

6.5.2 To achieve the above targets, vigorous efforts are necessary on the part of Government, credit institutions and NABARD. The approach may be to attain a level of short-term credit above the lower estimate in the Seventh Plan, but close to the higher estimate in the Eighth Plan. Efforts should also be made to increase the disbursements of medium and long-term loans over that indicated above. These will have to be reviewed in the light of experience during mid-term appraisal of each Plan.

CHAPTER 7

CONCLUSION

7.1.1 West Bengal is endowed with rich natural resources. Historically, its agricultural productivity was among the highest in the country. However, its performance in agriculture, particularly in the last decade, has been poor and it has lost its pre-eminence. This is because of certain constraints in the optimum utilisation of land and water resources and inadequacy of infrastructure for adoption of modern agricultural technology.

7.1.2 As a result of developmental efforts of the Government, the State is now close to the threshold of accelerated agricultural progress. The high yields obtained by farmers in wheat, *boro* (summer) rice and vegetables have demonstrated their capacity to adopt technological innovations in agriculture. The State reaped a bumper harvest in 1983-84.

7.1.3 If steps are taken to enable the farmers to exploit the potential fully through better land and water management practices, augmentation of irrigation and drainage facilities, especially tubewells and pumps, rural electrification, assured power supply, sound infrastructure for quality seed production distribution of inputs, credit delivery, custom service and marketing and rural industry centres, the State can achieve much higher growth rate. The policy measures needed have been outlined in our Report. If these are effectively pursued, the State could attain an annual growth in productivity of 3 to 4 per cent during the next 10 years. The annual growth in production during this period could be even higher at 4 to 6 per cent due to expansion in irrigated area.

7.1.4 This will, however, call for substantial public investment and credit from cooperatives and commercial banks and efficient management.

PART III

ORISSA

CHAPTER 8

INTRODUCTION

8.1.1 Orissa receives plenty of rainfall and has large surface and groundwater resources. Soil and climatic conditions are, by and large, favourable for raising a variety of crops.

8.1.2 Rice production in the State increased from 32 lakh tonnes during triennium ending 1960-61 to 50 lakh tonnes in 1983-84. Unlike the other eastern States, production of pulses recorded a substantial increase from 2 lakh tonnes to 10 lakh tonnes during this period. At present Orissa ranks first in the country in the production of mung and fifth in the production of pulses. There has also been an increase in the production of cash crops, mainly oilseeds. State's *rabi* groundnut yield is the highest in India. Between triennium ending 1960-61 and 1980-81, cropping intensity went up by 28 per cent. Use of HYV seeds has been increasing. They covered around 30 per cent of cropped area under rice and 100 per cent under wheat in 1980-81. Research needs are sought to be met by Orissa University of Agriculture and Technology, Bhubaneswar and Central Rice Research Institute, Cuttack. T & V system of extension has been introduced in the State to provide efficient professional extension service to the farming community. For catering to the needs of farmers for modern implements, two implements factories have been set up, one at Bhubaneswar and another at Sambalpur.

8.1.3 Even though some progress has been achieved in certain areas, the growth rates in crop production taken as a whole have been modest. Foodgrains which account for nearly 80 per cent of cropped area registered a compound growth rate of only 0.9 per cent per annum during 1971-81. Yield of rice, the principal foodgrain crop, has remained more or less stagnant during the last one decade. There is a wide gap between the yields achieved by average farmers and those by good farmers.

8.1.4 Despite being endowed with large water resources, only about 20 per cent of cropped area is irrigated. Dugwell programme

taken up in early 1970s has made some good progress. Yet, groundwater exploitation is insignificant, being a little over 5 per cent of potential. Consumption of fertilizers is low, being around 14 Kg/ha in 1983-84. Despite efforts made for crop diversification, rice still accounts for about 50 per cent of cropped area.

8.1.5 Orissa has the requisite potential to achieve a higher growth rate in crop production than hitherto. There are, however, some constraints, which need to be overcome for accelerating the process of development. The main focus of development strategy should be to intensify land use through science-based and industry-linked modern farming techniques supported by a good infrastructure. Recent experience shows that adoption of modern technology in agriculture in the high growth states of north-west India has been made possible primarily due to expansion of irrigation facilities. We consider that adequate and controlled water supply is a pre-requisite for intensification of agricultural production. The spearhead for development has, therefore, to be expansion in irrigation and improvement in water management practices including development of an efficient drainage system. In the coastal region of Orissa, drainage has to be given topmost priority.

8.1.6 Improvement in irrigation and drainage alone will not be adequate. These will have to be supplemented by (i) better organisation and management of farm operations through joint action by farmers, given the small and fragmented size of holdings, (ii) greater use of improved tools and implements to improve efficiency of labour, (iii) encouragement of crop diversification from low-income generating crops to high yielding and high value crops, (iv) reorientation of research and extension to the emerging needs of the farming community and (v) strengthening of the infrastructure for seed production and distribution of inputs, credit delivery and post-harvest handling arrangements. These steps will call for a reorganisation and restructuring of the management of agricultural development programme, larger Plan allocations for agriculture and irrigation and sizeable increase in credit support from the banking system.

8.1.7 Before we outline the policy measures for accelerating agricultural development, it may be relevant to describe briefly the natural endowments of the State. This is set out in the following paragraphs. The succeeding chapters present a brief review of

agricultural development since 1960, main constraints which impeded development so far, policy measures needed to accelerate development and investments and credit support necessary to attain these goals.

8.2 *Physical Features*

8.2.1 The State accounts for about 5 per cent of the country's geographical area and 4 per cent of population. It has a geographical area of 1.56 lakh sq. km. It lies between 17°31' and 22°27' North Latitude and 81°27', and 87°30' East Longitude. Administratively, it is divided into 13 districts, 314 Community Development Blocks and 51639 villages.

8.3 *Population*

8.3.1 As per 1981 Census, the State has a population of 26 million. Density of population is 169 per sq. km., much lower than in the other states of the eastern region. Man-land ratio is also not very high. The number of agricultural workers[1] per 100 ha of net sown area was 106 during triennium ending 1980-81, as against 198 in Bihar. 155 in West Bengal and 167 in East U.P.

8.3.2 About 88 per cent of the population is rural. Scheduled castes and Scheduled tribes account for 15 per cent and 22 per cent, respectively, of the population.

8.3.3 Some basic data on the State's population, alongwith that for the country as a whole are given in Annexure 8.1.

8.4 *Climate and Rainfall*

8.4.1 The State has a tropical climate with high humidity. Winter is short and mild. The average temperature ranges between minimum of 12°C and maximum of 39°C. Climate is suitable for rice cultivation. Some limitation exists, however, in regard to wheat due to short and mild winter.

8.4.2 Average annual rainfall in the State during the last 50 years is around 1480 mm. However, variations from year to year are considerable. There are also inter-district variations, ranging from

[1] Cultivators and agricultural labourers taken together.

1300 mm in Ganjam district to between 1650 mm in Sambalpur district. Over 75 per cent of rainfall is received during June to September. The distribution of rainfall is, however, erratic. Highly variable rainfall at the beginning and end of the monsoon delays sowing of crop or retards plant growth in crucial periods, affecting crop yields. Moisture stress at critical stages, waterlogging in low lands and excessive inundation at the tillering stage also adversely affects farming.

8.5. *Natural Calamities*

8.5.1 Flood, drought or cyclones occur in almost every alternate year causing considerable loss in crop production. While flood occurs almost every year with varying intensity, drought conditions are experienced once in every three years. These have contributed to considerable instability in agricultural production, as may be seen below.

Table 8.1. Foodgrains Production, 1965-66 to 1980-81

(Lakh tonnes)

Abnormal years			Normal years	
Year	Factor	Production	Year	Production
1965-66	Severe drought	36.9	1970-71	51.0
1966-67	Drought	42.3	1973-74	52.7
1967-68	Floods and cyclone	41.4	1975-76	55.7
1968-69	Mild flood	47.2	1977-78	55.6
1969-70	Mild flood	47.3	1978-79	57.7
1971-72	Severe cyclone and flood	43.5	1980-81	59.8
1972-73	Drought and flood	48.6		
1974-75	Severe drought and flood	39.7		
1976-77	Severe drought	40.8		
1979-80	Severe drought	38.7		

8.6 *Soils*

8.6.1 The State has varieties of soils ranging from fertile alluvial deltaic soils in coastal areas (a part of which is saline), soils with

low fertility in Northern Plateau, mixed red and black soils in Central Table land and black soils in Eastern Ghat Region. The soil types differ widely from highly acidic to slightly alkaline and from light sandy to stiff clays. Soil types in different agro-climatic zones are presented in Chapter 10.

8.6.2 It has been estimated that Orissa has about 45 lakh ha of acidic soils with varying PH value, 4 lakh ha are exposed to saline inundation, 3.5 lakh ha to flooding and 0.8 lakh ha to waterlogging, particularly in deltaic areas.

8.7 *Land Use*

8.7.1 Out of a geographical area of 155.4 lakh ha, only about 40 per cent is available for cultivation. Forests account for around 43 per cent of total area (Table 8.2).

Table 8.2. Land Use Pattern, 1980-81

		Area (Lakh ha)	Percentage of reporting area
1.	Net sown area	61.3	39.5
2.	Current fallows	4.5	2.9
3.	Other fallow land	1.9	1.2
4.	Forests	66.4	42.7
5.	Area put to non-agricultural use	6.3	4.1
6.	Barren and uncultivable land	2.7	1.7
7.	Others*	12.3	7.9
	Total	155.4	100.0

8.7.2 Of the net cultivated area during 1980-81, high lands including marginal, sub-marginal and sloppy lands accounted for 41 per cent, medium and low lands accounted for 33 per cent and 26 per cent, respectively.

* Includes land under (i) permanent pastures and grazing land (ii) miscellaneous tree crops not included in net sown area and (iii) cultivable wasteland.

8.8 *Agrarain Structure*

8.8.1 As per Agricultural Census 1980-81, about 47 per cent of the operational holdings are held by marginal farmers operating less than one ha. Small farmers operating between 1 to 2 ha account for 27 per cent. Thus the marginal and small farmers together account for 74 per cent of the total operational holdings. However their share in total operated area was only 38 per cent. The medium and large farmers who operate 26 per cent of the operational holdings account for as much as 62 per cent of total area. The average size-of holding in the State is about 1.6 ha. The following table sets out size-wise distribution of holdings.

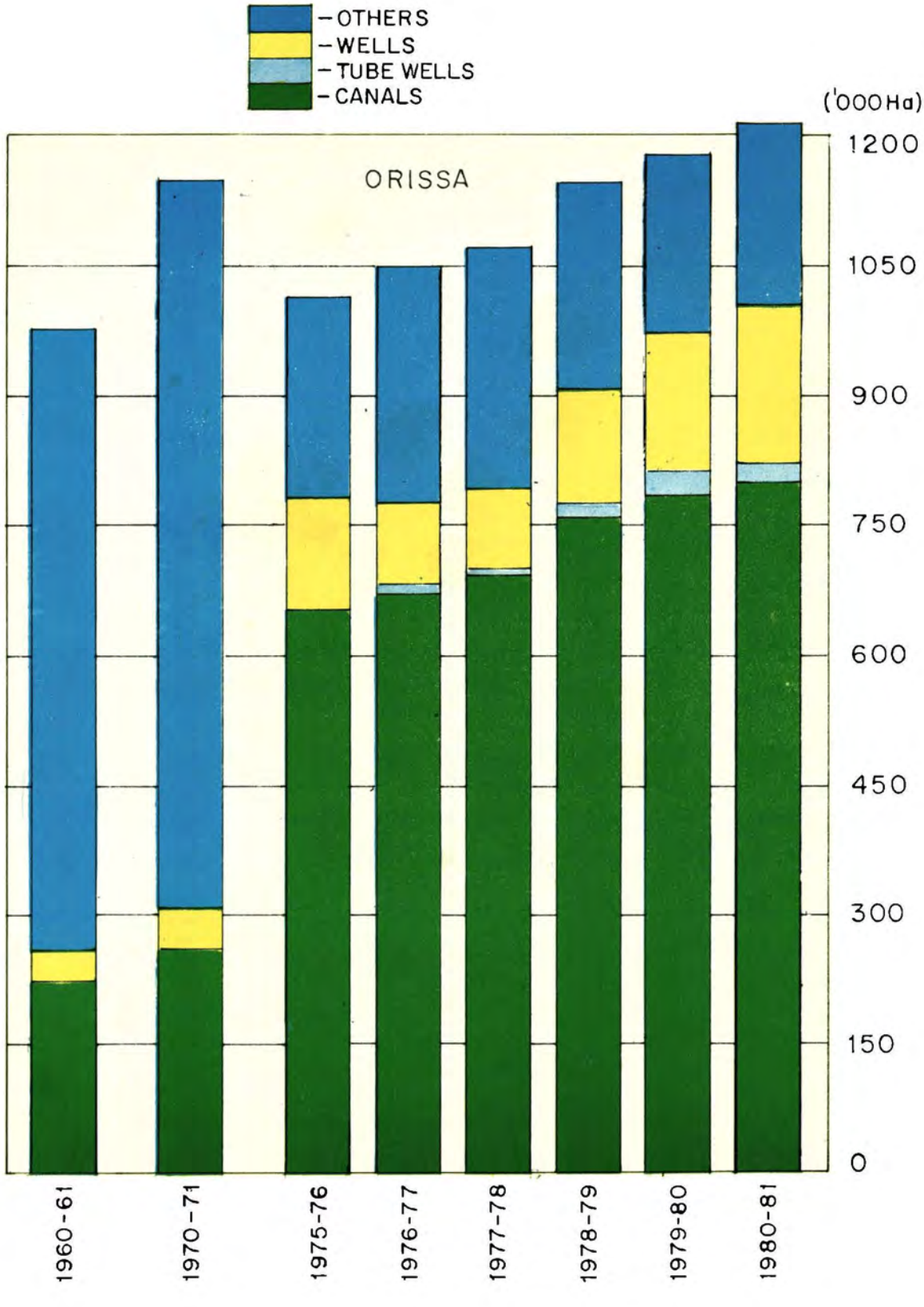
Table 8.3. Size-wise Distribution of Holdings, 1980-81

Category	1970-71 Number of holdings (per cent)	1970-71 Area (per cent)	1980-81 Number of holdings (per cent)	1980-81 Area (per cent)
Below 1 ha	44.6	12.0	46.8	14.9
Between 1 & 2 ha	30.9	26.6	26.8	23.0
Between 2 & 4 ha	13.7	21.1	18.4	29.8
Between 4 & 10 ha	9.4	27.8	7.2	24.9
10 ha and above	1.4	12.5	0.8	7.4
	100.0	100.0	100.0	100.0

8.8.2 Not only the holding is small, but also very fragmented. This is one of the main factors inhibiting on-farm investment in agriculture.

8.8.3 Realising the need for consolidation, the State Government initiated a programme of consolidation of holdings in 9 districts in 1974 after enactment of the legislation entitled "Orissa Consolidation and Prevention of Fragmentation Act, 1972". At present

SOURCE-WISE NET IRRIGATED AREA



this programme has been taken up in an area covering 8.2 lakh ha in the districts of Cuttack, Puri, Balasore, Ganjam, Mayurbhanj, Bolangir, Sambalpur and Keonjhar. The farmers have been impressed by the benefits of consolidation. Therefore, there is good response to this programme particularly in irrigated areas. Although the programme was initiated in 1974, due emphasis has been accorded to this programme only in the Sixth Five Year Plan. By 1983-84, an area of 2.7 lakh ha has been brought under the programme. The slow progress is attributed partly to paucity of funds.

8.9 *Irrigation*

8.9.1 The State is endowed with good water resources provided by rivers, canals, tanks and from groundwater. The Mahanadi and its tributaries have large water resources. Similarly, there are several other rivers with good potential for major and medium irrigation projects. Orissa has seven big irrigation systems, viz., Mahanadi, Hirakud, Salandi, Rushikulya, Upper Kolab, Rengali and Indravati. Last three are under progress.

8.9.2 The identified irrigation potential of the State is 59 lakh ha comprising 36 lakh ha under major and medium irrigation projects and 23 lakh ha under minor irrigation projects. As against this, the actual irrigated area (gross) in 1980-81 was only 16.8 lakh ha, constituting about 28 per cent of potential and 20 per cent of gross sown area (Table 8.4).

Table 8.4. Irrigated Area — Source-wise, 1980-81

(Lakh ha)

	Net irrigated area	Gross irrigated area
Major and medium projects	7.5	11.1
Minor flow irrigation	2.7	2.9
Minor lift irrigation	0.1	0.3
Others	1.7	2.5
Total	12.0	16.8

8.9.3 The exploitation of groundwater resources in the State is low, being only 6 per cent as of 1982.

8.10.1 *Waterlogging*: Waterlogging is a serious problem in the coastal districts. This has affected both productivity and production. According to a survey conducted by the Directorate of Soil Conservation in 1975, through Remote Sensing Technique, the waterlogged lands in various districts are as follows :

Table 8.5. Area Under Waterlogging

Name of district	Area waterlogged ('000 ha)	Name of district	Area waterlogged ('000 ha)
Balasore	6.4	Koraput	3.8
Bolangir	3.4	Mayurbhanj	1.2
Cuttack	31.4	Phulbani	1.1
Dhenkanal	0.9	Puri	14.0
Ganjam	5.9	Sambalpur	7.7
Kalahandi	6.3	Sundergarh	1.8
Keonjhar	1.0		

8.10.2 Apart from inadequacy of drainage system, lack of adequate field channels is the other major factor that has led to wastage of water and poor productivity.

Annexure 8.1

Basic Data on Population, 1980-81

	Orissa	All-India
1. Population (Million)	26.4	685.2
(i) Rural population (Million)	23.3	525.5
(ii) Urban population (Million)	3.1	159.7
2. Agricultural workers (Million)	6.4	148.0
(i) Cultivators (Million)	4.0	92.5
(ii) Agricultural labourers (Million)	2.4	55.5
3. Percentage of		
(i) Rural population to total population	88.3	76.7
(ii) Agricultural workers to rural population	27.5	28.2
4. Decennial population growth rates, 1971-81 (per cent)		
(i) Total	20.5	25.0
(ii) Rural	15.9	19.7
5. Population density (No. per sq. km.)	169	221

CHAPTER 9

REVIEW OF AGRICULTURAL DEVELOPMENT SINCE 1960

9.1 *Cropping Pattern*

9.1.1 According to land use data for 1980-81, about 80 per cent of the gross cropped area was devoted for growing foodgrain crops. Among them, rice accounted for about 48 per cent, wheat and other cereals for about 12 per cent and pulses about 20 per cent. Area under non-foodgrain crops was around 20 per cent. (Annexure 9.1).

9.2 *Cropping Intensity*

9.2.1 Cropping intensity showed an increase from 108 per cent during triennium 1960-61 to 138 per cent during triennium 1980-81 due to an increase in gross cropped area.

9.3 *Foodgrains*

9.3.1 Area under foodgrains went up from about 46 lakh ha during triennium ending 1960-61 to about 67 lakh ha during triennium ending 1980-81, registering a compound growth rate of 1.8 per cent per annum@. During the year 1982-83, area dropped to about 64 lakh ha from 69 lakh ha in 1980-81 under the impact of drought. However, in the year 1983-84, it rose to 68 lakh ha.

9.3.2 The compound growth rate in foodgrains production during 1961-71 was 3.1 per cent per annum. Both area and yield contributed to this increase. However, during 1971-81 the growth rate dropped down sharply to 0.9 per cent per annum. Taking the period 1961-81, the overall growth rate worked out to 2 per cent. During the year 1982-83, production suffered a setback due to drought. In the year 1983-84, however, production was normal. Thus, production of foodgrains increased from 35 lakh tonnes during the triennium ending 1960-61 to 52 lakh tonnes during the triennium ending 1980-81 and to 54 lakh tonnes during the year 1981-82.

@ Based on triennium averages. All growth rates given in this chapter are based on triennium averages.

However, it declined to 45 lakh tonnes in 1982-83 due to severe drought. Production in 1983-84 touched a record level of 68 lakh tonnes (Annexures 9.2 and 9.3).

9.3.3 The past production trends reveal considerable year to year fluctuations, depending upon the occurrence of natural calamities like floods and drought. Taking the last 23 years, lowest production, viz., 39 lakh tonnes was recorded in 1979-80 and the highest viz., 68 lakh tonnes in 1983-84.

Table 9.1. Production of Foodgrains

(In lakh tonnes)

Year	Production	Year	Production
1960-61	40.3	1977-78	55.6
1970-71	51.0	1978-79	57.7
1974-75	39.7	1979-80	38.7
1975-76	55.7	1980-81	59.8
1976-77	40.8	1981-82	54.4
		1982-83	45.6
		1983-84	68.4

9.4 *Rice*

9.4.1 Within the 'foodgrains' group, performance of rice, (which is the most important crop grown in the State) showed considerable fluctuations. The compound growth rate in rice production showed an increase of about 2.0 per cent per annum during 1961-71, due to an expansion both in area and yield. During the period 1971-81, however, the rising trend was reversed. Production during this period declined by 0.4 per cent per annum due to a shrinkage in area.

9.4.2 Trends in rice yields show that no major breakthrough has been achieved in improving yields. Even in good harvest years, the average yield per ha was only around 1 tonne (Table 9.2).

Table 9.2. Yield Rates of Rice

(In kg. per ha)

Year	Autumn rice	Winter rice	Summer rice	Total
1970-71	542	964	1386	917
1976-77	438	763	1511	735
1977-78	710	1023	1405	981
1978-79	690	1081	1290	1007
1979-80	309	796	1289	709
1980-81	600	1114	1572	1026
1981-82	668	984	1385	926
1982-83	488	765	1315	737
1983-84	NA	NA	NA	1157

9.4.3 The State's rice yields are not only low, but show considerable year to year variation. As scope for bringing more land under the plough is limited, hope for augmenting rice production lies in enhancing yield.

9.5 *Wheat*

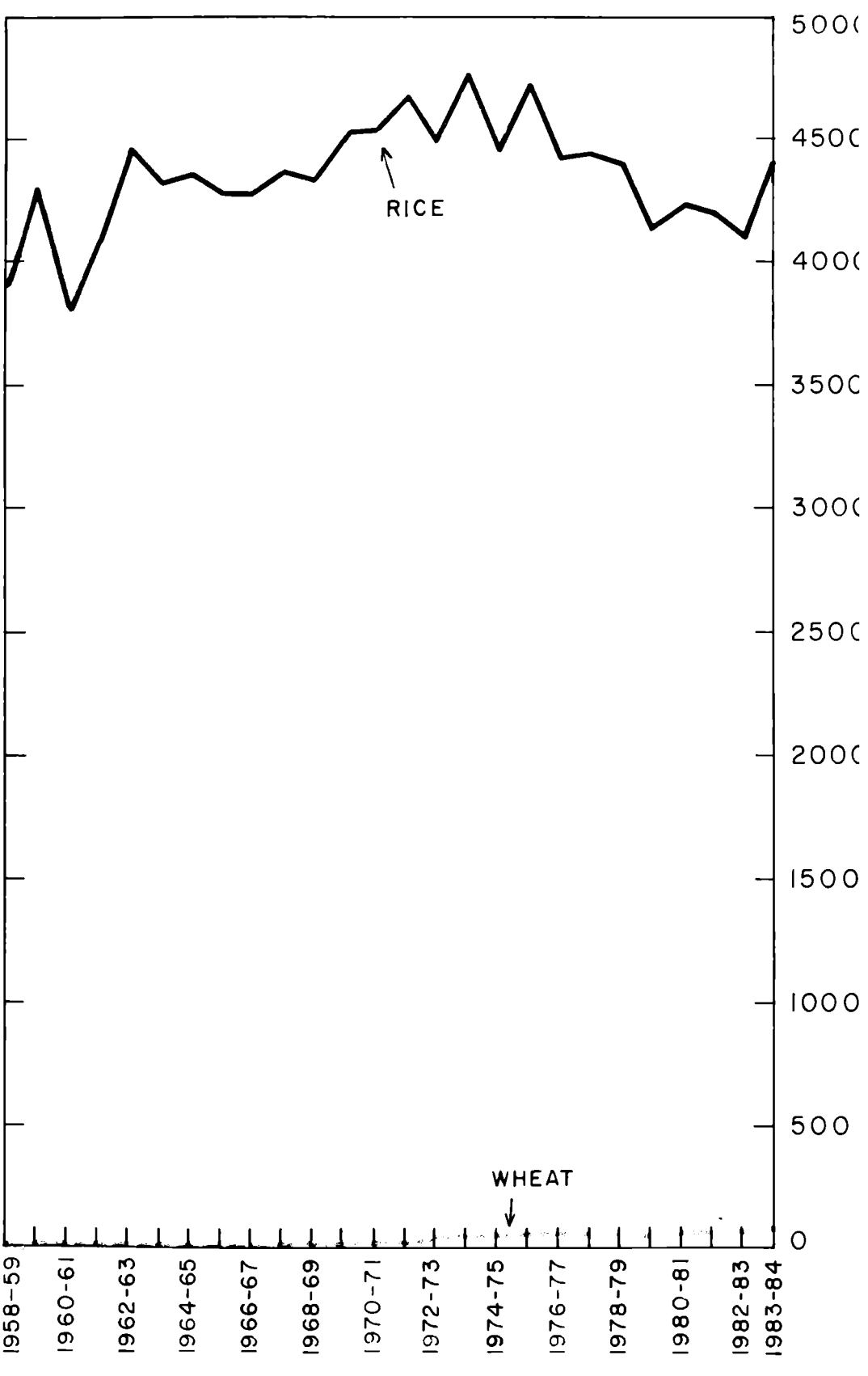
9.5.1 The State is not a major producer of wheat although the area under this crop has been increasing. Area under wheat went up from 7000 ha in 1960-61 to 64000 ha in 1982-83. During the same period, production went up from 4000 tonnes to 1.2 lakh tonnes.

9.6 *Other Cereals*

9.6.1 Other main cereals grown in the State are small millets, ragi, maize and jowar in that order. Total area under these cereals increased from 1.5 lakh ha during the triennium ending 1960-61 to 7.5 lakh ha during the triennium ending 1980-81. It declined to 6.4 lakh ha in 1981-82 though in the subsequent years, there was a marginal increase. Production increased steadily from 59000

ORISSA

AREA UNDER RICE AND WHEAT



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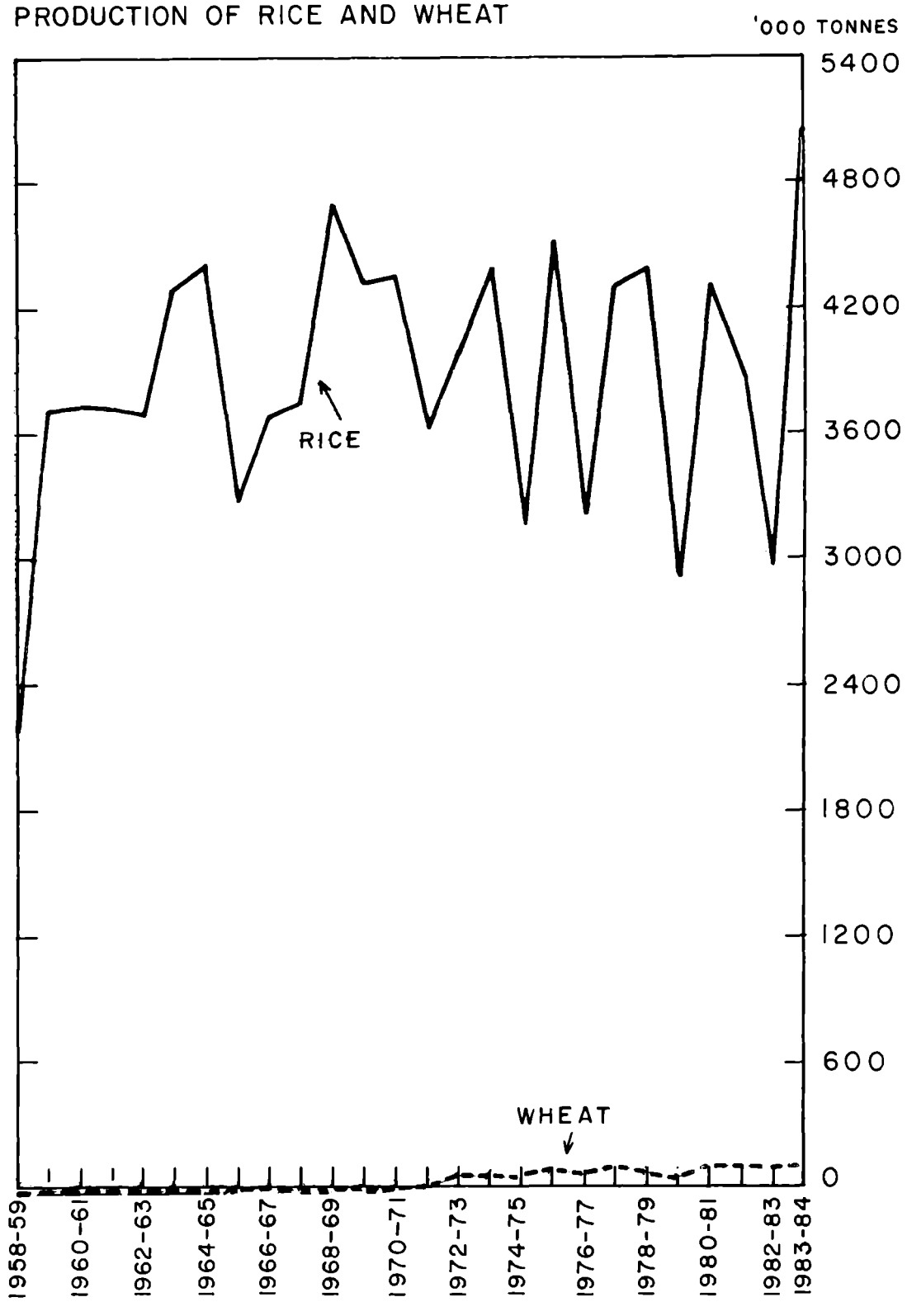
PRODUCTION OF RICE AND WHEAT



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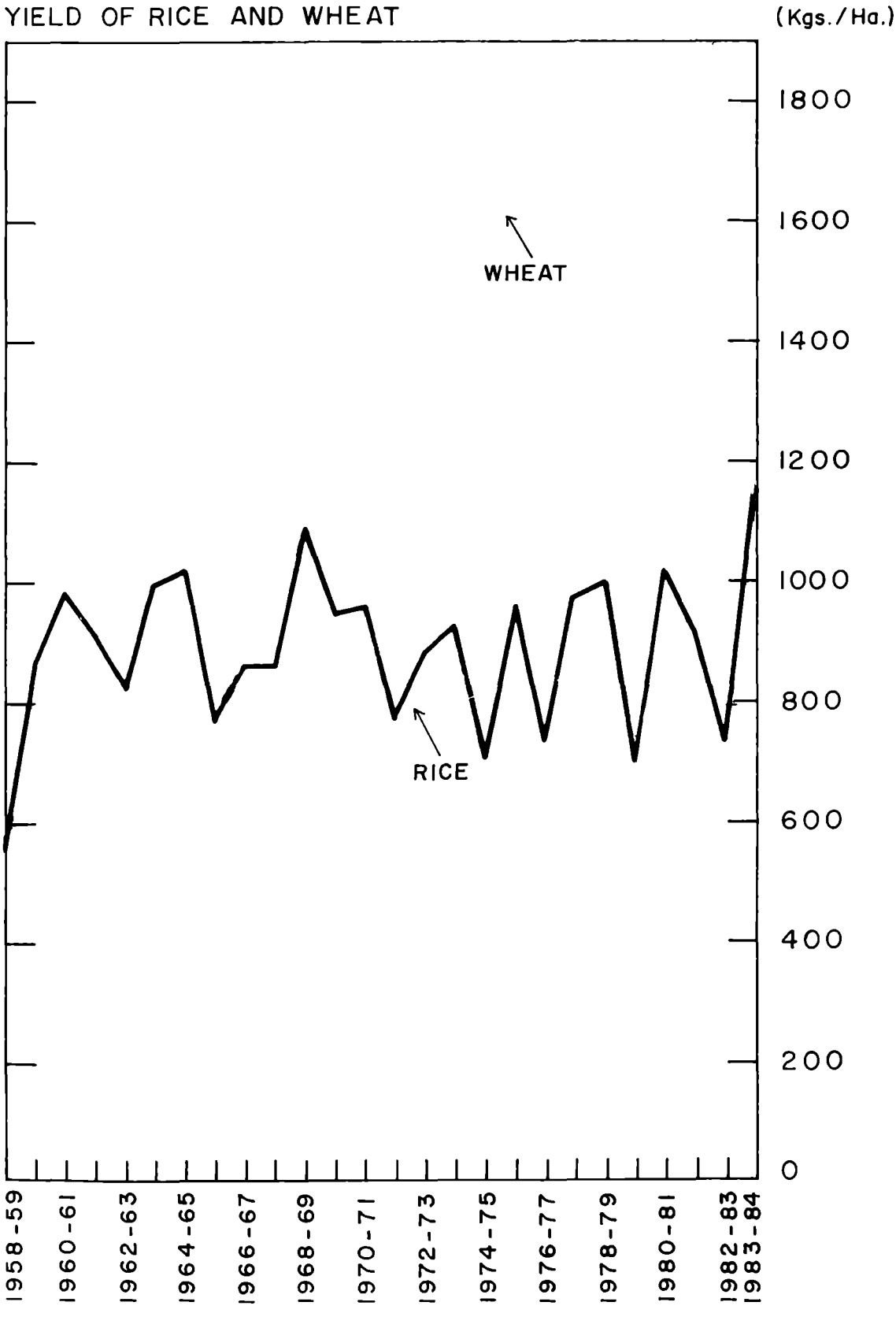
YIELD OF RICE AND WHEAT



tonnes during the triennium ending 1960-61 to 6.3 lakh tonnes during 1983-84. The sustained increase in production of these cereals was brought about by an increase in yield from 404 kg/ha during the triennium ending 1960-61 to 910 kg/ha during the year 1983-84.

9.7 *Pulses*

9.7.1 Main pulses grown in Orissa are mung, gram, *biri* and *kulthi*. There was a significant increase in production of pulses during the last two decades. From 2.4 lakh tonnes during the triennium ending 1960-61, production increased to 7.5 lakh tonnes during the triennium ending 1980-81 and further to 10.5 lakh tonnes during the year 1983-84. The steady improvement in production of pulses during the last 23 years was largely due to a substantial increase in the area. Area under pulses as a proportion to total area under foodgrains increased from 11 per cent in 1960-61 to 25 per cent in 1983-84.

9.8 *Non-foodgrain Crops*

9.8.1 The major non-foodgrain crops grown in the State are oilseeds, jute and mesta, potato and sugarcane. The area covered by non-foodgrain crops is small at about 18 lakh ha during 1980-81 or about 20 per cent of the gross sown area (Annexure 9.1).

9.8.2 *Oilseeds*: Major oilseeds crops grown in the State are groundnut, rapeseed and mustard, sesamum, etc. State's oilseeds production increased from 0.6 lakh tonnes during the triennium ending 1960-61 to about 4 lakh tonnes during the triennium ending 1980-81 and to about 7 lakh tonnes in 1983-84. Both area and yields contributed to the increase in production. During the period 1961-81, area increased from 1.9 lakh ha to 7.1 lakh ha and further to 9.4 lakh ha during 1983-84. Yields increased from 332 kg/ha during the triennium ending 1960-61 to 735 kg/ha during 1983-84. *Rabi* groundnut yield in Orissa is highest in India.

9.8.3 *Jute and Mesta*. The production of jute and mesta has been rising in the State, although overall output is still small. It is noteworthy that yields of jute have been rising continuously

since 1960. On the other hand, yield rates of mesta have remained more or less stagnant, as may be seen below.

Table 9.3. Area, Production and Yield of Jute and Mesta

Period		Area ('000 ha)		Production ('000 bales of 180 kg each)		Yield (kg/ha)	
		Jute	Mesta	Jute	Mesta	Jute	Mesta
Triennium ending	1960-61	37	7	211	37	1030	905
	1970-71	44	24	311	137	1281	1033
	1980-81	46	39	356	200	1388	925
During	1981-82	52	43	383	220	1331	912
	1982-83	41	37	304	180	1351	888
	1983-84	40	37	340	180	1519	888

9.8.4 *Potato*: Production of potato showed a sharp increase from 30,000 tonnes during the triennium ending 1960-61 to 2.8 lakh tonnes during the triennium ending 1970-71. The increase was due both to an expansion in area and improvement in yield. Production, however, came down sharply to 55,000 tonnes during the triennium ending 1980-81 due to a decline both in area and yield.

9.8.5 *Sugarcane*: Sugarcane cultivation in the State has shown some improvement in recent years. From 73,000 tonnes (in terms of gur) during the triennium 1960-61, production increased steadily to 2.9 lakh tonnes during the triennium ending 1980-81. The increase was mainly on account of the expansion in area from 24000 ha to 47000 ha during the period. In the year 1981-82, production showed a further increase to 3.2 lakh tonnes.

This increase was the result of an improvement in yield from 3054 kg/ha during the triennum ending 1960-61 to 6440 kg/ha during the year 1981-82. In the subsequent two years, production showed some decline. While the decline in production during 1982-83 was the result of a fall in yield, the decline in 1983-84 was due to a shrinkage in area.

9.8.6 The other crops grown in the State are tobacco, fruits, vegetables, etc. Among these crops, vegetable cultivation is showing an increase in recent years.

9.9 *Allied Activities*

9.9.1 *Dairy*: The number of cows in the State increased from about 30 lakhs in 1961 to about 44 lakhs in 1981. The population of breeding buffaloes which was about 3 lakhs in 1961 increased to about 5 lakhs in 1981. Output of milk in the State is around 3 lakh tonnes only.

9.9.2 *Poultry*: The population of poultry birds (hens, ducks, etc.) went up from about 54 lakhs in 1961 to about 107 lakhs in 1981. In the year 1978-79 egg production amounted to 434 million.

9.9.3 *Sheep and Goat Development*: Sheep population in the State increased from about 10 lakhs in 1961 to about 15 lakhs in 1981. The number of goats increased from about 24 lakhs to about 35 lakhs during this period.

9.9.4 *Draught Animals*: The number of draught animals increased from about 50 lakhs in 1961 to about 58 lakhs in 1981.

9.9.5 *Inland Fisheries*: The State has rich aquatic potential from reservoirs, lakes and tanks. The fish production during 1982 amounted to only 0.7 lakh tonne comprising 0.4 lakh tonne of inland fish and 0.3 lakh tonne of marine fish.

9.9.6 *Sericulture*: Production of raw silk more than doubled from about 24 tonnes in 1978 to 55 tonnes in 1981.

9.10 *Forestry*

9.10.1 The State has considerable forest wealth. Production of timber, round wood and pulp in the State was 4.5 lakh cubic metres in 1978-79. Fuelwood, firewood and charcoal production during 1978-79 was 6.8 lakh cubic metres. The value of the forest produce was Rs. 15.5 crores as against Rs. 3.8 crores in 1973-74.

9.11 *Inputs*

9.11.1 A review of the input distribution system and input supply situation is given below.

9.11.2 *Seeds*: The major agencies handling seeds distribution are (i) The State Department of Agriculture, (ii) The State Seeds Corporation, (iii) The National Seeds Corporation, and (iv) private dealers.

9.11.3 The State Department of Agriculture supplies seeds of major crops like paddy, wheat, oilseeds, etc., to farmers at subsidised rates. It has a network of distribution centres at block levels. However, the seed requirements of farmers ar not met adequately by the State Government. This is due to the low procurement of seeds from its seed multiplication farms. Not even 3-5 per cent of the requirements of farmers are met by the State Department of Agriculture.

9.11.4 The State Seeds Corporation was established in 1976 to procure seeds from registered seed growers. However, the quantity procured is not sufficient to meet the growing demand of farmers.

9.11.5 Seed certification agency has been established by the State Government to support the production of certified seeds through registered growers. A seed testing laboratory also has been set up for testing the quality of seeds produced or procured for sale to farmers.

9.11.6 The PACS were not handling seed distribution business till 1982-83. However, commencing from 1983-84, one PACS in each block is involved in seed distribution. PACS act as agents of the Orissa State Seed Corporation. Some private dealers are also engaged in seed distribution. But their share in seed distribution is small.

9.11.7 As certified seeds are in short supply, many farmers produce their own seeds. The practice of mutual exchange of seeds among farmers is also prevalent. On account of shortage of seeds, only 2 per cent of seeds are renewed annually as against the norm of 20 per cent.

9.11.8 For popularising use of HYV seeds, Government distributes seed kits to farmers free of cost. The progress in distribution of free kits during the last few years is indicated below. (Table 9.4).

Table 9.4. Progress in Distribution of Seed Kits

Year	No. of paddy seeds kits distributed	No. of other seed kits distributed
1980-81	1846	628
1981-82	50648	1825
1982-83	372648	104736
1983-84	146659	46342

9.11.9 For popularising early sowing/planting of rice, Government provides incentives to farmers in the form of free seeds. Seed kits along with fertilizers are supplied to small and marginal farmers under a centrally sponsored scheme.

9.11.10 The seed supply situation in the State is not satisfactory. The supply position of seeds of vegetables and fruits of improved varieties is particularly poor. There is, therefore, urgent need for augmenting the supply of seeds. Distribution network particularly below block level needs strengthening.

9.11.11 The coverage of HYV area under summer rice has steadily improved from 65 per cent in 1971-72 to about 96 per cent in 1980-81. However, total area under HYV summer rice has been in the range of 1 lakh to 2 lakh ha only. In the case of *kharif* rice, area brought under HYV has improved from about 1 lakh ha in 1970-71 to about 10 lakh ha in 1980-81. While in 1970-71 area under HYV

of *kharif* rice formed hardly 2 per cent of the total area under *kharif* rice, the coverage improved to about 26 per cent in 1980-81. Coverage of HYV wheat is now 100 per cent and of maize 30 per cent. (Table 9.5).

Table 9.5. Area under HYV Crops

('000 ha)

Year	Rice		Wheat	Maize
	Summer rice	*Kharif* rice		
1970-71	100 (74.8)	82 (1.9)	7 (53.8)	3 (4.7)
1971-72	106 (65.0)	91 (2.0)	13 (61.9)	5 (6.6)
1972-73	150 (82.0)	151 (3.5)	42 (82.4)	6 (7.4)
1973-74	134 (81.7)	225 (4.9)	46 (88.5)	13 (15.8)
1974-75	112 (71.8)	201 (4.7)	49 (89.1)	18 (19.0)
1975-76	159 (88.3)	324 (7.6)	60 (95.2)	30 (24.4)
1976-77	155 (89.6)	402 (9.6)	53 (96.4)	33 (26.3)
1977-78	176 (93.1)	471 (11.2)	66 (97.1)	36 (27.5)
1978-79	157 (95.2)	710 (16.9)	60 (96.1)	36 (27.4)
1979-80	135 (94.4)	807 (20.3)	49 (96.1)	41 (31.4)
1980-81	165 (95.9)	1042 (25.9)	67 (100.0)	54 (30.0)

Note : Figures in brackets represent percentage of gross cropped area under each crop.

9.11.12 *Fertilizers*: Data on fertilizer consumption in the State during the last two decades are indicated below.

Table 9.6. Consumption of Fertilizers

Year	NPK ('000 tonnes)	Kg/ha
1960-61	5	0.9
1970-71	28	3.8
1976-77	62	8.0
1977-78	64	9.0
1978-79	72	9.9
1979-80	67	8.3
1980-81	77	8.7
1981-82	82	9.5
1982-83	89	10.2

However, per ha consumption in the State is lowest when compared with other States of the region.

9.11.13 Season-wise offtake of fertilizer in State is indicated below.

Table 9.7. Fertilizer Consumption, Season-wise

('000 tonnes)

	1980-81	1981-82	1982-83
Kharif Season	35	38	38
Rabi Season	42	44	51
Total	77	82	89

9.11.14 Not only consumption of fertilizer is low, but there are also considerable inter-district variations. Data for 1979-80 show that while consumption per ha was 0.6 kg. in Kalahandi, it was 20 kg in Sambalpur. (Annexure 9.4).

9.11.15 Three main agencies are engaged in the distribution of fertilizers. These are (i) Co-operatives, (ii) Orissa Agro-Industries Corporation and (iii) private sector. The share of co-operatives in distribution is 50 per cent. The Orissa Agro-Industries Corporation has 40 per cent share and the private sector the balance of 10 per cent. These agencies barring co-operatives have distribution outlets upto the block level only. Co-operatives in some cases, have distribution points at the Panchayat level.

9.11.16 There is a shortage of fertilizer in the State. Malpractices such as adulteration and short weights are also reported. Flooding and poor drainage have also contributed to poor offtake. All these have contributed to low level of consumption in the State.

9.11.17 *Pesticides*: The surveillance organisation consists of a Pest Surveillance Officer assisted by 13 Assistant Protection Officers, 26 Plant Protection Assistants and 30 FMDs. But this organisation is not adequate for exercising surveillance satisfactorily. The pesticides business is not handled by the co-operatives. The entire distribution is handled by the private sector. In order to encourage use of plant protection equipments, State Government provides 25 per cent subsidy to farmers on the purchase of these equipments.

9.11.18 *Electric Power*: Power supply and provision of power connections are the responsibility of the State Electricity Board. Although the Board has adequate field organisation to undertake these activities, power supply is erratic. The Board is not very enthusiatic about rural electrification. Further, even when power supply is erratic, farmers are charged for electricity consumption on full day basis. This is self-defeating.

9.12 *Agricultural Credit Situation*

9.12.1 *Institutional Set-up*: Institutional credit for agriculture is provided by (i) co-operatives, (ii) commercial banks and (iii) Regional Rural Banks. The short-term credit structure consists of the Orissa State Co-operative Bank at the apex level, 17 central co-operative banks at the intermediate level serving 13 districts and 2565 PACS, 6 FSSs and 222 LAMPS as at the end of March, 1980. The long-term credit structure consists of the Orissa State Co-operative Land Development Bank Ltd. at the apex level and

54 PLDBs at the sub-divisional level. The LDB structure in Orissa is federal.

9.12.2 As at end-June 1983, 1322 branches of commercial banks were operating in the State, of which 968 were rural (73 per cent), 215 semi-urban (16 per cent) and 139 urban (11 per cent). Rural population covered per branch was about 24,000. There are 9 RRBs in the State covering 12 districts. Phulbani district is not yet covered by any RRB. The 9 RRBs have in all 510 branches.

9.12.3 *Recent Trends in Agricultural Credit*: The membership of PACS increased from 14 lakhs in 1970-71 to 27 lakhs in 1982-83. The membership coverage of rural house holds increased from about 39 per cent in 1974-75 to about 44 per cent in 1979-80. The borrowing membership constituted 21 per cent of the total membership in 1982-83. PACS provide mainly short-term credit and to a small extent medium term loans. Data on loans disbursed by PACS and percentage of overdues to demand during the last few years is given below.

Table 9.8. Credit Disbursed by PACS

Year	Short-term loan (Rs. crores)	Medium term loan (Rs. crores)	Loans advanced per borrowing member (Rs.)	Percentage of overdues to demand
1970-71	7.8	0.9	280	61
1979-80	41.1	21.6	759	41
1980-81	54.6	12.6	776	40
1981-82	59.0	10.7	1111	43
1982-83	58.1	15.7	1301	41

9.12.4 Loans issued by the Orissa State Co-operative Land Development Bank were insignificant prior to 1970. They ranged around Rs. 4 crores during mid-1970s. Thereafter they showed an increase touching a highest level of Rs. 12 crores in 1979-80. Since then they have shown a declining trend. During 1983-84 18 PLDBs had unrestricted eligibility, while 36 had only restricted eligibility for obtaining refinance from NABARD.

Table 9.9. Loan Disbursements and Overdues of Orissa State Co-operative Land Development Bank

Year	Loans issued (Rs. crores)	Percentage of overdues to demand (Primary level)
1970-71	3.6	46
1974-75	3.0	57
1978-79	7.9	45
1979-80	11.7	59
1980-81	9.9	39
1981-82	9.6	49
1982-83	9.0	59

9.12.5 *Commercial Banks*: Disbursements of credit by commercial banks were negligible upto mid-1970s but improved steadily thereafter as may be seen below (Table 9.10).

Table 9.10. Loans Disbursed by Commercial Banks

(Rs crores)

Year	Short-term loans	Medium-term and long-term loans
1974-75	2.1	1.3
1975-76	3.5	2.1
1976-77	5.2	3.8
1977-78	6.8	5.8
1978-79	8.5	10.4
1979-80	9.9	7.6
1980-81	31.2	39.3

9.12.6 Commercial banks are also facing the problem of overdues. Their overdues at the end of 1981-82 were 59 per cent of demand.

9.12.7 *Regional Rural Banks*: Loan disbursements by RRBs have been showing a rising trend. As on June 30, 1983 their loan outstandings amounted to Rs. 66.5 crores. The percentage of overdues to outstanding was 27.5.

9.13 *Crop Insurance*

9.13.1 A crop insurance scheme was introduced in the State in the year 1981. This programme was implemented through Central Co-operative Banks. The progress under the scheme during 1981-83 is indicated below.

Table 9.11. Crop Insurance Scheme

Season	No. of CCBs	No. of Blocks	Amount (Rs. lakhs)	No. of farmers benefited
Kharif 1981	10	15	4.98	800
Rabi 1981-82	6	40	21.08	1600
Kharif 1982	11	67	33.76	4008
Rabi 1982-83	6	35	22.82	1500
Kharif 1983	14	124	56.41	6447

9.13.2 This is a Group Insurance Scheme. Block is the unit. Premium rates and indemnity for a given crop and a given block is uniform for all farmers. The scheme is voluntary. The GIC which is the implementing agency, does not deal with individual farmers, but is implemented through CCBs. Since *kharif* 1984, commercial banks are also being involved. The scheme covers all unavoidable risks operating during the crop season, except war and nuclear risks.

9.14 *Special Development Programmes*

9.14.1 Major development programmes implemented in the State are (i) Compact Area Programme, (ii) Economic Rehabilitation of Rural Poor, (iii) Programme of Dugwells, (iv) Establishment of Community Nurseries, (v) Schemes for Development of Maize, Pulses and Oilseeds, (vi) Command Area Development Programme, (vii) Integrated Rural Development Programme, (viii) Drought

Prone Area Programme, (ix) Programme of Assistance to Small and Marginal Farmers for increasing agricultural production, and (x) Special programme for increasing rice production. Major highlights of these development programmes are set out in the following paragraphs.

9.14.2 *Compact Area Programme*: The programme was launched by the State Government in 1979. It is based on minimum yield guarantee approach. Under the scheme, inputs and extension service are made available to the farmers at their doorsteps. Handpicked field staff perform close supervision in the field.

9.14.3 When introduced for the first time in 1979, a compact area of 140 ha in Puri district was selected for implementation of the scheme. The programme was implemented under close supervision. Yield of paddy showed a sharp improvement to 4.20 tonnes per ha as compared with the normal yield of 2.35 tonnes per ha. The programme was extended to an area of 10000 ha in 1980-81. Yields of various crops under the scheme during 1980-81 are set out below along with yields in non-compact area.

Table 9.12. Yields of Crops Under Compact Area Programmes During 1980-81

Crop	Land covered under compact area programme (ha)	Yield (tonnes/ ha)	State average yield (tonnes/ ha)
Paddy (*Kharif*)	175000	3.20	1.52
Paddy (*Rabi*)	100000	4.00	2.24
Mung (*Kharif*)	32600	0.95	0.45
Mung (*Rabi*)	24000	1.00	0.55
Biri (*Kharif*)	7200	0.95	0.56
Biri (*Rabi*)	10000	1.00	0.54
Groundnut (*Kharif*)	9400	1.80	1.14
Groundnut (*Rabi*)	86000	2.00	1.53

9.14.4 Encouraged by these results, a larger area was brought under the scheme in the subsequent years. Areas brought under the scheme in 1982-83 and 1983-84 are set out below.

Table 9.13. Area Brought Under the Scheme, Crop-wise
('000 ha)

Crop	During 1982-83	During 1983-84
Paddy	341	411
Maize	15	115
Ragi	20	20
Arhar	16	14
Mung	223	19
Biri	20	19
Groundnut	23	29
Til	7	3
Jute	7	6
Cotton	1	Neg.

9.14.5 The working of this scheme shows that with concerted efforts of extension and better provision of inputs, significant increase in yields can be obtained without straining the state budget.

9.14.6 *Economic Rehabilitation of Rural Poor (ERRP)*: The State Government initiated a new programme in 1980-81 known as Economic Rehabilitation of Rural Poor (ERRP) to improve the economic status of the poor families in rural areas. This programme aims at providing assistance to 10 poorest families in each village. The beneficiaries under the ERRP are allowed full subsidy in respect of the land-based and pisciculture schemes. For schemes relating to animal husbandry and artisan crafts, subsidy is allowed at the rate of 75 per cent. The ERRP programme is specially beneficial to the Scheduled Castes and Scheduled Tribes who constitute two-thirds of the total number of beneficiaries.

9.14.7 The Sixth Five Year Plan envisaged a target to rehabilitate 5 lakh poor families under different schemes relating to agriculture, animal husbandry, fisheries and non-agricultural employment schemes including development of rural industries. Against the above target, 2,69,928 families were covered upto the end of 1983-84 and 1,06,000 families are likely to be covered in 1984-85. As against the Plan provision of Rs. 25 crores, the anticipated expenditure during the Sixth Plan for this programme would be Rs. 17 crores.

9.14.8 The scheme-wise coverage of beneficiaries during the first four years of the Sixth Plan are given below.

Year	Land based schemes	A.H. schemes	Fishery	Non-Agricultural employment schemes	All schemes
1980-81	13650	15926	1334	6146	37056
1981-82	22966	28176	1731	12311	65184
1982-83	12327	25772	7282	20284	65665
1983-84	32000	16593	10184	43246	102023
Total	80943	86467	20531	81987	269928

9.14.9 *Programme for Dugwells*: In view of the large number of small and fragmented holdings, the State initiated a scheme for construction of dugwells in 1972 with liberal subsidy. Most of these wells are manually operated and irrigate 1 ha in *kharif* and 1.5 ha in *rabi*/summer, Some are fitted with pumpsets. This has become popular. In drought years the dugwells were found to be particularly beneficial. Very high yields have been noticed in these areas in some cases in Ganjam district. Employment also has increased. Net income from a ha is over Rs. 25,000 a year, much more than in areas getting flow irrigation.

9.14.10 *Establishment of Community Nurseries*: This scheme provides facilities to farmers for raising advance paddy nurseries on community basis in areas where irrigation is available by the first week of June. Incentives are provided to farmers in such areas in the form of seeds and pesticides, valued at Rs. 1500 per ha of nursery. In 1983-84, an aggregate area of 3140 ha had been brought under the scheme. It is a good scheme worth emulating.

9.14.11 *Schemes for Development of Maize, Pulses and Oilseeds*: In tribal areas of Orissa, a scheme for intensification of maize cultivation has been launched. Under this scheme, demonstrations are conducted in fields of tribal farmers with a view to educating them on the technology of higher maize production. Each demonstration is conducted in one hectare field. The required seeds and fertilizers for demonstration purpose are supplied free of cost by the Government.

9.14.12 Under the intensive pulses development programme, farmers are given subsidy on irrigation, seeds, etc. for conducting field demonstrations.

9.14.13 Assistance is provided to the farmers with a view to increasing the production of oilseeds such as groundnut, mustard, sesamum, safflower and sunflower. Improved oilseeds are distributed at subsidised rates. Seed kits of improved varieties are also distributed. Plant protection chemicals are supplied to oilseeds growers and their use is also demonstrated.

9.14.14 *Command Area Development Programme*: The Command Area Development Programme was launched in 1976-77 in Mahanadi, Salandi and Hirakud irrigation project areas. The programme covered 53 blocks in Cuttak, Puri, Balasore, Sambalpur and Bolangir districts. Total area covered under the programme was 5.3 lakh ha.

9.14.15 The implementation of the programme, however, has been tardy. Till the end of 1982-83, field channels have been constructed only in 53000 ha which constituted 10 per cent of the command area. The pace of consolidation of holdings in command area is also slow.

9.14.16 In command areas where on-farm development has been taken up, the following beneficial impact was noticed: (i) large areas have been brought under HYV, (ii) increase in irrigation has contributed to an increase in gross cropped area, and (iii) a marked improvement in yields of crops grown.

9.14.17 *Integrated Rural Development Programme*: This programme is being implemented in all the 314 blocks in the State. The number of persons benefiting from the programme during the first four years of the Sixth Five Year Plan was 708312. Of these,

Scheduled Castes/Tribes accounted for 43 per cent. Subsidy provided amounted to Rs. 67 crores. Credit provided by financial institutions to identified beneficiaries for acquisition of assets amounted to Rs. 102 crores.

9.14.18 *Drought-Prone Area Programme*: This programme is being implemented in 29 blocks in Boudh-Khondmal, Kalahandi, Sambalpur and Bolangir. Following introduction of IRDP two programmes only are being implemented under DPAP *viz.*, (i) dugwell programme, and (ii) growing of fuel and timber in private lands under a subsidy scheme.

9.14.19 Provision by State Government for DPAP in the State during the Sixth Plan period is Rs. 7.0 crores. Actual expenditure during the first three years of the Sixth Plan amounted to Rs. 3.7 crores.

9.14.20 *Programme of Assistance to Small and Marginal Farmers for Increasing Agricultural Production*: This special programme for increasing agricultural production was introduced in 1983-84. Under the programme, small and marginal farmers were provided subsidy on minor irrigation schemes, plantation of trees, etc. Minikits of seeds and fertilizers were also distributed under the programme.

9.14.21 An outlay of Rs. 5 lakh per block is envisaged under the programme. This is allocated under various schemes as follows :

(i) Subsidy on wells and pumpsets on the holdings of small and marginal farmers at the rate of 50 per cent of the cost.	Rs. 3.50 lakh
(ii) Subsidy on plantation of fuel and fruit trees on the holdings of small and marginal farmers at the rate of 50 per cent of the cost.	Rs. 0.50 lakh
(iii) Distribution of seeds and fertilizer for oilseeds and pulses production and land development.	Rs. 1.00 lakh

9.14.22 Under this programme, a provision was made for Rs. 6.0 crores in 1983-84. For 1984-85, allocation has been enhanced to Rs. 7.9 crores.

9.14.19 *Specail Programme for Increasing Rice Production*: Orissa is one of the six States selected by the Government of India for implementing the special scheme formulated by it for increasing rice production in 1984-85. Of the 400 Blocks selected in the six States for implementing the scheme, 63 are in Orissa. The programme envisages close co-ordination between the various departments, particularly the Agriculture and Irrigation Department. T & V will be used for extension service. Emphasis is on expansion of area under HYV, maximisation of yield in irrigated areas through adoption of high production technology, selection of suitable varieties of rice for cultivation, removal of micronutrient deficiency, increase in fertilizer use, etc. For 1984-85 a pilot programme has been taken up covering 51 Blocks in the six selected States of which 7 are in Orissa. Assistance at the rate of Rs. 10 lakh per Block is provided by the Government of India. In the Seventh Plan, the programme will be implemented as a Centrally Sponsored Scheme with 50 per cent assistance provided by the Centre and the remaining 50 per cent by the State Government.

Annexure 9.1

Crop Pattern, 1980-81

	Area ('000 ha)	Percentage of total
I. **Cereals**		
i) **Rice**		
a) Autumn	865	9.9
b) Winter	3154	36.0
c) Summer	172	2.0
Total Rice	4191	47.9
ii) Wheat	67	0.8
iii) Maize	181	2.1
iv) Ragi	336	3.8
v) Jowar	37	0.4
vi) Other millets	371	4.3
Total Cereals and Millets	5183	59.3
II. **Total pulses**	1726	19.7
Total Foodgrains (I & II)	6909	79.0
III. **Other Food Crops**		
i) Sugarcane	49	0.6
ii) Condiments & spices	136	1.5
iii) Fruits & vegetables	597	6.8
Total other food crops	783	8.9
Total Food Crops (I + II + III)	7691	87.9

Annexure 9.1 (concld.)

	Area ('000 ha)	Percentage of total
IV. **Non-Food Crops**		
i) Oilseeds		
a) Sesamum (Til)	156	1.8
b) Rapeseed & mustard seed	162	1.8
c) Linseed	36	0.4
d) Groundnut	172	2.0
e) Others	210	2.4
Total Oilseeds	736	8.4
ii) Fibre Crops		
a) Cotton	4	—
b) Jute	44	0.5
c) Mesta	42	0.5
d) Other fibres	10	0.1
Total fibres	100	1.1
iii) **Drug & Narcotics**		
a) Tobacco	21	0.2
Total Drug & Narcotics	21	0.2
iv) Fodder crops and other non-food crops including mulberry, etc.	198	2.2
Total non-food crops	1055	12.1
Total	8746	(100.0)

Annexure 9.2

Area, Production and Productivity of Major Crops

Crop	Area ('000 ha)						Production ('000 tonnes)						Productivity (Kg/ha)					
	Triennium ending			During			Triennium ending			During			Triennium ending			During		
	1961	1971	1981	1981-82	1982-83	1983-84	1961	1971	1981	1981-82	1982-83	1983-84	1961	1971	1981	1981-82	1982-83	1983-84
Rice	3990	4381	4226	4159	4058	4364	3213	4017	3874	3853	2991	5048	805	917	917	926	737	1157
Wheat	7	14	60	66	64	64	4	17	105	125	121	121	571	1243	1750	1894	1906	1906
Other cercals	146	415	747	639	672	688	59	278	478	515	529	626	404	667	640	806	787	910
Pulses	498	878	1648	1767	1643	1695	243	458	748	944	922	1050	488	522	454	534	561	620
Total food-grains	4641	5688	6681	6632	6437	6810	3519	4770	5205	5437	4563	6845	758	839	779	820	709	1005
Groundnut	24	71	164	216	253	279	18	85	182	292	333	379	757	1198	1111	1352	1317	1358
Rapeseed & mustard	37	60	153	162	124	133	15	26	60	72	57	62	405	426	392	447	460	467
Total oil seeds	187	349	707	860	784	935	62	207	397	597	590	687	332	593	561	694	752	735
Sugarcane (Gur)	24	35	47	50	51	42	73	192	289	322	317	286	3054	5452	6155	6440	6190	6766
Jute	37	44	46	52	41	40	211@	311@	356@	383@	304@	340@	1030	1281	1388	1331	1351	1519
Mesta	7	24	39	43	37	37	37@	137@	200@	220@	180@	180@	905	1033	925	912	888	888
Potato	10	25	8	10	9	10	30	282	55	66	60	81	3000	11183	6815	6989	7024	8505

@ In thousand bales of 180 kgs. each.

Annexure 9.3

Annual Compound Growth Rate (Per cent)

Crop	Area			Production			Yield		
	1961-71	1971-81	1961-81	1961-71	1971-81	1961-81	1961-71	1971-81	1961-81
Rice	0.9	— 0.4	0.3	2.3	— 0.4	0.9	1.3	—	0.6
Wheat	7.2	15.7	11.3	15.6	20.0	17.7	8.1	3.5	5.8
Other cereals	11.0	6.0	8.5	16.8	5.6	11.0	5.1	— 0.4	2.3
Pulses	5.8	6.5	6.2	6.5	5.0	5.8	0.7	— 1.4	— 0.4
Total foodgrains	2.1	1.6	1.8	3.1	0.9	2.0	1.0	— 0.7	0.1
Groundnut	11.5	8.7	10.1	16.8	7.9	12.3	4.7	— 0.8	1.9
Rapeseed & mustard	5.0	9.8	7.4	5.7	8.7	7.2	0.5	— 0.8	— 0.2
Total oilseeds	6.4	7.3	6.9	12.8	6.7	9.7	6.0	— 0.6	2.7
Sugarcane (Gur)	3.9	3.0	3.4	10.2	4.2	7.1	6.0	1.2	3.6
Jute	1.8	0.5	1.1	4.0	1.4	2.6	2.2	0.8	1.5
Mesta	13.1	5.0	9.0	14.0	3.9	8.8	1.3	— 1.1	0.1
Potato	9.6	—10.8	— 1.1	25.1	—15.1	3.1	14.1	— 4.8	4.2

— = Nil or negligible.

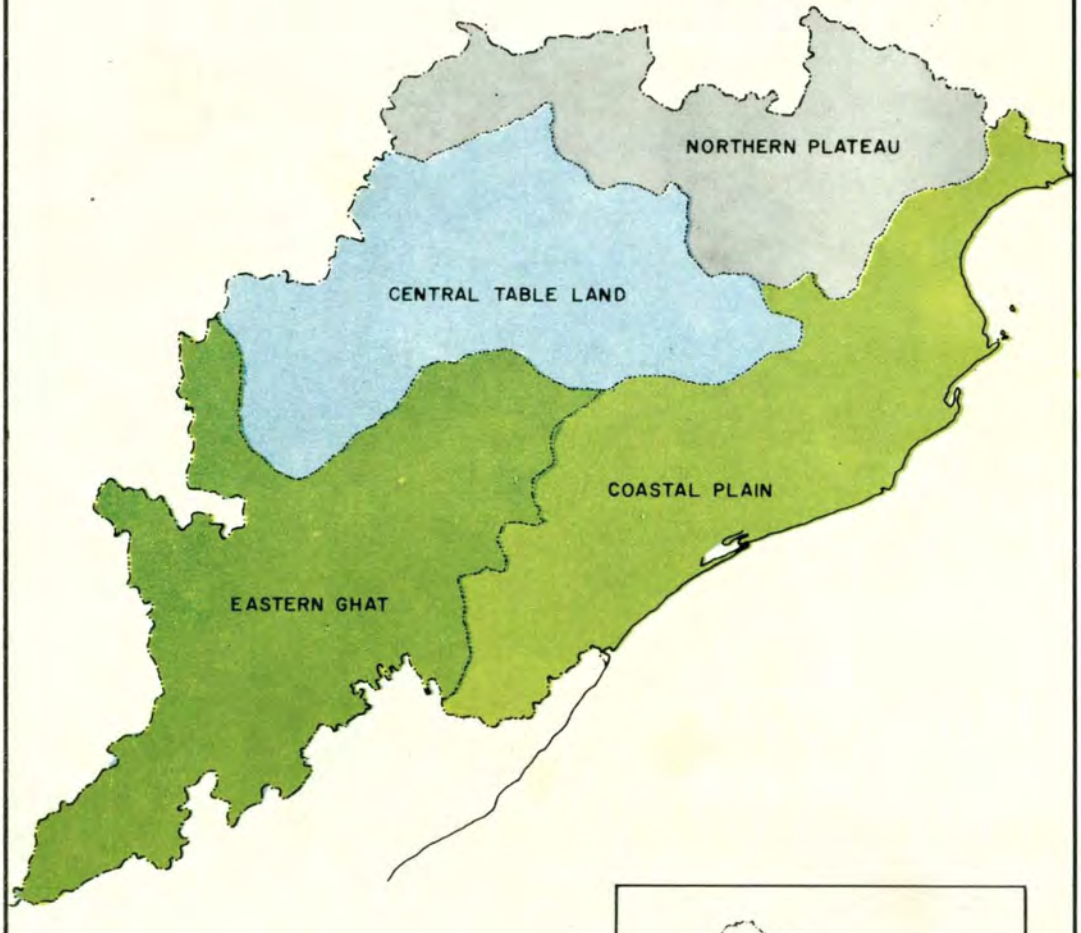
Annexure 9.4

Consumption of NPK, 1979-81

Districts above State average	(Kg/ha)	Districts below State average	(Kg/ha)
Balasore	9.7	Dhenkanal	4.2
Bolangir	9.9	Kalahandi	0.6
Cuttack	12.7	Keonjhar	2.8
Ganjam	14.9	Koraput	2.9
Puri	9.4	Mayurbhanj	3.7
Sambalpur	19.9	Phulbani	3.0
		Sundargarh	5.4

State average : 8.6 Kg/ha

ORISSA
AGRO-CLIMATIC ZONES



1 Based upon Survey of India map with the permission of the Surveyor General of India.

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3 The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line.

4 Responsibility for the correctness of internal details shown on the maps rests with the publishor.

CHAPTER 10

AGRO-CLIMATIC ZONES

10.1 In this Report, the zonal classification of the State made by the Department of Agriculture, Government of Orissa has been adopted with some adjustment for want of data below district level. This is indicated below.

1.	Northern Plateau Districts	Mayurbhanj, Keonjhar, Sundergarh.
2.	Central Table Land Districts.	Bolangir, Sambalpur, Dhenkanal.
3.	Eastern Ghat Districts.	Koraput, Kalahandi, Phulbani.
4.	Coastal Plain Districts	Balasore, Cuttack, Puri, Ganjam.

10.2 *Northern Plateau*

10.2.1 *General Features*: The total geographical area of this zone is 28327 sq. km. accounting for 18 per cent of the total area of the State. It is a continuation of Chhotanagpur plateau of Bihar. There are a number of hill ranges in this zone. These are thickly wooded.

10.2.2 *Soils*: The zone has red and yellow soils. However, the soils on the ridges and the slopes are of lighter texture and are susceptible to erosion. The soils are acidic and have low fertility. The yellow soils have better soil moisture due to heaviness of sub-soil.

10.2.3 *Rainfall*: The mean annual rainfall is about 1600 mm. Nearly 85 per cent of the rainfall is received during June-September. Rainfall during the other months is generally below 50 mm. Therefore, the zone has high moisture deficit. The climate is hot and moist or sub-humid. Temperature ranges between 15°C and 38°C.

10.2.4 *Socio-Economic Characteristics*: Total population of the zone, according to 1981 Census is 4 million, of which 85 per cent is rural. Population density is 142 sq. km. as against the State aver-

age of 169 per sq. km. The zone has the largest proportion of scheduled tribes population (52 per cent of the total population). The scheduled castes constitute 8.5 per cent of total population. Total work force in the zone is 1.4 million, of which 45 per cent are cultivators and 26 per cent agricultural labourers. The literacy rate is around 30 per cent as against the State average of 34 per cent.

10.2.5 *Pattern of Land Holdings*: The number and area of operational holdings according to size classes, during 1970-71 and 1976-77, are indicated in Annexure 10.1. During this period, the number of marginal and small holdings increased by 0.8 lakh to 3.7 lakh. However, increase in area operated was small (0.2 lakh ha). During 1976-77 these holdings constituted about 75 per cent of the total holdings, accounting for only about 40 per cent of the total area.

10.2.6 *Land Use Pattern*: The land use pattern of the zone for 1980-81 is indicated in the table below.

Table 10.1. Land Use Pattern-Northern Plateau Districts

Classification	Area ('000 ha)	Per cent of total reporting area	Col. 2 as per cent of State total
(1)	(2)	(3)	(4)
1. **Reporting area**	**2850**	**100.0**	**18.3**
2. Forests	1424	50.0	21.4
3. Not available for cultivation	152	5.3	16.9
4. Permanent pastures and other grazing land	107	3.8	19.1
5. Land under miscellaneous tree crops and groves	29	1.0	6.9
6. Cultivable waste land	25	0.9	10.9
7. Fallow lands			
(i) Current fallows	95	3.3	21.0
(ii) Others	40	1.4	21.2
8. Net area sown	978	34.3	16.0

10.2.7 Around 50 per cent of the reporting area of the zone is covered by forests. Cultivable area is around 41 per cent only. However, cultivated area constitutes about 38 per cent of the reporting area.

10.2.8 *Cropping Pattern*: Major *kharif* crop of the zone is rice. To a small extent, maize, ragi, tur and other *kharif* pulses are also grown. Major *rabi* crops are gram, mung, *biri, kulthi,* rape-seed and mustard, linseed and vegetables. However, area sown to these crops is not significant. Cropping intensity is low at 120 per cent. Data on cropping pattern of the zone is given in Annexure 10.2.

10.2.9 *Irrigation Pattern*: Data on irrigation for the years 1972-73 and 1980-81, source-wise and crop-wise are presented in Table 10.2.

Table 10.2. Net and Gross Irrigated Area-Northern Plateau Districts

('000 ha)

Source	Net irrigated area 1972-73	1980-81@	Crop	Gross irrigated area 1972-73	1980-81
Canals	3.7	21.4	Winter rice	50.5	64.0
	(7.3)	(25.1)		(85.2)	(61.5)
			Summer rice	2.7	2.6
Tanks	31.9	42.6		(4.6)	(2.5)
	(63.0)	(50.0)	Wheat	4.0	13.5
				(6.7)	(13.0)
Tubewells	2.3	0.8	Sugarcane	0.6	0.9
	(4.6)	(0.9)		(1.0)	(0.9)
			Other crops	1.5	23.0
Other wells	12.7	20.4	(including	(2.5)	(22.1)
	(25.1)	(24.0)	vegetables)		
Total	50.6	85.2	Total	59.3	104.0
	(100.0)	(100.0)		(100.0)	(100.0)

@ Data for 1980-81 are not strictly comparable with those for 1972-73 due to changes in source-wise classification.

Note : Figures in brackets represent percentage of total.

10.2.10 Net irrigated area increased during 1972-73 to 1980-81 by about 68 per cent. Nevertheless, net sown area irrigated is less than 10 per cent. Irrigation facilities are available mainly during the *kharif* season. Winter rice crop benefits from irrigation to the extent of nearly 15 per cent. Autumn rice crop is mainly grown under rainfed conditions. Irrigation facilities during the *rabi* season are inadequate. Area irrigated more than once is only 22 per cent of net irrigated area.

10.2.11 *Fertilizer Consumption*: Data on fertilizer offtake in the zone during the triennium ending 1980-81 are as indicated below.

Table 10.3. Consumption of Fertilizers-Northern Plateau Districts

(Kg/ha)

District	NPK
Mayurbhanj	3.7
Keonjhar	2.8
Sundergarh	5.4
Average	4.0

Note: Data compiled by AER Centre, Santiniketan.

10.2.12 *High Yielding Varieties*: Data on area under HYV of crops for the triennium ending 1980-81 are presented below.

Table 10.4. Area Under High Yielding Varieties-Northern Plateau Districts

('000 ha)

Crop	Total area	Area under HYV*	Per cent of Col. (3) to Col. (2)
1.	2.	3.	4.
Kharif rice	762.3	111.4	14.6
Summer rice	2.2	2.2	100.0
Wheat	9.8	9.8	100.0

* Data compiled by AER Centre, Santiniketan.

These data indicate that progress in the introduction of HYV under the main crop, *viz., kharif* rice is slow.

10.2.13 *Area, Production and Productivity*: This zone accounts for about 14 per cent of the State's total foodgrains production. Data on area, production and productivity of principal crops in the zone during the triennia ending 1972-73 and 1980-81 and for the year 1981-82 are presented in Annexure 10.6. Yield of the major crop *viz.*, rice is about 75 per cent of the average yield in Eastern India. In the case of maize, gram, tur and sugarcane, the yields are only around 50 to 70 per cent of the average yields of these crops in Eastern India. Wheat yield is about 50 per cent higher than its average yield in Eastern India.

10.3 *Central Table Land*

10.3.1 *General Features*: Bolangir, Sambalpur and Dhenkanal are covered in this zone. The total geographical area of the zone is 37299 sq. km. forming 24 per cent of the State total. The zone is generally flat with undulating and folding topography. It consists chiefly of Mahanadi basin with its tributaries. The table land gradually rises from east to west.

10.3.2 *Soils*: The zone has light to medium textured red soils and heavy textured calcareous soils in Sambalpur and Bolangir districts. In Dhenkanal, however, light textured laterite soils, medium textured red loam soils and mixed red and black soils of clay loam texture are also found. Besides, there are alluvial soils on hill slopes and river valleys.

10.3.3 *Rainfall*: The average rainfall in this zone is 1485 mm. However, there are inter-district variations. Sambalpur has the highest average annual rainfall of 1530 mm. Around 85 per cent of the rainfall is recorded during the months of June to September. The average rainfall during February-May ranges between 50 mm and 100 mm. The frequent crop failures in this zone may be ascribed to fluctuations in rainfall during monsoon period. The climate is hot and sub-humid in Sambalpur and Bolangir. It is hot, moist and sub-humid in Dhenkanal.

10.3.4 *Socio-Economic Characteristics*: The population of the zone according to 1981 Census is 5 million of which 88.5 per cent is rural. The density of population is 143 per sq. km. The scheduled castes and scheduled tribes constitute around 15 per cent and

20 per cent, respectively, of the total population. The total work force of the zone is 1.8 million, of which around 45 per cent are cultivators and nearly 30 per cent agricultural labourers. The literacy rate is 32 per cent as against the State average of 34 per cent.

10.3.5 *Pattern of Land Holdings*: The classification of the operational holdings in the zone according to size groups for the years 1970-71 and 1976-77 are indicated in Annexure 10.1. Number of marginal and small holdings in 1976-77, constituted about 75 per cent of the total holdings, accounting for about 40 per cent of the total area.

10.3.6 *Land Use Pattern*: Data on land use pattern in the zone for the year 1980-81 are presented in the table below.

Table 10.5. Land Use Pattern-Central Table Land Districts

Classification	Area ('000 ha)	Per cent of total reporting area	Col. (2) as per cent of State total
(1)	(2)	(3)	(4)
1. **Reporting area**	**3724**	**100.0**	**24.0**
2. Forests	1368	36.8	20.6
3. Not available for cultivation	235	6.3	26.2
4. Permanent pastures and other grazing lands	155	4.2	27.7
5. Land under misc. tree crops and groves	155	4.2	36.6
6. Cultivable waste land	117	3.1	47.0
7. Fallow Lands			
(i) Current fallows	179	4.8	39.6
(ii) Others	76	2.0	40.2
8. Net area sown	1439	38.6	23.5

10.3.7 Around 55 per cent of the reporting area of this zone is cultivable. Cultivated area, however, is less than 45 per cent.

10.3.8 *Cropping Pattern*: The major crop grown in the zone is rice which accounts for about 50 per cent of gross cropped area during the *kharif* season. Maize, ragi, small millets, *kharif* pulses and *kharif* groundnut account for 15 per cent of gross sown area during this season. Multiple cropping is undertaken in some areas. Summer rice, wheat, pulses (green gram, black gram and horse gram) and oilseeds (groundnut and sesamum) are some of the crops grown during the *rabi* season. Vegetable cultivation is also undertaken on a large scale in areas served by lift irrigation projects. The cropping intensity is around 130 per cent. The cropping pattern in the zone for 1980-81 is shown in Annexure 10.3.

10.3.9 *Irrigation Pattern*: Data on irrigated area in the zone (net and gross) for the years 1972-73 and 1980-81 are presented below.

Table 10.6. Net and Gross Irrigated Area-Central Table Land Districts

('000 ha)

Source	Net Irrigated Area 1972-73	1980-81@	Crop	Gross Irrigated Area 1972-73	1980-81
Canals	164.3	166.4	Rice		
	(63.8)	(65.3)	Winter	257.8	216.3
				(67.7)	(53.6)
Tanks	33.9	49.9	Summer	91.2	99.4
	(13.1)	(19.5)		(24.0)	(24.7)
			Total	349.0	315.7
Tubewells	59.6	38.0		(91.7)	(78.3)
Other			Wheat	16.5	20.7
wells	(23.1)	(14.9)		(4.4)	(5.1)
			Groundnut	1.7	2.0
				(0.4)	(0.5)
			Sugarcane	7.7	7.6
				(2.0)	(1.9)
			Other crops	5.7	57.2
			(including	(1.5)	(14.2)
			vegetables)		
Total	257.8	255.2	Total	380.6	403.2
	(100.0)	(100.0)		(100.0)	(100.0)

@ — Data for 1980-81 are not strictly comparable with those for 1972-73 due to changes in source-wise classification.

Note: Figures in brackets denote percentage of total.

10.3.10 There was no change in the net irrigated area in the zone between 1972-73 and 1980-81. Extent of net sown area benefited by irrigation is 18 per cent. In the case of gross irrigated area, winter and summer rice accounts for around 80 per cent. On the other hand, autumn rice (which accounts for over 15 per cent of gross cropped area) is grown under rainfed conditions. Soil potential is good in this zone.

10.3.11 *Fertilizer Consumption*: Data on fertilizer consumption during 1980-81 are indicated in the table below.

Table 10.7. Consumption of Fertilizers-Central Table Land Districts

(Kg/ha)

District	NPK
Bolangir	9.9
Sambalpur	19.9
Dhenkanal	4.2
Average	11.3

Note: Data compiled by AER Centre, Santiniketan.

10.3.12 *High Yielding Varieties*: Data on area under HYV of rice and wheat for the triennium ending 1980-81 are presented below.

Table 10.8. Area Under High Yielding Varieties-Central Table Land Districts

('000 ha)

Crop	Total area	Area under HYV*	Per cent of Col. (3) to Col. (2)
(1)	(2)	(3)	(4)
Kharif rice	975.3	219.3	22.5
Summer rice	90.2	90.2	100.0
Wheat	19.4	18.7	96.4

Note: Data compiled by AER Centre, Santiniketan.

10.3.13 *Area, Production and Productivity*: The share of the zone in the State's foodgrains production is about 23 per cent. Data on area, production and productivity of principal crops in the zone during the triennia ending 1972-73 and 1980-81 and for the year 1981-82 are presented in Annexure 10.6. According to these data, the average yield of rice was around 85 per cent of that of Eastern India. In the case of maize and ragi the average yields are around 85 and 95, respectively, of the yields in Eastern India. In the case of gram and tur and sugarcane the average yield is much lower being around 65, 45 and 75 per cent, respectively, of that in Eastern India. However, the average yields of wheat and rapeseed and mustard crops are about 25 and 20 per cent higher than the corresponding average yields in Eastern India.

10.4 *Eastern Ghat*

10.4.1 *General Features*: Districts included in this zone are Koraput, Kalahandi and Phulbani. The total geographical area of the zone is 49865 sq. km. constituting 32 per cent of State total. This zone has several hill ranges and extensive plateaus.

10.4.2 *Soils*: Soils in Koraput district are mostly red. These are deficient in organic matter and micro-nutrients but rich in iron and aluminium. In Kalahandi district, black soils occupy quite an extensive landscape. Mixed red and black soils are found in association. Soils are medium to high textured, of low to medium fertility and moderately acidic to slightly alkaline. The black soils have higher water retentivity. However, with depletion of soil moisture, great moisture stress develops and plants wither. In Phulbani district, brown forest soils are found which are medium textured, sandy loam to sandy clay loam, moderately to slightly acidic and medium in soil fertility.

10.4.3 *Rainfall*: The average annual rainfall in the zone ranges between 1350 to 1520 mm. The rainfall gradually decreases from north to south. About 75 per cent of the rainfall is received during June to September. The rainfall is scanty during the pre-monsoon and post-monsoon months. The maximum and minimum temperatures vary between 38°C and 7.5°C. By and large the climate is hot and moist or sub-humid.

10.4.4 *Socio-Economic Characteristics*: Population of the zone according to 1981 Census is 4.5 million, of which 90 per cent is rural. The density of population is 91 per sq. km. The Scheduled castes and Scheduled tribes constitute around 15 per cent and 45 per cent, respectively, of the total population. The zone has a total work force of 1.7 million, of which nearly 53 per cent are cultivators and 31 per cent agricultural labourers. The literacy rate is 19 per cent as against the State average of 34 per cent.

10.4.5 *Pattern of Land Holdings*: The data on distribution of the operational holdings in the zone according to size groups for the years 1970-71 and 1976-77 are presented in Annexure 10.1. Between 1970-71 and 1976-77 the number of marginal farmers increased by nearly 30000. Taken together, marginal and small farmers constituted more than 60 per cent of total farmers and accounted for only 25 per cent of the total area operated in 1976-77.

10.4.6 *Land Use Pattern*: The land use pattern of the zone for the year 1980-81 is indicated in the table below.

Table 10.9. Land Use Pattern-Eastern Ghat Districts

Classification	Area ('000 ha)	Per cent of total reporting area	Col. 2 as per cent of State total
(1)	(2)	(3)	(4)
1. **Reporting area**	**4964**	**100.0**	**31.9**
2. Forests	2756	44.5	41.5
3. Not available for cultivation	191	3.8	21.3
4. Permanent pastures and other grazing land	139	2.8	24.8
5. Land under miscellaneous tree crops and groves	126	2.6	29.8
6. Cultivable waste land	40	0.8	16.1
7. Fallow lands			
(i) Current fallows	79	1.6	17.5
(ii) Others	30	0.6	15.8
8. Net area sown	1603	32.3	26.2

10.4.7 Around 45 per cent of the reporting area in the zone is covered by forests. Nearly 38 per cent of the reporting area is cultivable and 34 per cent is under cultivation.

10.4.8 The zone has a diversified cropping pattern. Only one-third of gross cropped area is under rice. Maize, ragi, small millets, pulses, oilseeds and vegetables are other important *kharif* crops. These account for another one-third of gross cropped area. Pulses and oilseeds are cultivated during the *rabi* season as well. These crops cover nearly 25 per cent of gross cropped area. The cropping intensity is around 130 per cent. Annexure 10.4 presents the cropping pattern of the zone for 1980-81.

10.4.9 *Irrigation Pattern*: Data on net and gross irrigated area for the years 1972-73 and 1980-81 are presented in Table 10.10.

Table 10.10. Net and Gross Irrigated Area-Eastern Ghat Districts

('000 ha)

Source	Net Irrigated Area 1972-73	1980-81@	Crop	Gross Irrigated Area 1972-73	1980-81
Canals	19.0	34.8	Winter rice	71.6	73.8
	(26.5)	(33.3)		(81.6)	(47.3)
Tanks	27.5	39.0	Summer rice	4.9	7.1
	(38.3)	(37.4)		(5.6)	(4.6)
Tubewells	2.3	1.4	Wheat	4.2	15.3
	(3.2)	(1.3)		(4.8)	(9.9)
Other	22.9	29.0	Sugarcane	5.9	5.8
wells	(32.0)	(28.0)		(6.7)	(3.7)
			Other crops	1.2	53.8
			(including	(1.3)	(34.5)
			vegetables)		
Total	71.7	104.2	Total	87.8	155.8
	(100.0)	(100.0)		(100.0)	(100.0)

@ Data for 1980-81 are not strictly comparable with those those for 1972-73 due to changes in source-wise classification.

Note: Figures in brackets represent percentage of total.

10.4.10 Between 1972-73 and 1980-81 net irrigated area in the zone has increased by around 45 per cent. Nevertheless, this constitutes only 6.5 per cent of the net sown area. Area irrigated more than once is around 50 per cent of the net irrigated area.

10.4.11 *Fertilizer Consumption*: Data on fertilizer consumption in the zone for the triennium ended 1980-81 are presented in the table below.

Table 10.11. Fertilizer Consumption-Eastern Ghat Districts

(kg/ha)

District	NPK
Koraput	2.9
Kalahandi	0.6
Phulbani	3.0
Average	2.2

Note: Data compiled by AER Centre, Santiniketan.

10.4.12 Fertilizer consumption of around 3 kgs. per ha of gross cropped area in Koraput and Phulbani districts and around $\frac{1}{2}$ kg. per ha in Kalahandi district is extremely low even compared to that for the State as a whole, *viz.*, 9 kgs. per ha.

10.4.13 *High Yielding Varieties*: Data on area under HYV of rice and wheat for 1980-81 are presented in Table 10.12.

Table 10.12. Area Under High Yielding Varieties-Eastern Ghat Districts

('000 ha)

Crop	Total area	Area under HYV*	Per cent of Col. (3) to Col. (2)
(1)	(2)	(3)	(4)
Kharif rice	715.6	175.1	24.4
Summer rice	8.0	5.0	62.5
Wheat	13.4	13.4	100.0

* Data compiled by AER Centre, Santiniketan.

10.4.14 *Area, Production and Productivity*: This zone constitutes about one-third of the total geographical area, but accounts for only 18 per cent of the total foodgrains production of the State. Data on area, production and productivity of principal crops of the zone during the triennia ending 1972-73 and 1980-81 and for the year 1981-82 are presented in Annexure 10.6. Despite the increase in rice yield noticed during this period, it is only about 80 per cent of the average yield of rice in Eastern India. For many other crops grown in these districts, namely maize, ragi, gram, sugarcane, groundnut and mesta the yield levels are only around 60 to 85 per cent of the corresponding average yields in Eastern India. Only in the case of wheat, jowar, rapeseed and mustard and sesamum are the yield levels either around or higher than the yields in Eastern India.

10.5 *Coastal Plain*

10.5.1 *General Features*: Districts covered in this zone are Balasore, Cuttack, Puri and Ganjam. The total gropraphical area of the zone is 40291 sq. km. forming 26 per cent of the State total. There are a number of deltas in this zone which are formed by the rivers Subarnarekha, Budhabalanga, Salandi, Baitarani, Brahmani, Mahanadi and Rusikulya. It has two lakes *viz.*, Chilka and Sar in Puri district. The coastal belt, particularly in Balasore, Cuttack and Ganjam is exposed to frequent cyclones.

10.5.2 *Soils*: The soils are by and large alluvial. In Balasore soils are of varying texture ranging from loamy sand to clay, medium fertile and slightly acidic to neutral. The coastal alluviam in Cuttack, Puri and Ganjam is generally fertile. But soils with low nitrogen and phosphorus content are also found. A narrow strip of land (2 to 10 km. wide) along the sea coast in these districts is rendered saline by the incursion of brakish tidal water. The saline water which flows through rivulets and creeks inundates the flat plain lands. Salinity level reaches critical limit during periods after the cessation of monsoon. This hampers the prospects of raising a second crop.

10.5.3 *Rainfall*: The climate is by and large hot and humid in this zone. The mean annual rainfall ranges between 1520 and 1570 mm. About 70-75 per cent of the rainfall is received during June-September. The zone receives a rainfall of 100-200 mm. during the month of October as well. As a result, residual soil

moisture is retained even after the cessation of monsoon which helps in raising a second crop during *rabi* season. The maximum and minimum temperature varies between 39°C and 11.5°C.

10.5.4 *Socio-Economic Characteristics*: The population of the zone according to 1981 Census is 12.5 million, of which 88 per cent is rural. The zone has the highest density of 310 per sq. km. as against the State average of 169 per sq. km. Scheduled castes and Scheduled tribes constitute 16 per cent and 5 per cent, respectively, of the total population. The zone has a total work force of 10.7 million of which 45 per cent are cultivators and 26 per cent agricultural labourers. The literacy rate is 42 per cent.

10.5.5 *Pattern of Land Holdings*: Data on number and area of operational holdings in the zone according to size classes during 1970-71 and 1976-77 are presented in Annexure 10.1. Marginal and small holdings constitute more than 80 per cent of total holdings. These account for about 50 per cent of the total area which is sizeable. Medium and large farmers constituting around 5 per cent of the holdings account for about 22 per cent of the total area.

10.5.6 *Land Use Pattern*: Table below indicates the land use pattern of the zone for the year 1980-81.

Table 10.13. Land Use Pattern-Coastal Plain Districts

Classification	Area ('000 ha)	Per cent of total reporting area	Col. (2) as per cent of State total
(1)	(2)	(3)	(4)
1. **Reporting area**	**4002**	**100.0**	**25.8**
2. Forests	1092	27.3	16.4
3. Not available for cultivation	319	8.0	35.6
4. Permanent pastures and other grazing land	159	4.0	28.4
5. Land under miscellaneous tree crops and groves	113	2.8	26.7
6. Cultivable waste land	67	1.7	26.9
7. Fallow lands			
(i) Current fallows	99	2.4	21.9
(ii) Others	43	1.1	22.8
8. Net area sown	2110	52.7	34.4

10.5.7 Around 60 per cent of the reporting area of the zone is cultivable. Cultivated area constitutes 55 per cent of the total. The net sown area of the zone accounts for about one-third of the total net sown area of the State. Around one-fourth of the reporting area is under forests.

10.5.8 *Cropping Pattern*: Winter rice (*kharif*) is the major crop of the zone. This accounts for about 45 per cent of gross cropped area. Maize, ragi, *kharif* pulses, *kharif* vegetables and jute are the other crops grown during this season. Crops grown during *rabi* season are summer rice, wheat, pulses, oilseeds and vegetables. Plantation crops like coconut, arecanut, cashewnut and banana are also grown in this zone. The cropping intensity is around 165 per cent. Data on cropping pattern of the zone are presented in Annexure 10.5.

10.5.9 *Irrigation Pattern*: Data on irrigated area (net and gross) for 1972-73 and 1980-81 are presented in Table 10.14.

Table 10.14. Net and Gross Irrigated Area-Coastal Plain Districts

('000 ha)

Source	Net irrigated area		Crop	Gross irrigated area	
	1972-73	1980-81@		1972-73	1980-81
Canals	396.3 (73.8)	527.4 (70.1)	Winter rice	536.8 (73.3)	666.4 (63.5)
Tanks	99.7 (18.6)	139.0 (18.5)	Summer rice	84.1 (11.5)	62.6 (6.0)
			Ragi	11.2 (1.5)	19.8 (1.9)
Tubewells and other wells	40.8 (7.6)	85.6 (11.4)	Wheat	9.3 (1.3)	17.6 (1.7)
Total	536.8 (100.0)	752.0 (100.0)	Pulses	—	66.5 (6.3)
			Sugarcane	12.4 (1.6)	13.9 (1.3)
			Groundnut	15.0 (2.0)	42.3 (4.0)
			Total oilseeds	15.0 (2.0)	65.6 (6.2)
			Jute	—	22.6 (2.2)
			Other crops (including vegetables)	63.8 (8.8)	114.0 (10.9)
			Total	732.6 (100.0)	1049.0 (100.0)

@ Data for 1980-81 are not strictly comparable with those for 1972-73 due to changes in source-wise classification.

Note: Figures in brackets represent percentage of total.

10.5.10 Net irrigated area increased by 40 per cent during this period and gross irrigated area by 43 per cent. Nevertheless, only around 35 per cent of net sown area and 30 per cent of gross sown area has benefited from irrigation. Area irrigated more than once is around 40 per cent of the net irrigated area. Crops such as jute, pulses, etc., also receive the benefit of irrigation. Groundwater potential in this zone is high.

10.5.11 *Fertilizer Consumption*: Data on fertilizer offtake during the triennium ended 1980-81 are presented in the table below.

Table 10.15. Consumption of Fertilizers-Coastal Plain Districts Orissa

(Kg/ha)

District	NPK
Balasore	9.7
Cuttack	12.7
Puri	9.4
Ganjam	14.9
Average	11.7

Note: Data compiled by AER Centre, Santiniketan.

10.5.12 *High Yielding Varieties*: Data on area under HYV of crops for the triennium ended 1980-81 are presented in the table below.

Table 10.16. Area Under High Yielding Varieties-Coastal Plain Districts

('000 ha)

Crop	Total area	Area under HYV*	Per cent of col. 3 to col. 2
(1)	(2)	(3)	(4)
Kharif rice	1613.3	347.0	21.5
Summer rice	83.6	49.2	58.8
Wheat	15.5	14.0	90.3

* Data compiled by AER Centre, Santiniketan. Coverage of HYV under *kharif* rice is low.

10.5.13 *Area, Production and Productivity*: This zone accounts for about 45 per cent of the total foodgrains production in the State. Data on area, production and productivity of principal crops in the zone during the triennia ended 1972-73 and 1980-81 and for the year 1981-82 are presented in Annexure 10.6. There was no significant improvement in rice yields during this period. The average yield of rice is around 90 per cent of its yield in Eastern India. Average yields of tur, maize and jowar are only around 35 to 45 per cent of the average yields of these crops in Eastern India. Average yield of sugarcane is 95 per cent of that for Eastern India. However, average yields of wheat, groundnut and jute are around 45, 50 and 60 per cent, respectively, higher than the corresponding yields in Eastern India.

Annexure 10.1

Number and Area of Operational Holdings — Zone-wise

Size Class (ha)	1970-71		1976-77	
	Number ('000)	Area ('000 ha)	Number ('000)	Area ('000 ha)
I. *Northern Plateau Districts*				
Below 1.0 (Marginal)	147 (34.0)	92 (9.6)	227 (44.3)	120 (13.8)
1.0—2.0 (Small)	153 (35.4)	249 (25.8)	148 (28.9)	241 (27.8)
2.0—4.0 (Semi-Medium)	78 (18.1)	244 (25.3)	101 (19.7)	278 (32.0)
4.0—10.0 (Medium)	48 (11.1)	277 (28.7)	33 (6.5)	188 (21.7)
10.0 and above (Large)	6 (1.4)	102 (10.6)	3 (0.6)	41 (4.7)
Total	432 (100.0)	964 (100.0)	512 (100.0)	868 (100.0)
II. *Central Table Land Districts*				
Below 1.0 (Marginal)	321 (38.5)	175 (9.8)	326 (38.6)	176 (11.8)
1.0—2.0 (Small)	287 (34.5)	439 (24.6)	290 (34.4)	389 (26.0)
2.0—4.0 (Semi-Medium)	120 (14.4)	361 (20.2)	155 (18.4)	409 (27.3)
4.0—10.0 (Medium)	87 (10.4)	503 (28.2)	61 (7.2)	339 (22.7)
10.0 and above (Large)	18 (2.2)	306 (17.2)	12 (1.4)	183 (12.2)
Total	833 (100.0)	1784 (100.0)	844 (100.0)	1496 (100.0)

Annexure 10.1 (Concld.)

Number and Area of Operational Holdings — Zone-wise

Size Class (ha)	1970-71		1976-77	
	Number ('000)	Area ('000 ha)	Number ('000)	Area ('000 ha)
III. *Eastern Ghat Districts*				
Below 1.0 (Marginal)	176 (30.1)	123 (7.6)	206 (33.0)	121 (8.5)
1.0—2.0 (Small)	194 (33.2)	322 (20.0)	186 (29.8)	265 (18.6)
2.0—4.0 (Semi-Medium)	102 (17.5)	311 (19.3)	143 (23.0)	397 (27.9)
4.0—10.0 (Medium)	94 (16.1)	577 (35.8)	72 (11.6)	413 (29.1)
10.0 and above (Large)	18 (3.1)	280 (17.3)	16 (2.6)	226 (15.9)
Total	584 (100.0)	1613 (100.0)	623 (100.0)	1422 (100.0)
IV. *Coastal Plain Districts*				
Below 1.0 (Marginal)	832 (53.3)	379 (18.1)	916 (56.8)	437 (22.2)
1.0—2.0 (Small)	486 (31.1)	704 (33.5)	421 (26.1)	569 (28.9)
2.0—4.0 (Semi-Medium)	152 (9.7)	448 (21.3)	202 (12.5)	516 (26.3)
4.0—10.0 (Medium)	83 (5.3)	438 (20.9)	67 (4.2)	364 (18.5)
10.0 and above (Large)	9 (0.6)	130 (6.2)	6 (0.4)	80 (4.1)
Total	1562 (100.0)	2099 (100.0)	1612 (100.0)	1966 (100.0)

Annexure 10.2

Cropping Pattern — Northern Plateau Districts

Crop	Area ('000 ha)	Per cent of gross cropped area	Crop	Area ('000 ha)	Per cent of gross cropped area
Rice			Rapeseed and mustard	22.6	1.9
i) Autumn	261.0	22.2			
			Linseed	11.0	0.9
ii) Winter	450.0	38.2			
			Total oilseeds	93.2	7.9
iii) Summer	2.7	0.2			
Total Rice	713.7	60.6	Sweet potato	7.6	0.6
Maize	36.8	3.1	Onion	5.7	0.5
Ragi	10.4	0.9	Total vegetables	68.6	5.8
Wheat	13.5	1.1			
			Fruits	4.2	0.4
Total Cereals	805.2	68.4			
			Total fruits and vegetables	72.8	6.2
Kharif pulses	39.4	3.3			
Rabi pulses	107.0	9.1	Mesta	7.1	0.6
Total pulses	146.4	12.4	Condiments and spices	14.5	1.2
Total foodgrains	951.6	80.8	Gross area sown	1177.0	100.0

Annexure 10.3

Cropping Pattern — Central Table Land District

Crop	Area ('000 ha)	Per cent of gross cropped area	Crop	Area ('000 ha)	Per cent of gross cropped area
Rice			Groundnut	49.0	2.6
i) Autumn	294.0	15.6	Sesamum	53.2	2.8
ii) Winter	674.0	35.7	Total oilseeds	137.2	7.3
iii) Summer	99.4	5.3			
			Sugarcane	11.2	0.6
Total rice	1067.4	56.6			
			Sweet potato	15.7	0.8
Wheat	20.7	1.1	Onion	14.7	0.7
Maize	25.1	1.3	Total vegetables	129.3	6.8
Ragi	30.2	1.6			
			Fruits	5.1	0.3
Total cereals and millets	1248.7	66.0	Total fruits and vegetables	134.4	7.1
Kharif pulses	116.4	6.2			
			Mesta	12.3	0.7
Rabi pulses	169.9	9.0	Chillies	17.9	—
Total pulses	286.3	15.2	Total condiments and spices	25.8	1.3
Total foodgrains	1535.0	81.2	Gross area sown	1890.0	100.0

Annexure 10.4

Cropping Pattern — Eastern Ghat Districts

Crop	Area ('000 ha)	Per cent of gross cropped area	Crop	Area ('000 ha)	Per cent of gross cropped area
Rice			Nigerseed	107.4	4.9
			Sesamum	45.7	2.0
i) Autumn	234.0	10.7	Castor	27.8	1.3
			Rapeseed and		
ii) Winter	489.0	22.3	mustard	69.3	3.2
iii) Summer	7.1	0.3	Linseed	19.7	0.9
Total rice	730.1	33.3	Total oilseeds	286.2	13.0
Wheat	15.3	0.7	Sugarcane	15.3	0.7
			Sweet potato	21.5	1.0
Maize	93.9	4.2	Onion	12.9	0.6
			Total		
Ragi	177.6	8.1	vegetables	145.7	6.6
Small millets	205.4	9.4			
			Fruits	4.5	0.2
Total cereals					
and millets	1252.9	57.1	Total fruits and		
			vegetables	150.2	6.8
Kharif pulses	122.7	5.6			
			Mesta	14.1	0.6
Rabi pulses	236.8	10.8	Condiments		
			and spices	52.2	2.3
Total pulses	359.5	16.4	Tobacco	17.0	0.8
Total			Gross area		
foodgrains	1612.4	73.5	sown	2192.0	100.0

Annexure 10.5

Cropping Pattern — Coastal Plain Districts

Crop	Area ('000 ha)	Per cent of gross cropped area	Crop	Area ('000 ha)	Per cent of gross cropped area
Rice			Groundnut	106.6	3.1
i) Autumn	76.0	2.2	Sesamum	49.5	1.4
ii) Winter	1541.0	44.2	Rapeseed and mustard	43.9	1.3
iii) Summer	62.7	1.8	Total oilseeds	219.9	6.3
Total rice	1679.7	48.2			
Wheat	17.6	0.5			
Maize	24.9	0.7	Sugarcane	20.0	0.6
Ragi	118.3	3.4	*Kharif* vegetables	102.4	2.9
Total cereals	1876.3	53.8	Total vegetables	231.5	6.6
Mung	491.8	14.1			
Biri	247.5	7.1			
Kulthi	145.6	4.1	Fruits	8.2	0.2
Kharif pulses	39.0	1.1	Jute	40.7	1.1
Rabi pulses	894.4	25.7	Chillies	27.7	0.8
Total pulses	933.4	26.8	Total condiments and spices	43.1	1.2
Total foodgrains	2809.7	80.6	TOTAL	3487.0	100.0

Annexure 10.6

Area, Production and Yield of Principal Crops — Zone-wise

Area = '000 hectares
Production = '000 tonnes
Yield = Kg/ha

Crop	Area			Production			Yield		
	Triennium ending 1972-73	Triennium ending 1980-81	1981-82	Triennium ending 1972-73	Triennium ending 1980-81	1981-82	Triennium ending 1972-73	Triennium ending 1980-81	1981-82
I — Northern Plateu Districts									
Rice									
Autumn	183.7	281.3	739.0	86.6	144.0	635.0	471	511	859
Winter	547.0	481.0		474.0	445.0		866	925	
Summer	2.7	2.2	3.3	2.8	2.2	4.1	1037	1000	1242
Total	733.4	764.5	742.3	573.4	559.2	639.1	782	731.4 (72.2)	861
Wheat	5.7	9.8	12.2	9.6	20.9	26.9	1684	2132 (153.4)	2204
Maize	0.1	28.1	30.2	11.2	18.6	27.3	695	661 (71.8)	904
Ragi	2.6	7.3	8.5	1.2	4.9	3.5	461	671 (106.3)	411
Gram	6.7	11.5	9.1	4.4	5.0	4.7	656	434 (62.0)	516

Annexure 10.6 (Contd.)

Area, Production and Yield of Principal Crops — Zone-wise

Crop	Area			Production			Yield		
	Triennium ending 1972-73	Triennium ending 1980-81	1981-82	Triennium ending 1972-73	Triennium ending 1980-81	1981-82	Triennium ending 1972-73	Triennium ending 1980-81	1981-82
Tur	6.1	11.1	14.3	3.1	6.0	7.7	508	540 (53.2)	538
Rapeseed & mustard	8.5	20.4	14.9	4.5	10.1	7.4	529	495 (116.2)	496
Sesamum	7.1	11.8	17.2	3.5	4.6	7.9	493	389 (96.1)	459
Jute*	2.7	2.6	3.1	15.7	17.6	18.0	1046	1218 (96.1)	1045
Mesta*	5.2	6.6	8.4	24.5	33.3	41.0	838	908 (93.7)	878
Sugarcane (Gur)	1.2	2.0	2.6	7.8	9.9	14.2	6500	4950 (59.8)	5461
II — Central Table Land Districts									
Rice									
Autumn	340.0	300.3	964.0	195.6	144.6	919.0	575	481	953
Winter	789.3	675.0		744.3	657.3		943	974	
Summer	91.2	90.2	96.6	121.8	130.0	143.5	1336	1441	1485
Total	1220.5	1055.5	1060.6	1061.7	931.9	1062.5	870	875 (86.4)	1002

Annexure 10.6 (Contd.)

Area, Production and Yield of Principal Crops — Zone-wise

Crop	Area			Production			Yield		
	Triennium ending 1972-73	Triennium ending 1980-81	1981-82	Triennium ending 1972-73	Triennium ending 1980-81	1981-82	Triennium ending 1972-73	Triennium ending 1980-81	1981-82
Wheat	11.4	19.4	22.5	20.9	33.6	39.8	1833	1732 (124.6)	1769
Maize	9.8	19.4	19.0	7.6	15.5	17.3	756	799 (86.8)	911
Ragi	10.0	23.6	24.1	6.1	14.3	21.1	610	606 (96.1)	876
Gram	5.2	8.8	7.6	2.5	4.0	3.9	481	455 (65.0)	513
Tur	8.2	13.6	20.1	4.2	6.1	10.9	512	449 (44.2)	542
Sugarcane (Gur)	7.8	12.4	11.5	50.0	76.1	72.2	6410	6137 (74.2)	6278
Groundnut	39.7	50.4	63.8	42.3	46.0	83.7	1065	913 (88.3)	1312
Rapeseed & mustard	10.9	26.2	24.5	5.1	13.3	12.3	468	508 (119.2)	502
Sesamum	31.7	57.7	72.3	16.6	20.0	28.5	524	347 (85.7)	394
Mesta*	9.6	11.1	11.3	55.0	59.2	53.0	1031	960 (99.1)	844
	III — Eastern Ghat Districts								
Rice									
Autumn	163.6	227.6	730.0	82.3	125.3	649.0	503	550	889
Winter	592.3	488.0		358.2	457.0		605	936	
Summer	4.9	8.0	5.7	4.7	5.8	5.0	959	725	877
Total :	760.8	723.6	735.7	445.2	588.1	654.0	585	813 (80.3)	899

Annexure 10.6 (Contd.)

Area, Production and Yield of Principal Crops — Zone-wise

Crop	Area			Production			Yield		
	Triennium ending 1972-73	Triennium ending 1980-81	1981-82	Triennium ending 1972-73	Triennium ending 1980-81	1981-82	Triennium ending 1972-73	Triennium ending 1980-81	1981-82
Wheat	4.4	13.4	11.7	5.4	19.0	16.7	1227	1418 (102.0)	1427
Jowar	12.8	22.3	23.4	7.6	15.0	22.6	594	672 (116.9)	966
Maize	39.4	72.9	86.7	28.8	53.8	108.0	731	738 (80.2)	1245
Ragi	83.0	149.1	149.6	69.3	71.4	118.6	835	479 (75.9)	793
Gram	7.0	21.7	23.5	3.7	10.8	12.6	529	498 (71.1)	536
Tur	28.5	57.8	47.8	15.1	20.0	23.6	530	346 (34.0)	494
Sugarcane (Gur)	9.2	13.7	12.5	48.0	70.6	64.5	5217	5153 (62.3)	5160
Groundnut	6.0	10.6	12.0	7.1	9.2	12.2	1183	868 (84.0)	1017
Rapeseed & mustard	29.1	70.9	58.4	12.1	26.9	26.7	416	379 (89.0)	457
Sesamum	62.8	50.2	65.2	11.2	19.5	28.4	178	388 (95.8)	436
Mesta*	6.4	11.4	14.5	28.8	40.0	71.0	810	631 (65.1)	881
Tobacco	10.4	15.4	12.1	10.0	6.0	5.6	962	389 (59.9)	463
	IV — Coastal Plain Districts								
Rice									
Autumn	60.3	76.6	1589.0	35.6	59.6	1460.0	590	778	919
Winter	1694.6	1536.7		1474.0	1438.3		870	936	

Annexure 10.6 (Contd.)

Area, Production and Yield of Principal Crops — Zone-wise

Crop	Area			Production			Yield		
	Triennium ending 1972-73	Triennium ending 1980-81	1981-82	Triennium ending 1972-73	Triennium ending 1980-81	1981-82	Triennium ending 1972-73	Triennium ending 1980-81	1981-82
Summer	84.1	83.6	32.0	118.7	60.1	37.3	1141	719	1165
Total	1839.0	1696.9	1621.0	1628.3	1558.0	1497 3	885	918 (90.6)	924
Wheat	13.2	15.5	16.5	9.5	31.5	34.9	719	2032 (146.2)	2115
Jowar	5.6	11.3	5.2	0.9	2.9	5.6	160	256 (44.5)	1077
Maize	8.7	35.3	18.1	9.0	12.4	18.7	1034	351 (38.2)	1033
Ragi	56.6	111.1	106.7	56.8	68.2	94.8	1003	613 (97.1)	888
Tur	8.0	22.4	18.1	4.3	8.1	10.0	537	361 (35.6)	522
Sugarcane (Gur)	12.3	17.3	16.2	77.7	133.1	117.7	6317	7694 (93.0)	8216
Groundnut	31.7	69.4	137.6	38.7	109.0	193.3	1220	1570 (151.8)	1405
Rapeseed & mustard	14.3	53.1	37.1	6.4	19.6	20.0	447	369 (86.6)	539
Sesamum	31.3	50.8	30.8	15.6	22.7	14.3	501	447 (110.4)	464
Jute*	42.5	29.8	49.2	291.2	336.5	390.5	1233	2033 (160.3)	1428
Mesta*	8.5	11.0	9.3	53.2	50.3	55.0	1126	823 (84.9)	1064

* Production in thousand bales of 180 kgs. each

Note : Figures within brackets denote the Relative Yield Index (RYI) i.e. zonal yield as per cent of average yield in Eastern India.

CHAPTER 11

CONSTRAINTS TO GROWTH

11.1 *Dimensions of the Problem*

11.1.1 The review of past trends in agricultural production and productivity in the State presented in the earlier chapters indicate that the performance of agriculture has been rather poor. The annual compound growth rate in foodgrains production during the decade ending 1980-81 was less than one per cent. Besides the poor growth rate noticed in output, there have also been wide year to year fluctuations.

11.1.2 The State, however, has good potential to achieve a much higher rate of growth. But, this may not come off if the present agricultural production strategy is continued. There is, therefore, need for a new reorientation of this policy. It should aim at the twin objectives of raising productivity per ha and per capita. The new strategy should also aim at promoting spread of agro-based and agro-related industries in rural areas, thereby expanding the scope for rural employment in the non-farm sector. Such a process would also help in reducing the man-land ratio.

11.1.3 A strategy for accelerated growth, however, may not be easy to implement because of several impediments. Therefore, it will be necessary at the outset to identify the main constraints which have impeded growth so far. The general constraints may be classified into three broad categories, viz, (i) social and structural, (ii) organizational, and (iii) technological. The constraints, faced by Orissa are by and large common to the eastern region, which are spelt out in Chapter 4 of Part 1 of our Report. They are briefly reviewed in the following paragraphs. This is followed by certain specific constraints experienced by Orissa at the zonal level.

11.2 *Social and Structural Constraints*

11.2.1 *Agrarian Structure*: About 74 per cent of the farm operators are small and marginal farmers, with 2 ha or less. These holdings are not only small in size, but also highly fragmented. Consolidation of lands has made some progress. Area covered

is still small but much more remains to be done. Landless or near land-less constitute about 37 per cent of the total agricultural workers. Off-farm employment opportunities in agro-based rural industries and services which could have absorbed surplus labour have not expanded.

11.2.2 Tenancy is prohibited in the State except in some hardship cases. However, concealed tenancy exists. Practice of sharecropping is widespread. The State Government has not taken the initiative to launch a programme like 'Operation Barga' as in West Bengal for recording of sharecroppers. As tenancy laws are not effectively enforced, unrecorded sharecroppers are not able to obtain credit from financial institutions. This has affected agricultural productivity.

11.2.3 Small and fragmented size of holdings and absence of clearly defined tenancy and sharecropping arrangements are some of the major constraints for investment in agriculture and improvement of productivity.

11.2.4 *Rainfall Pattern*: The State receives plenty of rainfall. Average annual precipitation is around 1480 mm., falling within 75 days. However, it is erratic. The intermittent long dry spells at crucial periods of plant growth affect agricultural productivity.

11.2.5 *Temperature*: The average temperature in the State is suitable for rice production. However, short and mild winter of the State does not favour wheat cultivation.

11.2.6 *Natural Calamities*: Flood, drought and cyclones are major constraints which adversely affect agriculture in Orissa. While floods of varying intensities occur almost every year in some part or other of the State, severe drought conditions are experienced generally once in three years. The coastal areas are vulnerable to cyclones. On account of the frequent occurrence of these natural calamities, agricultural production in the State has not shown stability. During the last 19 years, natural calamities occurred in 11 years, leading to substantial loss in crops.

11.2.7 *Problem Soil Areas*: Soil types differ widely from highly acidic to slightly alkaline soils. Acidic soils are found in large parts of the State. It is estimated that about 4 lakh ha are expo-

sed to saline inundation, 3.5 lakh ha to flooding and 0.7 lakh ha to waterlogging, particularly in the deltaic areas in the State.

11.2.8 *Deficiency in Nutrients*: The residual soils of the uplands are low in organic matter and nitrogen with high phosphorus fixation capacity. Production on these lands is limited both by fertility and water holding capacity. The soils in the low lands are moderately fertile.

11.2.9 *Pests and Diseases*: Crop production is affected by the attack of insects, pests and diseases. Blast and bacterial leaf blight have become major diseases limiting rice production.

11.3 *Organizational Constraints*

11.3.1 *Input Delivery System*: There is a shortage of certified seeds and fertilizers in the State. Arrangements for input distribution particularly in interior areas are not satisfactory. Most of the input distribution outlets are located at block headquarters and therefore, farmers have to walk long distances for procuring inputs. Lack of adequate storage facility at block level or below also hampers timely supply of inputs.

11.3.2 *Credit*: Flow of institutional credit for financing of inputs and on-farm investments is affected due to several constraints. Co-operative credit structure is weak and cannot meet the growing credit needs of farmers. Rising overdues of PACS and PLDBs have restricted the capabilities of co-operatives for lending. In the case of LAMPS, large area of operations has affected their efficient working. Commercial banks are still urban-oriented. Moreover their effectiveness is constrained by inadequate branch network in rural areas and lack of adequate staff at the branches. All the institutional credit agencies suffer from shortage of village-biased, skilled and trained manpower at the branch levels. Other major handicaps are inadequate supervision over end-use of credit, lack of follow-up action in the matter of recovery, absence of effective coordination between lending operations of the credit agencies and development programmes of the Government, input supply and extension agencies.

11.3.3 *Electric Power*: Power supply is both inadequate and erratic. Therefore, it has not been possible to promote optimum utilisation of tubewells and pumpsets.

11.3.4 *Marketing Facilities*: Facilities for marketing, particularly of perishable commodities are not satisfactory. As a result, farmers in interior areas do not get remunerative prices for their produce. They are exposed to exploitation by powerful trading rings. Rural godowns, cold storage and processing facilities are not adequate.

11.3.5 *Coordination*: Several Departments are connected with development of agriculture and allied activities. However, coordination among them is unsatisfacory. This is so even at district level. This has affected implementation of agricultural developmental programmes.

11.4 *Technological Constraints*

11.4.1 *Water Management*: The State has been endowed with large surface and groundwater resources. However, in the absence of efficient and scientific water management, the State has not been able to derive optimum benefit. At the end of 1980-81, only 20 per cent of the total cropped area was irrigated. During the *rabi* season, irrigation was available only in 5 lakh ha or 29 per cent of the cropped area. About 80 per cent of the *kharif* rice crop is grown under unirrigated conditions. The water from high lands is lost by seepage and percolation. Medium and low medium lands face problem of waterlogging. Further, owing to erratic nature of rainfall, there is a tendency to impound as much water as possible in the field. Excess water thus impounded affects agricultural productivity.

11.4.2 In the major irrigation projects, optimum benefit is not obtained due to absence of adequate on-farm development works such as field channels, field drains, etc. Out of the irrigated area of about 5.3 lakh ha under major irrigation projects, only 12,000 ha have been covered by on-farm development works, which permit controlled supply of water below the outlet level. In the rest of the areas, field to field irrigation is still in practice. Heavy seepage from canals, lack of regulatory structures at distribution points and field to field irrigaion below the outlet level leads to wastage of water, counter-productive inundation, waterlogging in low lying areas and scarcity of water in tail reaches at crucial stages. Maintenance of canal system is poor due to lack of funds. Further, water rates are low. They do not cover even the maintenance cost of the irrigation system.

11.4.3 Groundwater exploitation has not received adequate attention in the State. Groundwater tapped ranges from 1 per cent in Koraput district to 18 per cent in Balasore. Main reason for the poor groundwater exploitation is the preponderance of small and marginal farmers who do not have adequate resources for investment in dugwells, tubewells and pumpsets. The State Lift Irrigation Corporation has installed a number of deep tubewells and river lift irrigation (RLI) projects in the State. However, as the water rates are uneconomic, the Corporation is incurring heavy losses. Further, the capacity of deep tubewells and RLIs constructed by the Corporation is not fully utilised, due partly to erratic power supply and partly to absence of adequate field channels. As a result, one deep tubewell irrigates about 25-30 ha only as against an average command area of abuot 100 ha.

11.4.4 *Machinery and Implements*: Farmers continue to use the age old traditional farming tools and implements. Modern implements such as improved ploughs, seed-cum-fertilizer drills suited to the locality, etc., are either not available or not sufficiently demonstrated. where available.

11.5 *Problems of Agriculture in Tribal Areas*

11.5.1 The primary constraints to growth of agriculture in tribal areas is the failure to adapt or evolve development programmes in harmony with customs and life style of the tribals. The growth process in its initial phases has to be gradual and within the framework of obtaining socio-economic milieu. Some of the major constraints on modernising tribal agriculture are lack of the right type of institutions (especially credit and financial institutions) to motivate tribals to invest in modern agriculture, lack of administrative structure which is fully aware of and responsive to tribal customs and rquirements, over-exploitation of forest resources, etc.

11.6 *Research*

11.6.1 The main gaps in research are the following.

(i) Soil management in situations of surface erosion due to excessive run off, acidity and high salinity, deep sub-mergence and waterlogging.

(ii) Water harvesting technology under rainfed conditions.

(iii) Resource inventory studies on watrshed basis.

(iv) Crop-varietal research such as methods of sowing, manurial practices etc., in the case of rice, wheat varieties suited for pre-winter and winter seasons, identification and adaptation of HYV oilseeds, pulses, coarse grains, etc.

(v) Agricultural practices, e.g., cultivation on hill slopes by tribals, methods and dosages of fertilizer application, particularly crops such as coarse grains, oilseeds, etc.

(vi) Location specific pest and disease control measures in respect of major disease-prone crops.

(vii) Cropping patterns for difficult areas such as flooded/sub-merged areas, saline areas, acidic soils, etc.

(viii) Forest and pastural programmes and fuel tree growing.

(ix) Dairy farming and goat breeding in plateau regions.

11.7 *Specific Problems of Agro-climatic Zones*

11.7.1 Specific constraints faced by different agro-climatic zones are given below.

11.7.2 *Northern Plateau*

(i) Soil erosion is an acute problem in uplands due to excessive run-off water which erodes fertile soil.

(ii) High moisture stress render the raising of a second crop difficult under rainfed conditions.

(iii) Acidity and low fertility of soils.

(iv) Inadequate irrigation facilities particularly during the *rabi* season.

(v) Lack of short duration high yielding varieties of rice suited to farming conditions in these districts.

(vi) Lack of improved varieties of oilseeds like niger and small millets, etc., whch are grown extensively by tribals in this region.

(vii) The practice of shifting cultivation by hill tribes impoverishing the fertility of the soil.

(viii) Lack of adequate infrastructure like irrigation, agricultural extension, credit and suitable technology.

11.7.3 *Central Table Land*

(i) Residual soil moisture insufficient for raising of second crop under rainfed conditions.

(ii) Due to erratic distribution of rainfall during monsoon months, some parts of the zone are chronically drought prone.

(iii) Early maturing varieties of rice and millets have not been introduced extensively.

(iv) Multiple and mixed farming schedule for irrigated uplands, medium lands and rainfed uplands has not been determined.

(v) Integrated measures for control of pests and diseases of rice, pulses, groundnut and other crops have not been popularised.

11.7.4 *Eastern Ghat*

(i) Lack of adequate irrigation facilities.

(ii) Research on water harvesting structures has not been undertaken.

(iii) Lack of rice varieties suited to different land situations and also short duration and drought resistant varieties.

(iv) Micro-nutrient deficiencies in soils have not been indentified. Measures for correcting such deficiencies have not been evolved. Research on management of acidic soils and correcting aluminium and iron toxicity is lacking.

11.7.5 *Coastal Plain*

(i) Problems of waterlogging in low lands in canal irrigated areas.

(ii) A part of the zone is flood prone.

(iii) Tidal water gives rise to salinity problems in the coastal areas. Salinity level attains critical limit during the period after cessation of monsoon.

(iv) Salt resistant crop varieties suited to cropping pattern adopted in saline lands have not been popularised.

(v) Irrigation facilities have not been fully developed to support multiple cropping.

11.C.1 In this Chapter, we have highlighted some of the main constraints at the State level and the zone level. For successful implementation of the strategy for accelerated development outlined in this Report, it will be necessary for the State Government to identify the constraints below the zone level, i.e., at district, block or even village level and take necessary steps to overcome these location specific constraints.

CHAPTER 12

POLICY MEASURES FOR ACCELERATING AGRICULTURAL DEVELOPMENT

12.1 *Introduction*

12.1.1 The major constraints impeding agricultural development in the State are given in the preceding Chapter. In this Chapter, the strategy to overcome the constraints and accelerate the process of agricultural development is set out. The main components of this strategy are in the spheres of land policy, irrigation, drainnage and water management, mechanization of farm operations, custom service, rural industry centres, input supply, credit delivery, research, extension and training, ancillary activities and transport and marketing arrangements, etc. These policy measures are more or less common to Eastern India as a whole and are set out in detail in Chapter 7 to 16 of Part I of the Report. The more important of these measures along with location specific measures to overcome constraints at the zonal level are briefly given below.

12.2 *Land Policy*

12.2.1 The basic constraint to improve productivity is the small size and fragmented nature of holdings. The following steps should be taken to reduce their adverse impact:

(i) consolidation of holdings,

(ii) encouragement of small farmers to form small Groups or Associations to deal with common problems,

(iii) leasing of holdings by small and marginal farmers, and

(iv) fixation of a "floor" limit for operational holdings.

12.2.2 Our recommendations on each of the above steps are set out in Chapter 8, Part I. Consolidation of holdings, particularly in irrigated areas as well as areas having good groundwater potential, needs to be given high priority. This should be implemented

in a phased manner, so as to complete the entire operation by the end of the Eighth Plan. Specific allocations for this should be made in State Plans.

12.3. *Irrigation and Water Management*

12.3.1 Water is the most important input for agriculture. The erratic nature of monsoon during the critical periods of plant growth affects productivity adversely. Therefore, the major thrust of development strategy for the State has to be in the sphere of irrigation, drainage, water management and micro-watershed development.

12.3.2 The State has large surface and ground water potential. Efficient utilisation of these resources can provide a very powerful spearhead for agricultural development. Our recommendations in this regard are spelt out in Chapter 9 of Part I.

12.3.3 The present level of utilisation of groundwater in the State is very low. Exploitation of groundwater potential should form the key element of the water management strategy. Major recommendations in this regard are briefly set out below.

(i) The State Government should exploit groundwater to the maximum extent in 'white' areas. In 'grey' areas, this source should be utilised to the extent it can be economically exploited.

(ii) In compact areas, a battery of tubewells and pumpsets, either electric or diesel, may be installed. This will serve a dual purpose - provide irrigation and take out excess water during *kharif*.

(iii) In selected compact areas particularly of the deltaic coastal regions, batteries of tubewell bores and connecting electric lines should be provided free of cost under a Centrally Sponsored Scheme. Individual farmers, farmer groups or local entrepreneurs should be invited to provide pumps and motors on ownership or lease basis. Wherever farmers/farmers' groups and private entrepreneurs are not forthcoming, Government may provide pumpsets and recover lease rent from beneficiary farmers along with water rates.

(iv) For electric pumpsets in compact areas, uninterrupted power supply for at least 8 hours in a day has to be ensured.

Therefore, dedicated lines may be provided in such areas. If dedicated lines cannot be provided, a rotational system of power supply as in Tamil Nadu could be considered as an alternative (*vide* Chapter 9 of Part I).

(v) Sale of water by tubewell owners, particularly small farmers, should be encouraged, as it will help maximise benefit from investment.

(vi) In unelectrified villages or villages where uncertainty of power supply is a persisting problem, farmers should be encouraged to go in for diesel pumps. The State Government should, however, take necessary steps to ensure regular supply of diesel to farmers. As the diesel pumps can be easily transported, pumpset owners particularly, small farmers, should be encouraged to hire out pumpsets to other farmers. This would provide additional income to pumpset owners and at the same time other farmers will be able to get benefit without capital investment.

(vii) For encouraging use of diesel pumpsets, oil companies should set up properly equipped diesel sale and service stations in rural areas on a 'franchise' basis, on the model of what they are doing now for petrol sale and servicing stations in urban areas. Such arrangements are particularly needed in dry areas.

(viii) Tubewells and electric/diesel pumpsets may be owned or leased or operated by (a) individuals or Farmers' Groups/ Associations, (b) public sector agencies or (c) private sector enterprises.

(ix) The ownership of tubewells and pumpsets may prove onerous for small and marginal farmers. Therefore, setting up of leasing companies to provide pumpsets on lease basis should be encouraged in each block. These should operate on a competitive basis. Monopoly by any one agency should be avoided.

(x) In some parts of Orissa, there is good scope for construction of dugwells. Dugwells are popular with farmers (*vide* Chapter 10 Part II). In suitable areas a planned and suitably subsidised programme of construction of dugwells should be undertaken by the State Government under a Centrally Sponsored Scheme. NREP and RLEGP may be utilised for this purpose. The tribal areas should

be given a special priority in the construction of dugwells. However tribals themselves should purchase the pumpsets or hire from leasing agencies. Credit institutions should provide the necessary loan facilities for this purpose.

(xi) A failed well compensation scheme for shallow tubewells/ dugwells should be introduced by NABARD in consultation with Government of India and State Government.

(xii) *Deep Tubewells*: Deep tubewells owned by Orissa Lift Irrigation Corporation (OLIC) are very much underutilised due mainly to poor maintenance, inadequate supervision and negligence of the tubewell operators. Therefore, steps should be taken to achieve optimum utilisation of their potential. For attaining this objective, uninterrupted power supply should be ensured to deep tubewells for at least 8 hours a day. Further their operation and maintenance should be entrusted on a contract basis to beneficiary Farmers' Groups or Associations or a Committee of Beneficiaries, voluntary organizations or private entrepreneurs as may be appropriate.

(xiii) Such contractual arrangements may not be possible in respect of all poorly managed deep tubewells. Therefore, OLIC may continue to manage them. In such cases, one of the following alternative may be adopted.

(a) Shortfall in the resources of the Corporation may be made good from the Budget by the State Government. This should, however, be subject to the condition that the Corporation will meet the cost of operation and maintenance from revenues generated through higher water rates, within a stipulated period.

(b) The State Government may purchase water from the Corporation for sale to the farmers so that the latter will not incur any loss on sale of water due to charging subsidised rates.

(xiv) The prevailing water rates may be reviewed and restructured. Restructuring of water rates may be done on the basis of hours of supply or volume of water released. State Government may also consider the introduction of differential rates — a basic rate for the *kharif* season and the basic plus additional rate for the *rabi* season. These rates my be fixed per acre inch of water supplied or on crop basis.

(xv) Water and electricity charges should be related to actual consumption and should not be charged when there is no supply (*vide* paragraph 9.3.26, Chapter 9 of Part I).

12.3.4 *Surface Irrigation*: The potential created under major and medium irrigation projects is not used optimally due to certain critical gaps in field channels, drains, etc. Hence, high priority should be given to on-farm development works like field channels, field drains. etc., in command areas of irrigation projects. Under a Centrally Sponsored Scheme, the Government of India provides 50 per cent finance for construction of field channels. But owing to paucity of resources, the State Government is not able to finance remaining 50 per cent. Consequently the progress is very slow. Therefore, the Central Government may provide 100 per cent cost of field channels. This would expedite the work of construction of field channels.

12.3.5 Release of water and closure of canals should be timed according to the requirements of crops and weather conditions. The State Irrigation and Agriculture Departments should have close coordination for this purpose.

12.3.6 Water rates charged in canal irrigated areas are low. They are insufficient to cover even costs of operation and maintenance. Therefore, the rates may be enhanced step by step to economic levels.

12.3.7 Lining of canals may be undertaken only in areas where there is heavy loss of water due to seepage.

12.3.8 There is need to encourage conjunctive use of surface and groundwater in the command areas of major and medium irrigation projects through a programme of sinking tubewells. This will help control drainage problem.

12.3.9 As riverlift irrigation schemes are easy to execute in a short time, there is good scope for taking up a large number of such schemes. Such schemes should be taken up even if the benefit of irrigation can be provided during *kharif* season alone. They are particularly useful in drought-prone areas.

12.3.10 *Micro-watersheds and Other Minor Structures*: In rainfed and drought-prone areas, particularly in the Northern Plateau Zone, water harvesting technology should be developed to store rain water. In these areas high priority should be

given for micro-watershed development, farm ponds, check bunds, etc. These works can be executed under various programmes like Drought-Prone Area Programme, NREP, etc.

12·3.11 In hilly areas, minor irrigation structures such as Kolhapur weirs, Mandi type pipe systems and hydrams should be considered.

12.3.12 Farmers are not making full use of tanks and canals due to poor maintenance. These should, therefore, be maintained properly. New tanks should be constructed wherever potential exists. The State Government should pass legislation for taking over of fishing rights on the lines of the Act recently passed by the West Bengal Government.

12.3.13 *Waterlogging and Drainage*: Provision for drainage facilities has not received adequate attention in the State and consequently parts of areas in the districts of Balasore, Cuttack, Ganjam, Kalahandi, Puri and Sambalpur and in some parts of Salandi projects have gone out of cultivation. Therefore, in these areas drainage has to be given top priority. A Master Plan for drainage system should be prepared. In future, when a new major and medium irrigation project is formulated, drainage should be an integral part of the project and should be implemented simultaneously. Suitable crops which can withstand waterlogging and flooding in the initial stages of plant growth need to be encouraged. The State Government should take advantage of research work already done in this area.

12.3.14 Besides the general measures for improving irrigation and water management outlined above, specific measures suited to different agro-climatic zones are indicated below.

12.3.15 *Northern Plateau*

(i) Crops in many areas of Northern Plateau zone wither away due to long dry spells during the monsoon which causes severe moisture stress resulting in partial or even total failure of crops. To overcome this constraint, it is necessary to undertake watershed planning.

(ii) Micro-watershed development and agro-forestry need to be given special priority in this zone.

(iii) Under rainfed farming, it is necessary to develop water harvesting technology for utilisation of excess run-off water. It is also necessary to develop and popularise soil and water management practices.

12.3.16 *Central Table Land*

(i) Many areas in this zone are drought-prone. The State Government should implement the recommendations of the National Committee on Development of Backward Area on development of drought-prone areas (*vide* Appendix 8, Part I).

(ii) In the irrigated areas of Hirakud Project, it may be ensured that potential created is utilised to the optimum extent and fields at the tail-end are not starved of irrigation.

(iii) Schemes should be formulated for storing surface water wherever supply is plentiful to provide a cushion against vagaries of monsoon. In Bolangir and Dhenkanal districts, irrigation facilities should be augmented.

12.3.17 *Eastern Ghat*

(i) At present, irrigation is available only in 6.5 per cent of net sown area of the zone. It is, therefore, necessary to undertake an integrated programme of water harvesting, water management, lift irrigation and contour bunding.

(ii) Micro-watershed development and agro-forestry have to be accorded special priority in this zone.

12.3.18 *Coastal Plain*

(i) Measures should be taken for maximum utilisation of irrigation in this zone. Farmers should be educated about the benefits of on-farm development like construction of field channels, drainage, etc,. as well as economy in the use of irrigation water.

(ii) Waterlogging is a serious problem in some parts of this zone. It is, therefore, necessary to formulate a Master Plan for drainage development and improve drainage facilities.

(iii) The zone is rich in groundwater resources which need to be developed. Conjunctive use of rainfall, surface and groundwater resources would be helpful in increasing agricultural production.

12.4 *Crop Planning*

12.4.1 Our recommendations on crop planning are set out in Chapter 8 of Part I of the Report. These are briefly listed below.

12.4.2 In monsoon areas, steps should be taken for contingency planning against uncertainty of rainfall. On the basis of rainfall data given in Part VI of the Report, contingency plans should be prepared district-wise. Contingency planning suggested for Bhubaneswar by All-India Coordinated Research Project for Dryland Agriculture may be studied by the State Government and improved upon, if found necessary. Similar plans should be prepared for other districts as well.

12.4.3 In areas where rainfall is inadequate and erratic, farmers should be persuaded to mix with or substitute rice by low duty crops like millets, pulses, etc. Similarly, in areas where irrigation during *rabi* is limited, efforts should be made to economise water by giving preference to wheat over summer rice.

12.4.4 Rice is grown extensively in the State irrespective of suitability of land. Consequently, the yield in some areas in Northern Plateau and Central Table Land and Eastern Ghat districts is very low. To improve productivity per unit of area, it is necessary to diversify agriculture and farmers should be persuaded to grow alternative crops like pulses, maize, small millets and oilseeds. For encouraging small and marginal farmers to undertake cultivation of suitable crops, incentives in the form of inputs and credit as also facilities for marketing the produce should be provided.

12.4.5 Use of marginal and sub-marginal lands for cultivation of rice should be discouraged. In such areas, coarse grains and fodder crops should be promoted instead.

12.4.6 Small and marginal farmers should be encouraged to go for mixed farming.

12.4.7 The State Government should encourage community nurseries to ensure early sowing of paddy. This will save the crop from the effects of delayed and erratic rainfall.

12.4.8 Adaptive research stations located in different agro-climatic zones should evolve suitable cropping pattern based on rainfall, soil and agro-climatic conditions.

12.4.9 *Rainfed and Dry Farming*: In rainfed areas, cultivation of drought resistant and early maturing crops should be encouraged. Dry farming techniques should be vigorously pursued to preserve the moisture present in soils. In drought-prone areas, cultivation of pulses, millets and oilseeds should be encouraged. In heavy rainfall areas, varieties of deep water paddy and flood tolerant varieties of other crops should be introduced.

12.4.10 In Northern Plateau, districts, soil erosion should be checked through afforestation, contour bunding, contour ploughing and other soil conservation methods.

12.5 *Development Strategy for Small and Marginal Farmers*

12.5.1 In the case of small and marginal farmers, a significant improvement in their incomes cannot be brought about merely by growing staple crops. In small farms with assured irrigation and having access to motorable roads to marketing centres, farmers should be encouraged to raise, on a part of their holdings, high value crops such as vegetables, flowers, fruits and/or HYV of staple crops. The area devoted to high value crops can be increased step by step. This will improve their incomes from farming operations.

12.5.2 Along with cultivation of high value crops, marginal and small farmers should be encouraged to take up ancillary activities such as animal husbandry, fisheries, etc. Detailed recommendations on growing of high value crops and development of ancillary activities are set out in Chapters 8 and 14 of Part I of the Report.

12.6 *Farm Machinery and Implements*

12.6.1 For improving efficiency of labour, use of modern, but less expensive farm machinery and implements (manually operated water lifts, seed-cum-fertilizer drills, hand sprayers, improved ploughs, winnowers, paddle threshers, wheel hoes and paddy weeders, etc.) should be encouraged.

12.7 *Input Supply*

12.7.1 Our recommendations on input supply policy are set out in Chapter 10, Part I. They are briefly presented below.

12.7.2 *Seeds*: The State is experiencing shortage of HYV/improved seeds. The Orissa Agriculture University and Central Rice Research Institute have been evolving varieties suitable for different agro-climatic regions. Steps should be taken for multiplication of those varieties. In the case of seeds of crops like wheat, which are usually procured from outside the State, the State Government should ensure quality as well as timely supply. Seed storage and distribution centres should be set up preferably at Panchayat level, but not necessarily by the Government alone.

12.7.3 *Fertilizers*: For improvement of fertilizer consumption in *kharif* season, new practices such as placing fertilizer below seeds through use of seed drills, etc., should be popularised which would reduce the loss of fertilizers on account of heavy rains.

12.7.4 Distribution network needs to be strengthened, particularly in hilly and interior areas. Steps should be taken to cover every Punchayat by a distribution centre by the end of the Seventh Plan.

12.7.5 Use of bio-fertilizers like blue green algae (BGA) should be encouraged.

12.7.6 *Pesticides*: The pest surveillance units need to be strengthened. Farmers should be educated about damage to crops from pests and diseases and measures for controlling them. Facility for hiring of pest control equipment like sprayers etc., should be provided to farmers. The State Government should also check the quality of pesticides sold by private traders to prevent adulteration.

12.8 *Credit*

12.8.1 The reorganisation of credit structure and improvements required in the credit policies are discussed in Chapter 15, Part I.

12.9 *Insurance*

12.9.1 The State Government in consultation with GIC should introduce an insurance scheme for all types of productive invest-

ments such as tubewells, pumpsets, machinery, etc. Crop insurance should be made compulsory for all bank-financed schemes and government programmes.

12.10 *Agricultural Research, Extension and Training*

12.10.1 Improvements required in agricultural research, extension and training are discussed in detail in Chapter 11, Part I. Specific suggestions in respect of Orissa are given below.

12.10.2 *Results of Research Available on Shelf*: Significant achievements in agricultural research have been reported by various ICAR Institutes, Agricultural University and the State Department of Agriculture. The principal areas of research relate to (i) raising the yield potential of crops, (ii) achieving stability in agricultural production, (iii) breeding high yielding varieties resistant to various pests and diseases and also drought resistant, salt tolerant varieties, (iv) improvement in crop production technology for dry land areas, (v) irrigation scheduling in crops, (vi) integrated pest management, (vii) post-harvest technology, (viii) upgrading indigenous breeds of livestock in addition to cross breeding with exotics, (ix) evolution of high yielding strains of poultry, (x) development of high production technology for fisheries and (xi) design and fabrication of improved agricultural implements and machinery.

12.10.3 Reseacrh findings suited for extension to the field are listed on an illustrative basis in Annexures 12.1 to 12.3 separately for staple crops, high value crops, new practices in crop production and improved implements. The recent recommendations of the CRRI for increasing productivity of rice are given in Annexure 12.4. Similar research findings in animal husbandry and fisheries are given in Chapter 14, Part I of our Report. Besides, work being done at the international institutions like the IRRI, Manila and the AVRDC, Taiwan might also provide suitable technologies/varieties for the State. The State Government and the OUAT might undertake a collaborative exercise to prepare an exhaustive list of findings of research on the shelf suitable for field application in various agro-climatic situations of the State. It is also necessary to investigate the reasons for non-adoption of research findings cleared by the adaptive research stations.

12.10.4 *Coordination Arrangements*: Closer coordination is necessary between research and extension for ensuring effective transfer of feasible technology to the field. The Orissa Agricultural Development Project (OADP) contained provisions for improving coordination between the various agencies conducting research so as to avoid any duplication of research effort as also for horizontal linkages between the University and the State Departments of Agriculture, Animal Husbandry, etc. This was essential since the University had to function as the clearing house for all technologies developed and offered for adoption in the State.

12.10.5 *Recommendations of CRRI for Increasing Rice Productivity*: The CRRI has made some useful suggestions for rice production. These are given in Annexure 12.4. The State Government should examine these suggestions and take effective steps to implement them.

12.10.6 *Agricultural Extension and Training*: Orissa was one of the first States to adopt the T & V system. The recently terminated Orissa Agricultural Development Project (OADP) had become effective from July 1977. While the physical performance of the project has generally been good in comparison with many other projects in India, the progress measured against targets has been behind schedule in all components. There remain a number of staffing short-falls, some serious, which continue to impede progress. Under the project, the number of village agritural workers allowed an average ratio of 1: 600 farming families. Around 6000 VAWs were in position (November 1983) against the sanctioned strength of 6500. There were 91 vacancies of AEOs, 36 of SMS at district level and 26 at range level.

12.10.7 For details of various measures on extension, reference may be made to Chapter 11 of Part I.

12.11 *Specific Suggestions for Agro-climatic Zones*

(i) *Northern Plateau*: The adaptive research stations in the Northern Plateau Zone should concentrate on development of improved rainfed agriculture and package of practices to improve productivity.

(ii) *Central Tableland*: In order to minimise the effects of erratic rainfall and long dry spells during the rainy season, the adaptive

research stations in this zone should develop suitable millet varieties and early maturing varieties of rice tolerant to moisture stress.

(iii) *Eastern Ghat*: The adaptive research stations should develop suitable rice varieties for different levels/situations and also a package of practices for *jhola* rice cultivated in tribal areas. For this region, research is also needed for identification of wheat varieties suitable for pre-winter and winter season. Further, research is required for evolving *ragi* varieties of different maturity groups to fit into multiple cropping patterns and identification of high yielding varieties of other millets. The adaptive research stations should also develop a package of manurial, cultural and plant protection practices so that cultivation of vegetable crops is remunerative to farmers.

(iv) *Coastal Plain*: The adaptive research stations in this zone should devise suitable amelioration measures and culturable practices for saline soils. Salt tolerant varieties need to be evolved. There are some flood prone and waterlogged areas in this zone. For such areas, suitable flood tolerant varieties/cropping patterns should be evolved. Similarly, suitable HYV varieties of rice need to be evolved to be grown under deep water conditions during *kharif* to improve productivity in low lands which is affected by waterlogging and floods every year.

12.12 *Ancillary Activities*

12.12.1 Recommendations on ancillary activities such as animal husbandry, dairy development and fisheries are set out in detail in Chapter 14 of Part I. The State Government should identify suitable areas for different types of activities, select compact areas for development, making adequate arrangements for marketing of products.

12.13 *Rural Industry Centres*

12.13.1 Adequate employment opportunities have to be created in the countryside in the non-farm sector for reducing pressure on land. This calls for effective linkage between agricultural and non-agricultural sectors, through a planned development of marketing and processing units in the secondary markets and other potential growth centres.

12.14 *Marketing*

12.14.1 Agricultural trade in Orissa is traditionally dominated by rice, jute and oilseeds.

12.14.2 There are about 1400 primary village markets and 170 assembling markets in the State. Producers often sell in village markets. They also sell to local traders at the farm site. The traders stock for resale to wholesalers at the secondary markets. The access of producers to wholesale market is limited.

12.14.3 The coverage of markets under the Market Regulation Act is very poor. Less than 10 per cent of the markets is being regulated. Even in the regulated markets, the physical and other facilities provided are inadequate. A large number of commodities traded are not notified.

12.14.4 Two Central Sector Schemes are being implemented for improvement of marketing facilities in various States. However, the coverage under these schemes in Orissa has been thin. Only 12 regulated markets were taken up under the first scheme and 90 under the second. However, only 4 regulated markets under the first scheme and 2 rural markets under the second scheme have entered the second phase of development. It is necessary to step up the targets under these two schemes considerably.

12.14.5 The system of regulation should be extended to all markets according to a time bound programme. The facilities in markets also need to be strengthened to the standards recommended by the NCA and other expert bodies like the National Committee on the Development of Backward Areas (November 1981) set up by the Planning Commission and the Group on Perishable Commodities set up by the Ministry of Agriculture, Government of India. Our recommendations for improving network of regulated markets and the facilities for institutional marketing and marketing of perishable commodities are set out in Chapter 12 of Part I.

12.14.6 As distress sales take place during years of bumper crop, arrangements should be made to siphon off excess produce during years of glut. Procurement agencies should help farmers realise remunerative price for their produce. Therefore these agencies should play a very active role in procurement.

12.14.7 A continuous watch on price trends of important crops on an area to area basis is necessary so that timely corrective measures can be taken in the interest of the producers. We, therefore, recommend the setting up of Watch Groups, consisting of marketing functionaries, farmers' representatives and experts in relevant disciplines at all the major marketing centres. The "Watch Group" would monitor trends in prices of major commodities and report to the State Government and Directorate of Agricultural Marketing.

12.15 *Transport*

12.15.1 The State's road network is fairly satisfactory upto the town level, but inadequate beyond urban limits and scarce in interior areas. The road infrasructure down to the district level has not shown any improvement in the State. However, at the lower level, there is considerable extension of road mileage particularly on behalf of Panchayat Samities and Gram Panchayats. Their length has gone up from 19 thousand kms. in 1970-71 to 67 thousand kms. in 1978-79.

12.15.2 We recommend that the road infrastructure should be considerably strengthened in the State so that it links not only villages to each other but also with market centres and towns. The need for such stregthening is particularly felt in isolated areas of the State generally inhabited by tribals. Such a link-up, as also development of suitable transport vehicles, is an essential pre-requisite for effective marketing as recommended by us in Chapter 12, Part I of this Report.

12.16 *Storage*

12.16.1 The Agricultural Produce Development and Warehousing Corporation Act was passed in 1956. The Central Warehousing Corporation (CWC) was set up in 1957 to construct and operate warehouses. As a subsidiary of CWC, a State Warehousing Corporation (SWC) has been set up in the State. The CWC and SWC provide specialised storage for Central grain stocks. There is a network of co-operative storages mostly used for input storage.

12.16.2 Traders are making maximum use of the facilities of CWC. SWC facilities are primarily utilised by the State Govern-

ment followed by traders. Co-operatives and producers make only marginal use of these facilities.

12.16.3 The number of rural godowns in the State has gone up from 365 at the end of June 1975 to 1036 by end June 1983. The corresponding increase in the number of market godowns has been from 66 to 302. Total storage capacity in the rural and market godowns has gone up from 53,000 tonnes at end-June 1975 to about 2 lakh tonnes at end-June 1983.

12.16.4 Special measures are necessary to build up storage capacity for use of farmers. Such measures should be accompanied by simplification of procedures for credit delivery to them against hypothecation of their stocks.

12.17 *Perishable and Semi-perishable Commodities*

12.17 1 In areas growing mainly vegetables, fruits, potatoes and other perishable commodities, adequate cold storages facilities should be provided. The cold storage would also be useful for storing milk and poultry products.

12.17.2 Possibilities of export of perishable items have to be explored. For this purpose. production of standardised varieties in demand has to be encouraged. Strict enforcement of quality standards and grading is necessary. Further, processing, packaging and marketing for export purposes has to be organised on institutional basis and not left entirely to trade. The State Government should promote one public sector organisation and encourage one or two private sector organizations to enter export trade in these commodities on competitive basis. The State Government may consider establishing a Horticulture Marketing and Processing Company, if necessary, as a joint venture with private sector.

12.18 *Agriculture in Tribal Areas*

12.18.1 Recommendations for agricultural development in tribal areas are set out in Chapter 13 of Part I.

12.19 *Management and Organisational Reforms*

12.19.1 The administrative departments and agencies involved in management of various programmes should be reoriented and geared to achieve optimal efficiency. The main areas where

improvements are needed are indicated in Chapter 7 of Part I of the Report.

12.19.2 *Monitoring and Evaluation*: For monitoring and evaluation of the various programmes implemented, a special cell may be created. The Union Ministry of Agriculture should in consultation with NABARD, evolve suitable guidelines for this cell.

12.20 *Appointment of Standing Committees*

12.20.1 We recommend the appointment of two Committees, *viz.*, (i) Ministerial Committee headed by the Chief Minister and (ii) The Commitee of Secretaries headed by the Chief Secretary. Their composition and functions are described in Chapter 7, Part I.

12.21 *Other Follow-up Action*

12.21.1 *Improvement in the Method of Crop Estimation*: The method of estimating yield rates needs a close examination. Presently, the crop cuttings where nil yield is obtained due to crops damaged by drought/flood/cyclones/hailstorm also find a place in the data used for arriving at the average yield. Similarly, fallow lands also become part of sample and, therefore, deflate average yield. Therefore, sampling methods should be reviewed to avoid such discrepancies.

12.21.2 *Compact Area Programme*: The Compact Area Programme introduced in the State has shown that with the available technology, a break-through can be achieved in agricultural production through single line administration. The State Government should cover more areas under this programme so that this can have demonstration effect on other farmers.

12.22 *Improvements Needed in Agricultural Statistics*

12.22.1 For a proper understanding of the current trends in agricultural production and the technological, ecological and other constraints hampering agricultural growth, up-to-date information on various aspects of agriculture at micro-level are necessary. However, reliable agricultural statistics, particularly below district level are lacking. Steps should, therefore, be taken to improve the collection of agricultural statistics.

Annexure 12.1

Improved Varieties of Staple Crops

Major crops of the State are rice,* ragi and maize among cereals, pulses, groundnut, mustard and sesamum among oilseeds, fruits and vegetables and spices and condiments. These crops accounted for 85 per cent of the gross cropped area in 1980-81. Besides, wheat and jute are also grown to a considerable extent. A large number of crop varieties comprising cereals, oilseeds, forage crops and jute have been tested and identified as suitable for propagation in Orissa. An illustrative list of recommended varieties of different crops other than rice is given below:

1.	Wheat	Recently released Sagarika (OW-6), Ulkalika (OW-801-3).
2.	Maize	Synthetics such as BSM-2, BSM-3 and 4F-11.
3.	Ragi	Nilachal, Dibyasingha, AKP-7, A 2-3-4, B-77-43, Mug-18 (white grained).
4.	Pulses	Mutant lines of green gram (TT 9E) under popular name Dhauli and blackgram (B12-4) named 'Sarala'.
5.	Jute	JRC-4444 (Baldev) and TU-40.
6.	Groundnut	Pedigree line OG-1-13-3 with the popular name of 'kisan' (maturity period of 95 days) and bunch type selection under the popular name of 'Jaw' (suitable for both *kharif* and *rabi*).
7.	Sesamum	BM-7 (Mutant of Vinayak) and Pedigree line B 56.
8.	Niger	Two cultures, viz., IGP 72 and Raichur 70.

* For information on rice, please see Annexure 12.5

Annexure 12.2

Improved Varieties of High Value Crops

Vegetables, fruits, flowers and plantation crops are high value crops. An illustrative list of some of the varieties evolved during recent years for cultivation in the State is given below.

1.	Potato	Kufri lalima for mid-hill regions and plains
2.	Mango	Baneshah, Neelum Suvarnrekha, Latasundari, Totapun red small and Hemsagar.
3.	Banana	Robusta and dwarf Cavendish.
4.	Pineapple	Clones like Kew, Giant Kew, Queen, Jaldhup, etc.
5.	Cashewnuts	Hybrid - 2/12, M-3/2, M-1/2 and Vengurla 36/3
6.	Coconut	Salkhigopal, West Coast Tall, Ganga Baudam and Laccadive Micro.
7.	Chillies	G5, CA-960, X-197, 235, Kalyan/Chaman and BR-Red.
8.	Brinjal	Pusa Purples - long, round and cluster and Mukta Keshi.
9.	Vegetables	Improved varieties of pea, okra, cauliflower, cabbage and pointed gourd, spine gourd
10.	Spices	(a) Ginger - PGS-30 and Kurmaput (local).
		(b) Turmeric - CLS-13 and CLS--18.
		(c) Cardamom - Pattveer unpatti and Mysore large

Annexure 12.3

New Practices in Crop Production

For better utilization of existing resources for attaining higher yields, the following improved practices have been found suitable for the State.

(a) Root-zone placement of urea supergranules coated with *Carbofuran* (WP), Coaltar or neem oil results in considerable reduction in the incidence of gallmidge and stemborer in paddy.

(b) Urea supergranules placed 8 cm. below the soil surface increase the root spread, root volume and total grain yield of rice.

(c) Stomp @ 1 kg. ai/ha as a pre-emergence application very effectively is helpful in controlling the troublesome weed, *Phalaris minor* in wheat fields.

(d) In rice-wheat rotations, the seed rate of wheat should be increased by 25 per cent over the normal when wheat is broadcast amidst *kharif* stubbles. After harvesting rice, 2 ploughings should be given, followed by seeding within the shortest possible time to avoid excessive moisture losses.

(e) Methods of establishment of wheat with minimum tillage after rice have been standardised to minimise the ill effects of late sowing of wheat.

(f) Crops having high yield potential under rainfed conditions are field peas, sunflower, gram and yellow sarson, which get established with minimum tillage.

(g) Commercial cultivation technology of a few edible mushrooms has been standardised along with production of their spawn.

(h) Rice responds positively to phosphate manuring in winter and low lying situations.

(i) In high yielding maize varieties, application of organic manures @10 tonnes/ha in conjunction with inorganic fertilizers, can minimise the requirement of nitrogenous fertilizer to the tune of 40 kg/ha.

(j) On the basis of physiological stages of crop growth, dwarf wheat should be irrigated at crown root initiation, maximum tillering or late jointing, flowering and dough stages.

(k) Mustard must be irrigated at branching and flowering stages.

(l) Effective control of weeds in direct seeded rice was achieved by spraying 1 to 1.5 litres of Butchlor Commercial (*Macheta liquid*) or 3 litres of Nirofen commercial (Tok E-25) mixed with 600 litres of water per ha., 1 to 2 days after sowing.

(m) Effective weed control in transplanted paddy can be achieved spreading 45 kg Butachlor commercail (*Macheta granules*) or 25 kg Nitrofen Commercial (*Tok granular*) on standing water within 4 to 6 days after transplanting.

(n) Gall midge incidence in paddy can be significantly reduced by dipping paddy seedlings in 0.2 per cent dursban solution (a.i) for 6 hours immediately before transplanting.

(o) Supplementing nitrogen to rice crop through application of *Azolla Anabena* complex which fixes atmospheric nitrogen in rice fields.

(p) Package of practices for cultivation of rice in rainfed areas:
(i) *Preparatory Cultivation*: Hot weather cultivation by soil inverting plough during the premonsoon period (April-May). Adoption of stale seedbed practice after the break of monsoon to help conserve rain water and control of weeds. This consists of allowing weeds to come up after the first rains, and then giving a shallow ploughing followed by perfect levelling.

(ii) *Time of seeding*: Seeding when a minimum of 60 mm rainfall is received over a period of fortnight in June ensuring uniform and satisfactory level of crop stand as against that of seeding ahead of rains.

(iii) *Use of quality seeds*: It involves elimination of unfilled grains by screening in brine solution of 100 gm. common salt/ litre of water.

(iv) *Row seeding/drilling*: Optimum distance between row in a drilled crop is 20-30 cms. This facilitates uniform germination besides protection against bird, rodent and ant damages.

(v) *Seed rate*: A seed rate of 75-80 kg/ha (300 viable seeds/ m^2) provides optimum stand.

(vi) *Fertilizer management*: Basal application of 10-15 kg each of P_2O_5 and K_2O/ha for plains and 20-30 kg/ha for hilly terrain. Top dressing with 20 kg N/ha after first weeding during 15-20 days after sowing (DAS) followed by 8-10 kg. N/ha each at 35-40 DAS and at bore leaf stage. Each application of N fertilizer need be followed by ranking for increased efficiency through soil incorporation, preferably in moist soil. Rice belt normally experiencing drought spell in September should prefer application of entire N into two splits while in case of drought spells both in August and September through single application at 20 DAS.

(q) *Mineral nutrition and micro-nutrient requirements*: *Molysdenum* applied as presoaking seed treatment with 1 per cent Ammoum molybdate in black gram could increase nodule number by nearly 200 per cent.

The acid laterite soils are characterised by low phosphate and high Fe content leading to Fe toxicity. Increasing P supply not only alleviates the phosphate needs but also counteracts the Fe toxicity by immobilising Fe within the plants. Grain yields have increased in rice by adequate supply of phosphate and zinc.

Soil application of 5 kg. Borax/ha corrected the deficiency of boron in sunflower grown as a dryland yield crop and seed.

(r) *Application of growth regulators to crop plants*: Foliar application of NAA at 20 ppm has been found to be highly effective increasing seed yield and oil content of seeds of sesamum.

(s) *Wheat sowing*: The best time for sowing in the costal area has been identified to be 20-25 November when cool weather sets in. November 10-15 is suitable sowing time for inland areas. In high altitude locations like Semiliguda, sowing should be as early as 1st November.

(t) *Fodder and forage crops*: Among perennial grasses, hybrid *napier* has proved superior to all other grasses like Guinea and Para. It provides supply of fodder throughout the year. Among cereal fodder crops, M.P. Chari and *Teosuite* have produced higher yield over maize and jowar in *kharif* season.

Annexure 12-4

Package of Practices Recommended for Transplanted Rice in Medium and Low Lands by the Central Rice Research Institute

(i) Selection of suitable high yielding varieties of different durations (early, medium or long propagated by the State Extension Agency/Agricultural University).

(ii) Seed treatment.

(iii) For seed nursery 800 sq.m. are required in *kharif* and 1000 sq. m. in *rabi* for one hectare of land

For dry nursery, light soils are preferable to obtain fine tilth. Long beds of one metre depth are necessary to facilitate weeding and to provide channels of 30 cm. width between beds for drainage and irrigation.

Selected seed should be sown 10 cm. apart and 2 cm. deep in dry nursery to facilitate weeding, prevent bird damage and to ensure good germination. In wet nursery, which can be raised with assured irrigation, sprouted seed should be broadcast on the surface without standing water.

Nursery should be manured with 40 kg. N/ha, 20 kg. P_2O_5/ha and 20 kg. K_2O/ha in *kharif* and 60 kg. N/ha, kg. P_2O_5/ and 30 kg. K_2O/ha in *rabi* to obtain healthy and well grown seedlings and to enable seedlings to establish quickly and withstand adverse climatic conditions after planting. Compost can also be used and the chemical fertilizer reduced proportionately.

Seedlings should be uprooted at the age of 3 weeks in case of early varieties and 4 weeks in case of medium and late duration varieties. Seedlings with leaves are ready for planting.

(iv) Land should be prepared with thorough puddling at least upto 15 cm. depth followed by perfect levelling.

Seedlings should be planted using 2-3 per hill with a spacing of 15 x 10 cm. (*rabi*) to get 66 hills/sq.m. and 15 x 15 cm. (*kharif*) to obtain 44 hills/sq.m. Early planting can help escaping from pests like stem borer and gallmidge.

Application of all phosphate and potash as basal at planting 75 per cent nitrogen before the crop is 4 weeks old — 50 per cent as basal, 25 per cent when the crop is 3 weeks old or 25 per cent nitrogen as basal, 50 per cent when the crop is 3 weeks old. Rest 25 per cent nitrogen should be applied any time between elongation of stem and leaf stage. Incorporate the fertilizers into soil by a rake after application. Keep minimum water at the time of fertilizer application.

CHAPTER 13

INVESTMENT AND CREDIT REQUIREMENTS

13.1 *Investments*

13·1.1 *Agriculture and Allied Services*: The outlay on agriculture and allied services during the Seventh Plan is estimated by us at Rs. 580 crores as against Rs. 285 crores anticipated during the Sixth Plan. The estimate for the Eighth Plan is placed at Rs. 1150 crores.

13.1.2 *Irrigation*: In regard to major and medium irrigation projects, the additional irrigation potential likely to be created is estimated at 3 lakh ha each during the Seventh and Eighth Plan periods.

13.1.3 The additional area that would be brought under minor irrigation is estimated at 4 lakh ha during the Seventh Plan and 8 lakh ha during the Eighth Plan.

13.1.4 For achieving these targets under minor irrigation, substantial investment is necessary for construction of dugwells and installation of pumpsets, etc. We have prepared two estimates, *viz.*, (i) Estimate I which we consider necessary and (ii) Estimate II which is based on past performance (Table 13.1).

Table 13.1. Minor Irrigation Structures

(In '000 units)

Type of investment	Estimates			
	Seventh Plan		Eighth Plan	
	Estimate I	Estimate II	Estimate I	Estimate II
1. Shallow tubewell bores and filter points	15	8	25	20
2. Medium/deep tubewells and riverlifts	8	6	13	13
3. Dugwells	75	50	270	260
4. Pumpsets	120	90	370	350

13.1.5 The additional area that would be irrigated under major, medium and minor irrigation projects during the Seventh and Eighth Plan periods is estimated at about 7 lakh ha and 11 lakh ha respectively. We have also prepared another estimate (Estimate II) according to which, the additional irrigated area would be 5 lakh ha and 10 lakh ha, respectively, during the two Plan periods.

13.1.6 The Government's investment on minor irrigation would cover cost of construction of dugwells and sinking of tubewell bores under Centrally Sponsored Schemes, subsidies to small and marginal farmers and Government contribution to the construction of deep tubewells and riverlifts. Provision has also to be made for extension of electric lines in the case of electric pumpsets needed for dugwells and bores under Centrally Sponsored Schemes. The estimated cost of Centrally Sponsored Schemes for dugwells and tubewell bores and energisation of pumpsets is as under.

Table 13.2. Investment Cost of Centrally Sponsored Schemes for Groundwater Exploitation

(Rs. crores)

	Seventh Plan	Eighth Plan
For tubewell bores and dugwells	50	140
For energisation of pumpsets	25	60
Total	75	200

13.1.7 Investment needed in Orissa for improvement in drainage facilities is of crucial importance. The investment cost on this account has been estimated by us at Rs. 130 crores during the Seventh Plan and Rs. 150 crores during the Eighth Plan.

13.1.8 In view of the importance of on-farm development works in command areas, a provision of Rs. 20 crores during Seventh Plan and Rs. 40 crores during Eighth Plan has been made by us for command area development.

13.1.9 Our estimate of total public investment cost on drainage, command area development and minor irrigation during the Seventh and Eighth Plan periods is given below.

Table 13.3. Public Investment on Drainage, CAD and Minor Irrigation

(Rs. crores)

	Seventh Plan	Eighth Plan
Drainage	130	150
CAD	20	40
Minor Irrigation	250*	400*

* Excluding the investment cost of energisation of pumpsets shown under "Rural Electrification".

13.1.10 *Rural Electrification*: On the basis of certain assumptions (see paragraph 16.3.1, Chapter 16 of Part I), our estimate of investment cost on rural electrification (including energisation of pumpsets for the Centrally Sponsored Scheme) is Rs. 130 crores during Seventh Plan and Rs. 260 crores during Eighth Plan.

13.1.11 *Rural Industry Centres*: Provision has been made for Government outlay of Rs. 55 crores during Seventh Plan and Rs. 75 crores during Eighth Plan for rural industry centres.

13.2 *Credit*

13.2.1 *Short-term Credit*: Based on the assumptions set out in Chaper 16, Part I, the short-term credit requirements are placed at Rs. 690 crores during the terminal year of the Seventh Plan and Rs. 750 crores during the terminal year of the Eighth Plan. Considering the past trends, etc., our lower estimate of short-term credit requirements is Rs. 390 crores and Rs. 540 crores, respectively, for the two reference periods.

13.2.2 *Medium and Long-term Loans*: Our estimate of medium and long-term loans is as under.

(Rs. crores)

	Seventh Plan	Eighth Plan
Minor Irrigation*	150	310
Other purposes@	170	190
	320	500

* Including loans to State Electricity Board for energisation of pumpsets.

@ Including land development, soil conservation, dry farming, animal husbandry, fisheries, forestry, farm machinery, storage and rural industry centres, etc.

13.3·1 The above estimates, according to us, are modest. Efforts should be made to exceed the projected level of disbursements. Vigorous efforts are necessary on the part of Government, credit institutions and NABARD to attain the level of credit flow projected by us. The approach should be to attain a level of short-term credit above the lower estimate in the Seventh Plan and close to the higher estimate in the Eighth Plan. Efforts should also be made to provide larger medium and long-term loans than indicated by us. These may be reviewed in the light of experience gained at the time of mid-term appraisal of each Plan.

CHAPTER 14

CONCLUSION

14.1.1 The performance of agriculture in Orissa during the last two decades has been sluggish. Foodgrains yield did not show any significant variation during 1961-81. In fact, there was a decline in productivity during 1971-81. The State, however, recorded an all-time high in foodgrains production during 1983-84, due to favourable weather conditions.

14.1.2 The improved extension service now available under the T & V system and the beneficial impact of the Compact Area Programme have inspired confidence among farmers. If adequate attention is paid for improving irrigation and drainage facilities and infrastructure particularly for seed production and distribution of seeds and fertilizers, Orissa can considerably improve its productivity.

14.1.3 We have set out in this Report the steps necessary to achieve this end. If these are effectively planned and implemented, we are confident that Orissa can achieve an annual growth rate of 2 - 2.5 per cent in agricultural productivity and over 3-4 per cent in agricultural production during the next 10 years. This will, however, require considerable public investment and credit support from the banking system.

PART IV

BIHAR

CHAPTER 15

INTRODUCTION

15.1.1 Bihar has fertile alluvial soils in most parts, receives good rainfall and has plenty of surface and groundwater resources. Soil and climatic conditions are suitable for growing a variety of crops.

15.1.2 Despite large potential, the progress made by Bihar in the last two and a half decades is not satisfactory. During 1951-61, the State had achieved a compound growth rate of 5 per cent per annum in foodgrains production. This was not sustained thereafter. During 1961-81, the growth rate in production and yield of foodgrains decelerated to 1.2 per cent per annum. With population rising at a higher rate than food production, Bihar is faced with a growing deficit in food supply.

15.1.3 The technological innovations which transformed agriculture in the north-western region of the country have not made any significant headway in Bihar. Yield levels are low. There is a wide gap between the yield levels of the average farmers and those realised by some progressive farmers and in demonstration farms.

15.1.4 No significant changes have taken place in the cropping pattern since early 1960s. Foodgrains continue to be grown in 90 per cent of the cropped area. Notwithstanding an increase in wheat area, rice still accounts for about one-half of gross cropped area.

15.1.5 Although the State has large surface and groundwater resources, only a little over 30 per cent of gross cropped area is irrigated. Out of the identified groundwater potential, only about 25 per cent has been exploited so far.

15.1.6 The State has the necessary potential for attaining a higher growth rate in crop production. However, there are several constraints which need to be overcome if the objective of higher growth rate is to be achieved. In our view, an essential pre-requisite for intensification of agricultural production in the State is the supply of adequate water in a controlled

manner. The spearhead for development has, therefore, to be in the domain of expansion of irrigation and improvement in drainage facilities.

15.1.7 Improvement in irrigation and drainage alone will not be sufficient. These will have to be supplemented by (i) better organization and management of farm operations, particularly in small and fragmented holdings, (ii) larger use of improved tools and machinery so that labour efficiency will improve, (iii) crop diversification from the present low income generating crops to high value crops and high yielding staple crops, (iv) re-orientation of research, extension and custom service facilities with a view to meeting the emerging needs of the farming community and (v) improvement in the delivery system of inputs such as seeds, fertilizers, pesticides and credit. These improvements call for a thorough re-organisation and management of agricultural development programmes, larger Plan investments in agriculture and irrigation and sizeable credit support from the banking system.

15.1.8 Before we outline these policy measures, it may be relevant to set out briefly details of the resource potential of the State. This will serve as a background to the policy framework for a greater use of this potential.

15.2 *Physical Features*

15.2.1 Bihar has a total geographical area of 1.74 lakh sq. km and ranks sixth in the country in terms of area. It lies between 27° 31" and 21° 58" North Latitude and 88° 18" and 83° 20" East Longitude. Administratively, it is divided into 38 districts, 587 Community Development Blocks and 78,027 villages.

15.2.2 The State is divided into three physiographic regions, *viz.*, North Bihar, South Bihar and Chhotanagpur. North Bihar and South Bihar account for 31 and 23 per cent respectively of the State area, while Chhotanagpur plateau accounts for 46 per cent. North Bihar is the most fertile part of the State.

15.2.3 The topography of North and South Bihar is practically plain, while that of Chhotanagpur plateau is undulating. The

latter consists of several plateaus having altitudes ranging between 300 and 1000 m above sea level, with valleys in between.

15.3 *Population*

15.3.1 According to 1981 Census, Bihar has a total population of 70 million. It is the second largest populated State in the country, next only to Uttar Pradesh. It has a population density of 402 per sq. km. The man-land ratio is very high. The number of agricultural workers per 100 ha of net sown area was 198 during triennium ending 1980-81.

15.3.2 Nearly 90 per cent of the State's population is rural. Scheduled Castes and Scheduled Tribes account for about 14 per cent and 8 per cent respectively of the population.

15.3.3 Some basic data on the State's population, along with that for the country, are given in Annexure 15.1.

15.4 *Climate and Rainfall*

15.4.1 The State has a hot summer, wet monsoon and dry cool winter. Maximum temperature varies between 39°C and 23°C and minimum temperature between 26°C and 9°C.

15.4.2 Average annual rainfall in the State is around 1270 mm, with considerable year to year variations. There are also inter-district variations ranging between 990 mm in Nalanda and about 1700 mm in Purnea. About 75 per cent of rainfall is recorded in 50 days during south-west monsoon period from June to September.

15.5 *Soils*

15.5.1 Soils of Bihar may be broadly classified into 6 groups, *viz.*, (i) Recent alluvium, (ii) Young alluvium, (iii) Old alluvium, (iv) Sub-Himalayan and forest, (v) Red and Yellow and (vi) Tal land. The whole of Bihar plains (both north and south) is practically an alluvial tract. The plateau region has red and yellow soils and black forest soils in some parts, which are not fertile. The "tal" lands are found mainly on the backwaters of Ganges and Sone rivers. These lands remain inundated during *kharif* season and only *rabi* crop is raised in such areas (for details agro-climatic zone-wise, see Chapter 17).

15.6 *Land-use Pattern*

15.6.1 During 1980-81, the State's net sown area was 83 lakh ha accounting for around 48 per cent of the total reporting area. Over the last 20 years, there has been no significant change in the land-use pattern, as may be seen below.

Table 15.1. Land Use Pattern

(Area in lakh ha)

Category	1960-61		1980-81	
	Area	Percentage	Area	Percentage
1. Net area sown	80.3	46.3	83.1	48.0
2. Current fallows	13.4	7.7	17.2	9.9
3. Other fallow land	8.4	4.9	9.4	5.4
4. Forests	37.6	21.7	28.3	16.4
5. Area put to non-agricultural use	13.9	8.0	17.2	9.9
6. Barren and uncultivable land	8.5	4.9	10.1	5.8
7. Others*	11.2	6.5	8.0	4.6
Total	173.3	100.0	173.3	100.0

* Includes land under (i) permanent pastures and grazing land (ii) miscellaneous tree crops and (iii) cultivable waste land.

15.7 *Agrarian Structure*

15.7.1 About 75 per cent of the operational holdings are held by marginal farmers and 11 per cent by small farmers. Together, they account for only 42 per cent of the State's cultivated area. On the other hand, medium and large farmers, who together account for only 14 per cent of the holdings, operate as much as 58 per cent of the cultivated area (Table 15.2). The average size of holding is around 1.01 ha. The average size of holding of marginal farmers who account for as much as 75 per cent of farm operators is as low as 0.4 ha.

Table 15.2. Size-wise Distribution of Holdings, 1980-81

Size group	No. of holdings (in lakhs)	Percentage to total	Area (in lakh ha.)	Percentage to total
One ha and below	85.2	75.9	29.5	26.7
Between 1 and 2 ha	12.2	10.8	16.5	14.9
Between 2 and 4 ha.	9.5	8.5	25.9	23.4
Between 4 and 10 ha.	4.7	4.2	27.1	24.5
10 ha and above	0.7	0.6	11.7	10.5
Total	112.3	100.0	110.7	100.0

15.7.2 Not only the average size of holding is small, but it is also very much fragmented. The field investigations conducted by AERC, Santiniketan, revealed that the number of fragments per holding ranged between 17 and 20 in Bihar as shown below.

District	Village	No. of fragments
Nalanda	Khemonbigha	20
—do—	Sathopur	17
Rohtas	Khirodharpur	20
—do—	Pipari	20

The trend towards sub-division and fragmentation of holdings has been increasing over the years. Between 1970-71 and 1980-81, the proportion of holdings of 1 ha and less went up from 64 to 76 per cent.

15.7.3 Although tenancy is prohibited in the State, concealed tenancy exists. Share cropping is widely prevalent. Informal estimates of concealed tenancy indicate that about one-third of the land is held under 'oral' lease arrangements. Settlement has been completed in Kosi Division and districts of Bhagalpur, Gaya, Shahabad and Singhbhum. In Gandak sub-division, Ranchi, Palamau, Dhanbad and Santhal Parganas districts, it has commenced. Districts where it has not yet commenced are Monghyr, Hazaribagh and Patna. Paucity of funds is a major constraint. Up-to-date land records are essential for development.

15.7.4 The programme of land consolidation has been taken up in 16 districts, but progress is slow.

15.8 *Irrigation*

15.8.1 Even though the State is endowed with large water resources, much of it has remained untapped. Out of identified irrigation potential of 124 lakh ha (65 lakh ha under major and medium irrigation projects and 59 lakh ha under minor irrigation), net irrigated area by 1980-81 was only 29 lakh ha.

15.8.2 The State has five major irrigation projects, *viz.*, (i) Gandak, (ii) Kosi, (iii) Sone, (iv) Kiul-Badua-Chandan and (v) Subarnarekha. The first four projects together are expected to provide irrigation to the extent of 14 lakh ha by the end of the Sixth Plan. A further 2 lakh ha is expected to be irrigated by Subarnarekha after completion.

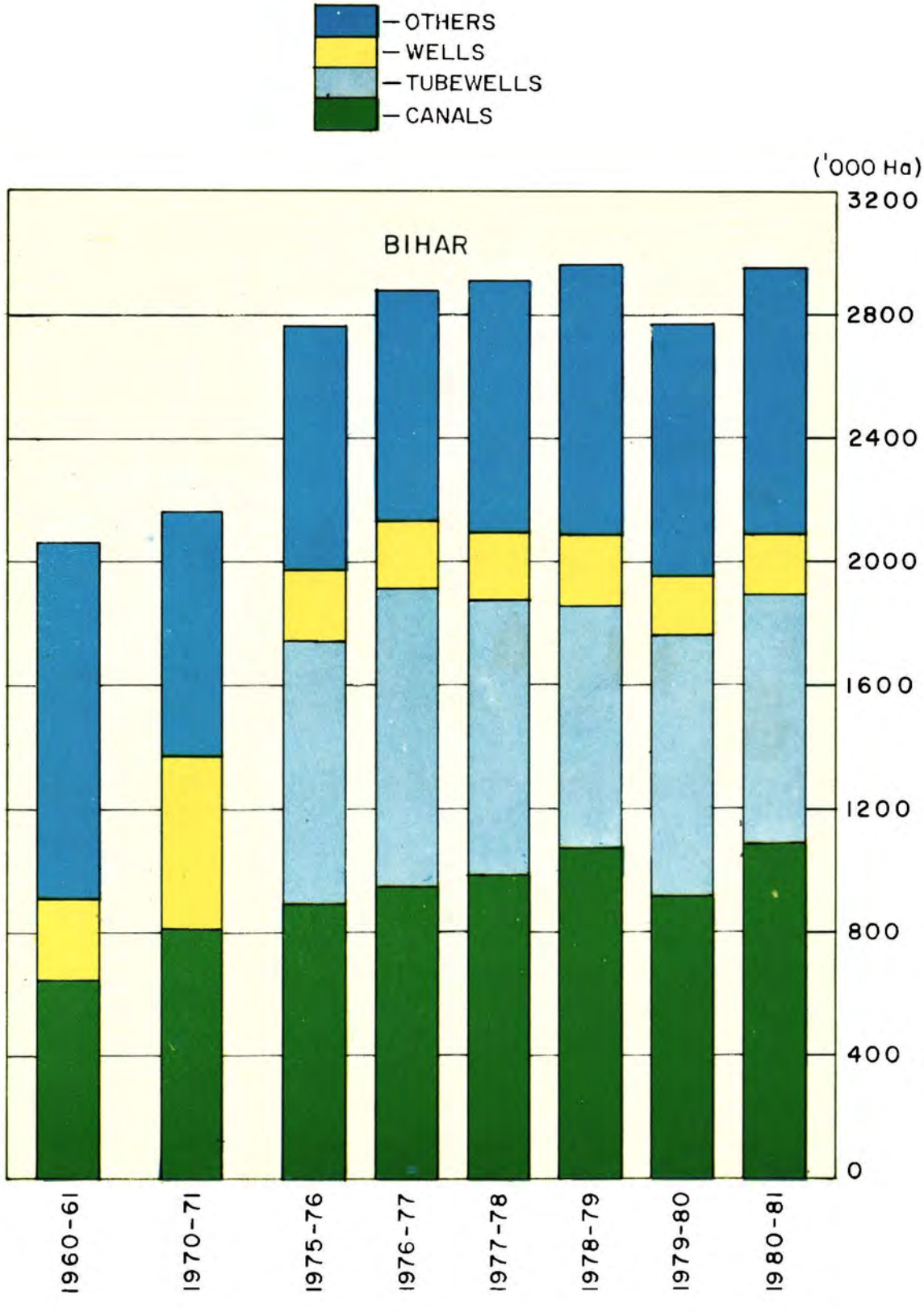
15.8.3 The potential created under major irrigation projects is not fully utilised. About 25 per cent of irrigation potential created is reported to be not utilised because of inadequacy of field channels, field drains etc. As adequate emphasis has not been laid on construction of field drains, drainage presents serious problems. Further, irrigation is mostly of protective nature in *kharif* season.

15.8.4 Despite considerable groundwater potential, its exploitation by 1982 was only about one-fourth. According to the State groundwater organization's assessment as of March, 1984, out of 587 blocks, only 24 blocks are identified as "dark" and 85 as "grey". There is considerable scope for exploitation of groundwater resources in most parts of Bihar plains.

15.9 *Infrastructure Facilities*

15.9.1 There are nearly 6000 rural markets in the State. The number of wholesale markets and sub-market yards in the State are 672 and 552, respectively. On an average, there is one wholesale market for about one lakh population. The market infrastructure is not satisfactory particularly in interior areas of the State.

SOURCE-WISE NET IRRIGATED AREA



Annexure 15.1

Basic Data on Population

Particulars	Bihar	All India
1. Population (Million)	69.9	685.2
i) Rural population (Million)	61.2	525.5
ii) Urban population (Million)	8.7	159.7
2. Agricultural workers (Million)	16.4	148.0
i) Cultivators (Million)	9.1	92.5
ii) Agricultural labourers (Million)	7.3	55.5
3. Percentages of		
i) Rural population to total population	87.6	76.7
ii) Agricultural workers to rural population	26.8	28.2
4. Decennial population growth rate — 1971-81 (percent)		
i) Total	24.2	25.0
ii) Rural	20.7	19.7
5. Population density (No. per sq. km)	402	221

CHAPTER 16

REVIEW OF AGRICULTURAL DEVELOPMENT SINCE 1960

16.1 *Introduction*

16.1.1 The cropping pattern in Bihar is dominated by foodgrains. According to land use data for 1980-81, rice accounted for nearly 50 per cent and wheat 16 per cent of gross cropped area. Other cereals and pulses accounted for about 12 per cent each. Area devoted to non-foodgrains was only around 10 per cent (Annexure 16.1).

16.2 *Cropping Intensity*

16.2.1 During 1961-71, net sown area registered a modest increase, but gross cropped area a marginal decline. As a result cropping intensity declined from 138 to 131 per cent. During 1971-81, net sown area declined somewhat and gross cropped area remained unchanged. Consequently, cropping intensity showed a modest increase to 133 per cent during triennium ending 1980-81.

16.3 *Foodgrains*

16.3.1 Area under foodgrains has remained, by and large, static at around 100 lakh ha during 1961-81. During 1981-82 and 1982-83, the cropped area came down under the impact of drought, but increased somewhat in 1983-84 touching a level of 91 lakh ha (Annexure 16.2).

16.3.2 The compound growth rate in foodgrains production during 1961-71[1] was 1.5 per cent per annum. It declined to 1.1 per cent per annum during 1971-81[1], due to a fall in yields (Annexure 16.3). There was a setback in production in 1981-82 and 1982-83, due to drought conditions referred to above, followed by a marked recovery in 1983-84.

16.3.3 The past production trends reveal considerable year to year fluctuations, depending on the incidence of natural

[1] Based on triennium averages. All growth rates given in this Chapter are based on triennium averages.

calamities like drought and floods. Over the last 23 years[2], production of foodgrains fluctuated between 70 lakh tonnes in 1982-83 and 100 lakh tonnes in 1978-79. The extent of fluctuations is more marked in the last five years (Table 16.1).

Table 16.1. Production of Foodgrains

(In lakh tonnes)

Year	Production	Year	Production
1974-75	82.5	1979-80	71.0
1975-76	91.8	1980-81	99.1
1976-77	91.8	1981-82	82.4
1977-78	96.9	1982-83	73.2
1978-79	99.8	1983-84	96.3

16.4 *Rice*

16.4.1 Within the "foodgrains" group, rice production recorded an increase of 0.3 per cent per annum during 1961-71 and 1.0 per cent per annum in 1971-81. The expansion in area under the crop in the 20 year period under review was negligible.

16.4.2 The production trends in rice since 1960 show considerable year to year variations. A record output of 56 lakh tonnes was achieved during 1980-81, but slumped to 31 lakh tonnes in 1982-83. It went up once again touching a level of 50 lakh tonnes in 1983-84. These trends indicate that rice production is considerably influenced by the vagaries of rainfall.

16.4.3 The State has not made any significant breakthrough in improving rice yields. Even in a good year like 1980-81, the average yield levels were only a little over 1 tonne/ha (Table 16.2).

[2] Excluding the abnormally low level of 36 lakh tonnes recorded in 1966-67.

Table 16.2. Yield Rates of Rice

(Kg/ha)

Year	Autumn rice	Winter rice	Summer rice	Total
1970-71	540	809	1064	788
1976-77	617	926	1306	895
1977-78	675	1022	1049	983
1978-79	681	1022	873	984
1979-80	592	716	984	704
1980-81	798	1041	1104	1016
1981-82	677	806	1028	793
1982-83	654	680	1033	681

16.4.4 Bihar's yield rates of rice are low. As the scope for area expansion is limited, an increase in rice output is possible only through increased yields.

16.5 *Wheat*

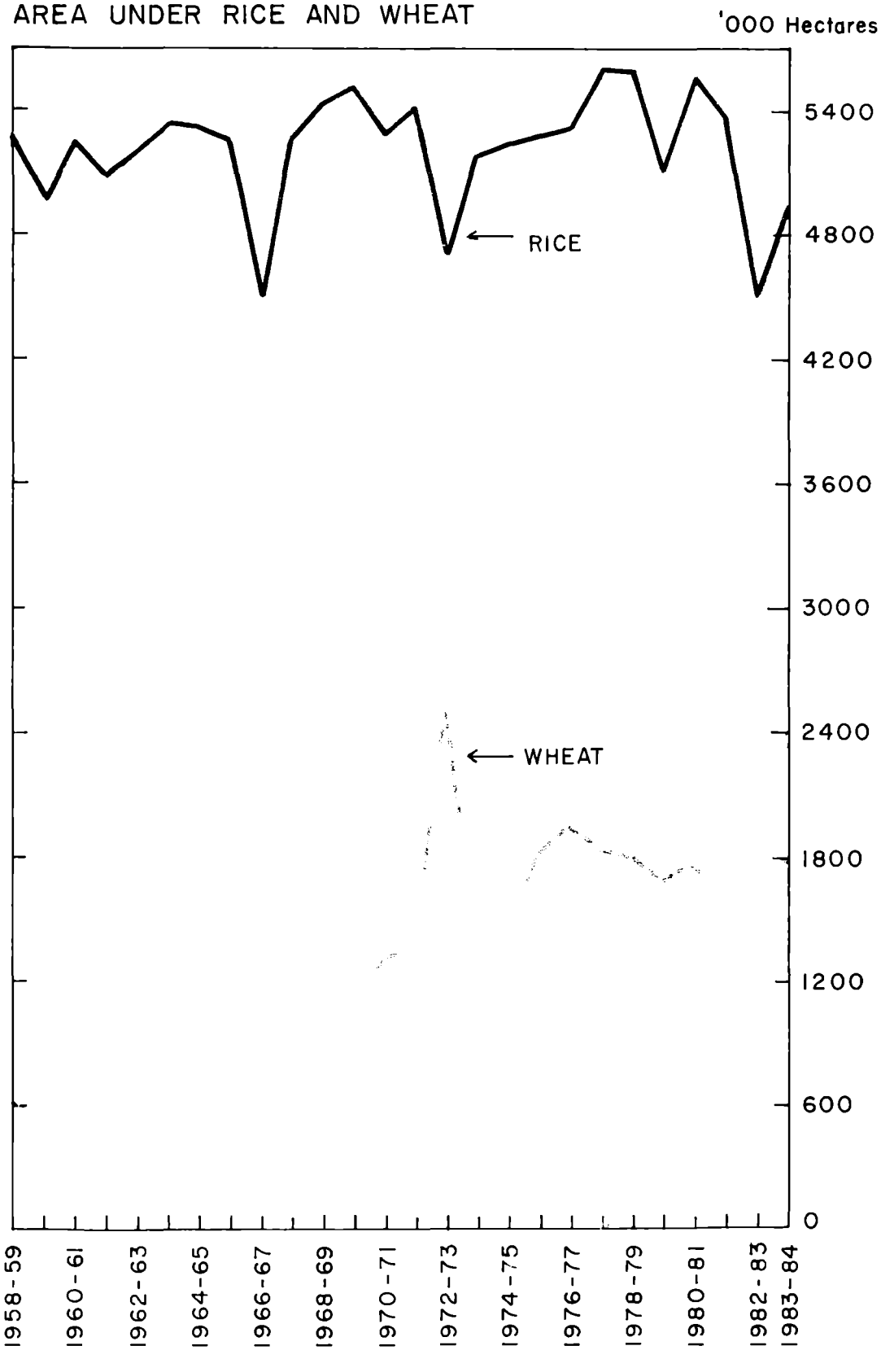
16.5.1 A significant feature of Bihar's cropping pattern is the impressive performance of wheat. From about 7 per cent in 1960-61, its share in total foodgrains production increased significantly to 29 per cent in 1983-84.

16.5.2 Wheat production increased sharply from 4 lakh tonnes during triennium ending 1960-61 to 22 lakh tonnes during the corresponding period of 1980-81, i.e. at an annual compound growth rate of 9 per cent. Both area expansion and increase in productivity contributed to the high growth rates in an almost equal measure. However, there was some decline in output in 1981-82, improving once again to touch a record level of 27.5 lakh tonnes in 1983-84.

16.5.3 Yield rates improved progressively from 644 kg/ha during triennium ending 1960-61 to 1554 kg/ha during 1983-84. Although these are still lower than that achieved by some advanced States, substantial improvement recorded over the last 23 years indicates that Bihar farmers are not unresponsive to technological innovation.

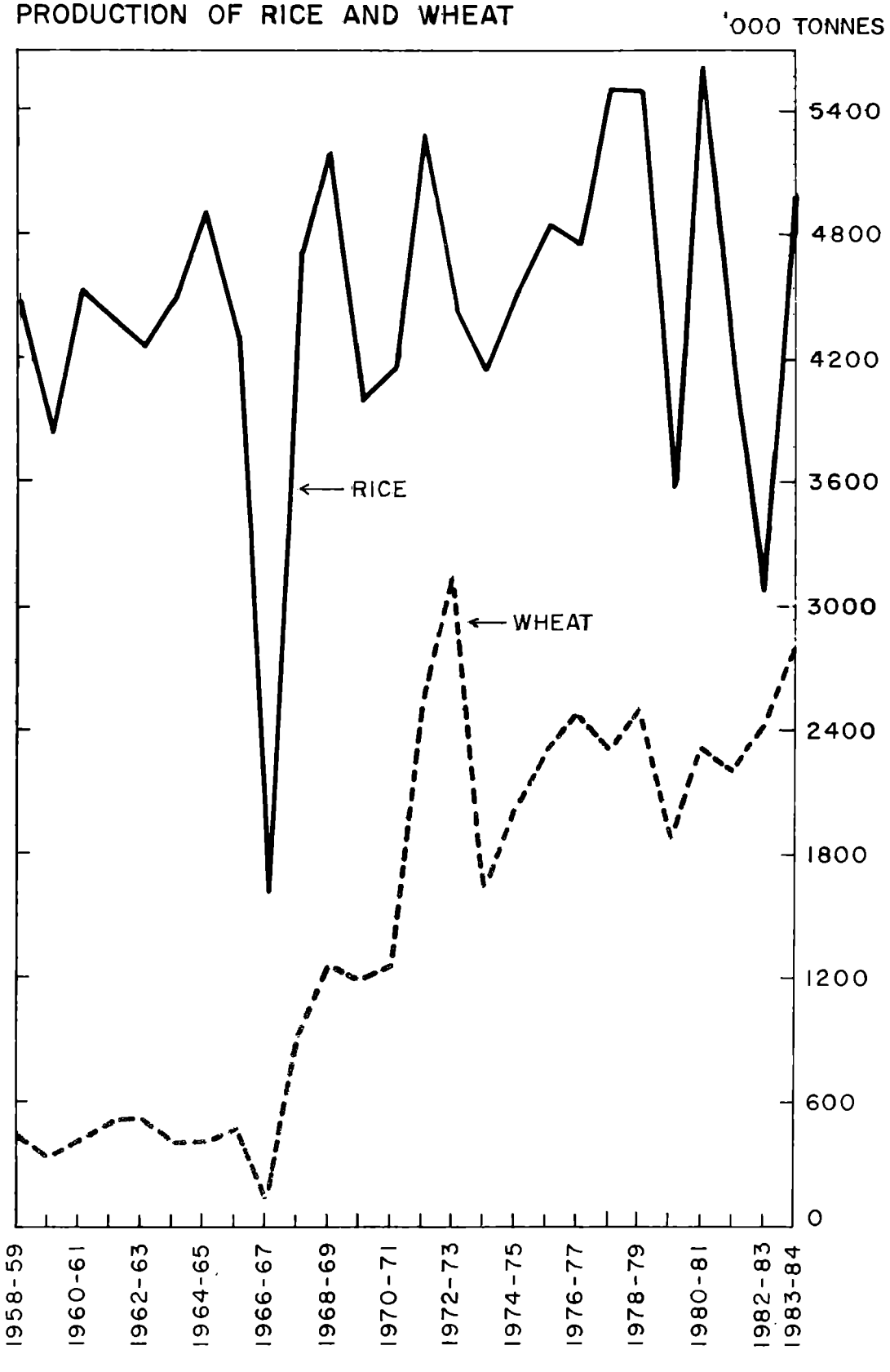
BIHAR

AREA UNDER RICE AND WHEAT



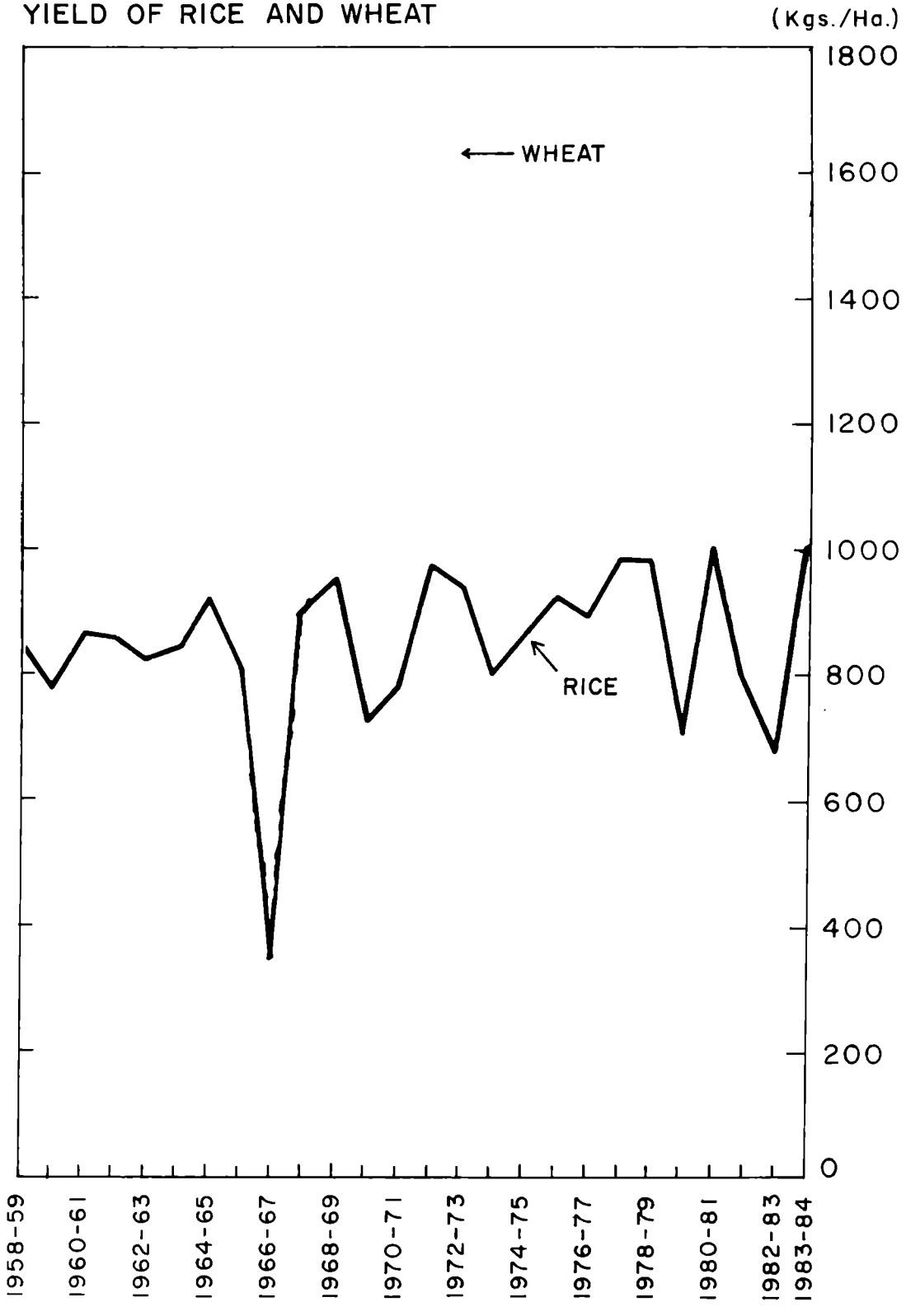
BIHAR

PRODUCTION OF RICE AND WHEAT



BIHAR

YIELD OF RICE AND WHEAT



16.6 *Maize*

16.6.1 After rice and wheat, the next important crop in the State is maize. At present, it accounts for about 10 per cent of the total foodgrains production. There have been no significant changes in the output of maize over the last 23 years. It went up slightly from 8 lakh tonnes in 1960-61 to 10 lakh tonnes in 1970-71 but declined to 7 lakh tonnes by 1982-83. It improved to 9.5 lakh tonnes in 1983-84.

16.7 *Other Minor Cereals*

16.7.1 Other minor cereals grown in Bihar are ragi, barley and small millets. Area sown to these crops is negligible. Both area and production of these crops have shown a progressive decline over the years. Area sown to these crops dropped from 8.9 lakh ha in 1960-61 to 4.6 lakh ha in 1980-81 and further to 3.9 lakh ha in 1983-84. Production declined from 6.4 lakh tonnes in 1960-61 to 2.7 lakh tonnes in 1980-81 and to 2.4 lakh tonnes in 1983-84.

16.8 *Pulses*

16.8.1 Gram, tur, urad, moong, kesari and kulthi are the major pulses grown in the State. Over the last two and a half decades, there has been a sharp decline in both area and production of these crops. Area sown to pulses declined from 24 per cent of foodgrains area during triennium ending 1960-61 to 13 per cent during 1983-84. Its share in total foodgrain production also showed a decline from 16 per cent to 7 per cent during this period. The yield rates however have shown some improvement from about 475 kg/ha to 591 kg/ha, but for which the fall in production would have been even larger.

16.9 *Non-foodgrain Crops*

16.9.1 The main non-foodgrain crops grown in the State are oilseeds, sugarcane, jute and mesta, potato, fruits and vegetables. Area covered by these crops was around 11 lakh ha during 1980-81 (Annexure 16.1).

16.9.2 *Oilseeds* : The major oilseed crops of the State are linseed, nigerseed, rapeseed and mustard. Area under oilseeds

during the 20 year period remained more or less steady at 2 lakh ha. Production was maintained at around 1 lakh tonnes.

16.9.3 *Sugarcane* : Area and productivity of sugarcane in the State showed a steady decline during 1961-81. Yield in terms of gur which was around 37-39 quintals/ha during 1961-71, came down to 30 quintals/ha. Sugarcane yields in Bihar are the lowest when compared with other sugarcane producing States.

16.9.4 *Jute and Mesta* Jute and mesta are major cash crops of the State. The State ranks second in the country next to West Bengal in the production of these two crops. Data on area, production and yield under there crops during the years 1960-61 to 1983-84 are given below.

Table 16.3. Area, Production and Yield of Jute and Mesta

Period		Area ('000 ha)		Production ('000 bales of 180 kg each)		Yield (kg/ha)	
		Jute	Mesta	Jute	Mesta	Jute	Mesta
Triennium	ending						
	1960-61	164	41	989	143	1085	629
	1970-71	123	31	614	125	895	735
	1980-81	155	35	824	183	955	941
During	1981-82	141	29	833	146	1061	920
	1982-83	119	27	740	133	1116	872
	1983-84	119	28	740	173	1116	1114

It will be seen from the above that jute yield declined during 1961-71, but improved thereafter. Even so yields obtained in Bihar are much lower than that in West Bengal. Deterioration of input supply and uncertain market conditions explain the fluctuating levels in the yield of jute. In regard to mesta, there has been a steady improvement in yields since 1960-61.

16.9.5 *Potato* : Between 1960-61 and 1982-83 potato output more than doubled from 5 lakh tonnes to 12 lakh tonnes.

16.9.6 *Other Crops*: Besides the crops referred to above, small quantities of a variety of crops such as tobacco, onion, chillies, turmeric, bananas, etc., are also grown in the State. The cultivation of vegetables is on the increase, particularly in the periphery of urban areas.

16.10 *Allied Activities*

16.10.1 *Dairy*: As per the livestock and Farm Equipment Census 1977, the number of breeding cows (over 3 years) increased only slightly from 38 lakhs in 1966 to 39 lakhs in 1977. On the other hand, the number of breeding buffaloes increased from 16 lakhs to 20 lakhs during this period. Output of milk which averaged around 19 lakh tonnes during 1977-80 increased to 22 lakh tonnes in 1982-83. A provision was made in the Sixth Plan for three frozen semen stations, of which two have already been set up in Muzaffarpur and Purnea.

16.10.2 *Poultry*: The population of poultry birds (including fowls and ducks) went up from nearly 110 lakhs in 1966 to 141 lakhs in 1977. Production of eggs is estimated to have increased from 780 millions in 1978-79 to 931 millions in 1983-84.

16.10.3 *Sheep and Goat Development*: Sheep population in the State declined from 12.5 lakhs in 1966 to 11.5 lakhs in 1977. On the other hand, the number of goats showed a marked increase from 78 lakhs in 1966 to 99 lakhs in 1977.

16.10.4 *Piggery*: The State's pig population was around 9.2 lakhs as per 1977 Census, of which nearly 50 per cent was concentrated in the districts of Santhal Parganas and Ranchi. Tribals take a special interest in rearing pigs.

16.10.5 *Inland Fisheries*: Bihar has rich aquatic potential in its reservoirs, lakes and tanks scattered throughout the State. The production of inland fish was of the order of 0.75 lakh tonnes and 0.80 lakh tonnes, respectively during 1980-81 and 1981-82.

16.11 *Forestry*

16.11.1 Bihar has large forest resources. The production of timber, roundwood and pulp was about 5 lakh cubic metres and of fuelwood, firewood and charcoal about 3 lakh cubic metres during 1978-79. The value of produce was about Rs. 9 crores as against Rs. 4 crores in 1973-74.

16.11.2 As regards minor forest produce, there has been some increase in the production of bamboo. Other items show a decline between 1971-72 and 1977-78. However, due to general rise in prices, the value of minor forest produce increased significantly (Table 16.4).

Table 16.4. Minor Forest Produce

	Bamboo		Kendu Leaf	
	Quantity in '000 tonnes	Value in Rs. lakhs	Quantity in '000 tonnes	Value in Rs. lakhs
1972-73	146	58	947	108
1973-74	146	56	735	213
1974-75	158	89	833	516
1975-76	159	101	942	412
1976-77	187	128	874	455
1977-78	172	135	778	424

16.12 *Inputs*

16.12.1 Use of agricultural inputs is slowly increasing in Bihar. A large part of the distribution of inputs is handled by co-operatives, especially the Bihar State Co-operative Marketing Union (BISCOMAUN), the functioning of which leaves much to be desired. The share of private sector has increased recently, particularly in regard to fertilizer distribution. However, distribution network is available up to the block level. There is usually no agency for selling inputs below the block level. The network of retail outlets, particularly in the interior and hilly areas is unsatisfactory. A review of the input distribution system and input supply situation is given below.

16.12.2 *Seeds*: Major agencies handling seeds distribution are the BISCOMAUN Bihar Beej Nigam (BRBN) and private dealers. National Seeds Corporation (NSC) and Terai Dvelopment Corporation (TDC) also have dealer network in the State. The PACS and Vyapar Mandals procure seeds from BISCOMAUN on commission basis for sale to the farmers. However, their share in total trade

handled by BISCOMAUN is very small. The BISCOMAUN's network of godowns is available up to the block level only. Most of the private dealers are also located at the block level. There is usually no agency for supply of seeds below block level.

16.12.3 During 1982-83 the share of BISCOMAUN in the distribution of wheat and paddy seeds was around 70 per cent and 30 per cent, respectively. Private dealers sell mostly paddy and maize seeds.

16.12.4 BRBN has contract growers in the project areas of the Corporation. The State Government farms also produce seeds of different crops. Over the last three years there has been a sizeable increase in the production of certified seeds as may be seen below.

Table 16.5. Production of Certified Seeds in Government Farms

(Kgs.)

Crop	1980-81	1981-82	1982-83
Rice	4870	30813	35264
Wheat	1309	11718	14313
Maize	178	4800	634
Gram	191	1326	1404
Pulses	—	286	562
Oilseeds	—	369	435
Others (Jute, Potato, etc.)	1162	17253	24001

16.12.5 The production of certified seeds, however, is very much short of the State's requirements. Therefore the State has to depend for most of its seeds on outside sources.

16.12.6 Seed replacement is 5 per cent in rice and 10 per cent in wheat as against the norm of 20 per cent. Most of the farmers make their own arrangements for paddy seeds through mutual exchange or buying from private dealers. The State Agricultural Department also distributes seeds through the State Seeds Corporation. However, this hardly provides 5 per cent of the total re-

quirements. The State claims to have evolved rice varieties for different climatic situations except low lands or lands affected by waterlogging. But production of seeds of these varieties is inadequate to meet the demand. There is considerable time lag in producing adequate quantities of certified seeds of newly released varieties.

16.12.7 The State Agricultural Department and Agricultural Universities have identified suitable wheat varieties for the State. However, foundation seeds and breeder seeds are not available in the State. Therefore, the State has to depend on outside resources. It has also to depend on outside sources for supply of seeds of pulses and oilseeds.

16.12.8 Area under HYV rice is low. It was around 25 per cent in 1980-81. In wheat, it was nearly 100 per cent and in maize about 50 per cent.

Table 16.6. Area Under HYV Crops

('000 ha)

Year	Paddy	Wheat	Maize
1975-76	768 (14.6)	1229 (67.7)	357 (38.2)
1976-77	998 (18.8)	1417 (72.9)	314 (33.7)
1977-78	1300 (23.3)	1418 (76.8)	350 (39.3)
1978-79	1365 (24.5)	1440 (79.7)	360 (40.5)
1979-80	1060 (20.7)	1400 (82.3)	370 (44.6)
1980-81	1400 (25.5)	1800 (99.8)	450 (50.6)

Note : Figures in brackets are percentage of gross cropped area under each crop.

16.12.9 *Fertilizers*: Over the last two decades, there has been some increase in the consumption of fertilizers. From an almost negligible level in 1960-61, the consumption went up to 19 kg/ha per gross sown area in 1982-83, as may be seen from Table 16.7.

Table 16.7. Consumption of Fertilizers

	NPK (in '000 tonnes)	Kg/ha
1960-61	17	1.5
1970-71	100	9.0
1976-77	156	13.8
1977-78	174	15.3
1978-79	195	17.2
1979-80	184	17.7
1980-81	205	18.4
1981-82	206	18.4
1982-83	211	18.9

16.12.10 A large part of the fertilizer consumption is in *rabi* season. During *kharif* season, fertilizers are mostly used in cultivation of vegetables and other cash crops.

Table 16.8. Seasonwise Fertilizer Consumption

('000 tonnes)

	1980-81	1981-82
Kharif season	47 (22.5)	51 (24.4)
Rabi season	158 (77.5)	155 (75.6)
Total	205 (100.0)	206 (100.0)

Note : Figures in brackets represent percentage of the total.

16.12.11 Not only consumption of fertilizers is low, but also subject to considerable inter-district variations. Data for the triennium ending 1980-81 show that in 3 districts of Patna, Muzaffarpur and Gopalganj, the consumption of fertilizers ranged between 35 and 38 kg/ha, in 12 other districts, between 18 and 34 kg/ha, and in the remaining 16 districts, it was below 18 kg/ha (*vide.*, Annexure 16.4).

16.12.12 At present, about 50 per cent of the fertilizers is distributed by BISCOMAUN and the balance by private dealers, as shown below.

Table 16.9. Distribution of Fertilizers

(In '000 tonnes)

Year	BISCOMAUN	Private Dealers
1980-81	137 (57.2)	67 (32.8)
1981-82	98 (47.9)	107 (52.1)
1982-83	103 (50.5)	101 (49.5)

Note : Figures in brackets are percentage of total.

16.12.13 BISCOMAUN is the distribution agency for the Government. Besides PACS who are its members, is has 590 depots for distribution of inputs. There are also a number of private dealers selling fertilizers. However, they are mostly located near rail heads, cities, towns and in areas where fertilizer consumption is high. The decline of 25 per cent in the sale of fertilizer by BISCOMAUN between 1980-81 and 1981-82 reflects its inefficiency in working.

16.12.14 Bihar is experiencing shortage of fertilizers. Further, distribution arrangements below block level are not satisfactory. As a result, farmers in some areas have to travel long distances for buying this input. Adulteration and other malpractices by private dealers are also reported to be widespread. Besides supply bottlenecks, there are constraints in the flow of credit to finance purchase of fertilizers. The application of fertilizers during *kharif* is low because farmers do not get good returns in the absence of controlled water supply.

16.12.15 *Pesticides* : The loss of crops due to pests and diseases and weeds is estimated to be around 15 to 20 per cent of the produce. There are endemic areas of various pests in different parts of the State. The surveillance units are located at Patna and Ranchi.

16.12.16 Pesticides are bought by BISCOMAUN and sold to farmers through its 590 depots and 466 plant protection centres at block levels. Besides, there are nearly 4000 private licence holders dealing in pesticides. There are reports of adulteration in pesticides.

16.12.17 *Electric Power*: In Bihar, only about 43 per cent of villages are electrified as against 100 per cent in Punjab and Haryana. Moreover, electric power is in short supply and highly uncertain. Thefts of wires and transformers have aggravated the situation.

16.12.18 The per capita consumption of electricity in Bihar at 83 KWH (in 1981-82) is the lowest in the eastern region. Data for the period 1974-75 to 1978-79 are presented in Annexure 2., which shows that quantity of electricity sold for irrigation is steadily declining since 1975-76, whereas it is increasing for purposes other than agriculture. Sale of electricity for irrigation came down sharply from 454 MKW in 1975-76 to 197 MKW in 1978-79 (Annexure 16.5). As against the estimated requirement of 16 hours per day of uninterrupted power supply during peak irrigation and 6 hours per day during lean irrigation, public tubewells actually could get power supply for about 2 to 2.5 hours only per day in 1983-84. Even that was erratic. Experience of private tubewells was no better.

16.12.19 The critical power supply situation is a major constraint to the efficient utilisation of tubewells. This underscores the need for according priority for power supply to tubewells and pumpsets for a fuller utilisation of the irrigation potential.

16.13 *Agricultural Credit Situation*

16.13.1 *Institutional Setup* : Institutional credit for agriculture in Bihar is provided by (i) Co-operatives, (ii) Commercial banks and (iii) Regional Rural Banks. The short-term co-operative credit structure consists of the State Co-operative Bank at the apex level, 34 Central Co-operative Banks[1], 6,182 PACS, 101 FSS

[1] In terms of the programme of rationalisation, the number of CCBs were reduced from 47 in 1956-57 to 28 in 1967-68. Since then, following increase in the number of districts to 38, 6 more CCBs were organised raising the total number of CCBs to 34. The RBI did not, however, favour the creation of 6 new CCBs as these banks would take a long time to become viable.

and 474 LAMPS. The long-term co-operative credit structure consists of Bihar State Land Development Bank set up in 1958-59. The LDB structure in Bihar is unitary. The LDB has 164 branches as at the end of June 1983.

16.13.2 The commercial banks provide both short and long-term credit. They had a network of 3039 branches at the end of June 1983, of which 2119 (70 per cent) were rural. Rural population covered per rural branch is around 29,000 as against all-India average of 24,000. There are 17 RRBs in the State covering 32 out of 38 districts.

16.13.3 *Recent Trends in Agricultural Credit*: The membership of the primary societies more than doubled from 28 lakhs in 1970-71 to 58 lakhs in 1982-83. The membership coverage of rural households is around 54 per cent. The borrowing members constituted about 48 per cent of the total membership in 1982-83. Credit disbursed by the primary societies and percentage overdues of demand during the 4 years ending 1982-83 along with that for 1970-71 are indicated below. Overlues have been mounting in Bihar.

Table 16.10. Trends in Agricultural Credit

Year	Short-term loan (Rs. crores)	Medium-term loan (Rs. crores)	Loans advanced per borrowing member (Rs.)	Percentage overdues to demand
1970-71	11.5	0.9	137	56
1979-80	21.0	3.9	150	63
1980-81	14.6	2.0	76	46
1981-82	25.4	2.3	102	66
1982-83	26.9	2.2	104	75

16.13.4 The loans issued by the LDB were small upto 1970-71. There was a progressive increase in loan disbursement upto 1976-77. However, in the subsequent 2 years, there was a set-back in lending. But lending picked up in the following years due to the improved eligibility of branches after the adoption of a rehabilitation programme. The LDB was not in a position to

maintain a steady progress in its loan business because of mounting overdues. Data on the loan disbursements by LDB and percentage of overdues for 1970-71, 1974-75 and 1978-79 to 1982-83 are indicated below.

Table 16.11. Operations of LDB

Year	Loans issued (Rs. crores)	Percentage of overdues to demand (at primary level)
1970-71	6.9	31.6
1974-75	11.3	33.6
1978-79	5.2	59.4
1979-80	8.6	76.7
1980-81	14.3	18.9
1981-82	29.1	45.9
1982-83	20.2	59.6

16.13.5 In view of the high overdue position, the State Government was requested to take up a rehabilitation programme of the LDB to enable it to participate in the fourth ARDC credit project. Under this rehabilitation programme in 1979-80 the State Government contributed Rs. 25 crores towards share capital of the LDB and further Rs. 1.2 crores each towards share capital and a short-term loan in 1980-81. Overdues arising from natural calamities amounting to Rs. 8.2 crores in 1980-81 and Rs. 5.1 crores in 1981-82 were rephased by the LDB. Further, it was permitted to block overdues over 3 years amounting to Rs. 11.8 crores subject to a firm commitment from Government of Bihar that it will meet the shortfall in the recoveries upto 20 per cent of the blocked amount every year. An amount of Rs. 6.7 crores in 1980-81 and Rs. 4.0 crores in 1981 was blocked by LDB.

16.13.6 As a result of the above steps, overdues of LDB were brought down substantially in 1980-81. However, the problem of overdues re-emerged in 1981-82.

16.13.7 *Commercial Banks* : Disbursement of loans for agriculture by commercial banks has been rising since mid-1970s. Yet they are of a small order. During 1980-81, short-term loans disbursed by them amounted to Rs. 6 crores and term loans

Rs. 15 crores. They also faced the problem of mounting overdues as in the case of co-operatives. Their overdues as percentage of demand as at the end of 1981-82 was 60 per cent (*vide* table below).

Table 16.12. Short-term and Term Loans Disbursed by Commerial Banks

(Rs. crores)

Year	Short-term	Medium-term and long-term loans
1974-75	1.2	3.8
1975-76	4.3	5.2
1976-77	5.4	13.7
1977-78	6.1	11.9
1978-79	4.9	18.9
1979-80	5.5	19.5
1980-81	5.7	14.7

16.14 *Special Development Programmes*

16.14.1 Major development programmes undertaken in the State are (i) Drought Prone Area Programme, (ii) Command Area Development Programme, (iii) Integrated Rural Development Programme and (iv) Pilot Project for boosting rice production. Details of some of these development programmes are briefly set out in the following paragraphs.

16.14.2 *Drought Prone Area Programme*: This programme was launched in 1974 in the districts of Palamau, Nawadah, Rohtas and Monghyr. Later it was extended to Godda district. At present, however, Palamau and Godda are the only two districts covered by the programme.

16.14.3 In the chronically drought-prone areas of the above districts, this programme is executed on watershed basis. It is implemented) along with other programmes of development such as IRDP, TRYSEM, through a common agency, *viz.*, District Rural Development Agency (DRDA) with effect from 1982-83.

16.14.4 The physical targets and achievements under the programme are indicated in Table 16.23.

Table 16.13. Progress of Drought-Prone Area Programme in the State

Item	Achie-vements upto 1979-80	Target 1980-85	Achie-vements during 1980-81	Achie-vements during 1981-82	Achie-vements during 1982-83	Expected achieve-ments in 1983-84	Target 1984-85
1. Creation of irri-gation potential ('000 ha)	9.89	32.14	9.11	5.73	9.74	3.50	3.50
2. Area treat-ed with soil conser-vation measures ('000 ha)	40.69	72.79	10.48	14.00	6.91	7.80	7.80
3. Affores-tation ('000 ha)	58.31	72.79	15.66	14.00	1.98	7.80	7.80
4. Agricul-ture ('000 farmers)	132.47	94.39	29.37	17.55	17.55	10.30	10.30
5. Animal husbandry ('000 farmers)	8.25	34.04	4.25	6.53	6.74	4.00	4.00

Source : Draft Annual Plan 1984-85

16.15 *Integrated Rural Development Programme*

16.15.1 The outlay approved for the State for the period 1980-85 is Rs. 85 crores. The actual expenditure under the programme increased from Rs. 10 crores during 1981-82 to Rs. 31 crores during 1982-83 and further to Rs. 34 crores during 1983-84.

16.15.2 As regards physical progress, the number of beneficiaries covered upto 1982-83 was 8,91.153.

16.16 *Command Area Development*

16.16.1 Command Area Development Agencies have been set up one each for the major irrigation projects of the State *viz.*, Kosi, Sone, Gandak and Kiul-Badna-Chandan for the integrat-

ed development of the respective command areas based on total utilisation of irrigation potential created, conjunctive use of ground and surface water and speedy solution of problems affecting the development of agriculture.

16.16.2 The physical targets and achievements of the programme are indicated below.

Table 16.14. Command Area Development Programme – Physical Targets and Achievements

Item	Achievements upto 1979-80	Achievements during 1980-81	Achievements during 1981-82	Achievements during 1982-83	Target 1983-84	Target 1984-85
1. Contour survey (lakh ha)	3.87	2.21	1.89	2.58	2.00	2.00
2. Soil survey (lakh ha)	3.23	1.24	1.18	1.91	2.00	2.00
3. Planning and design (lakh ha)	1.69	1.95	1.79	2.46	2.00	2.00
4. Construction of field channels (lakh ha)	0.69	1.28	1.63	2.09	2.50	2.55
5. Construction of field drains ('000 ha)	1.47	0.08	0.05	—	15.00	15.00
6. Land levelling ('000 ha)	0.60	0.07	—	—	25.00	30.00
7. Installation of State and private tubewells (number)	1374	66	66	—	—	—

Source : Annual Draft Plan, 1984-85

16.17 *Programme for Increasing Rice Production*

16.17.1 Under this programme, 118 blocks would be covered for intensive rice development during the Seventh Plan. A pilot project was taken up in 10 districts of Bihar during 1984-85.

Annexure 16.1

Area Under Different Crops, 1980-81

('000 ha)

Crop	Area	Percentage
1. **Foodgrain crops**		
a) Cereals		
(i) Rice		
(a) Autumn	598.7	
(b) Winter	4839.8	
(c) Summer	52.0	
Total rice	5490.5	(49.3)
(ii) Wheat	1803.0	(16.2)
(iii) Maize	890.0	(8.0)
(iv) Ragi	177.4	(1.6)
(v) Barley	129.0	(1.2)
(vi) Bajra	12.6	(Neg.)
(vii) Jowar	8.5	(Neg.)
(viii) Other millets	149.4	(1.3)
b) Pulses	1390.9	(12.5)
Total foodgrain crops	10051.3	(90.2)
2. Sugarcane	110.8	(1.0)
3. Potato	195.3	(1.8)
4. Oilseeds*	249.8	(2.2)
5. Jute and mesta		
(i) Jute	154.5	(1.4)
(ii) Mesta	34.5	(Neg.)
Total	189.0	(1.6)
6. Tobacco	12.0	(Neg.)
7. Other non-foodgrain crops	339.8	(3.0)
8. Total non-foodgrain crops	1096.7	(9.8)
Total area sown — 1980-81	11148.0	(100.0)

Neg. = Negligible

* Oilseeds comprise groundnut, linseed, rape and mustard seed, niger and other oilseeds.

Annexure 16.2

Area, Production and Productivity of Major Crops

Crop	Area ('000 ha.)						Production ('000 tonnes)						Productivity (Kg./ha.)					
	Triennium ending			During			Triennium ending			During			Triennium ending			During		
	1961	1971	1981	1981-82	1982-83	1983-84	1961	1971	1981	1981-82	1982-83	1983-84	1961	1971	1981	1981-82	1982-83	1983-84
Rice	5148	5399	5409	5367	4498	4904	4308	4454	4906	4257	3065	4983	837	825	907	793	681	1016
Wheat	639	1185	1754	1640	1733	1770	412	1239	2231	2202	2426	2750	644	1045	1272	1342	1400	1554
Other cereals	1715	1671	1341	1286	1164	1201	1194	1372	1137	1009	1123	1190	697	821	848	785	965	991
Pulses	2318	1626	1345	1262	1189	1189	1101	1034	724	771	702	702	475	636	538	611	591	591
Total food-grains	9820	9881	9849	9555	8584	9064	7015	8099	8998	8239	7316	9625	714	820	914	862	852	1062
Oilseeds	240	241	258	237	235	242	75	108	107	112	114	121	311	450	415	473	484	502
Sugarcane (Gur)	176	160	121	124	130	128	665	623	365	418	446	388	3772	3883	3033	3382	3423	3044
Jute	164	123	155	141	119	119	989*	614*	824*	833*	740*	740*	1085	895	955	1061	1116	1116
Mesta	41	31	35	29	27	28	143*	125*	183*	146*	133*	173*	629	735	941	920	872	1114
Potato	72	104	134	131	133	133	484	1020	1076	1231	1238	1238	6719	9802	8022	9376	9336	9336

* Figures are in thousand bales of 180 kgs. each

Annexure 16.3

Compound Growth Rate

(In per cent per annum)

Crop	Area			Production			Yield		
	1961-71	1971-81	1961-81	1961-71	1971-81	1961-81	1961-71	1971-81	1961-81
Rice	0.5	—	0.3	0.3	1.0	0.7	— 0.1	1.0	0.4
Wheat	6.4	4.0	5.2	11.6	6.1	8.8	5.0	2.0	3.5
Other cereals	— 0.3	— 2.2	— 1.2	1.4	— 1.9	— 0.2	1.7	0.3	1.0
Pulses	— 3.5	— 1.9	— 2.7	— 0.6	— 3.5	— 2.1	3.0	— 1.7	0.6
Total food-grains	0.1	—	—	1.5	1.1	1.2	1.4	1.1	1.2
Oilseeds	—	0.7	0.4	3.7	— 0.1	1.8	3.8	— 0.8	1.4
Sugarcane (gur)	— 1.0	— 2.8	— 1.9	— 0.7	— 5.2	— 3.0	0.3	— 2.4	— 1.1
Jute	— 2.8	2.3	— 0.3	— 4.7	3.0	— 0.9	— 1.9	0.7	— 0.6
Mesta	— 2.8	1.2	— 0.8	— 1.3	3.9	1.2	1.6	2.5	2.0
Potato	3.8	2.6	3.2	7.7	0.5	4.1	3.9	— 2.0	0.9

Annexure 16.4

Consumption of Fertilizers – Districtwise During Triennium Ending 1980-81

High consumption districts		Medium consumption districts		Low consumption districts	
District	Kg/ha	District	Kg/ha	District	Kg/ha
1. Gopalganj	38.1	1. Bhojpur	33.7	1. Sitamarhi	15.4
2. Patna	36.6	2. Nalanda	32.3	2. Monghyr	15.2
3. Muzaffarpur	35.4	3. Saran	31.3	3. West Champaran	14.5
		4. Gaya	29.1	4. Aurangabad	12.8
		5. Rohtas	28.2	5. Dharbhanga	10.9
		6. Samastipur	27.6	6. Saharsa	7.1
		7. Madhubani	25.8	7. Begusarai	6.9
		8. Siwan	23.4	8. Purnia	6.9
		9. Bhagalpur	23.3	9. Ranchi	6.4
		10. East Champaran	22.8	10. Santhal Parganas	6.1
		11. Nawadh	19.4	11. Katihar	5.1
		12. Vaishali	18.0	12. Hazaribagh	4.8
				13. Giridih	4.5
				14. Palamau	3.5
				15. Dhanbad	3.1
				16. Singhbhum	2.7

State average : 17.1

Annexure 16.5

Sale of Electricity by State Electricity Board (MKW)

Class of consumers	1974-75	1975-76	1976-77	1977-78	1978-79
Domestic	89.88 (3.67)	119.74 (4.18)	145.06 (4.79)	168.47 (5.66)	184.00 (6.02)
Commercial	81.77 (3.33)	103.76 (3.62)	112.70 (3.72)	128.99 (4.33)	121.07 (3.96)
Industrial (up to 650 volts)	57.02 (2.33)	214.79 (7.48)	247.30 (8.17)	305.70 (10.27)	290.44 (0.50)
Public lighting	4.42 (0.18)	5.39 (0.19)	5.58 (0.10)	5.11 (0.17)	5.98 (0.20)
Industrial (above 650 volts)	1017.03 (41.50)	1363.85 (47.59)	1545.56 (51.04)	1544.38 (51.88)	1601.51 (52.37)
Traction	225.94 (9.22)	260.69 (9.10)	258.17 (8.53)	280.27 (9.22)	244.41 (7.34)
Irrigation	326.40 (13.32)	454.13 (15.85)	450.12 (14.86)	299.08 (10.05)	196.71 (6.43)
Public water works	42.57 (1.74)	50.40 (1.76)	48.84 (1.61)	50.98 (1.71)	53.53 (1.75)
Bulk sale to (a) Licencee	90.00 (3.67)	35.18 (1.28)	— (—)	18.72 (0.63)	17.55 (0.57)
(b) Other agencies	—	—	—	—	—

Source : Bihar State Electricity Board, Patna.

Notes : Figures in brackets indicate percentages.

CHAPTER 17

AGRO-CLIMATIC ZONES

17.1.1 In this Report, the zonal classifications of the State made by the Rajendra Agricultural University has been adopted as shown below.

Zone	Districts covered
1. North West Alluvial Plains Districts	West Champaran, East Champaran, Gopalganj, Siwan, Saran, Sitamarhi, Muzaffarpur, Vaishali, Madhubani, Darbhanga and Samastipur.
2. East Alluvial Plains Districts	Purnea, Katihar, Saharsa, Begusarai, Monghyr and Bhagalpur.
3. South-West Alluvial Plains Districts	Gaya, Aurangabad, Rohtas, Bhojpur, Patna, Nalanda and Nawada.
4. Plateau Districts	Hazaribagh, Giridih, Santhal Parganas, Dhanbad, Palamau, Ranchi and Singhbhum.

17.2 *North West Alluvial Plains Zone*

17.2.1 *General Features*: The total geographical area of this zone is 32,664 sq. kms forming 19 per cent of the total area of the State. This zone spreads from Nepal border in the North to Ganga in the South.

17.2.2 *Soils* : The zone has four soil groups, namely, (i) sub-Himalayan hill and forest, (ii) recent alluvium non-calcareous non-saline, (iii) recent alluvium terai and (iv) young alluvium calcareous. Parts of Saran, Siwan, Muzaffarpur and Samastipur districts have saline soils. Highly leached soils are found in Terai area which are acidic in surface layer. The medium low land

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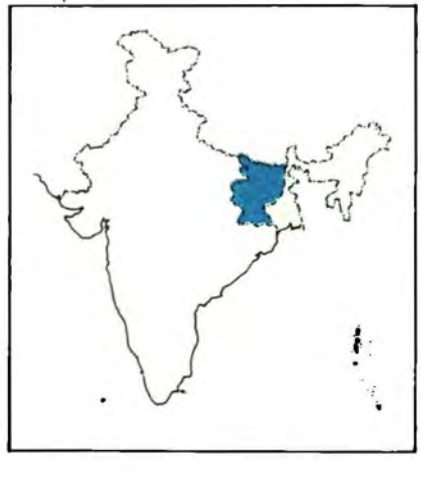
AGRO-CLIMATIC ZONES



1 The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line.

2 Based upon Survey of India map with the permission of the Surveyor General of India.

4 Responsibility for the correctness of internal details shown on the maps rests with the publisher.

soils, though of good to moderate permeability are somewhat poorly drained due to high water table in these areas. The soils are moderately rich to poor in nitrogen (especially in Gopalganj and Siwan districts), moderate to very low in phosphorus and medium to high in potash.

17.2.3 *Rainfall* : There is district to district variation in rainfall. It is the highest (1447 mm) in West Champaran and the lowest (1000 mm) in southern districts of Saran, Siwan and Vaishali. Nearly 80 per cent of the total rainfall is received during June to September and 10 per cent during March to May. The monsoon season is characterised by cloudy weather, high humidity and frequent rains. The maximum and minimum temperatures vary between 42°C and 7°C. The average relative humidity varies between 67 and 59 per cent.

17.2.4 *Socio-Economic Characteristics*: Total population of the zone, according to 1981 Census is 22 million, of which 94 per cent is rural. Population density is 674 per sq. km as against the State average of 402 per sq. km. As between the districts, however, there is considerable variation. Vaishali has the highest density of population (984 per sq. km.). In West Champaran, however, it is 377 per sq. km. Scheduled Castes constitute 14 per cent of the zone's population. However, Scheduled Tribes constitute only a negligible proportion of total population. Total work force of the zone is about 6 million of which around 45 per cent are cultivators and 41 per cent agricultural labourers. The literacy rate is 23 per cent as against the State average of 26 per cent.

17.2.5 *Pattern of Land Holdings* : The number and area of operational holdings according to size classes during 1970-71 and 1980-81 are indicated in Annexure 17.1. During this period the number of marginal holdings increased from 1.9 to 3.5 lakhs and area operated from 0.7 to 1.1 lakh ha. Marginal holdings of 1 ha and less constituted 85 per cent of total holdings, but 43 per cent of the total area in 1980-81. Small and marginal farmers taken together accounted for 93 per cent of holdings and 59 per cent of operational area during 1980-81.

17.2.6 *Land Use Pattern* : Land use pattern of the zone for 1980-81 is indicated in Table 17.1.

Tab'e 17.1. Land Use Pattern – North West Alluvial Plains Zone (1980-81)

Classification (1)	Area ('000 ha) (2)	Percentage of total reporting area (3)	Col. 2 as per cent of State total (4)
1. **Reporting area**	**3261.3**	**100.0**	**18.8**
2. Forests	91.7	2.8	3.2
3. Not available for cultivation	562.7	17.3	20.6
4. Permanent pastures and other grazing land	8.9	0.3	6.2
5. Land under miscellaneous tree crops and groves	95.7	2.9	45.2
6. Cultivable waste land	11.9	0.4	2.6
7. Fallow lands			
i) Current fallows	175.5	5.3	10.2
ii) Others	40.2	1.2	4.2
8. Net area sown	2274.7	69.7	27.3

17.2.7 Around 80 per cent of total reporting area of the zone is cultivable. The cultivated area is 75 per cent of the reporting area. Area covered by forests is less than 3 per cent of the reporting area.

17.2.8 *Cropping pattern* : The crops cultivated in this zone are predominantly foodgrains. Rice, maize, urad, mung and *kulthi* are the crops grown during *kharif* season. Major crops grown during *rabi* season are wheat and pulses (khesari, masoor, moong). Foodgrains account for about 88 per cent of cropped area. Cropping intensity is around 140 per cent. Annexure 17.2 presents the cropping pattern of the zone for the year 1980-81.

17.2.9 *Irrigation Pattern* : Data on irrigation source-wise/crop-wise for the zone are presented in Table 17.2 for the years 1970-71 and 1980-81.

Table 17.2. Net and Gross Irrigated Area – North West Alluvial Plains Zone

('000 ha)

Source	Net Irrigated Area 1970-71	1980-81	Crop	Gross Irrigated Area 1970-71	1980-81
Canals	122.5	329.9	Rice		
			Autumn	19.5	59.9
	(30.7)	(32.1)		(4.1)	(6.8)
			Winter	111.2	143.8
				(23.5)	(16.3)
Tanks	32.1	36.3	Summer	17.7	13.8
				(3.7)	(1.6)
	(8.1)	(4.8)	Total	148.4	217.5
				(31.3)	(24.7)
			Maize	15.5	101.2
Tubewells	109.2	311.8		(3.3)	(11.5)
			Wheat	218.7	467.3
	(27.4)	(41.6)		(46.2)	(53.1)
			Barley	30.1	7.3
				(6.4)	(0.8)
Other wells	84.3	61.2	Total cereals	417.1	796.9
	(21.2)	(8.2)		(88.1)	(90.5)
			Total pulses	8.6	7.8
				(1.8)	(0.9)
Other sources	50.2	99.7	Total foodgrains	425.7	804.7
				(89.9)	(91.4)
	(12.6)	(13.3)	Sugarcane	7.1	11.0
				(1.5)	(1.2)
			Fruits & vegetables	28.2	52.5
Total	398.3	748.9		(6.0)	(6.0)
	(100.0)	(100.0)	Total	473.3	880.5
				(100.0)	(100.0)

Notes : Figures in brackets are prccentages of total.

17.2.10 Net irrigated area during the period increased by nearly 88 per cent. Tubewells and Government canals in the main contributed to this increase. Nevertheless, only one-third of the net sown area and around one-fourth of gross cropped area benefited from irrigation. Wheat and maize accounted for nearly two-thirds of the gross irrigated area and rice for one-fourth.

17.2.11 *Fertilizer Consumption* : Data on fertilizer consumption in the zone during 1970-71 and 1980-81 (triennium average) are provided in Table 17.3 below.

Table 17.3. Fertilizer Consumption* - North West Alluvial Plains Zone

(Kg./ha.)

District	Triennium ending 1970-71 NPK	Triennium ending 1980-81 NPK
West Champaran, East Champaran	14.0	19.0
Gopalganj, Siwan, Saran	15.0	31.0
Sitamarhi, Muzaffarpur, Vaishali	7.0	24.0
Madhubani, Darbhanaga, Samastipur	7.0	14.0
Average	10.8	22.0

* Data compiled by AER Centre, Santiniketan.

Data indicate that fertilizer offtake in the zone has more than doubled during the ten year period. The average level of consumption (22 kg/ha) of the zone is higher than that of the State (18 kg/ha).

17.2.12 *High Yielding Varieties* : The latest data on area under HYV of crops are available for the triennium ending 1980-81. These are presented in Table 17.4.

Table 17.4. Area Under High Yielding Varieties – North West Alluvial Plains

('000 ha)

Crop	Total area	Area under HYV*	Per cent of col. 3 to col. 2
(1)	(2)	(3)	(4)
Wheat	661.7	631.0	95.4
Summer rice	18.8	13.7	72.9

* Data compiled by AER Centre, Santiniketan. Area sown to HYV of winter rice is not available.

These data indicate the considerable progress attained in the introduction of HYV under wheat.

17.2.13 *Area, Production and Productivity* : This zone accounts for about one-fourth of the total production of foodgrains in the State. Area, production and productivity of principal crops in the zone during the triennia ending 1972-73 and 1980-81 and for the year 1981-82 are presented in Annexure 17.6. These data indicate that average yields of various crops in this zone are low. Among foodgrains, yields of major crops such as rice, wheat, barley and gram are 10 to 20 per cent lower than the yields attained in Eastern India. Although more than 95 per cent area under wheat has been brought under HYV, yields during triennium ending 1980-81 were significantly lower than those during triennium ending 1972-73. The average yield of sugarcane is only around 40 per cent of its yield in Eastern India. Only in the case of a few crops, namely, maize, ragi, rapeseed and mustard, linseed and tobacco, the relative yield index (RYI), i.e., zonal yield expressed as per cent of yield in Eastern India is 15 to 25 per cent higher.

17.3 *East Alluvial Plains Zone*

17.3.1 *General Features* : Districts included in this zone are Purnea, Katihar, Saharsa, Begusarai, Bhagalpur and Monghyr. The total geographical area of the zone is 32381 sq. km comprising 18.6 per cent of the State total. It comprises alluvial plains of Kosi, Mahananda and its tributaries and the Ganges. The topography is slightly undulating to rolling with long stretches

of nearly flat landscape. The area is full of streams, small lakes and shallow marshes. Vast areas in this zone remain waterlogged for a considerable part of the year.

17.3.2 *Soils* : The dominant soil groups are (i) recent alluvium (ii) tal land (iii) old alluvium grey heavy textured and old alluvium yellow of foothills. Soils in between the natural levees of Ganga and Kosi and away from the influence of running waters of the rivers are heavy textured and have sandy substratum below 40 to 180 cm. depth. The soils, especially the very light textured, are poor in nitrogen and very poor to medium in phosphorus and potash.

17.3.3 *Rainfall* : The zone has a monsoon climate which is humid to sub-humid. The average annual rainfall ranges between 1200 mm to 1700 mm., the highest being in the north and north-eastern part of Purnea district. More than 80 per cent of rainfall is received during south-west monsoon season. Monsoon season commences early in the zone generally in last week of May or 1st week of June. Summer rains account for nearly 9 per cent of total rainfall and help early sowing of crops. The maximum and minimum temperature varies between 43°C and 4.5°C and the relative humidity between 74 and 61 per cent. The warm and humid climate is very congenial for growing jute and rice.

17.3.4 *Socio-Economic Characteristics* : The population of the zone according to 1981 Census is 15.4 million of which 90 per cent is rural. The density of population is 475 per sq. km as against the State average of 402 per sq. km. The Scheduled Castes and Scheduled Tribes constitute around 13.4 and 2.4 per cent, respectively, of total population. Total work force of the zone is 4.9 million of which around 38 per cent are cultivators and 46 per cent agricultural labourers. Literacy rate is 23 per cent as against the State average of 26 per cent.

17.3.5. *Pattern of Land Holdings* : The classification of operational holdings in the zone according to size groups for the years 1970-71 and 1980-81 is indicated in Annexure 17.1. Between 1970-71 and 1980-81 the number of operational holdings in the zone increased by one lakh. Practically whole of this increase was on account of marginal holdings. Marginal

and small holdings together constituted around 90 per cent of total holdings during 1980-81 accounting for nearly 45 per cent of the total area.

17.3.6 *Land Use Pattern*: Land use pattern in the zone for the year 1980-81 is presented in the table below.

Table 17.5. Land Use Pattern – East Alluvial Plains Zone (1980-81)

Classification	Area ('000 ha)	Per cent of total reporting area	Col. 2 as per cent of State total
1.	2.	3.	4.
1. **Reporting area**	**3180.5**	**100.0**	**18.3**
2. Forests	180.1	5.6	6.4
3. Not available for cultivation	612.8	19.3	22.5
4. Permanent pastures and other grazing land	16.1	0.6	11.2
5. Land under miscellaneous tree crops and groves	51.5	1.7	24.3
6. Cultivable waste land	62.1	1.9	13.9
7. Fallow lands			
i) Current fallows	292.1	9.2	17.0
ii) Others	104.0	3.2	11.1
8. Net area sown	1861.8	58.5	22.3

17.3.7 Around 75 per cent of the reporting area of this zone is cultivable. Cultivated area, however, is about 68 per cent. More than 12 per cent of the reporting area consists of fallow lands. Nearly 3 lakh ha, (more than 9 per cent) of land is current fallows. Forests cover only about 6 per cent of the reporting area. The zone is not ecologically balanced.

17.3.8 *Cropping Pattern* : Cropping pattern is more or less similar to that of North-West Alluvial Plains Districts. Major crop grown is rice. Maize is another major crop grown both during *kharif* and *rabi* seasons. Important *rabi* crops are wheat, gram, khesari and masoor. About 86 per cent of gross cropped area is accounted for by foodgrains. Jute is the only important

cash crop grown. This is cultivated mainly in Purnea and Saharsa districts. This zone accounts for more than 95 per cent of the aggregate area under jute in the State. The cropping intensity is around 140 per cent. Annexure 17.3 gives the cropping pattern in this zone for 1980-81.

17.3.9 *Irrigation Pattern* : Data on irrigated area in the zone (net and gross) for the years 1970-71 and 1980-81 are presented below.

Table 17.6. Net and Gross Irrigated Area - East Alluvial Plains Zone ('000 ha)

Source	Net Irrigated Area 1970-71	1980-81	Crop	Gross Irrigated Area 1970-71	1980-81
Canals	149.6	250.3	Rice		
	(56.1)	(44.4)	Autumn	3.4	5.8
				(0.7)	(0.8)
			Winter	286.3	316.1
Tanks	8.5	18.2		(66.0)	(45.2)
	(3.2)	(3.3)	Summer	7.2	14.3
				(1.7)	(2.0)
			Total	296.9	336.2
Tubewells	36.8	155.8		(68.4)	(48.0)
	(13.8)	(27.6)	Maize	4.1	72.8
				(1.0)	(10.4)
			Wheat	107.6	252.0
Other wells	11.3	46.4		(24.8)	(36.0)
	(4.3)	(8.2)	Total cereals		
			& millets	412.3	665.3
				(95.0)	(95.1)
Other sources	60.0	92.8	Total pulses	4.1	6.9
	(22.6)	(16.5)		(1.0)	(1.0)
			Total food-		
			grains	416.4	672.2
Total	266.2	563.5		(96.0)	(96.1)
	(100.0)	(100.0)	Fruits &		
			vegetables	10.5	20.7
				(2.4)	(3.0)
			Total	433.7	699.8
				(100.0)	(100.0)

Notes : Figures within brackets are percentage of total.

17.3.10 These data indicate that net irrigated area in the zone more than doubled by 1980-81. However, gross cropped area benefiting from irrigation was 27 per cent. Major crops benefiting from irrigation were rice, wheat and maize. Together, they accounted for 95 per cent of the gross irrigated area. Nearly 60 per cent of the area under wheat benefited from irrigation.

17.3.11 *Fertilizer Consumption*: Data on fertilizer consumption in the zone during 1970-71 and 1980-81 (triennium averages) are indicated below.

Table 17.7. Fertilizer Consumption* – East Alluvial Plains Zone

(Kg/ha)

District	Triennium ending 1970-71 NPK	Triennium ending 1980-81 NPK
Purnea, Katihar	4.0	7.0
Saharsa, Begusarai	6.0	7.0
Bhagalpur	6.0	24.0
Monghyr	9.0	20.0
Average	6.3	14.5

* Data compiled by AER Centre, Santiniketan.

Average fertilizer consumption in this zone has more than doubled. However, the level of offtake is low.

17.3.12 *High Yielding Varieties*: Data on area under HYV of rice and wheat for the year 1980-81 (triennium average) are presented in Table 17.8 below.

Table 17.8. Area Under High Yielding Varieties – Alluvial Plains Districts

('000 ha)

Crop	Total area	Area under HYV*	Per cent of col. 3 to col. 2
(1)	(2)	(3)	(4)
Wheat	419.0	283.4	67.6
Summer rice	23.0	12.6	54.8

* Data compiled by AER Centre, Santiniketan. Area sown to HYV of winter rice is not available.

17.3.13 *Area, Production and Productivity*: The share of the zone in the State's aggregate foodgrains production is around 23 per cent. Data on area, production and yield of principal crops grown in the zone for the triennia ended 1972-73 and 1980-81 and for the year 1981-82 are presented in Annexure 17.6. These data show that crop yields have by and large, remained stagnant during the last decade. Yield rates, particularly of rice, jute and sugarcane are lower than the average yields for these crops in Eastern India as a whole. In the case of wheat, rapeseed and mustard and linseed, however, the yields are higher than the corresponding average yields in Eastern India.

17.4 *South West Alluvial Plains Zone*

17.4.1 *General Features*: The districts included in this zone are Gaya, Aurangabad, Rohtas, Bhojpur, Patna, Nalanda and Nawada. The total geographical area of the zone is 29,193 sq. km. forming around 17 per cent of the State total. The lands slope towards north-east. South of natural levees of Ganga, there is vast stretch of 'Tal' lands.

17.4.2 *Soils*: The soil groups found in this zone are (i) old alluvium reddish yellow grey catenary, (ii) oil alluvium heavy textured, (iii) tal land, and (iv) yellow reddish medium deep light textured catenary. The soils are by and large poor in nitrogen, phosphorus and potash. However, the soils of medium low lands to low lands are comparatively more fertile.

17.4.3 *Rainfall*: This zone is the driest part of the State. The normal annual rainfall ranges between 990 mm and 1150 mm. However, there are inter district variations. Patna and Nalanda districts record the lowest rainfall (below 1000 mm). Nearly 87 per cent rainfall is received between June and September. Post-monsoon rains, which are important for sowing of *rabi* crops are inadequate. The maximum and minimum temperatures vary between 45°C and 0.8°C.

17.4.4 *Socio-Economic Characteristics* : Population of the zone according to 1981 Census is around 15 million of which about 85 per cent is rural. The zone's density of population is 511 per sq. km. (State average is 402 per sq. km.). Scheduled Castes constitute nearly 20 per cent of total population. Scheduled Tribes population is negligible. The zone has a total work force of 4.2

million of which 40.6 per cent are cultivators and 10.5 per cent agricultural labourers. The literacy rate is 32 per cent as against the State average of 26 per cent.

17.4.5 *Pattern of Land Holdings* : The distribution of operational holdings in the zone according to size groups for the years 1970-71 and 1980-81 is presented in Annexure 17.1. The number of operational holdings increased by more than 0.5 lakh. Practically the entire increase was accounted for by marginal holdings. During 1980-81 the marginal and small holdings constituted more than 86 per cent of total holdings operating around 46 per cent of total area.

17.4.6 *Land Use Pattern* : The land use pattern of the zone for the year 1980-81 is indicated in the table below.

Table 17.9. Land Use Pattern – South West Alluvial Plains Zone (1980-81)

Classification	Area ('000 ha)	Per cent of total reporting area	Col. 2 as per cent of State total
(1)	(2)	(3)	(4)
1. **Reporting area**	**2917.8**	**100.0**	**16.8**
2. Forests	318.8	10.9	11.2
3. Not available for cultivation	433.7	14.8	15.9
4. Permanent pastures and other grazing lands	11.1	0.4	7.7
5. Land under miscellaneous tree crops and groves	8.8	0.3	4.2
6. Cultivable waste land	28.8	1.0	8.3
7. Fallow lands			
i) Current fallows	252.8	8.7	14.7
ii) Others	43.6	1.5	4.6
8. Net area sown	1820.2	62.4	21.9

17.4.7 Around 74 per cent of reporting area in this zone is cultivable of which more than 71 per cent has been brought under cultivation. Scope for bringing more area under cultivation is limited. However, a sizeable area of nearly 3 lakhs ha (more than 10 per cent of reporting area) is under fallow lands.

17.4.8 *Cropping Pattern* : Nearly 95 per cent of gross cropped area in the zone is accounted for by foodgrains. Among foodgrains, major crop is rice (*kharif*) which accounts for nearly 50 per cent of the gross cropped area. Wheat accounts for nearly one-fourth of gross cropped area. In the vast 'Tal' areas and 'Diara' lands in the zone only one crop is possible due to waterlogging. Cropping intensity is 143 per cent. The cropping pattern of the zone during the year 1980-81 is given in Annexure 17.4.

17.4.9 *Irrigation Pattern* : Data on net and gross irrigated area for the years 1970-71 and 1980-81 are presented in the table below.

Table 17.10. Irrigation Pattern – South West Alluvial Plains Zone

('000 ha)

Source	Net irrigated area 1970-71	1980-81	Crop	Gross irrigated area 1970-71	1980-81
Canals	507.0	548.2	Rice		
	(39.0)	(37.7)	Winter	1128.1	1224.6
				(69.8)	(67.3)
			Summer	42.6	9.4
Tanks	60.6	18.5		(2.6)	(0.5)
	(4.7)	(1.2)	Total	1173.8	1234.6
				(72.6)	(67.8)
			Wheat	330.0	493.6
Tubewells	216.5	307.6		(20.4)	(27.1)
	(16.6)	(21.2)	Total cereals		
			& millets	1519.6	1749.0
				(94.0)	(96.2)
Other wells	60.9	52.1	Total pulses	7.4	4.1
	(4.7)	(3.6)		(0.5)	(0.2)

			Total food-grains	1527.0	1753.1
Other				(94.5)	(96.4)
Sources	455.3	526.9	Sugarcane	28.1	12.2
	(35.0)	(36.3)		(1.8)	(0.7)
			Fruits & vegetables	48.0	42.3
Total	1300.3	1453.3		(3.0)	(2.3)
	(100.0)	(100.0)	Total oilseeds	6.7	7.0
				(0.4)	(0.3)
			Total	1617.3	1819.0
				(100.0)	(100.0)

Notes : Figures in brackets represent percentage of total.

17.4.10 Irrigated area in the zone (gross and net) has increased by nearly 12 per cent over this period. In 1980-81, about 80 per cent of the net sown area benefited from irrigation. Gross sown area benefiting from irrigation was 70 per cent.

17.4.11 *Fertilizer Consumption* : Fertilizer offtake in the zone during the years 1970-71 and 1980-81 (triennium averages) is indicated below in Table 17.11.

Table 17.11. Fertilizer Consumption* – South West Alluvial Plains Zone

(Kg/ha)

District	Triennium ending 1970-71 NPK	Triennium ending 1980-81 NPK
Gaya, Aurangabad	9.0	25.0
Rohtas, Bhojpur	18.0	36.0
Patna, Nalanda and Nawada	20.0	37.0
Average	15.7	32.7

* Data compiled by AER Centre, Santiniketan.

Average fertilizer consumption in this zone during the period has doubled to about 33 kgs/ha. This is higher than the State average of 18 kg/ha of cropped area.

17.4.12 *High Yielding Varieties* : Data on area under HYV of rice for the triennium ending 1980-81 is presented in the table below.

Table 17.12. Area Under High Yielding Varieties – South West Alluvial Plains Zone

('000 ha)

Crop	Total area	Area under HYV*	Percent of col. 3 to col. 2
(1)	(2)	(3)	(4)
Wheat	601.6	102.2	30.3
Summer rice	10.1	10.1	100.0

* Data compiled by AER Centre, Santiniketan.

These data indicate that progress in the adoption of HYV wheat in the zone has been low, despite the fact that substantial area has benefited from irrigation.

17.4.13 *Area, Production and Productivity* : Data on area, production and productivity of principal crops of the zone during the triennia ending 1972-73 and 1980-81 and for the year 1981-82 are presented in Annexure 17.6. The average yield of rice is higher than that in the North West and East Alluvial Zones as also that of Eastern India. This is due to the fact that substantial area under the crop has benefited from irrigation. In the case of wheat, although more than 80 per cent of the area sown has benefited from irrigation, its yield is around 83 per cent only of average yield in Eastern India. The average yield of millets and pulses are around 85 to 95 per cent of yields in Eastern India. However, in the case of sugarcane average yield is around 30 per cent of that of Eastern India.

17.5 *Plateau Zone*

17.5.1 *General Features*: The districts included in this zone are Hazaribagh, Giridih, Santhal Parganas, Dhanbad, Palamau, Ranchi and Singhbhum. The total geographical area of the zone is 79638 sq. kms forming 45 per cent of the State total. All these districts belong to Chhotanagpur Division except Santhal Parganas which is a district of Bhagalpur Division.

17.5.2 *Soils*: The soils found in this zone are (i) red-yellow light grey catenary, (ii) yellow-reddish, yellow medium deep light textured catenary, (iii) red yellow-chocolate of iron-ore region and (iv) red-yellow laterite. Soils of these districts are mostly sedentary. However, in a few blocks of Singhbhum, alluvial soils are found, which are deposited by river Subarnarekha. The soils are either red or yellowish. These are poor in fertility. Acidity of soils causes many problems in nutrient supply.

17.5.3 *Rainfall*: The normal annual precipitation in the zone ranges between 1284 mm and 1482 mm. However, there are inter-district variations. Giridih district receives the lowest rainfall. Maximum temperature varies between 41°C and 46°C and the minimum between 4°C and 6°C. The relative humidity varies between 59 and 64 per cent, 40 and 64 per cent.

17.5.4 *Socio-Economic Characteristics*: The population of this zone according to 1981 Census is 17.6 million of which around 80 per cent is rural. The density of population is low being 221 per sq. km as against the State average of 402 per sq. km. However, there are inter-district variations. The density is highest (706 per sq. km) in Dhanbad district. Scheduled Castes and Scheduled Tribes constitute around 12 per cent and 30 per cent, respectively, of the total population. The Scheduled Tribes population of the zone constitutes around 92 per cent of the State's total Scheduled Tribes population. These districts have a total work force of 8.5 million of which nearly 33 per cent are cultivators and 13 per cent agricultural labourers. A substantial proportion of the population is employed in industry, mining and quarrying. The literacy rate is 28 per cent as against the State average of 26 per cent.

17.5.5 *Pattern of Land Holdings*: The number and area of operational holdings according to size classes during 1970-71 and 1980-81 are indicated in Annexure 17.1. During this period the total number of operational holdings increased by over 0.4 lakh. The number of marginal holdings also increased by 0.4 lakh. During 1980-81 marginal and small holdings constituted around 75 per cent of total holdings, accounting for only one-fourth of the total area.

17.5.6 *Land Use Pattern* : The land use pattern of the zone for 1980-81 is indicated in table below.

Table 17.13. Land Use Pattern – Plateau Zone (1980-81)

Classification	Area ('000 ha)	Per cent of total reporting area	Col. 2 as per cent of State total
(1)	(2)	(3)	(4)
1. Reporting area	**7970.1**	**100.0**	**46.0**
2. Forests	2235.4	28.1	79.1
3. Not available for cultivation	1118.4	14.1	41.0
4. Permanent pastures and other grazing land	107.7	1.3	75.0
5. Land under miscellaneous tree crops and groves	55.5	0.7	26.2
6. Cultivable waste lands	344.4	4.3	77.1
7. Fallow lands			
i) Current fallows	999.6	12.5	58.1
ii) Others	751.3	9.4	80.0
8. Net area sown	2357.8	29.6	28.4

17.5.7 Around 55 per cent of reporting area of the zone is cultivable. However, cultivated area constitutes only around 40 per cent of the reporting area. Proportion of fallow lands (22 per cent) is quite high.

17.5.8 *Cropping Pattern* : Three-fourths of gross sown area of the zone is cultivated during the *kharif* season. Rice, maize and ragi are the main crops of the season. The crops grown during *rabi* season are wheat, gram, pulses and oilseeds. About 92 per cent of cropped area is sown to foodgrains. The cropping intensity is low being 114 per cent. Cropping pattern of the zone during 1980-81 is indicated in Annexure 17.5.

17.5.9 *Irrigation Pattern* : Data on the irrigated area (net and gross) for the years 1970-71 and 1980-81 are indicated below.

Table 17.14. Net and Gross Irrigated Area – Plateau Zone

('000 ha.)

Source	Net irrigated area		Crop	Gross irrigated area	
	1970-71	1980-81		1970-71	1980-81
Canals	35.0	56.0	Winter rice	151.2	105.9
	(18.0)	(30.0)		(72.7)	(45.6)
			Total rice	152.8	110.1
Tanks	67.8	23.0		(73.4)	(47.4)
	(34.8)	(12.2)	Wheat	15.6	58.1
				(7.5)	(25.0)
Tubewells	3.1	18.3	Total cereals		
	(1.6)	(9.8)	and millets	171.2	172.5
				(82.2)	(74.3)
Other wells	28.4	42.8	Total pulses	1.8	3.1
	(14.6)	(22.8)		(0.9)	(1.3)
			Total food-		
Other			grains	173.0	175.6
sources	60.4	47.5		(83.1)	(75.6)
	(31.0)	(25.2)	Sugarcane	5.8	4.3
				(2.8)	(1.8)
Total	194.7	187.6	Fruits and		
	(100.0)	(100.0)	vegetables	27.0	49.5
				(13.0)	(21.3)
			Total	208.1	232.3
				(100.0)	(100.0)

Notes : Figures in brackets represent percentage of total.

17.5.10 The net and gross irrigated areas constitute only 8 per cent and 9 per cent of net and gross sown areas respectively. Net irrigated area has remained more or less stagnant during this period. Gross irrigated area has, however, increased by around 12 per cent. There has been some change in the pattern of irrigation as well. While the proportion of area irrigated under rice has declined from 73 per cent in 1970-71 to 47 per cent in 1980-81, (1979-80 being a drought year) there has been a corresponding increase in the proportion of area irrigated under wheat and fruits and vegetables.

17.5.11 *Fertilizer Consumption*: Data on fertilizer offtake during the triennia ending 1970-71 and 1980-81 are presented in Table 17.15 below.

Table 17.15. Fertilizer Consumption* – Plateau Zone

(Kg/ha)

District	Triennium ending 1970-71 NPK	Triennium ending 1980-81 NPK
Hazaribagh, Giridih	2.0	5.0
Santhal Parganas	4.0	6.0
Dhanbad	2.0	4.0
Palamau	1.0	4.0
Ranchi	3.0	7.0
Singhbhum	2.0	4.0
Average	**2.4**	**5.0**

* Data compiled by AER Centre, Santiniketan.

17.5.12 *High Yielding Varieties*: Data on area under HYV of crops for the triennium ended 1980-81 are presented in the table below.

Table 17.16. Area Under High Yielding Varieties – Plateau Zone

('000 ha)

Crop	Total area	Area under HYV*	Per cent of col. 3 to 2
(1)	(2)	(3)	(4)
Summer rice	4.4	2.1	47.7
Wheat	76.8	40.0	52.1

* Data compiled by AER Centre, Santiniketan.

17.5.13 *Area, Production and Productivity*: This zone accounts for nearly one-fourth of the total foodgrains production in the State. Data on area, production and productivity of principal crops in the zone during the triennia ending 1972-73 and 1980-81 and during the year 1981-82 are presented in Annexure 17.6. These data indicate that yields in these districts are low. This is due largely to the rainfed conditions prevailing in a large proportion of the area. Among all the zones, rice yields in this zone are the lowest. Inspite of the fact that a large proportion of wheat crop is irrigated, its yield is low at around 75 per cent of that for Eastern India. Among cash crops, the yield of sugarcane is around 35 per cent and that of potato around 66 per cent of the average yields in Eastern India.

Annexure 17.1

Number and Size of Operational Holdings - Zonewise

Size class (ha)	1970-71		1980-81	
	Number ('000)	Area ('000 ha)	Number ('000)	Area ('000 ha)
(1)	(2)	(3)	(4)	(5)
1. North West Alluvial Plains Zone				
Below 1.0 (Marginal)	191.8 (73.6)	70.7 (25.4)	347.2 (85.2)	110.5 (43.0)
1.0 — 2.0 (Small)	32.5 (12.5)	45.2 (16.3)	31.4 (7.7)	40.5 (15.7)
2.0 — 4.0 (Semi-medium)	23.1 (8.9)	63.3 (22.8)	20.7 (5.1)	54.7 (21.2)
4.0 — 10.0 (Medium)	10.9 (4.2)	61.9 (22.3)	7.3 (1.8)	4.0 (15.4)
10.0 and above (Large)	2.1 (0.8)	36.8 (13.2)	0.7 (0.2)	1.2 (4.7)
Total	260.4 (100.0)	27.8 (100.0)	407.4 (100.0)	257.6 (100.0)
2. East Alluvial Plains Zone				
Below 1.0 (Marginal)	102.9 (63.4)	41.2 (15.8)	198.1 (76.0)	71.9 (29.3)
1.0 — 2.0 (Small)	25.3 (15.6)	35.2 (13.4)	29.5 (11.3)	38.4 (15.6)
2.0 — 4.0 (Semi-medium)	19.5 (12.0)	53.5 (20.5)	21.9 (8.4)	57.9 (23.6)
4.0 — 10.0 (Medium)	11.2 (6.9)	65.3 (25.0)	10.1 (3.9)	57.7 (23.5)
10.0 and above (Large)	3.4 (2.1)	66.0 (25.3)	1.1 (0.4)	19.5 (8.0)
Total	162.3 (100.0)	261.1 (100.0)	260.8 (100.0)	245.5 (100.0)

Annexure 17.1 (Contd.)

Size class (ha)	1970-71		1980-81	
	Number ('000)	Area ('000 ha)	Number ('000)	Area ('000 ha)
(1)	(2)	(3)	(4)	(5)
3. South West Alluvial Plains Zone				
Below 1.0	104.9	38.1	156.9	59.3
(Marginal)	(65.0)	(18.2)	(72.7)	(28.0)
1.0 — 2.0	25.3	35.8	29.5	38.6
(Small)	(15.6)	(17.0)	(13.7)	(18.2)
2.0 — 4.0	19.7	54.2	20.6	55.0
(Semi-medium)	(12.2)	(25.8)	(9.5)	(26.0)
4.0 — 10.0	10.0	56.9	8.2	47.4
(Medium)	(6.2)	(27.1)	(3.8)	(22.4)
10.0 and above	1.2	25.0	0.7	11.4
(Large)	(1.0)	(11.9)	(0.3)	(5.4)
Total	161.5	210.0	215.9	211.8
	(100.0)	(100.0)	(100.0)	(100.0)
4. Plateau Zone				
Below 1.0	87.9	34.6	126.4	53.5
(Marginal)	(50.6)	(8.6)	(58.6)	(13.5)
1.0 — 2.0	27.8	41.1	32.9	47.3
(Small)	(16.0)	(10.3)	(15.2)	(12.0)
2.0 — 4.0	29.2	82.7	30.8	92.9
(Semi-medium)	(16.8)	(20.7)	(14.3)	(23.4)
4.0 — 10.0	22.3	133.5	21.4	129.4
(Medium)	(12.9)	(33.3)	(9.9)	(32.6)
10.0 and above	6.4	108.2	4.3	73.1
(Large)	(3.7)	(27.1)	(2.0)	(18.5)
Total	173.5	400.1	215.8	396.3
	(100.0)	(100.0)	(100.0)	(100.0)

Note : Figures within brackets represent percentages to total.

Source : Status paper on Agricultural Productivity in Bihar, Department of Agriculture, Bihar.

Annexure 17.2

Cropping Pattern 1980-81 – North West Alluvial Plains Zone

Crop	Area ('000 ha)	Per cent of gross cropped area	Crop	Area ('000 ha)	Per cent of gross cropped area
(1)	(2)	(3)	(4)	(5)	(6)
Rice					
Autumn	262.9	8.2	Sugarcane	86.1	2.7
Winter	1196.2	37.0			
Summer	16.8	0.5	Rapeseed and mustard	23.6	0.7
Total	1475.9	45.7			
			Total oil-seeds	52.7	1.6
Maize	299.8	9.3			
Ragi	54.6	1.7	Potato	49.9	1.5
Wheat	649.9	20.2			
Barley	43.5	1.3	Onion	5.0	0.2
Total cereals	2547.5	79.0	Total fruits and vegetables	198.3	6.2
Gram	19.5	0.6			
Tur	36.4	1.1			
Other pulses	243.3	7.3	Jute	3.5	0.1
Total pulses	290.2	9.0			
Total food-grains	2837.7	88.0	Gross Area sown	3224.5	100.0

Annexure 17.3

Cropping Pattern 1980-81 – East Alluvial Plains Zone

Crop	Area ('000 ha)	Per cent of gross cropped area	Crop	Area ('000 ha)	Per cent of gross cropped area
(1)	(2)	(3)	(4)	(5)	(6)
Rice					
Autumn	137.1	5.2	Sugarcane	7.7	0.3
Winter	905.1	34.4			
Summer	21.4	0.8	Potato	25.2	1.0
Total	1063.6	40.4			
			Fruits and vegetables	97.9	3.7
Maize	356.6	13.5			
Ragi	21.7	0.8	Rapeseed and mustard	29.1	1.1
Wheat	420.0	16.0			
Barley	32.7	1.2			
Total cereals and millets	1913.7	72.7	Total oil-seeds	61.2	2.3
Gram	46.2	1.8	Jute	150.9	5.7
Tur	11.9	0.5			
Other pulses	286.4	10.9	Gross area sown	2632.0	100.0
Total pulses	344.5	13.1			
Total food-grains	2258.2	85.8			

Annexure 17.4

Cropping Pattern 1980-81 – South-West Alluvial Plains Zone

Crop	Area ('000 ha)	Per cent of gross cropped area	Crop	Area ('000 ha)	Per cent of gross cropped area
(1)	(2)	(3)	(4)	(5)	(6)
Rice					
Autumn	3.5	0.1	Sugarcane	12.3	0.5
Winter	1266.9	48.7			
Summer	9.4	0.4	Potato	28.7	1.1
Total	1279.8	49.2	Fruits and vegetables	60.1	2.3
Maize	58.6	2.3			
Wheat	610.3	23.4	Rapeseed and mustard	13.0	0.5
Barley	25.6	1.0			
Total cereals and millets	1992.2	76.5	Total oil-seeds	51.0	2.0
Gram	94.9	3.6			
Other pulses	376.1	14.5	Gross area sown	2603.0	100.0
Total pulses	471.0	18.1			
Total food-grains	2463.2	94.6			

Annexure 17.5

Cropping Pattern 1980-81 - Plateau Zone

Crop	Area ('000 ha)	Per cent of gross cropped area	Crop	Area ('000 ha)	Per cent of gross cropped area
(1)	(2)	(3)	(4)	(5)	(6)
Rice					
Autumn	195.2	7.3	Total'pulses	249.9	9.3
Winter	1556.3	57.9	Total food-grains	2479.7	92.2
Summer	4.5	0.2	Sugarcane	4.7	0.2
Total	1756.0	65.4	Potato	28.5	1.1
Maize	167.5	6.2	Total Fruits and vegetables	93.3	3.6
Ragi	91.5	3.4			
Wheat	76.1	2.8			
Barley	17.9	0.7	Rapeseed and mustard	20.1	0.7
Total cereals and millets	2229.8	82.9	Total oil-seeds	99.9	3.7
Gram	35.3	1.3			
Tur	32.9	1.2	Gross area sown	2689.4	100.0
Other pulses	181.7	6.8			

Annexure 17.6

Area, Production and Yield of Principal Crops – Zone-wise

Crop	Area ('000 ha)			Production ('000 tonnes)			Yield (Kg/ha)		
	Triennium ending 1972-73	Triennium ending 1980-81	1981-82	Triennium ending 1972-73	Triennium ending 1980-81	1981-82	Triennium ending 1972-73	Triennium ending 1980-81	1981-82
I. NORTH WEST ALLUVIAL PLAINS ZONE									
Rice									
Autumn	179.8	253.0	270.2	122.9	232.5	234.7	684	919	869
Winter	1127.7	1169.8	1142.7	899.6	1037.6	864.5	798	887	757
Summer	35.0	18.8	16.6	43.9	23.4	16.0	1254	1244	964
Total	1341.5	1441.6	1429.5	1066.4	1293.5	1115.2	795	897 (88.6)	780
Maize	329.5	297.0	294.1	296.5	335.9	306.5	900	1131 (123.0)	1042
Ragi	44.9	52.9	50.4	28.7	39.5	37.8	639	747 (118.3)	750
Wheat	438.0	661.7	619.5	730.1	834.1	868.2	1667	1260 (90.6)	1401
Barley	106.8	51.4	38.5	85.5	37.0	28.2	801	720 (77.4)	732
Gram	37.8	21.0	18.1	16.9	13.3	16.5	447	633 (90.4)	912
Tur	45.6	35.0	32.9	47.8	36.8	41.8	1048	1051 (103.5)	1271

Annexure 17.6 (Contd.)

Crop	Area ('000 ha)			Production ('000 tonnes)			Yield (Kg/ha)		
	Triennium ending 1972-73	Triennium ending 1980-81	1981-82	Triennium ending 1972-73	Triennium ending 1980-81	1981-82	Triennium ending 1972-73	Triennium ending 1980-81	1981-82
Sugarcane (Gur)	107.2	89.3	93.4	393.2	295.6	319.3	3668	3309 (40.0)	3419
Rapeseed and mustard	22.9	24.3	23.5	10.8	12.8	13.6	472	527 (123.7)	579
Linseed	22.6	24.9	23.8	14.0	10.7	10.5	619	429 (125.4)	441
Jute	9.9	3.7	3.5	6.6*	18.0*	23.5*	1211	876 (69.1)	1209
Mesta	3.2	5.0	4.3	13.2*	23.0*	22.8*	743	828 (85.4)	954
Tobacco	10.8	9.0	10.6	8.1	7.9	9.6	750	878 (114.9)	906
Chillies (Dry)	9.7	5.9	3.4	7.1	4.1	3.4	732	695 (92.9)	1000
Potato	24.4	53.8	50.7	219.4	486.4	617.3	8992	9040 (72.7)	12175

Annexure 17.6 (Contd.)

Crop	Area ('000 ha)			Production ('000 tonnes)			Yield (Kg/ha)		
	Triennium ending 1972-73	Triennium ending 1980-81	1981-82	Triennium ending 1972-73	Triennium ending 1980-81	1981-82	Triennium ending 1972-73	Triennium ending 1980-81	1981-82
II. EAST ALLUVIAL PLAINS ZONE									
Rice									
Autumn	124.5	135.4	137.2	56.6	89.1	83.7	455	658	610
Winter	820.0	906.5	890.2	955.8	871.8	676.5	962	962	760
Summer	21.5	23.0	20.0	15.3	19.1	20.3	711	830	1015
Total	966.0	1064.9	1047.4	1027.7	980.0	780.5	1064	920 (90.8)	745
Maize	289.6	346.7	336.6	174.7	316.7	302.3	603	913 (99.2)	898
Ragi	20.0	21.4	21.4	10.5	11.7	12.1	525	547 (86.7)	565
Wheat	311.8	419.0	377.5	456.1	743.0	511.8	1463	1773 (127.6)	1356
Barley	51.8	31.4	30.9	27.5	19.5	21.5	530	621 (66.8)	696
Gram	59.9	47.4	38.3	35.0	32.5	24.1	584	686 (98.0)	629
Tur	17.3	12.3	15.9	17.8	12.1	21.7	1029	984 (96.9)	1365

Annexure 17.6 (Contd.)

Crop	Area ('000 ha)			Production ('000 tonnes)			Yield (Kg/ha)		
	Triennium ending 1972-73	Triennium ending 1980-81	1981-82	Triennium ending 1972-73	Triennium ending 1980-81	1981-82	Triennium ending 1972-73	Triennium ending 1980-81	1981-82
Sugarcane (Gur)	9.7	8.9	9.9	31.4	30.8	27.1	3237	3461 (41.8)	2737
Rapeseed and mustard	27.8	31.3	27.1	16.0	14.4	18.5	576	460 (108.0)	683
Linseed	13.5	56.1	25.3	8.6	9.5	15.9	637	364 (106.4)	628
Jute	124.6	164.8	130.0	414.7*	211.3*	809.0*	590	943 (74.4)	1055
Mesta	29.1	29.8	23.5	124.3*	153.0*	123.5*	769	924 (95.4)	946
Tobacco	1.7	1.7	1.2	2.0	1.8	1.1	1176	1059 (138.6)	916
Chillies (Dry)	4.6	7.8	5.8	5.3	10.8	7.8	1152	1384 (185.1)	1344
Potato	12.5	23.0	24.3	155.8	155.9	186.9	12464	6778 (54.6)	7691

Annexure 17.6 (Contd.)

Crop	Area ('000 ha)			Production ('000 tonnes)			Yield (Kg/ha)		
	Triennium ending 1972-73	Triennium ending 1980-81	1981-82	Triennium ending 1972-73	Triennium ending 1980-81	1981-82	Triennium ending 1972-73	Triennium ending 1980-81	1981-82
III. SOUTH-WEST ALLUVIAL PLAINS ZONE									
Rice									
Autumn	6.3	3.9	3.5	3.8	3.3	2.5	603	846	714
Winter	1094.6	1130.4	1258.3	1116.0	1265.2	1297.6	1020	1119	1031
Summer	33.3	10.1	7.5	37.2	14.1	9.9	1117	1396	1320
Total	1134.2	1144.4	1269.3	1137.0	1282.6	1310.0	1002	1121 (110.7)	1032
Maize	68.3	57.0	51.7	64.4	50.0	36.0	942	877 (95.3)	696
Ragi	8.6	10.2	5.5	6.0	5.4	4.8	697	529 (83.8)	872
Wheat	506.6	601.6	586.2	605.1	693.2	763.6	1194	1152 (82.9)	1303
Barley	31.5	25.3	22.4	18.9	23.8	19.1	600	941 (101.2)	852
Gram	116.1	94.6	91.9	83.4	55.3	68.2	718	584 (83.4)	742

Annexure 17.6 (Contd.)

Crop	Area ('000 ha)			Production ('000 tonnes)			Yield (Kg/ha)		
	Triennium ending 1972-73	Triennium ending 1980-81	1981-82	Triennium ending 1972-73	Triennium ending 1980-81	1981-82	Triennium ending 1972-73	Triennium ending 1980-81	1981-82
Tur	18.0	10.2	11.6	17.1	10.1	6.8	950	990 (97.5)	586
Sugarcane (Gur)	23.1	12.2	15.3	67.0	29.6	49.6	2900	2426 (29.3)	3241
Rapeseed and mustard	15.2	12.0	12.4	8.2	6.9	9.2	539	575 (135.0)	742
Linseed	19.7	34.7	33.3	11.0	12.2	9.6	558	352 (102.9)	288
Chillies (Dry)	2.6	1.4	1.4	2.7	2.0	2.0	1038	1429 (191.1)	1429
Potato	34.6	31.4	29.1	249.2	275.4	338.7	7202	8770 (70.6)	11640

Annexure 17.6 (Contd.)

Crop	Area ('000 ha)			Production ('000 tonnes)			Yield (Kg/ha)		
	Triennium ending 1972-73	Triennium ending 1980-81	1981-82	Triennium ending 1972-73	Triennium ending 1980-81	1981-82	Triennium ending 1972-73	Triennium ending 1980-81	1981-82
IV. PLATEAU ZONE									
Rice									
Autumn	173.3	191.1	196.1	65.2	81.2	90.1	376	425	460
Winter	1466.4	1482.7	1431.4	1491.5	1345.7	957.8	1017	908	669
Summer	3.7	4.4	3.8	3.5	4.2	3.3	946	955	868
Total	1643.4	1678.3	1631.3	1560.2	1431.0	1051.2	949	853 (84.2)	644
Maize	170.0	166.7	168.3	120.7	157.5	124.3	710	945 (102.7)	739
Ragi	76.3	90.0	90.7	23.9	47.5	39.7	313	528 (83.7)	438
Wheat	39.4	76.8	57.0	51.6	83.3	58.2	1310	1085 (78.1)	1021
Barley	25.0	18.7	14.4	11.9	9.5	11.3	476	508 (54.6)	785
Gram	43.4	35.8	24.4	21.5	18.2	18.2	495	508 (72.6)	746
Tur	36.2	30.0	25.0	17.7	20.3	16.1	489	677 (66.7)	644

Annexure 17.6 (Concld.)

Crop	Area ('000 ha)			Production ('000 tonnes)			Yield (Kg/ha)		
	Triennium ending 1972-73	Triennium ending 1980-81	1981-82	Triennium ending 1972-73	Triennium ending 1980-81	1981-82	Triennium ending 1972-73	Triennium ending 1980-81	1981-82
Sugarcane (Gur)	6.3	4.8	5.1	15.7	14.2	18.0	2492	2958 (35.7)	3529
Rapeseed and mustard	16.8	18.6	11.9	8.2	6.1	4.6	488	328 (77.0)	387
Linseed	9.5	13.1	8.2	3.5	5.1	2.5	368	389 (113.7)	305
Potato	16.7	23.6	27.3	135.4	192.7	200.5	8108	8165 (65.7)	7344

* Production in thousand bales of 180 kgs. each

Note : Figures within brackets denote the Relative Yield Index (RYI), i.e. zonal yield as per cent of yield in Eastern India.

CHAPTER 18

CONSTRAINTS TO GROWTH

18.1 *Dimensions of the Problem*

18.1.1 Review of past trends in production and productivity in the State show that performance of the agricultural sector has been rather poor. Bihar is deficit in foodgrains production. Even in a good year, as in 1978-79, when total foodgrains output had touched a level of 100 lakh tonnes, the State was deficit to the extent of about 35 per cent. If this trend in production continues and given the expected increase in population, the food deficit will widen significantly.

18.1.2 The situation is no better in the case of cash crops. About one-half of the area under non-foodgrain crops is sown to jute and mesta, sugarcane and oilseeds. Yields of jute and sugarcane are very low.

18.1.3 The past production trends indicate the need for a new orientation in the agricultural development strategy with the twin objectives of raising productivity per ha of land and per capita. To ensure effective implementation of this strategy, it would be necessary at the outset to identify main constraints which impeded the growth process so far. Constraints vary from zone to zone, district to district, block to block or even village to village. They may be broadly classified into (i) social and structural, (ii) organisational, and (iii) technological. The constraints experienced by Bihar are, by and large, common to the eastern region which are spelt out in Chapter 4 of Part I of our Report. They are briefly reviewed in the following paragraphs.

18.2 *Social and Structural Constraints*

18.2.1 *Agrarian Structure* : The average size of holding is very small. About 75 per cent are marginal farmers with a holding

of 1 ha or less. Their average size of holding works out to around 0.4 ha. The holdings are not only small in size but also very much fragmented. Land consolidation has not made much progress.

18.2.2 Although tenancy is prohibited in the State, oral lease arrangements are widespread. But in the absence of a programme like "Operation Barga" as in West Bengal, many of the share-croppers are not yet recorded.

18.2.3 Land records are not uptodate. Unless rights over land are properly defined, assignment of water rights, management of tubewells, obtaining of bank loans, land improvement, etc.. become difficult.

18.2.4 Small and fragmented holdings and absence of clearly defined tenancy and sharecropping arrangements are some of the major constraints standing in the way of investment in agriculture.

18.2.5 *Erratic Rainfall* : Even though the State receives an annual average precipitation of 1300 mm, its erratic nature and intermittent long dry spells cause serious handicap to crop production.

18.2.6 *Natural Calamities*: Flood and drought also adversely affect agriculture in Bihar. An area of about 17 lakh ha in North Bihar is flood-prone. Some parts of the State, particularly in South Bihar, (e.g. Nalanda, Gaya, Nawadah, Rohtas, Monghyr, Palamau and Santhal Parganas) are drought-prone.

18.2.7 *Tal Lands* : About 0.8 lakh ha in the State are "tal" lands, located on the backwaters of Ganga and where flood water deposits sand. In such areas it is not possible to raise *kharif* crops. These lands become gradually unfit for cultivation in some of these areas.

18.2.8 *Problem Soil Areas*: Parts of North Bihar soils are salt affected. A large part of upland areas of the plateau region is affected by soil acidity. The upland areas of Chhotanagpur plateau face in addition problems of soil erosion. Some of these

problem soils may be reclaimed with the help of proper amendments. But the cost of reclamation may be very high.

18.2.9 *Deficiency in Nutrients*: Soils of parts of North and South Bihar are deficient in phosphorus, potash and micronutrients. These make the lands less productive.

18.2.10 *Pests and Diseases* : About 15 to 20 per cent of agricultural produce is estimated to be lost annually due to incidence of pests/diseases and weeds. There are endemic areas of various pests and diseases.

18.3 *Organisational Constraints*

18.3.1 *Inputs* : Certified seeds are in short supply in the State. Moreover, seed replacement rate is low. Owing to paucity of certified seeds, the practice of exchange of seeds among farmers is common. Complaints of large scale adulteration of seeds, fertilizers and pesticides are widely reported. Arrangements for distribution of seeds and fertilizers at block headquarters are not satisfactory and do not exist below block level. As a result, most farmers do not get the required inputs on time. In this context we may state that the performance of BISCOMAUN is highly unsatisfactory.

18.3.2 *Credit* : Flow of institutional credit for financing of both inputs and on-farm investments is adversely affected due to several factors. Rising overdues have crippled the capabilities of co-operatives. Further, their working is unsatisfactory due to managerial weaknesses. In the case of LAMPS, large areas of operation stands in the way of effective management. As regards commercial banks, inadequate branch network and lack of adequte staff at branch levels are the main problems. Both co-operatives and commercial banks suffer from shortage of village biased skilled and trained manpower. Other major handicaps are absence of one-window approach, inadequate supervision of end-use of credit and lack of follow-up action in the matter of recovery. There is no effective co-ordination between the lending operations of the credit agencies and development programmes of the Government, input supply and extension agencies.

18.3.3 *Electric Power* : Power supply is both inadequate and erratic due mainly to inefficient management. Therefore, it has not been possible to utilise tubewells and pumpsets optimally. Large scale thefts of electric wires and transformers have aggravated the problem.

18.3.4 *Extension* : The State has introduced the T&V system of extension in some areas. Coverage is proposed to be extended over the entire State by 1985-86. Extension service continues to be ineffective for want of adequate staff and lack of co-ordination with input supply. VAWs are still used for non-extension work. As a result, field visits by them are not adequate. Extension service, therefore, has not made any significant impact in the transfer of technology to the farmers. In tribal areas particularly, extension service is even poorer.

18.3.5 *Marketing Facilities*: Facilities for marketing, particularly of perishable crops are grossly unsatisfactory. Procurement facilities for all practical purposes are non-existent. Traders continue to exploit the farmers, the worst sufferers being small and marginal farmers. Rural godowns, cold storages and processing facilities are not available to small producers.

18.3.6 *Co-ordination* : Several Departments are connected with development of agriculture and allied activities. However, co-ordination among them is unsatisfactory at all levels. Poor co-ordination and lack of effective management have adversely affected implementation of agricultural development programmes.

18.4 *Technological Constraints*

18.4.1 *Water Management* : Despite large surface and groundwater resources, only a little over 30 per cent of the gross cropped area is covered by irrigation. Potential created under major irrigation projects is underutilised due to unsatisfactory distribution system and lack of arrangements for draining out excess water.

18.4.2 As regards groundwater, only about one-fourth of the potential has so far been exploited. Most of the deep tubewells are not functioning mainly because of poor management. Progress of private investments in shallow tubewells is slow due

to inadequate flow of credit, preponderance of small and marginal farmers and the problem of power supply.

18.4.3 *Machinery and Implements* : Farmers in Bihar continue to use the age-old traditional farming tools and implements. Modern implements such as improved ploughs, seed-cum-fertilizer drills suitable to the locality are not available or not sufficiently demonstrated where available.

18.4.4 *Problems of Agriculture in Tribal Areas* : . The primary constraint on growth of agriculture in tribal areas has been the failure to adapt or evolve development programmes in harmony with the customs and life style of tribals. More specifically, the constraints to modernising agriculture in tribal areas have been :

(i) lack of right type of institutions (especially credit and financial) to help tribals to invest in modern agriculture;

(ii) lack of an administrative structure fully aware of or responsive to tribal life styles;

(iii) inadequate marketing facilities particularly for disposal of minor forest produce;

(iv) inadequate research and extension support, particularly in regard to (a) HY/improved varieties of crops important in the tribal economy, (b) improved soil and water utilisation techniques, (c) livestock development, and (d) horticulture;

(v) overexploitation or lopsided utilisation of forest resources, mostly by nontribals, leading to environmental degradation.

18.4.5 *Research* : The main gaps in research are the following :-

(i) high yielding varieties of rice suitable for deepwater conditions are not available;

(ii) salt affected soils in the North East Alluvial Plains pose serious problems for the solution of which research efforts are lacking;

(iii) farming systems suited to "tal" lands have not been developed;

(iv) water management under drought and flood conditions has not received priority particularly in the North East and South Alluvial Plains;

(v) suitable varieties of seeds resistant to common pests and diseases have not been adequately developed.

18.5 *Specific Problems of Agro-Climatic Zones*

18.5.1 Specific constraints in the different agro-climatic zones are given below:

18.5.2 *North West Alluvial Plains Zone*

(i) Nearly one-third of the total cultivated area in the districts of Darbhanga, Sitamarhi, Samastipur, Muzaffarpur and East Champaran remain flooded during the '*kharif*' season. As a result most of this area is left uncultivated during the season.

(ii) In these districts rising water table in flood-prone areas has gradually led to partial shift of maize from *kharif* to *rabi* season. Suitable high yielding varieties are in short supply.

(iii) Drought-resistant varieties of wheat for unirrigated lands, red-rot resistant varieties of sugarcane, rapeseed and mustard seeds resistant to aphid attack and pulses suited to the soils of the zone such as gram and peas are lacking.

(iv) Volatilization loss as nitrogen from nitrogenous fertilizers applied to calcareous soils limits nitrogen availability.

(v) Considerable areas in the districts of Saran, Siwan and Vaishali are salt affected. This has contributed to poor productivity of crops.

18.5.3 *East Alluvial Plains Zone*

(i) Saharsa and Kosi area face the problem of recurrent floods and waterlogging.

(ii) Soil fertility suffers from heavy leaching of nutrients.

18.5.4 *South West Alluvial Plains Districts*

(i) Some districts have 'tal' lands.

(ii) Some areas of this zone have heavy textured soils which harden and crack and become difficult to cultivate. Suitable soil management technology, and agricultural practices to increase water percolation in these soils have not been developed.

(iii) Suitable short duration HYV of rice are not used in *kharif*. This results in late sowing of wheat and to low yields of both the crops. For dry areas, the adaptability of some fruit crops, particularly, those which are drought resistant namely, citrus, guava, pomegranate, custard apple and cashewnut may be tried.

18.5.5 *Plateau Zone*

(i) Lack of irrigation facilities and lack of economic soil and water conservation techniques handicap agriculture.

(ii) Soil erosion and nutrient deficiency of soils.

(iii) Search for varieties of *rabi* crops that can fit into double cropping system in low lands under late sowing and rainfed conditions has not yet been undertaken. There is also lack of suitable drought resistant varieties of rice and ragi.

18.6.1 We have attempted in this Chapter to list briefly the major constraints at the State level as also at the zonal level. For successful implementation of the strategy for accelerated development outlined in this Report, it will be necessary for the State Government to identify contraints below the zonal level, i.e., at district, block or even village level and take suitable steps to overcome such specific constraints. Even for this limited task, administrative efficiency of the State Government at all levels must be improved.

CHAPTER 19

POLICY MEASURES FOR ACCELERATING DEVELOPMENT

19.1 *Introduction*

19.1.1 Having regard to the constraints described in Chapter 18, policy measures needed to overcome them to usher in a process of accelerated development in Bihar are set out below. Such measures are mainly in the areas of land management, irrigation and drainage, farm policy, input supply, credit delivery, custom services, rural industries, ancillary activities, transport and marketing arrangements, development of tribal agriculture and management and organizational reforms. These are by and large common to Eastern India as a whole and are given in detail in Chapters 7 to 16 of Part I of the Report. Salient features of these policy measures are briefly mentioned below. Action programmes needed to overcome constraints at the zonal level are also indicated in this Chapter.

19.2 *Land Policy*

19.2.1 Given the basic constraint of small size and fragmented nature of holdings, the following steps should be taken to reduce its adverse impact.

(i) Consolidation of holdings.

(ii) Encouragement of farmers to form small Groups or Associations to deal with common problems.

(iii) Leasing of holdings by small and marginal farmers and

(iv) Fixation of a "floor" limit for operational holdings.

19.2.2 Our recommendations on each of these steps are given in Chapter 8 of Part I. Consolidation should be taken up in a phased manner in all the districts, other than hilly areas. so as to complete the process by the end of the Eighth Plan. To begin with, pilot projects in each district should be taken up in the Seventh Plan. Funds should be specially allocated by the Planning Commission to the State for this purpose.

19.3 *Irrigation, Drainage and Water Management*

19.3.1 As already stated in the preceding Chapter, a major constraint to agricultural development is either too much of water or too little of it and the erratic nature of monsoon during the critical periods of plant growth. Therefore, the major thrust of development strategy has to be in the sphere of irrigation, drainage and water management.

19.3.2 *Groundwater*: The vast untapped groundwater, especially in the alluvial plains of the State, if tapped intensively in a planned manner, can provide a very powerful spearhead for agricultural development. Therefore, exploitation of groundwater resources is to be given top priority. Our recommendations in this regard are spelt out in Chapter 9 of Part I. Major recommendations are briefly set out below.

(i) Compact areas in 'white' and 'grey' blocks should be covered by a battery of tubewells and pumpsets, either electric or diesel. This will serve a dual purpose - (a) provide protective irrigation in *kharif* and productive irrigation in *rabi* and (b) drain out excess water during *kharif*.

(ii) In such areas, under a Centrally Sponsored Scheme, tubewell bores and the connecting electric lines should be provided free of cost to the farmer. Individual farmers, farmer groups or local entrepreneurs should be invited to provide pumps and motors on ownership or lease basis. Wherever farmers/farmer groups and private entrepreneurs do not come forward, Government may provide the pumpsets but recover lease rent from beneficiary farmers along with water rates.

(iii) For electric pumpsets in compact areas, dedicated lines may be provided to ensure uninterrupted power supply for at least 8 hours in a day. If dedicated lines cannot be provided, a rotational system of power supply, which Tamil Nadu has adopted, could be thought of as an alternative.

(iv) In unelectrified villages or villages where uncertainty of power supply is a persisting problem, diesel pumpsets and carts should be provided. Carts can also be used for carrying PVC pipes for water conveyance. Bank assistance for the above purpose should be eligible for refinance from NABARD.

(v) For encouraging use of diesel pumpsets, oil companies should set up properly equipped diesel sale and service stations in rural areas on a 'franchise' basis, on the model of what they are doing now for petrol sale and servicing of vehicles in urban areas.

(vi) Tubewells and electric/diesel pumpsets may be either owned or leased or operated by individuals or farmer groups/associations, public sector agencies or private enterprise.

(vii) The setting up of leasing agencies/companies to provide pumpsets on lease basis should be encouraged. They should operate on a competitive basis.

(viii) In areas, where there is scope for construction of dugwells, a Centrally Sponsored Scheme for their construction should be taken up. This will be particularly useful in tribal areas. Pumpsets are to be purchased by the tribals out of loans provided by financial institutions.

(ix) A failed well compensation scheme for shallow tubewells/dugwells should be introduced by NABARD in consultation with Government of India and State Government.

(x) Deep tubewells constructed by the State Government are by and large underutilised due mainly to both poor management and lack of maintenance. Therefore, the running and maintenance of these tubewells should be entrusted on a contract basis to Beneficiary Farmers' Groups or Associations or a Committee of Beneficiaries or voluntary organizations or private entrepreneurs, as may be appropriate.

(xi) It may be difficult to make such contractual arrangement in respect of all poorly maintained deep tubewells. Therefore, the Water Development Corporation may have to continue managing such tubewells. However, in such cases, one of the following alternatives may be adopted.

(a) Shortfall in the resources of the Corporation managing such deep tubewells may be made good from the State Government. This should, however be subject to a condition that the Corporation will within a prescribed period meet the cost of operation and maintenance of the deep tubewells from the revenue generated through higher water rates.

(b) The State Government may purchase water from the Corporation for sale to the farmers so that the Corporation will not incur any loss on sale of water due to charging of subsidised rates.

(xii) The prevailing water rates may be reviewed and restructured. Water rates may be fixed on the basis of hours of supply or volume of water released. State Government may also consider introduction of differential rates - a basic rate for the *kharif* season and the basic *plus* additional rate for *rabi* season. These rates may be fixed per acre inch of water supplied or on crop basis.

(xiii) Electricity charges should relate to actual consumption. This can be done through a meter charging the consumer on the basis of actual power consumed.

19.3.3 *Surface Irrigation*: The potential created under major and medium irrigation projects is not used optimally due to certain critical gaps in field channels, drainage system, etc.

19.3.4 Release of water and closure of canals should be timed according to the requirements of crops. There is a case for advancing the closure of canal from June to May which will help early sowing of rice with consequent higher yields.

19.3.5 Present water rates in the State are so low that they do not cover even the cost of operation and maintenance of the irrigation system. Therefore these should be progressively raised to economic levels.

19.3.6 Lining of canals should be taken up only in areas where loss of water due to seepage is high or where there is serious risk of salinity.

19.3.7 Conjunctive use of surface and groundwater should be encouraged in the command areas of major and medium irrigation projects through a programme of sinking tubewells. This will help reduce waterlogging problem.

19.3.8 The State Government should provide adequate funds for the completion of distribution channels of river lifts in order to

reap optimum benefits from them. Also, it should identify areas suitable for setting up lift irrigation schemes, as the State in general has good potential for such schemes and also since their execution does not take much time. In drought prone areas, these may be encouraged for providing protective irrigation during *kharif* season.

19.3.9 *Micro-watersheds and Other Minor Structures*: In rainfed and drought-prone areas, development should be on micro-watershed basis. The Centrally Sponsored Scheme for Micro-Watershed Management should cover larger areas. Simultaneously, the State Government should take up such schemes in areas not covered by the Centrally Sponsored Scheme.

19.3.10 In hilly areas, construction of minor irrigation structures such as checkbunds, Kolhapur weirs/Mandi type pipe systems and hydram should be considered.

19.3.11 Bihar has a large number of lakes and irrigation tanks. These should be managed and maintained properly. Also, new tanks should be constructed wherever there is potential. Whenever necessary, legal provision should be made for Government takeover of fishing rights as has been done in West Bengal.

19.3.12 *Waterlogging and Drainage*: Drainage has not received adequate attention in the State due to paucity of resources. Therefore, there is need to increase financial allocations for anti-waterlogging measures. Also suitable crops which can withstand waterlogging and flooding in the initial stages of plant growth need to be encouraged.

19.3.13 A Master Plan for drainage on basin basis should be prepared. Three types of drainage channels are needed viz., (i) big drainage channels, (ii) intermediate drainage channels, and (iii) field drains. In the command areas of big irrigation projects, big drainage channels should be constructed in a phased manner. Funds required should be provided by the Government of India. This should be set apart as distinct from funds earmarked for expansion/maintenance of irrigation systems. Construction of intermediate drain channels should be taken up by the State Government. For this purpose, NREP and RLEGP could be utilised. Construction of field drains by farmers should be encouraged and assisted.

19.3.14 The possible directions of irrigation/drainage development for each agro-climatic zone are indicated below.

(i) In the North West Alluvial Plains Zone, nearly one-third of the total cultivated areas in the districts of Darbhanga, Sitamarhi, Samastipur, Muzaffarpur and East Champaran remain flooded during *kharif* season. In order to reclaim such areas, flood control and drainage measures should be undertaken. Recommendations of the National Committee on Development of Backward Areas in their Report on Development of Chronically Flood Affected Areas (listed in Part I of this Report) should be implemented. The drainage control should include not only measures for preventing the occurrence, recurrence of such situation but such areas should also be adopted on the principles of watershed management as in dryland farming. For increasing the intensity of cropping in irrigated areas of this zone from the present level of 120 per cent, utilisation of available potential in canal irrigation should be improved through better water management. Goundwater potential also should be fully exploited through tubewell irrigation.

(ii) In the East Alluvial Plains Zone, Saharsa and Kosi areas face the problem of floods. 'Diara' lands in this zone constitute the worst flood affected area of the State. In order to reclaim these areas for cultivation, simultaneous development of irrigation and drainage facilities is necessary. Groundwater resources should be exploited fully. This will not only improve irrigation intensity, but also provide the much needed irrigation for undertaking cultivation of *rabi* crops like wheat, mustard, *rabi* pulses, etc.

(iii) *South-West Alluvial Plains Zone*: In the 'diara' lands in Patna and Bhojpur districts of the zone, the cropping strategy suggested for similar lands of East Alluvial Plains Zone should be implemented. Additionally, early maturing varieties of maize may be adopted in these areas, so as to harvest them before invasion of flood water. In 'tal' lands of Patna and Nawadah districts, which remain inundated during *kharif* season, high yielding varieties of pulses should be tried. Even though nearly 80 per cent of the cultivated area in this zone is benefited by irrigation, yet substantial areas in Aurangabad and Rohtas districts are drought-prone. In these areas, cultivation of crops like pulses, maize, small millets, groundnut, etc. should be encouraged.

(iv) *Plateau Zone*: In this zone, only 8 per cent of the net sown area is benefited from irrigation. It is, therefore, necessary to augment irrigation facilities and to adopt suitable water manament techniques. Subarnarekha is an important river in this zone providing canal irrigation in Singhbhum district. Irrigation facility in this area can be augmented by tapping the riverbed through lift irrigation schemes and by constructing wells on the beds of the river. Further, special irrigation structures such as Kolhapur weirs need to be constructed for making full use of water in streams, nallas, springs and rivulets. Wherever suitable, tubewell and dugwell construction needs to be vigorously pursued. Water management should be supported by adequate supply of electricity and diesel.

19.4. *Crop Planning* :

19.4.1 Our recommendations on crop planning are set out in Chapter 8 of Part I. These are briefly given below.

19.4.2 In monsoon areas, steps should be taken for contingency planning against uncertainty of rainfall. On the basis of rainfall data given in Part VI, contingency plans should be drawn up distict-wise by the State Government.

19.4.3 The All-India Coordinated Research Project for Dryland Agriculture has prepared a contingency plan for Ranchi district which may also be referred to by the State Government.

19.4.4 In areas where rainfall fluctuations are heavy, rice should be mixed with and/or substituted by low duty crops. With a view to economising on water, wheat should be given preference over-summer (*boro*) rice.

19.4.5 Rice is grown in rainfed conditions in large areas. Some of them are quite unsuitable for rice cultivation. In such areas, it is more profitable to grow pulses/oilseeds/millets.

19.4.6 In irrigated areas, a 3-4 crop system with at least one short duration legume should be taken by rotation. Area under HYV rice, wheat and maize should be increased. Cultivation of companion crops particularily in *rabi* season, as for example, rice-tobacco-chillies-vegetables in Samastipur and rice-vegetables near Ranchi and Jamshedpur should be encouraged.

19.4.7 Soil erosion should be checked through afforestation, contour bunding and similar other soil conservation methods.

19.5 *Development Strategy for Small and Marginal Farmers*

19.5.1 In the case of small and marginal farmers, a significant improvement in their incomes cannot be brought about merely by growing ordinary varieties of staple crops. In small farms with assured irrigation and having access to motorable roads to marketing centres, farmers should be encouraged to raise on a part of their holdings high value crops such as vegetables, flowers, fruits and/or HYV of staple crops. The area devoted to high value crops can be increased step by step. This will improve the economy of farming operations.

19.5.2 Along with cultivation of high value crops, marginal and small farmers should be encouraged to take up ancillary activities such as animal husbandry, fisheries, etc. Detailed recommendations on growing of high value crop and development of ancillary activities are given in Chapter 9 of Part I.

19.6 *Farm Machinery and Implements*

19.6.1 For improving efficiency of labour, use of modern but less expensive farm machinery and implements (manually operated water-lifts, seed-cum-fertilizer drills, hand sprayers, improved ploughs, winnowers, paddle threshers, wheel hoes, paddy weeders, etc.) should be encouraged.

19.7.1 *Inputs Supply*: Our recommendations on input supply policy are set out in Chapter 10 of Part I. They are briefly discussed below.

19.7.2 *Seeds*: The State is faced with shortage of HYV/improved varieties of seeds. Therefore, seed multiplication programmes should be encouraged. Seed storage and distribution points should be set up preferably at Panchayat level.

19.7.3 *Fertilizers*: To suit requirements of marginal and small farmers as also to reduce chances of adulteration when sold loose, supply of sealed packets of 10 kg or 20 kg should be arranged. In predominantly vegetable growing areas, packets of 5 kgs should be made available.

19.7.4 Distribution network needs to be strengthened, particularly in hilly and interior regions.

19.7.5 *Bio-fertilizers*: Bio-fertilizers like blue green algae (BGA) are useful to supplement nitrogen content of the soil. State Government should, therefore, take up a scheme for producing BGA culture for distribution to farmers for multiplication and use by them. Production and multiplication of BGA and similar other cultures should be taken under a Centrally Sponsored Scheme in suitable locations, in consultation with ICAR.

19.7.6 *Pesticides*: The surveillance units located in Patna and Ranchi to keep vigilance over the incidence and spread of pests and diseases, need strengthening. Further, such units should be located at all Divisional levels with quick transport facilities. Improved facilities should be provided for hiring sprayers. Stocks of pesticides with private dealers should be checked periodically to prevent adulteration. Further, State Government should ensure that prices charged are according to stipulations. The District Agricultural Officer should also act as the vigilance officer and should periodically check the stocks maintained by private dealers.

19.8 *Credit*

19.8.1 The reorganization of credit structure and other improvements required in the credit policies are spelt out in Chapter 15 of Part I. These will have to be implemented in order to enable the credit system, particularly co-operative credit structure, to cater to the needs of farmers adequately.

19.9 *Insurance*

19.9.1 The State Government should introduce an insurance scheme for all types of productive investments such as tubewells, pumpsets, machinery, etc. Insurance should be made compulsory for all bank financed schemes and Government programmes.

19.9.2 *Crop Insurance*: There is need for introduction of crop insurance in selected areas. All farmers in selected areas should be covered. Premium should be kept low to induce farmers to avail of the facility. General Insurance Corporation in consultation with the State Government should work out the details of the scheme.

19.10.1 *Agricultural Research, Extension and Training*: Improvements required in agricultural research, extension and training are set out in detail in Chapter 11 of Part I. Specified suggestions in respect of Bihar are set out below.

19.10.2 Lack of location specific technology and inadequate transfer of available research findings of the Agricultural Universities and the Department of Agriculture are important factors contributing to the low growth rates in agricultural production in Bihar. This is due to the lack of co-ordination between the University and Department of Agriculture in the field of extension. A major shortcoming is inadequate staffing of the Agricultural Universities. Of the sanctioned strength of 900, many positions are vacant. In the case of adaptive research, field staff are, by and large, technically incompetent. This affects validity of results produced in the Field Experiment Service (FES). Further, the range of experiments in FES is limited. They do not meet the requirements of farmers in different agro-climatic regions.

19.10.3 ICAR conducted a review in 1982 of the existing facilities for research infrastructure. Based on this review, zone-wise recommendations were made for strengthening existing research facilities and promoting research on location specific problems. Details of existing infrastructure and ICAR's recommendations for strengthening these infrastructures are set out in Annexure 19.1. We support these recommendations which should be implemented at the earliest.

19.10.4 Some farms of the Department of Agriculture may be used for production of seeds and some others need to be developed as demonstration stations for recommended technology. They will thus serve as major links in the transfer of technology to the field.

19.10.5 *Coordination Arrangements*: The ICAR Committee referred to in Chapter 11 of Part I found that linkage between research organizations and development departments is weak due to lack of sufficient number of Regional Research Stations. Our recommendations for strengthening the linkage between research organizations and development departments are set out in detail in Chapter 11 of Part I.

19.10.6 *Results of Research Available on Shelf*: Significant achievements in agricultural research have been reported by various ICAR institutes, Agricultural Universities and State Department of Agriculture in raising yield potential of crops, attainment of stability in agricultural production, irrigation scheduling of crops, post harvest technology and similar other areas. Lists of latest research findings in respect of improved varieties staple crops and improved agricultural practices are given in Annexures 19.2 and 19.3.

19.10.7 The Agricultural Universities should, in collaboration with the concerned State Departments, prepare exhaustive lists of research findings on the shelf suitable for field extension and include these in the extension package in a phased manner.

19.10.8 *Recommendations of CRRI for Increasing Rice Productivity*: The CRRI has made some useful suggestions for increasing rice production. These are given in Annexure 19.4. The State Government should examine these suggestions and take effective steps to implement those that are appropriate to the State.

19.10.9 *Agricultural Extension and Training*: Bihar has adopted the T & V system and this is being extended over the entire State in a phased manner. It is expected that by 1985-86 the entire State will be covered.

19.10.10 The working of the system shows room for considerable improvement. VAWs do not visit field regularly. Time spent in villages also is small. Supervision by AEOs is poor. Further, involvement of Departmental staff above sub-divisional level in extension work in fields is limited. As a result, quality of extension service is poor.

19.10.11 As in West Bengal staffing under the scheme is below sanctioned strength. Further, research support for extension work is weak in rainfed and tribal areas.

19.10.12 The village extension worker continues to be involved in non-extension work.

19.10.13 We would like to emphasise the importance of orienting the T & V system, as also the overall approach to the concept of extension in favour of small and marginal farmers. Our detailed recommendations on this aspect are set out in Chapter 11 of Part I.

19.11 *Specific Problems of Agro-Climatic Zones*

19.11.1 *North West Alluvial Plains Zone*: In the districts of Darbhanga, Sitamarhi, Samastipur, Muzaffarpur and East Champaran, rising water table in flood-prone areas has gradually led to partial shift of maize (*kharif*) to *rabi* season. Suitable maize varieties and appropriate management technologies for cultivation of this crop during *rabi* have to be developed. It is also necessary to adopt new rice varieties (developed by the Central Rice Research Institute Cuttack and other research stations) which are tolerant to flood and waterlogging. Simultaneously, rice varieties suited to lowlands need to be evolved and adopted. So also drought resistant varieties of wheat, red rot and flood resistant varieties of sugarcane, rapeseed and mustard which can resist aphid attack have also to be developed. In calcareous soils, use of bio-fertilizers like blue green algae and azola should be popularised to supplement nitrogenous fertilizers.

19.11.2 *East Alluvial Plains Zone*: In the flood affected areas of this zone, after flood water has receded, intensive *rabi* cropping with irrigation and raising improved varieties of wheat, mustard, pulses, etc., should be undertaken. After *rabi*, irrigated summer cropping should be taken up with short duration summer varieties of maize, moong, rice, etc., so as to be harvested before the onset of monsoon. For *kharif* cropping, flood tolerant varieties of paddy such as Madhukar, Chokia-59 etc., may be adopted. Heavy leaching of soils causing soil acidity has to be checked. In areas affected with high soil acidity, the land should be puddled and then seeded or transplanted. Cultivation of jute suffers from low yields. Research is necessary to identify the reasons for low yield so that suitable remedial action can be taken. In the case of fruit crops grown in the zone, such as pineapple, banana, coconut, etc., suitable agronomic practices should be developed to increase productivity.

19.11.3 *South West Alluvial Plains Zone*: A major area in this zone has heavy textured soils which crack during *rabi* cultivation. The formation of big clods hinders land preparation and drainage. It is, therefore, necessary to increase water percolation in these soils through suitable agricultural practices. Cheap farm implements suited to such soils should be provided. As nearly 50 per cent of gross cropped area in this zone is under cultivation, Agricultural Universities and Research Stations should develop a suitable

rice based multiple cropping system for irrigated areas, with emphasis on pulses and wheat in *rabi* season.

19.11.4 *Plateau Zone*: To overcome soil erosion, which is the major constraint to agricultural productivity in this zone, economic soil and water conservation techniques especially on watershed basis should be developed. Introduction of suitable fodder crop or fruit crop, afforesation and agro-forestry may help in soil conservation. Soil acidity is another major constraint to agricultural productivity in this zone. Cropping systems suited to such soils should be identified. To increase availability of phosphate and other elements, research stations should evolve suitable management practices. Varieties of *rabi* crops which can fit in with double cropping system in lowlands under late sowing and rainfed conditions need to be developed. For uplands, suitable varieties of rice, ragi, groundnut, etc., which can withstand prolonged drought need to be evolved. In tribal areas, crops depending upon their eating habits as also orchard cultivation should be developed. Research, training and extension work in the field of tassar silk and lac should be developed as tribals are engaged in these occupations.

19.12 *Ancillary Activities*

19.12.1 Recommendations on ancillary activities such as animal husbandry, dairy development and fisheries are set out in detail in Chapter 14 of Part I. The State Government should identify suitable areas for different types of activities, select compact areas for development, making adequate arrangements for marketing of products.

19.13 *Linkages with Industry*

19.13.1 Adequate employment opportunities have to be created in the countryside in the non-farm sector. This calls for effective linkages between agricultural and non-agricultural sectors through a planned development of servicing, supplying, marketing and processing enterprises in the secondary markets and other potential growth centres to start with and then spread further in the hinterland. This has been dealt with at length in Chapters 9 and 12 of Part I.

19.14 *Marketing and Transport*

19.14.1 The State's agricultural marketing structure is inadequate and poorly organised. On an average there is only one wholesale

market for a population of 1 lakh and ten rural markets per wholesale market. Most of the markets lack basic infrastructure facilities. Marketing infrastructure in respect of perishables like vegetables and fruits is even more unsatisfactory, which compels farmers to sell their produce to local traders at very low prices.

19.14.2 There are about 7000 rural markets in the State, which function weekly or bi-weekly. There are 672 wholesale markets, of which regulated markets number 120 only. Even in the regulated markets, the facilities provided are inadequate. Only about 40 per cent of these markets have market yards. A number of commodities traded are not notified. Farmers usually sell their produce to local traders at the farm gate. As a result, they fetch very low prices. Traders often indulge in mal-practices to exploit the farmers.

19.14.3 Details of market infrastructure set out in the preceding paragraphs show that progress in development of marketing in the State has been slow.

19.14.4 We, therefore, recommend that the number of primary and secondary markets should be increased. Regulated markets should be extended to cover all assembling, wholesale and terminal markets. For this, a time bound programme should be drawn up. The facilities and services at these markets should be in accordance with the norms recommended by NCA. Adequate representation should be given to small farmers in the market committees.

19.14.5 We are of the view that improvement of marketing facilities and strengthening of the infrastructure, particularly in backward areas, are of crucial importance. Our recommendations for improving the network of regulated markets and other recommendations for improving the facilities for institutional marketing of perishable crops are set out in Chapter 12 of Part I.

19.14.6 A continuous watch on price trends of important crops on an area to area basis is necessary, so that corrective measures can be taken in time in the interest of the producer. We, therefore, recommend the setting up of Watch Groups, consisting of marketing functionaries, farmers' representatives and experts in relevant disciplines at all the major marketing centres, which would continuously monitor prices and marketing arrangements in

respect of all major commodities. These Groups should report to the State Directorate of Agriculture and also to the Directorate of Agricultural Marketing.

19.15 *Transport*

19.15.1 Transport infrastructure is unsatisfactory. The road network is inadequate outside urban limits. It is unsatisfactory in interior areas. The network of roads needs to be strengthened considerably so that all villages can be brought within easy access of market centres and nearby urban areas. Areas inhabited by tribals need priority in this respect. High priority needs to be given for maintenance of rural roads.

19.16 *Storage*

19.16.1 Agricultural commodities have to be stored at the farm and processing centres and at wholesale and retail market centres. The Bihar Warehousing Corporation which was established in 1957 holds stocks of agricultural commodities, consumer goods and inputs to meet situations of seasonal glut and scarcity. It provides storage facilities to farmers and arrange advancement of loan from commercial banks on the basis of receipts issued by it. The credit delivery system against hypothecated stocks, however. needs to be streamlined and simplified.

19.16.2 LAMPS numbering 474 have been sanctioned godown complexes of 100 tonnes capacity each. However, work under this programme is held up due to cost escalation. Additional provision necessary for this should be ensured.

19.16.3 The existing storage infrastructure is inadequate particularly in respect of rural godowns. The NCA had recommended that storage capacity should be created at the primary centres for 50 per cent of the marketed surplus of foodgrains. We agree with this recommendation. Adequate storage capacity should be available to service the public distribution system, particularly in drought and flood prone areas, as also in compact areas identified for production of horticulture and other high value products.

19.17 *Perishable and Semi-perishable Commodities*

19.17.1 Marketing of perishable commodities like vegetables and flowers, eggs, milk, etc. is controlled by private trade. The pro-

ducers get a very small share of the price paid by ultimate consumers and, therefore, have no incentive to grow these crops.

19.17.2 To free the producers from the clutches of the traders, it is necessary to organise the producers into growers' societies and also assist them in marketing under a co-operative framework. The State Government may establish a Horticulture Marketing and Processing Company, if necessary, as a joint venture, with private sector. Recommendations in this regard have been made in Part I of the Report.

19.17.3 As on December 31, 1982, there were 212 cold storages in the State with a capacity of 341000 tonnes. The capacity has to be strengthened substantially if horticultural development programmes in the State are to be expanded to a significant extent .

19.18 *Agriculture in Tribal Areas*

19.18.1 Special steps are necessary in regard to development of agriculture in tribal areas. Our recommendations in this regard are set out in Chapter 13 of Part I.

19.19 *Management and Organizational Reforms*

19.19.1 The administrative departments and agencies involved in management of various programmes should be reoriented and geared to achieve the developmental objectives in a coordinated and efficient manner. It is also important to ensure proper sequencing of actions by the concerned departments. The key word in this context should be 'innovative management' instead of conventional administration. The main areas where improvements are needed are indicated in Chapter 7 of Part I.

19.19.2 *Monitoring and Evaluation*: For monitoring and evaluation of the various programmes implemented, a special cell may be created. The Union Ministry of Agriculture should, in consultation with the Planning Commission and NABARD, evolve suitable guidelines for this cell.

19.20 *Appointment of Standing Committees*

19.20.1 We recommend the appointment of two Committees *viz.*, (i) a Ministerial Committee headed by the Chief Minister and

(ii) an official Committee consisting of Secretaries headed by the chief Secretary. The composition and functions of these committees are set out in Chapter 7 of Part I.

19.21 *Other Follow-up Action*

19.21.1 The State Government should undertake a study of productivity differences in different agro-climatic regions. Such a study would facilitate initiation of different strategies for different zones and help increase crop productivity.

19.21.2 Improved weather forecasting facilities through remote sensing should be matched by administrative efficiency and alertness, so that timely action can be initiated whenever natural calamities occur.

19.22 *Improvements Needed in Agricultural Statistics*

19.22.1 For a proper understanding of the current trends in agricultural production and the technological, ecological and other constraints hampering agricultural growth, uptodate information on various aspects of agriculture at micro-levels is necessary. However, reliable agricultural input and production statistics, particularly below district level are lacking. This needs to be corrected.

Annexure 19.1

Existing Research Infrastructure and Recommendations Made by the ICAR — IBRD Research Review Committee Set up Under the National Agricultural Research Project

Existing Research Infrastructure: In late 1970, basic and applied research in agriculture was transferred from the Department of Agriculture to the Rajendra Agricultural University, Pusa, Samastipur (RAU). Adaptive research, however, continues to be the responsibility of the Department of Agriculture. A second Agricultural University viz., the Birsa Agricultural University, Kanke, Ranchi (BAU) was set up in 1981. The RAU has four regional research stations located at Muzzaffarpur, Samastipur, Patna and Sabour and the BAU has one at Kanke, Ranchi. The RAU also has 10 research sub-stations; of these, four (rice research) are not functioning. The network of research facilities with the two Universities include agricultural research institutes at Patna, Dholi and Sabour, animal production research institute and sugarcane research institute, Pusa, three irrigation research substations at Saharsa, Rohtas and Purnea, jute research station, Katihar, banana research station, Hajipur and fruit research station, Chianki. The two universities are engaged in research schemes on various aspects related to crops, soils and animals. ICAR research schemes are commodity oriented.

Adaptive research as already mentioned is the responsibility of State Department of Agriculture.

The Review Committee recommended following research priorities in the various agro-climatic zones of the State:

(a) *North West Alluvial Plains* has predominance of rainfed farming and is subject to frequent flood and waterlogging. Research attention is needed for developing suitable farming systems for each specific situation. Sugarcane, a major crop of the zone is suffering due to waterlogging and also from red-rot disease, which need intensive research attention. Special research strategy is required for rainfed uplands and deep water paddies in flood affected, waterlogged and flood-prone situations. Research on rice-wheat based cropping systems and high yielding varieties of rice, maize, pulses and oilseeds should have high priority.

(b) *In North East Alluvial Plains,* salt affected soils, by and large, pose serious problems and research effort needs to be directed to solve these problems.

(c) *South West Alluvial Plains,* is located south of Ganga. Special programmes are required for the Diara and Tal lands which occupy a large part of the Zone and pose specific problems much different from other zones. A coordinated operational research project for problems of Tal and inundated lands is needed, along the lines of the on-going project for Diara lands. Research in agricultural engineering for developing agricultural tools and farm machine operations also deserves priority especially in heavy textured soils of Tal and Diara lands. Studies on plantation, crops, viz., banana, coconut, arecanut, pineapple, jack fruit and spices, specially ginger, are also needed.

(d) Water management under drought and flood conditions deserves priority research attention in both the North East and South Alluvial plains areas.

(e) *In the plateau zone,* soil and water conservation research on watershed basis alone can solve the problems of the area. This has to be supported with the development of efficient irrigation systems for water use. Suitable farming systems and technology for tribal dominated hilly and plain areas need special attention in the South-Eastern Plateau of the State.

Other areas requiring priority research attention in the zone are :

(i) Soil nutrition — soil acidity, nutrient fixation and soil erosion are also urgent problems of Plateau Zone which require special research effort. Special soil problems have developed due to washing flows from copper, manganese and iron-ore mines in the South Eastern Plateau region. This situation has resulted in nutrient deficiency and toxicities.

(ii) New Crops — Identification and introduction of dryland fruit crops like amla, ber, custard apple, jack fruit and guava which have high potential in the Western Plateau area.

Besides the above mentioned zone specific priorities, some aspects which deserve State-wide attention are:

(a) Crop diseases, pest and weeds,

(b) Introduction of new crops and crop varieties,

(c) Cultivation of vegetables (identification/evolving of improved varieties of local vegetables and acclimatisation of suitable exotic vegetables), and

(d) Work on alternative and cheaper sources of plant nutrients like bio-fertilizers, organic manures.

The main approach adopted under NARP is (i) to develop at least one main research station in each identified agro-climatic zone within the service area of an agricultural university supported by sub-stations, verifying and testing stations where necessary, (ii) provision of resources to initiate, strengthen and accelerate mission-oriented research on topics which are crucial for the long term development of agriculture in the State, and (iii) strengthening technical linkages of the research stations with State Departments of Agriculture, Animal Husbandry, etc.

Annexure 19.2

Improved Varieties of Staple Crops Considered Suitable for Bihar

Major crops of the State are rice, wheat and maize among cereals, pulses, rapeseed, mustard, nigerseed and linseed among oilseeds, sugarcane, fruits and vegetables. Jute is also grown in North Bihar. A number of improved varieties particularly of cereals and pulses have been tested and identified as suitable for propagation in Bihar. An illustrative list of such varieties is given below.

1. *Rice*

i) Early duration	Bala, Cauvery, Ratna, Pusa 2-21, Prahalad, Narsingh, Vishnu, Kiran, Kanchan.
ii) Medium duration	IR-8, Jaya, Padama IR-20, Jamuna, Sita, Deepa, Rajeshwari, Sabarmati, Rajendradhan-201 Archana, IET 281.
iii) Long duration	Mahsuri, Pankaj, Jagannath, Parsidhan I/II, IET 3257.

iv) RAU has evolved the variety '64-117 Jalpriya,' for shallow/ deep water situations, 1.5 to 2 m. water depth, sown in February-April and variety Kanchi for gall-midge susceptible areas under upland situations in Chhotanagpur area.

2. *Maize* — 'Diara' composite maize for 'diara' lands, 'Pathari Makka', a white gained composite, for

	Chhotanagpur.
3. *Pulses*	Some improved varieties evolved by RAU are : 'T-44', 'Sunaina' and 'Amrit' varieties of green gram, T-9 and 'Navin' varieties of black gram and 'Bahar', 'Laxmi' 'Bala' and 'Kiran' varieties of pigeonpea.
4. *Sugarcane*	Improved varieties evolved by RAU are 'BO 84', 'BO 88', 'BO 90', 'BO 91' and 'BO 99'.

Annexure 19.3

Suitable Improved Agricultural Practices for Bihar

1. Under the All-India Coordinated Project for dryland Agriculture, work is in progress for red-soil sub-humid region at Ranchi. This work relates to inter-cropping with oilseeds and pulses, alternate crops for different topo-sequences and run-off management and recycling of run-off.

2. Some of the improved agricultural practices evolved by research scientists in recent years for better utilisation of existing resources are mentioned below. These need to be considered by the State Government for promotion through the extension agencies.

3. Root-zone placement of urea supergranules coated with Corbofuran WP, Coaltar or neem oil results in considerable reduction in the incidence of gall-midge and stem-borer in paddy.

4. Urea supergranules placed 8 cm. below the soil surface increase the root spread, root volume and total grain yield of rice.

5. Stomp @ 1 Kg. ai/ha as a pre-emergence application very effectively is helpful in controlling the trouble-some weed, *Phalaris minor* in wheat fields.

6. In rice-wheat rotations, the seed rate of wheat should be increased by 25 per cent over the normal when wheat is broadcast amidst *kharif* stubbles. After harvesting rice, 2 ploughings should be given, followed by seeding within the shortest possible time to avoid excessive moisture losses.

7. Methods of establishment of wheat with minimum tillage after rice have been standardised to minimise the ill effects of late sowing of wheat.

8. Crops having high yield potential under rainfed conditions are field peas, sunflower, gram and yellow sarson, which get established with minimum tillage.

9. Commercial cultivation technology of a few edible mushrooms has been standardized alongwith production of their spawn.

10. Rice responds positively to phosphate manuring in winter and low lying situations.

11. In high yielding maize varieties, application of organic manures @ 10 tonnes/ha in conjunction with inorganic fertilizers, can minimise the requirement of nitrogenous fertilizer to the tune of 40 kg/ha.

12. On the basis of physiological stages of crop growth, dwarf wheat should be irrigated at crown root initiation, maximum tillering or late jointing and flowering stages.

13. Mustard must be irrigated at branching and flowering stages.

14. Effective control of weeds in direct seeded rice was achieved by spraying 1 to 1.5 litres of Butchlor commercial (Macheta Liquid) or 3 litres of Nirofen commercial (Tok E-25) mixed with 600 litres of water per hectare, 1 to 2 days after sowing.

15. Effective weed control in transplanted paddy can be achieved by spreading 45 kg. Butchlor commercial (Macheta granules) or 25 kg. Kitrofen commercial (Tok granular) on standing water within 4 to 6 days after transplanting.

16. Gall-midge incidence in paddy can be significantly reduced by dipping paddy seedlings in 0.2 per cent Dursban solution (a.i) for 6 hours immediately before transplanting.

17. Supplementing nitrogen to rice crop through application of Azolla Anabena complex which fixes atmospheric nitrogen in rice fields.

18. Package of practices for cultivation of rice in rain-fed areas.

19. *Preparatory Cultivation*: Hot weather cultivation by soil inverting plough during the premonsoon period (April-May). Adoption of stale seedbed practice after the break of monsoon to help conserve rain water and control of weeds. This consists of allowing weeds to come up after the first rains and then giving a shallow ploughing followed by perfect levelling.

20. *Time of Seeding*: Seeding when a minimum of 60 mm rainfall is received over a period of fortnight in June ensuring uniform and satisfactory crop stand as against that of seeding ahead of rains.

21. *Use of Quality Seeds*: It involves elimination of unfilled and partially filled grains by screening in brine solution of 100 gm. common salt/litre of water.

22. *Row Seeding/grilling*: Optimum distance between row to row in a drilled crop is 20-30 cms. This facilitates uniform germination besides protection against bird, rodent and ant damages.

23. *Seed Rate*: A seed rate of 75-80 kg/ha (300 viable seeds/m^2) provides optimum stand.

24. *Fertilizer Management*: Basal application of 10-15 kg. each of P_2O_5 and K_2/ha for plains and 20-30 kg/ha for hilly terrain. Top dressing with 20 kg/ha after first weeding during 15-20 days after sowing (DAS) followed by 8-10 kg N/ha each at 35-40 DAS and at bore leaf stage. Each application of N fertilizer need be followed by raking for increased efficiency through soil incorporation, preferably in moist soil. Rice belt normally experiencing drought spell in September should prefer application of entire N into two splits while in case of drought spells both in August and September through single application at 20 DAS.

25. *Mineral Nutrition and Micronutrient Requirements*: Molybdenum applied as presoaking seed treatment with 1 per cent Ammonium molybdate in black gram could increase nodule number by nearly 200 per cent. The acid laterite soils are characterised by low phosphate and high Re content leading to Fe toxicity. Increasing P supply not only alleviates the phosphate needs but also counteracts the Fe toxicity by immobilising Fe within the plants. Grain yields have increased in rice by adequate supply of phosphate and zinc.

Soil application of 5 kg Borax/ha corrected the deficiency of boron in sunflower grown as a dryland yield crop and seed.

26. *Application of Growth Regulators to Crop Plants*: Foliar application of NAA at 20 ppm has been found to be highly effective in increasing seed yield and oil content of seeds of sesamum.

27. *Fodder and Forage Crops*: Among perennial grasses hybrid napier has proved superior to all other grasses like Guinea and Para. It continues supply of fodder throughout the year.

Among cereal fodder crops, M.P. Chari and Teosuite have produced higher yield over maize and jowar in *Kharif* season.

Annexure 19.4

Recommendations for Increasing Productivity of Rice in the CRRI Study Entitled 'Strategies for Increasing Rice Production in Eastern States of India (May 1984)'

(a) *Flood Affected Rainfed Lowlands*: The standing water depths in these areas can be considered for convenience into three categories namely, water depth between 15-50 cm, between 1-100 cm and more than 1 meter. Most of these areas get river overflow floods causing complete submergence of the crop from 2-8 days depending upon the amount of rainfall in the catchment area and duration of floods.

The rice productivity of these areas can be considerably increased by replacing the existing varieties with the recently developed high yielding varieties suitable for different water depths. CR-1009, CR-1010, CR-1016, CR-1018, BR-14, BR-46 have been found suitable for water depths of 15-50 cms. These varieties can be either direct seeded or transplanted. N at 40 kg/ha P_2O_5 — 20 kg and K_2O — 20 kg be either drilled with the seed at the time of sowing in case of direct seeded crop or applied at the time of last puddling in case of transplanted crop. The basal application of fertilizers enhances crop growth and enables it to withstand submergence during floods.

In areas where white-backed plant hopper infestation occurs at vegetative stage of the crop, causing yellowing and stunting of the crop, the pest can be effectively controlled by carbaryl spray whenever the hopper population reaches 5 nymphs/adults/hill. Two rounds of spray may be necessary if the population persists.

Stem borer damage also occurs at the time of flowering causing white ear heads. This pest can also be controlled by spraying with chlorpyrifos/quinalphos/monocrotophos at flag leaf stage two rounds at weekly intervals.

For water depth of 50-100 cm varieties like CR-1030, Suresh, Biraj and Janaki 1 have been found to perform better. These varieties can also be either direct seeded or transplanted with basal application of fertilizer, N-40 kg/ha, P_2O_5 — 20 kg and K_2O — 20 kg/ha. The rice crop in these areas is invariably attacked by stem borer at heading stage which can be checked by spraying the crop at flag leaf stage with chlorpyrifos/quinalphos.

In waterlogged areas with standing water depth above 1 m. and above *chaur* lands, varieties, RD-19, Jalmagna, Jaladhi-1 and Panidhan, have been found to perform well. These varieties are direct seeded in dry soil before the onset of monsoon rain with N-40 kg, P_2O_5 — 20 kg, K_2O — 20 kg/ha applied in furrows with seed at the time of seeding. This gives early vigour and ability to better withstand submergence during the floods. The rice crop in deep water areas is subjected to stem borer attack at heading stage which can be checked by spraying the crop with chlorpyrifos/quinalphos/monocrotophos just before flowering.

(b) *Irrigated Areas*: Medium duration high yielding, 110-140 days duration, varieties like Jaya, Ratna, IR-20, IR-36, Saket-4, Pusa-33, Sita, BR-8, BR-34, Mahsuri should be grown in areas where local tall varieties are still being cultivated. Transplanting rice instead of direct seeding should be adopted. Adequate plant population, 50 hill/m^2 should be ensured. Fertilizer, N-60, P_2O_5 — 30 kg and K_2O — 30 kg/ha should be given. Nitrogen should be given in three splits while P_2O_5 and K_2O should be given as basal. Zinc deficiency wherever present need be corrected by soil application of 25 kg $ZnSO_4$ at the time of transplanting or at the time of sowing in case of direct seeding. Stem borer and rice hispa are the major pests. Stem borer can be effectively controlled by spraying the rice crop at flag leaf stage just before flowering with chlorpyrifos/quinalpos/monocrotophos. Rice hispa can be controlled by follar spray with quinalphos/fenitrothion/monocrotophos. This can bring about 50-60 per cent increase in rice production.

(c) *Upland Rainfed Areas*: The rice yields of rainfed upland areas can be increased from present level of 0.7 t/ha to 2.5 t/ha by replacing the local varieties with short duration (70-100 days) high yielding rice varieties like Sattari, CR-289-1208, CR-237-1, CR-143-2-2 and MW-10. These varieties have shown considerable tolerance to moisture stress in Hazaribagh area and should be seeded in lines, 20 cm apart in May-June with a seed rate of 70-80 kg/ha. The fertilizer P_2O_5 and K_2O at 20 kg/ha should be applied at the time of seeding while nitrogen at 40 kg N/ha should be applied in two splits of 20 kg N/ha each (the first after weeding done at 20-30 days after seeding and the second at panicle initiation stage). Weeds can be controlled either by pre-emergence application of Butachlor/Benthiocarb at 2 kg a.i./ha or by manual weeding or by running a harrow between the lines. Stale seed bed

technique be adopted in these areas. Gundhi bug is the major pest which can be controlled by dusting with BHC dust as soon as the pest population of 2/bug M^2 is noticed. The dusting should be done either in early morning hours or after sun set in the evening.

The rain water should be harvested by digging a tank in the middle of the land slope and collecting run off rain water in it. From a watershed of about 4 acres, the rain water collected in the tank can provide 2-3 life saving irrigations to about 2 acres of rice crop below the tank level, whenever there is a long break in the monsoon. Such irrigations in years of monsoon failure almost doubled the grain yield of the crop.

Inter-cropping rice with red gram in Tan-1 lands gives additional redgram yield over normal yield of rice in years of normal rains and yield of redgram is assured in case of failure of monsoon rains before maturity of rice crop which occurs about twice in 5 year cycle.

In Tan-2 and Tan-3, Bengalgram/lentil/safflower or niger are also suitable as a sequence crop after harvest of paddy in early September. The duration of the rice varieties selected for such areas should be 70-80 days so that the paddy crop is harvested in early September and land is opened to receive the last rains in second or third week of September. The moisture thus conserved would ensure successful harvest of the sequence crop.

Long-term Measures to Step up Production

I. *For Rainfed Uplands*

(i) Development of 70-100 days duration varieties with stable farm yield upto 3.0 t/ha.

(ii) Development of suitable seed-cum-fertilizer drill for direct seeding and hand hoe for interculture.

II. *Irrigated Lands*

Development of varieties resistant to pests and diseases like stemborer, hispa and tungro virus.

III. *Low Lands*

(i) Development of high-yielding stem borer, BLB tolerant/resistant varieties.

(ii) Developing the equipment for sub-soil placement of urea briquets, supergranules and prilled urea.

CHAPTER 20

INVESTMENT CREDIT REQUIREMENTS

20.1 *Investments*

20.1.1 *Agriculture and Allied Services*: The strategy for intensification of agriculture and improvement in productivity per ha and per capita set out in our Report would require substantial public outlay in the agricultural sector. The outlay on agriculture and allied services is estimated to go up from about Rs. 430 crores anticipated during the Sixth Plan to Rs. 930 crores during the Seventh Plan and further to Rs. 1850 during the Eighth Plan.

20.1.2 *Major and Medium Irrigation Projects*: It is assumed that no new major irrigation projects will be taken up, but efforts will be made to complete on-going projects. It is also assumed that some new medium irrigation projects will be taken up particularly in dry areas. On these assumptions our estimate of the additional irrigation potential likely to be created during the Seventh and the Eighth Plans will be 5 lakh ha and 9 lakh ha, respectively.

20.1.3 *Minor Irrigation*: Minor irrigation has been accorded a high priority in our strategy of agricultural development. It is estimated that the additional potential that would be created from this source would be 11 lakh ha and 17 lakh ha respectively during the Seventh and Eighth Plans.

20.1.4 For achieving the targets under minor irrigation, substantial investment will be necessary in sinking tubewells, installation of pumpsets, etc. Two estimates of minor irrigation works have been prepared by us, viz., (i) Estimate I which we consider is necessary and (ii) Estimate II which is likely to be obtained based on past performance (*vide* Table 20.1).

Table 20.1. Minor Irrigation Structure

(In '000 units)

Type of investment	Estimate			
	Seventh Plan		Eighth Plan	
	Estimate I	Estimate II	Estimate I	Estimate II
Shallow tubewell bores	300	200	450	400
Shallow tubewells with pumpsets	25	20	50	20
Medium/deep tubewells and riverlifts	7	4	9	5
Dugwells	45	30	75	60
Pumpsets	300	250	625	450

20.1.5 At present there is considerable under-utilisation of potential created under major and medium irrigation projects. After allowing for some time lag in the utilisation of potential created under surface irrigation, the additional area that would be brought under major, medium and minor irrigation during the Seventh and Eighth Plan periods would be about 15 lakh ha and 24 lakh ha, respectively. As per our second estimate, the additional irrigated area that would be brought under irrigation is 11 lakh ha and 20 lakh ha respectively during the Seventh and Eighth Plan periods.

20.1.6 These estimates proposed above would call for a substantially large public investment under minor irrigation. The Government investment, would cover expenditure on sinking of tubewell bores and construction of dugwells under Centrally Sponsored Schemes, subsidies to small and marginal farmers and Government contribution to the construction of deep medium tubewells and riverlifts. Provision will have to be made also for extension of electric lines in the case of electric pumpsets needed for bores and dugwells in compact areas under the Centrally Sponsored Schemes. The estimated cost under Centrally Sponsored Schemes for tubewell bores and dugwells and energisation of pumpsets is indicated in Table 20.2.

Table 20.2. Investment Cost of Centrally Sponsored Schemes for Groundwater Exploitation

(Rs. crores)

	Seventh Plan	Eighth Plan
For tubewell bores and dugwells	110	160
For energisation of pumpsets	75	110
TOTAL	185	270

20.1.7 *Drainage* : Drainage needs to be given high priority in Bihar. The investment on this account is estimated by us at Rs. 160 crores during the Seventh Plan and Rs. 200 crores during the Eighth Plan.

20.1.8 *Command Area Development*: In view of the importance of on-farm development works in command areas, a provision of Rs. 40 crores each during the Seventh and Eighth Plans has also been proposed by us for the outlay on CAD.

20.1.9 Our estimate of total public investment cost on drainage, command area development and minor irrigation during the Seventh and Eighth Plan periods is summarised below.

Table 20.3. Public Investment on Drainage, CAD and Minor Irrigation

(Rs. crores)

	Seventh Plan	Eighth Plan
Drainage	160	200
CAD	40	40
Minor Irrigation	425*	560*

* Excluding the investment cost of energisation of pumpsets shown under "Rural Electrification".

20.1.10 *Rural Electrification*: On the basis of certain assumptions (see paragraph 16.3.1, Chapter 16 of Part I) our estimate of investment cost on rural electrification (including energisation of pumpsets for the Centrally Sponsored Scheme) is Rs. 250 crores during the Seventh Plan and Rs. 400 crores duing the Eighth Plan.

20.1.11 *Rural Industry Centres*: The investment cost on setting up rural industry centres and recurrent cost on maintenance of basic infrastructure, are estimated at Rs. 70 crores during the Seventh Plan and Rs. 105 crores during the Eighth Plan.

20.2 *Short-term Credit*

20.2.1 The assumptions on which short-term credit requirements have been estimated are given in Chapter 16 of Part I. Based on these assumptions, the short-term credit requirements are placed at Rs. 1030 crores during the terminal year of the Seventh Plan and Rs. 1170 crores during the terminal year of the Eighth Plan. During 1980-81, short-term loans disbursed by PACS and co-operatives together were only Rs. 20 crores. Even though there has been some increase in loans disbursed thereafter, a massive effort will be necessary on the part of the credit institutions for meeting the above requirements. Therefore, we have also prepared a lower estimate also. Our lower estimate of short-term credit requirements is Rs. 670 crores and Rs. 830 crores, respectively for the two reference periods.

20.3 *Medium and Long-term Loans*

20.3.1 Our estimates for medium and long-term loans are shown below.

(Rs. crores)

	Seventh Plan	Eighth Plan
Minor Irrigation*	310	475
Other purposes@	165	225
TOTAL	475	700

* Including loans to State Electricity Board for energisation of pumpsets.
@ Including land development, soil conservation, dry farming, animal husbandry, fisheries, forestry, farm machinery, storage, rural industry centres, etc.

20.3.2 In our view, the above estimates are modest. Therefore, co-operatives, commercial banks and RRBs should strive to exceed the targets.

20.4.1 To achieve the above targets, vigorous efforts are necessary on the part of Government, credit institutions and NABARD. The approach should be to reach a level of credit disbursements above the lower estimate in the Seventh Plan, but close to the higher estimate in the Eighth Plan. These may be reviewed in the light of experience during mid-term appraisal of each Plan.

CHAPTER 21

CONCLUSION

21.1.1 Bihar Plains have one of the most fertile soils in the country. The State is endowed with large groundwater resources. Its soil and climatic conditions have favoured the development of a cropping system dominated by foodgrains.

21.1.2 Since early 1960s, agricultural progress in Bihar was particularly tardy. Its annual growth rate in foodgrains production dipped from 5 per cent during 1951-61 to a depressingly low level of 1.5 per cent during the subsequent two decades. Yields of rice and wheat are low. The yields are also poor in regard to sugarcane and jute — two important cash crops of the State.

21.1.3 Development measures taken up by the State have not induced intensification of agriculture to any significant extent due to bureaucratic approach and lack of efficient planning and poor implementation of development programmes. The farming community is now aware of the benefits from technological progress in agriculture. Irrigation facilities in some areas have enabled the farmers to take a second crop of wheat. With improved irrigation and drainage facilities, supported by a sound infrastructure for input supply to farmers, custom service, extension and marketing, assisted by an efficient management responsive to the needs and aspirations of farmers, Bihar can achieve a much higher growth level than that attained in the past two decades.

21.1.4 The policy measures recommended in this Report are directed towards removing the constraints which impede accelerated progress. If these are effectively implemented, it should be possible for the State to achieve an annual growth rate in agricultural productivity of at least 3 per cent per annum and in agricultural production of 4 to 5 per cent per annum over the next 10 years.

21.1.5 This would, however, require substantial public investment and credit support from the banking system and a much greater efficiency in the organization and management at all levels of administration.

PART V

EAST U.P.

CHAPTER 22

INTRODUCTION

22.1.1 East U.P.* has fertile soils in most parts and plenty of surface and groundwater resources. Soil and climatic conditions are suited for the development of agriculture.

22.1.2 Over the last two and a half decades, East U.P. has made noteworthy progress. Production of foodgrains went up sharply from a little over 45 lakh tonnes in 1960-61 to 81 lakh tonnes in 1981-82. The performance of wheat was impressive. Wheat production went up from 6 lakh tonnes to 32 lakh tonnes during 1961-81, showing an annual growth rate of 8.5 per cent. Output touched a record level in 1983-84.

22.1.3 There has been a progressive increase in the area under high yielding varieties. HYV coverage of rice in the region was around 50 per cent and of wheat 83 per cent in 1981-82. The fertilizer consumption has been steadily rising. It was around 50 kg/ha in 1981-82, much above the all-India average.

22.1.4 Although some progress has been made, it is not adequate considering its large potential. Notwithstanding a significant improvement in wheat output, the annual growth in production of foodgrains during 1961-81 was 2 per cent only. Yield levels are low. Per capita availability of foodgrains in East U.P. during 1981-82 was 195 kg., lower than in other regions of U.P. Gross value of agricultural produce per capita (rural) in 1980-81 was Rs. 648, lower than in all other regions of U.P.

22.1.5. Over the years, there has been no significant change in the cropping pattern, which continues to be dominated by foodgrains. Agriculture is the backbone of the economy, with practically no rural industrialisation.

22.1.6 Despite large groundwater potential, only about 32 per cent of it has been exploited so far.

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* Allahabad, Azamgarh, Bahraich, Ballia, Basti, Deoria, Faizabad, Ghazipur, Gonda, Ghorakhpur, Jaunpur, Mirzapur, Pratapgarh, Sultanpur and Varanasi.

22.1.7 Given its large potential and the need to raise productivity per ha and per capita for improving the socio-economic well-being of its peasantry, East U.P. can achieve a higher growth rate in agricultural productivity and production. Such a possibility has already been demonstrated by the impressive growth in wheat output in recent years. However, there are some constraints which have to be overcome for fuller utilisation of the potential. In the policy context, the improvement of irrigation and drainage facilities, supported by arrangements for improved supply and distribution of power and inputs, provision of custom services and an effective extension service needs to be accorded high priority.

22.1.8 Before we set out to indicate the policy measures necessary to overcome the constraints and promote an accelerated growth process, we present below a brief description of East U.P's natural and human resources.

22.2 *Physical Features*

22.2.1. East U.P. comprising 15 out of 57 districts of the State is one of the backward regions. It has a geographical area of 0.86 lakh sq. km accounting for about 29 per cent of the State area but has to support 38 per cent of the population. East U.P. has a high density of population, high man-land ratio, low agricultural productivity and lack in rural industries.

22.3 *Population*

22.3.1 According to 1981 Agricultural Census, the population of East U.P. was 415 lakhs. The region is most thickly populated. Density of population in this region is 484 per sq. km as compared to 377 per sq. km for the State as a whole. The number of agricultural workers per 100 ha of net sown area during triennium ending 1980-81 was 167 as against all-India average of 105.

22.3.2 Scheduled castes and Scheduled tribes account for 21 per cent of the total population, as per 1981 Census. Most of the tribal population is concentrated in Mirzapur district.

22.3.3 Nearly 90 per cent of the population in East U.P. live in rural areas. Of the total workers, 80 per cent are engaged in agriculture. Some basic data on population are given in Annexure 22.1.

22.4 *Climate and Rainfall*

22.4.1 The region has a tropical climate. The maximum temperature in summer touches a level of 46.5°C and minimum temperature in winter is 2.4°C. Annual average rainfall varies from 976 mm in Allahabad district to 1364 mm in Gorakhpur district. However, year to year and within the year variations in the rainfall are very large.

22.4.2 Floods are an almost annual feature in certain areas of Bahraich, Gonda, Faizabad, Azamgarh, Basti, Gorakhpur and Deoria. Ganga, Gomti, Ghagra, Rapti, Sarju, and Gandak rivers cause heavy flood damage. Ghagra, Sarju. Rapti and Gandak rivers have their origin in Nepal. Heavy rainfall in the catchment areas of these rivers causes flash floods destroying standing crops in large areas. Floods of the Ganga also affect large areas in the districts of Mirzapur, Ghazipur and Ballia, while river Gomti affect large areas in Sultanpur and Jaunpur districts. Deforestation in the upper catchment areas on a large scale causing soil erosion and silting of river beds has also been responsible for severity of floods. Data on area affected by floods during the last 10 years are given below.

Table 22.1. Cropped Area Affected by Floods

(Lakh ha)

Year	Area affected	Year	Area affected
1974	9.0	1979	4.9
1975	8.6	1980	14.6
1976	23.7	1981	12.9
1977	3.2	1982	15.2
1978	16.3	1983	11.4

22.4.3 Some parts of East U.P., particularly trans-Jamuna area of Allahabad and some parts of Mirzapur and Varanasi districts often experience drought. Irrigation facilities in these areas are poor and failure of rains or erratic rainfall affects production adversely. It is estimated that during 1983, 27 lakh ha of cropped

area was affected by drought and 4 lakh ha could not be sown because of failure of rains. As a result of frequent occurrence of drought, rural population migrate to other areas in search of employment.

22.5 *Soils*

22.5.1 The region has mainly fertile alluvial soils with patches of usar (saline) land in some places. Texture of soils of terai districts of Bahraich, Gonda, Basti, Gorakhpur and Deoria is mostly Domat and Matiyar, sandy loam and clay. Texture of soils in Azamgarh, Jaunpur, Ghazipur, Varanasi and Ballia districts vary from sandy loam to loam including Karail soils in some places, whereas soils of Faizabad, Sultanpur, Pratapgarh, Allahabad and Mirzapur districts are mostly Matiyar and Domat. Area under usar land is estimated at nearly 3 lakh ha as may be seen below.

Table 22.2. Usar Land, 1982-83

District	Area ('000 ha.)
Azamgarh	32
Faizabad	27
Sultanpur	42
Pratapgarh	32
Allahabad	68
Varanasi	23
Jaunpur	29
Ghazipur	15
Ballia	21
Gorakhpur	4
Total	293

22.6 *Agro-climatic Zones*

22.6.1 On the basis of climatic and physical characteristics of the region, East U.P. may be divided into three agro-climatic zones.

Zone	Districts
North-Eastern Plain Districts	Bahraich, Basti, Deoria, Gonda and Gorakhpur.
Eastern Plain Districts	Allahabad, Azamgarh, Ballia, Faizabad, Ghazipur, Jaunpur, Pratapgarh, Sultanpur and Varanasi.
The Vindhyan District	Mirzapur.

22·7 *Land Use Pattern*

22.7.1 Data pertaining to land use pattern in East U.P. are given below.

Table 22.3. Land Use Pattern, 1980-81

		Area (in lakh ha)	Percentage of reporting area
1.	Net area sown	56.5	65.6
2.	Current fallows	4.1	4.8
3.	Fallow land	2.2	2.6
4.	Forests	8.2	9.5
5.	Area put to non-agricultural uses	8.2	9.5
6.	Barren and uncultivable area	2.4	2.7
7.	Land under permanent pasture and grazing	0.2	neg.
8.	Land under miscellaneous plantation	2.2	2.6
9.	Cultivable waste area	2.3	2.7
	Total reported area	86.3	100.0

22.7.2 *Agrarian Structure*: According to 1980-81 Census, the average size of holdings in East U.P. was only 0.7 ha as compared to 1.1 ha for the State as a whole and 1.3 ha in West U.P. Seventy-nine per cent of operational holdings were 1 ha or less. These holdings accounted for only 34 per cent of total operated area. The holdings of 1 to 2 ha accounted for 13 per cent of total holdings, but 23 per cent of total reported area. Thus, 92 per cent of total holdings were less than 2 ha in size, accounting for only 58 per cent of total area. Medium and large size holdings, i.e., 2 ha and above which accounted for only 8 per cent of total operational holdings cover 42 per cent of area under cultivation (Table 22.4).

Table 22.4. Size-wise Distribution of Holdings in East U.P., 1980-81

Sl. No.	Size of holdings	No. of holdings (in lakhs)	Percentage of total	Area in lakh ha	Percentage of total
1.	Below 1 ha	59.4	79.3	18.9	34.3
2.	Between 1 and 2 ha	9.5	12.7	12.9	23.4
3.	Between 2 and 4 ha	4.3	5.8	11.7	21.3
4.	Between 4 and 10 ha	1.5	2.0	8.6	15.6
5.	10 ha and above	0.2	0.2	3.0	5.4
	Total	74.9	100.0	55.1	100.0

22.7.3 The share of small holdings has been steadily rising due to increasing sub-division of land. The share of holdings of less than 1 ha has increased from 75 per cent in 1970-71 to 79 per cent in 1980-81. On the other hand, the number of large holdings, i.e. 10 ha and more declined from 32000 in 1970-71 to 18000 in 1980-81. Consolidation of holdings was taken up and the first round is over. However, owing to further sub-division and fragmentation of lands, the holdings have again become fragmented and need another round of consolidation.

22.8 *Irrigation*

22.8.1 East U.P. is endowed with large surface and groundwater resources but its exploitation is low. Six main rivers, *viz.* Ganga, Gomti, Gandak, Ghagra, Tons and Jamuna and their tributaries flow in the region. During triennium ending 1980-81, gross irrigated area was 34 lakh ha, accounting for about 42 per cent of total gross cropped area. The area irrigated during *kharif* and *rabi* is about 5 lakh ha and 29 lakh ha, respectively.

22.8.2 The region has two major irrigation projects, *viz.*, Sharda Sahayak and Gandak. These two projects have a potential to irrigate 12.7 lakh ha and 4.4 lakh ha, respectively. However, the actual irrigation from these projects was only 4.5 lakh ha and 3.3 lakh ha respectively, at the end of 1980-81.

22.8.3 Although a large part of the irrigation is utilised in *rabi* season, it is inadequate to meet crop requirements. Even though wheat requires 5 to 6 irrigations, field studies show that about 27 per cent of the area under wheat gets only one irrigation, 38 per cent two irrigations, 26 per cent three irrigations and only 9 per cent get more than three irrigations.

22.8.4 Tubewells are the most important source of irrigation in the region (Table 22.5).

Table 22.5. Source-wise Net Irrigated Area

(Lakh ha)

	1970-71	1980-81
Canals	4.3	6.8
Tubewells	7.3	16.8
Tanks	2.5	0.9
Other wells	7.6	2.1
Other sources	1.9	1.1
Total	23.3	27.7

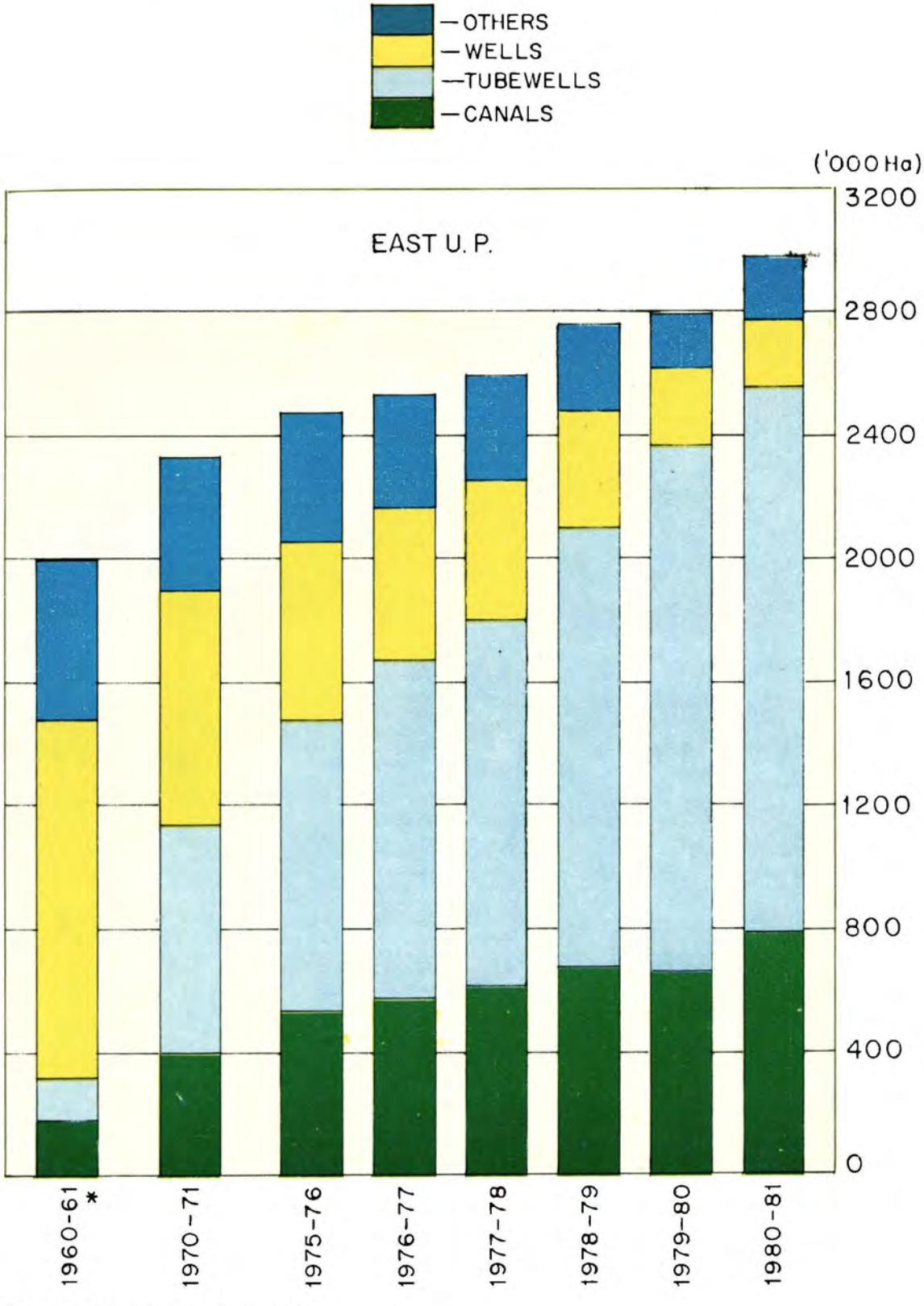
22.8.5 Hydrogeologically, East U.P. is part of Indo-Gangetic alluvium plain with considerable groundwater potential. Against the potential of 26240 MCM, the net draft as on March 31, 1982 was estimated at 8310 MCM leaving a balance of 17930 MCM yet to be exploited. Thus, only about 32 per cent of groundwater potential has been exploited. District-wise details of groundwater exploitation are given below.

Table 22.6. Groundwater Status in East U.P.

(As of 1982)

	District	Balance available (MCM)	Percentage of groundwater exploitation
1.	Allahabad	1140	32
2.	Faizabad	850	42
3.	Gonda	910	41
4.	Bahraich	750	31
5.	Sultanpur	1920	20
6.	Pratapgarh	3420	10
7.	Mirzapur	1510	13
8.	Gorakhpur	1620	33
9.	Deoria	690	60
10.	Basti	1340	35
11.	Azamgarh	810	46
12.	Varanasi	330	65
13.	Jaunpur	1440	30
14.	Gazipur	660	37
15.	Ballia	540	33
	Total	17930	32

SOURCE-WISE NET IRRIGATED AREA



* Data relates to 1959-60

22.9 *Waterlogging*

22.9.1 Waterlogging is an acute problem in East U.P., particularly in Sharda Sahayak Command area and Gandak Command area. It is estimated that about 4.5 lakh ha in Sharda Sahayak and 2.5 lakh ha in Gandak Command area has been affected by waterlogging. The problem has become so acute in certain areas that the water level has come within 2 meters of the ground level. In Sharda Sahayak Command area, the gain in irrigated area has been offset by the area lost in waterlogging. Gandak is also not much better.

Annexure 22.1

Basic Data on Population

(As per 1981 Census)

Sl. No.	Particulars	East U.P.	All India
1.	Population (Million)	41.5	685.2
	(i) Rural (Million)	37.1	525.5
	(ii) Urban (Million)	4.4	159.7
2.	Agricultural workers		
	(i) Cultivators (Million)	7.1	92.5
	(ii) Agricultural labourers (Million)	2.4	55.5
3.	Percentage of		
	(i) Rural population to total population	89.4	76.7
	(ii) Agricultural workers to rural population	25.6	28.2
4.	Decennial population growth, 1971-81 (per cent)		
	(i) Total	25.4	25.0
	(ii) Rural	22.0	19.7
5.	Population density (No per sq. km.)	484	221

CHAPTER 23

REVIEW OF AGRICULTURAL DEVELOPMENT SINCE 1960

23.1 *Introduction*

23.1.1 In East U.P., a substantial part of the cropped area is devoted to the cultivation of foodgrains. During 1980-81, 91 per-cent of the gross cropped area was under foodgrain crops. Rice is the main crop grown in the region. However, with the improvement in irrigation potential, wheat is also becoming very popular. On the other hand, acreage under pulses has been showing a declining trend. Among non-foodgrain crops, potato cultivation is increasing. Details of area under various crops in 1980-81 are given in Annexure 23.1.

23.2 *Cropping Intensity*

23.2.1 Cropping intensity went up from 131 per cent during triennium ending 1960-61 to 142 per cent during triennium ending 1980-81. There are, however, inter-district variations, with Gonda district having the highest and Mirzapur and Faizabad lowest cropping intensity.

23.3 *Crop-wise Analysis-Foodgrains*

23.3.1 Area under foodgrains increased from 66 lakh ha during triennium ending 1960-61 to 72 lakh ha during the corresponding period of 1980-81, recording a compound growth rate of 0.4 per cent per annum. During the same period, the output of foodgrains increased from 45 lakh tonnes to 69 lakh tonnes, recording an annual compound growth rate of about 2 per cent. In 1981-82, the output of foodgrains touched a high level of 81 lakh tonnes (Annexures 23.2 and 23.3).

23.3.2 Although the production of foodgrains has recorded a substantial increase during the last 21 years, analysis of past trends reveals wide fluctuations in production largely due to natural calamities like floods and drought (Table 23.1).

Table 23.1. Production of Foodgrains

(In lakh tonnes)

Year	Production	Year	Production
1970-71	59.9	1976-77	63.0
1971-72	52.1	1977-78	69.6
1972-73	52.2	1978-79	75.1
1973-74	49.5	1979-80	50.9
1974-75	53.4	1980-81	79.5
1975-76	63.1	1981-82	6·08

23.4 *Rice*

23.4.1 Within the foodgrains group, rice is the most important crop which accounts for about 35 per cent of total cropped area.

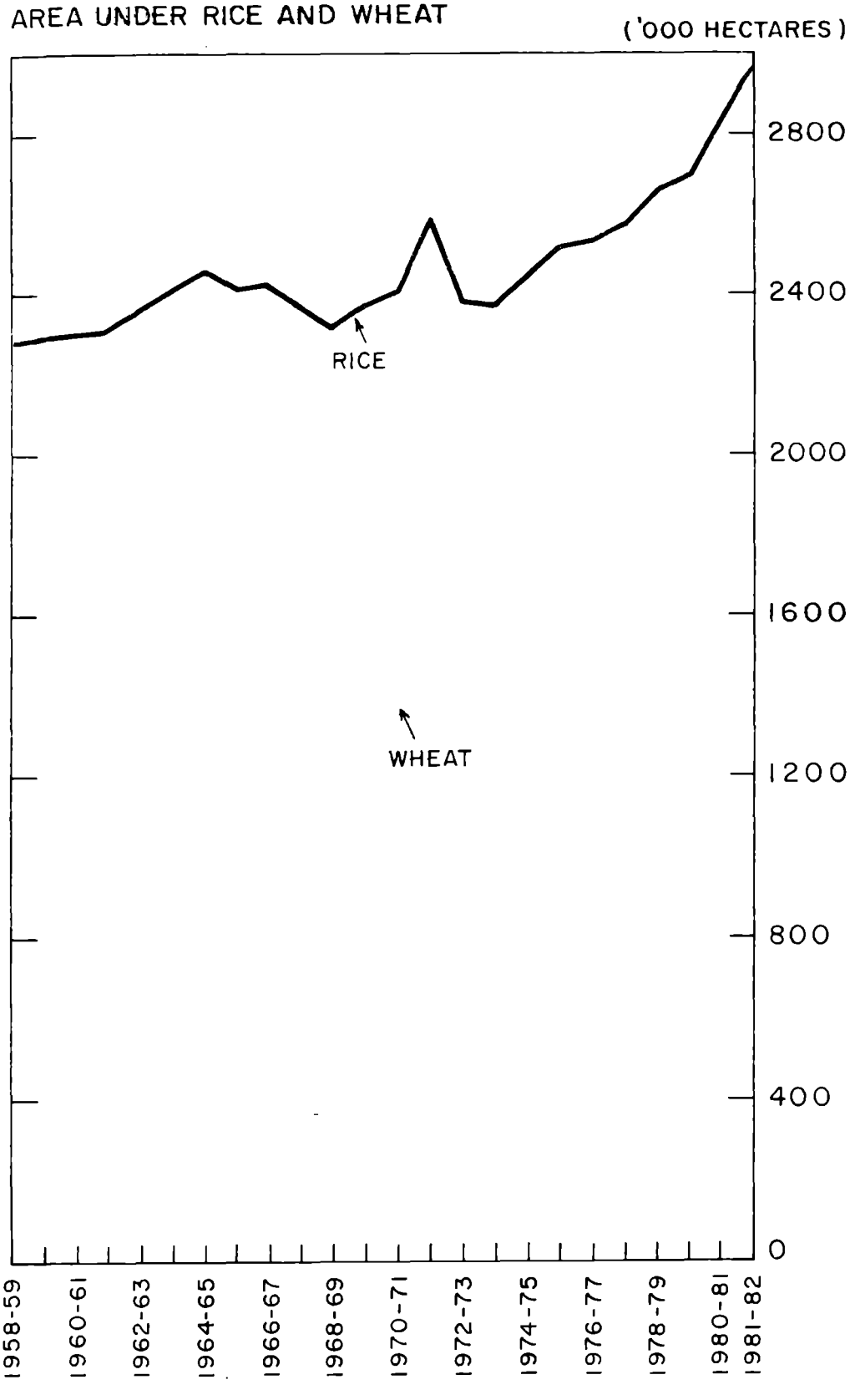
23.4.2 Production of rice recorded an annual growth of 1.4 per cent during 1961-71 and of 3 per cent during 1971-81. The larger increase in production during 1971-81 was brought about both by increase in area and yields.

23.4.3 Yield of rice increased from 600 kg/ha in triennium ending 1960-61 to 773 kg/ha in triennium ending 1980-81. The improvement in yield was largely contributed by extension of area under high yielding varieties.

23.5 *Wheat*

23.5.1 The most significant change in the cropping pattern of East U.P. during the last two decades is the sharp increase in area under wheat. Area under wheat increased three-fold between 1961-81. Output of wheat registered more than five times during the same period from 6 lakh tonnes during triennium ending 1960-61 to about 32 lakh tonnes during triennium ending 1980-81, reflecting a compound growth rate of 8.5 per cent per annum. Wheat output increased further to 39 lakh tonnes dur-

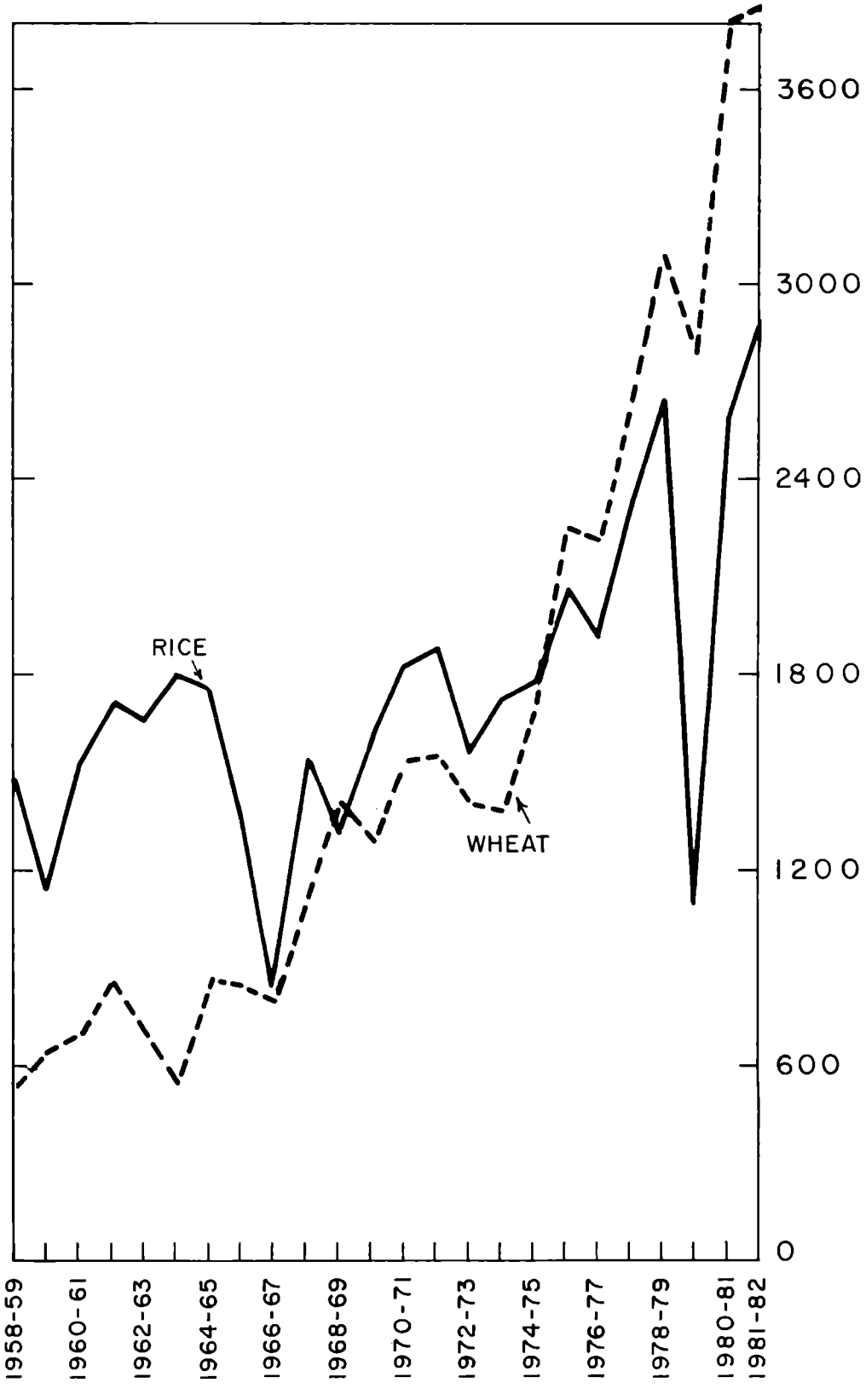
EAST UTTAR PRADESH
AREA UNDER RICE AND WHEAT



EAST UTTAR PRADESH

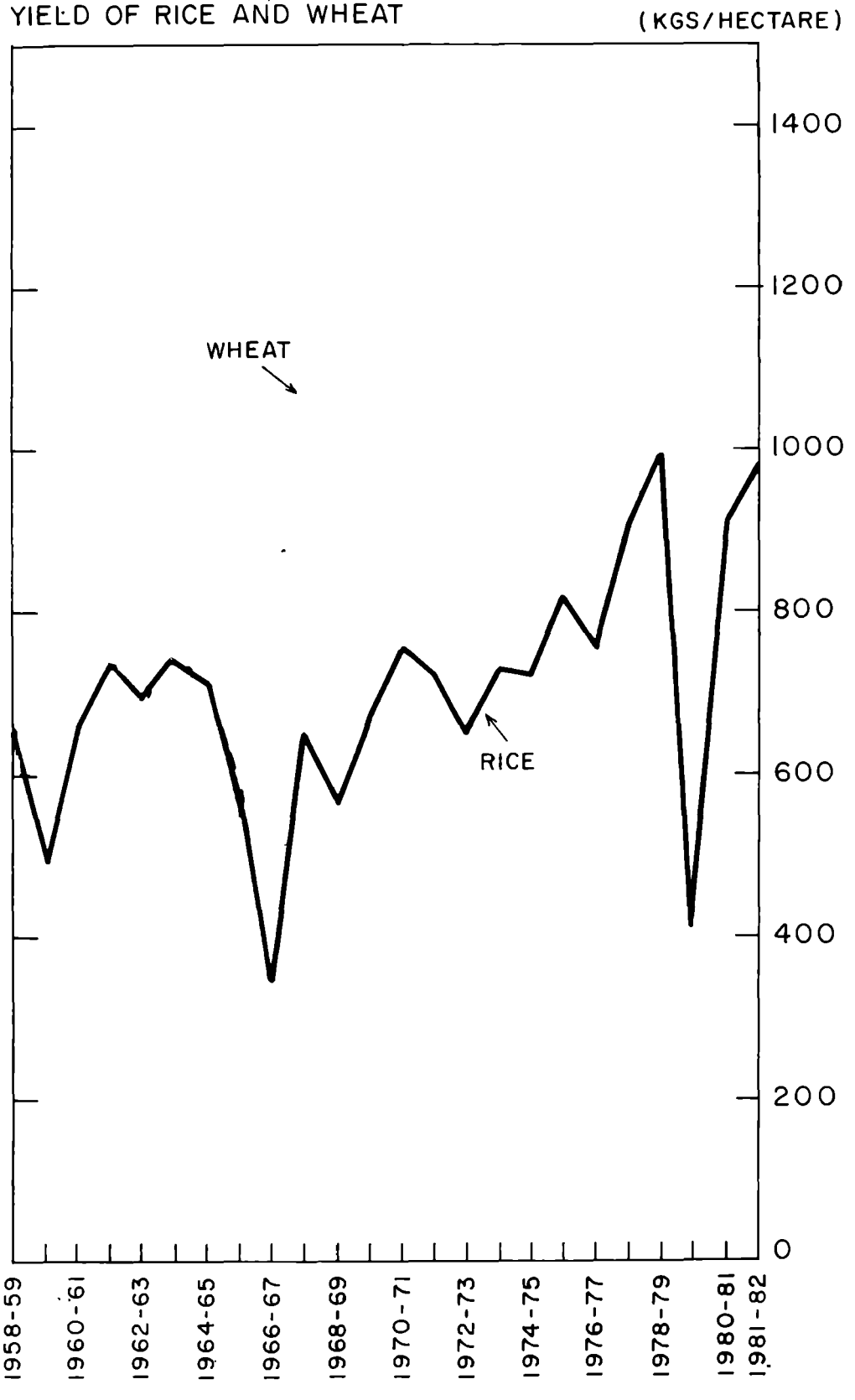
PRODUCTION OF RICE AND WHEAT

('000 TONNES)



EAST UTTAR PRADESH

YIELD OF RICE AND WHEAT



ing 1981-82. The increase in output during 1961-81 was contributed both by rise in area and yields as may be seen below.

Table 23.2. Area, Production and Productivity-Wheat

	Area ('000 ha)	Production ('000 tonnes)	Productivity (kg./ha.)
Triennium 1960-61	852	629	738
Triennium 1970-71	1292	1410	1091
Triennium 1980-81	2395	3226	1347
During the year 1981-82	2629	3859	1468
Compound growth rate (Per cent per annum)			
1961-71	4.3	8.4	4.0
1971-81	6.4	8.6	2.1
1961-81	5.3	8.5	3.1

23.5.2 Expansion in irrigation and introduction of HYV are major factors which have contributed to the increase in wheat yields. During 1980-81, 83 per cent of wheat acreage was covered under HYV.

23.6 *Other Cereals*

23.6.1 Besides rice and wheat, other important cereals produced in East U.P. are maize, bajra, ragi, barley, jowar and small millets. Area under these cereals in 1980-81 was 11 lakh ha which accounted for 14 per cent of total cropped area under foodgrains. This has, however, shown a consistent decline. It declined from 20 lakh ha during triennium ending 1960-61 to 10 lakh ha in 1981-82. Production also declined from 15 lakh tonnes to 7 lakh tonnes. Trends in production of maize and small millets are reviewed below.

23.6.2 *Maize*: Maize accounted for 3.5 per cent of cropped area in 1980-81. Area under this crop remained around 4 lakh ha till 1978-79; thereafter it showed some decline. During 1981-82, area

grown in the region are groundnut and mustard. Area under groundnut in 1980-81 was only 21,000 ha and production 12,000 tonnes. Area under other oilseeds remained around one lakh ha and production around 35,000 tonnes during the last twenty years. The yields also remained stagnant during this period.

23.8.2 *Potato*: Potato cultivation is gaining importance in East U.P. Area under potato increased from 40,000 ha in triennium ending 1960-61 to 88,000 ha in triennium ending 1980-81. Production increased from 3 lakh tonnes to 12 lakh tonnes during the same period due mostly to increase in yield. The yield increased from 7,050 kg/ha to 13,625 kg/ha.

23.9 *Input Delivery System*

23.9.1 The use of modern agricultural inputs like fertilizers and HYV seeds, etc., in the State has shown an increase, particularly since mid-1970s. Distribution of inputs is handled by the U.P. Co-operative Federation, U.P. Co-operative Cane Union Federation, Agro-Industries Corporation and Agriculture Department and private dealers. Among these agencies share of private dealers is the largest. However, distribution outlets are available only upto the block level.

23.9.2 *Seeds*: Demand for HYV and improved seeds has been increasing over the years. To meet the growing demand for seeds, more sale points have been opened. Between 1974-75 and 1980-81 the number of sale points increased by 40 per cent. The production of certified seeds, however, is not adequate to meet the demand.

23.9.3 In order to popularise the use of various high yielding varieties, minikits of paddy under demonstration/adaptive training programmes are supplied to farmers free of cost. Similarly, minikits of wheat seeds of pest resistant varieties and seeds of small millets are also distributed free of cost.

23.9.4 Owing to shortage of quality seeds, seed replacement rate in respect of wheat and rice is quite low. During 1982-83 and 1983-84, it was 6-8 per cent in the case of rice and 3 per cent in the case of wheat in 1982-83. The State Government has fixed a seed replacement target of 15 per cent for rice and 10 per cent for wheat during 1984-85. Even this target is much lower than the norm of 20 per cent.

23.9.5 *Area Under HYV*: Between 1974-75 and 1981-82, there has been a significant expansion in the coverage of area under HYV. During 1981-82 about 50 per cent of the area under rice and 83 per cent of the area under wheat was brought under HYV. The HYV area under maize, jowar and bajra is, however, very small as may be seen below.

Table 23.4. Percentage of Gross Cropped Area Under HYV

	1974-75	1981-82
Rice	34.7	49.6
Wheat	68.7	82.8
Maize	0.5	3.3
Jowar	—	1.2
Bajra	4.6	0.7

23.9.6 *Fertilizer*: Consumption of fertilizer in East U.P. has increased considerably from 20 kg/ha in 1970-71 to 49 kg/ha in 1980-81 as may be seen below.

Table 23.5. Use of Fertilizers per Unit of Cropped Area

(Kg./ha)

Year	East U.P.	All India
1970-71	19.7	13.6
1971-72	21.6	16.1
1972-73	21.7	17.1
1973-74	20.3	16.7
1974-75	18.0	15.7
1975-76	22.6	16.9
1976-77	34.7	20.4
1977-78	40.8	24.9
1978-79	48.3	29.2
1979-80	46.3	30.0
1980-81	48.9	31.5

A substantial part of fertilizer distribution is handled by the U.P. Co-operative Federation. The U.P. Co-operative Cane Union supplies fertilizers on credit to cane growers through sale points situated around the sugar factories. The State Agro-Industries Corporation has also set up sale outlets. The State Agriculture Department distributes fertilizers through its seed stores. Besides, there are a number of sale points run by the private dealers. There are nearly 7950 fertilizer sale centres in East U.P. which work out to 23 per block on an average.

23.9.7 *Pesticides*: Large cultivated areas in East U.P. are affected by diseases, pests and weeds every year. This underscores the importance of plant protection measures.

23.9.8 *Farm Machinery and Implements*: The use of farm machinery and implements has been increasing in East U.P. The increase in the use of pumps, tractors and threshers between 1966 and 1978 (latest year for which data are available) is indicated below.

Table 23.6. Use of Farm Machinery and Implements-Numbers

Year	Pumps	Tractors	Threshers
1966	8391	2081	2027
1972	86945	5240	32169
1978	186464	13766	75688

23.9.9 *Electric Power*: About 36 per cent of villages in East U.P. are electrified as compared to 50 per cent in West U.P. However, there is a shortage of power. Besides, power supply is erratic and uncertain. This adversely affects the optimum utilisation of pump-sets.

23.10 *Agricultural Credit Situation*

23.10·1 *Infrastructure*: Co-operatives provide bulk of the agricultural credit in East U.P. As on June 30, 1982, there were about 3500 PACS in this area to meet short-term production credit requirements of the farmers. Long, term credit is provided by U.P.

State Co-operative Land Development Bank Ltd. operating through its branches.

23.10.2 The commercial banks and RRBs provide short, medium and long-term credit. As at the end of June 1980, East U.P. had 1118 commercial bank branches of which 706 (63 per cent) were rural, 188 semi-urban and 224 urban. Rural population served by a rural branch works out to around 53,000. Bank of Baroda, Union Bank of India, Allahabad Bank, State Bank of India and Central Bank of India are "lead" banks for the 15 districts as shown below.

Table 23.7. Lead Banks in Eastern U.P.

Lead Bank	Districts allotted
1. Bank of Baroda	1. Allahabad
	2. Faizabad
	3. Pratapgarh
	4. Sultanpur
2. Union Bank of India	1. Azamgarh
	2. Ghazipur
	3. Jaunpur
	4. Varanasi
3. Allahabad Bank	1. Bahraich
	2. Gonda
	3. Mirzapur
4. State Bank of India	1. Basti
	2. Gorakhpur
5. Central Bank of India	1. Ballia
	2. Deoria

23.10.3 All the 15 districts of East U.P. are covered by RRBs. The first RRB (Gorakhpur Kshetriya Gramin Bank) in this region was set up in October 1975. As on December 31, 1983 there were 13 RRBs with 759 branches.

23.10.4 *Recent Trends in Agricultural Credit*: In East U.P., loans disbursed by CCBs to PACS (both short and medium-term) went up from Rs. 22 crores in 1971-72 to Rs. 67 crores in 1979-80. Term loans disbursed by LDB also showed an increase. In 1982-83, this amounted to Rs. 16 crores. Financing of agriculture by commercial banks and RRBs also has shown a marked increase during the last few years.

23.10.5 *Overdues*: The overdues of CCBs in East U.P. hovered around 32 per cent in 1971-72. They went up to 57 per cent in 1977-78 but came down to 48 per cent in 1978-79 and to 47 per cent in 1979-80.

23.11 *Special Development Programmes*

23.11.1 Major development programmes implemented in the State are (i) Drought Prone Area Programme, (ii) Command Area Development Programme, (iii) Integrated Rural Development Programme, (iv) Programme for Assistance to Small and Marginal Farmers, and (v) Special Programme for Increasing Rice Production.

23.11.2 *Drought Prone Area Programme*: In East U.P., the programme covers 39 blocks in 4 districts, *viz.*, Mirzapur, Banda, Bahraich and Gonda. The programme is being executed in selected watersheds. The main constituents of the programme are (a) soil and water management, (b) development of ground and surface water potentials of the area, (c) afforestation and social forestry, and (d) fuel and fodder and grassland development, etc.

23.11.3 *Command Area Development Programme*: Command Area Development Authorities have been set up for the major irrigation projects of the State *viz.* Gandak, Sharda Sahayak and Ramganga. The targets and achievements under these programmes during the Sixth Plan are given in Table 23.8.

23.11.4 *Integrated Rural Development Programme*: This programme is implemented in all blocks of East U.P. Each block is expected to cover 3000 families in the Sixth Plan and each block will have an outlay of Rs. 35 lakh during the Plan period.

23.11.5 *Programme for Assistance to Small and Marginal Farmers*: In 1983-84, a new programme was introduced for providing assistance to small and marginal farmers. Under this programme, an

Table 23.8. Command Area Development-Physical Targets and Achievements

Item	Unit	Sixth Plan target 1980-85	Achievements during 1980-83	Anticipated for 1983-84	Target for 1984-85
1. Soil survey	'000 ha	3000	1832	600	600
2. Topographic survey	„	2700	1468	625	500
3. On-farm development	„	2201	1487	550	440
4. Construction of field channels	'000 km.	110	77	28	22
5. Construction of drains	„	21	4	2	2
6. Construction of water control structures	'000 No.	220	124	55	14
7. Warabandi	'000 ha	—	159	110	340

amount of 5 lakh is allocated to each block for disbursement as subsidy to small and marginal farmers for minor irrigation, land development, plantation of fuel and fruit trees and distribution of minikits of seeds and fertilizers.

23.11.6 *Special Programme for Increasing Rice Production*: In 1984-85, a special programme was proposed to be implemented on a pilot basis in 10 blocks in East U.P. In the first year the pilot project will be fully financed by the Central Government at the rate of Rs. 10 lakhs per block. In the subsequent years the programme will be implemented as a Centrally Sponsored Scheme with State Government meeting 50 per cent of the expenditure.

23.11.7 In addition to the development progammes mentioned above, several other schemes have been implemented in the region for improving agricultural production and productivity. They include oilseeds development programme, intensive pulses development programme, community nursery programme, etc.

Annexure 23.1

Area Under Different Crops, 1980-81

(In '000 ha)

Crop	Area	Percentage
1. Foodgrain crops		
(a) **Cereals**		
(i) Rice	2842	34.6
(ii) Wheat	2599	31.7
(iii) Barley	267	3.3
(iv) Maize	285	3.5
(v) Other cereals	555	6.8
Total cereals	6548	79.9
(b) **Pulses**	921	11.2
Total foodgrain crops	7469	91.1
2. Sugarcane	272	3.3
3. Oilseeds	121	1.5
4. Potato	88	1.1
5. Other non-foodgrain crops	253	3.0
Total area sown	8203	100.0

Annexure 23.2

Area, Production and Productivity of Major Crops

Crop	Area ('000 ha)				Production ('000 tonnes)				Productivity Kg/ha			
	Triennium ending			Yearly	Triennium ending			Yearly	Triennium ending			Yearly
	1960-61	1970-71	1980-81	1981-82	1960-61	1970-71	1980-81	1981-82	1960-61	1970-71	1980-81	1981-82
Rice	2305	2376	2738	2973	1384	1582	2116	2898	600	666	773	975
Wheat	852	1292	2395	2629	629	1410	3226	3859	738	1091	1347	1468
Other cereals	2033	1912	1167	1000	1492	1557	822	722	734	814	704	722
Pulses	1366	1170	861	867	1046	997	688	613	766	852	799	707
Total food grains	6556	6750	7161	7469	4551	5546	6852	8092	694	822	957	1083
Oilseeds	95	101	114	132	34	37	36	58	354	364	317	439
Sugarcane	308	319	291	314	965	1362	1062	1406	3130	4274	3645	4478
Jute	6	4	3	3	0.039*	0.028*	0.024*	0.033*	1167	1250	1433	2000
Potato	40	58	88	92	282	528	1199	1375	7050	9057	13625	14923

* Production in '000 bales of 180 kgs.

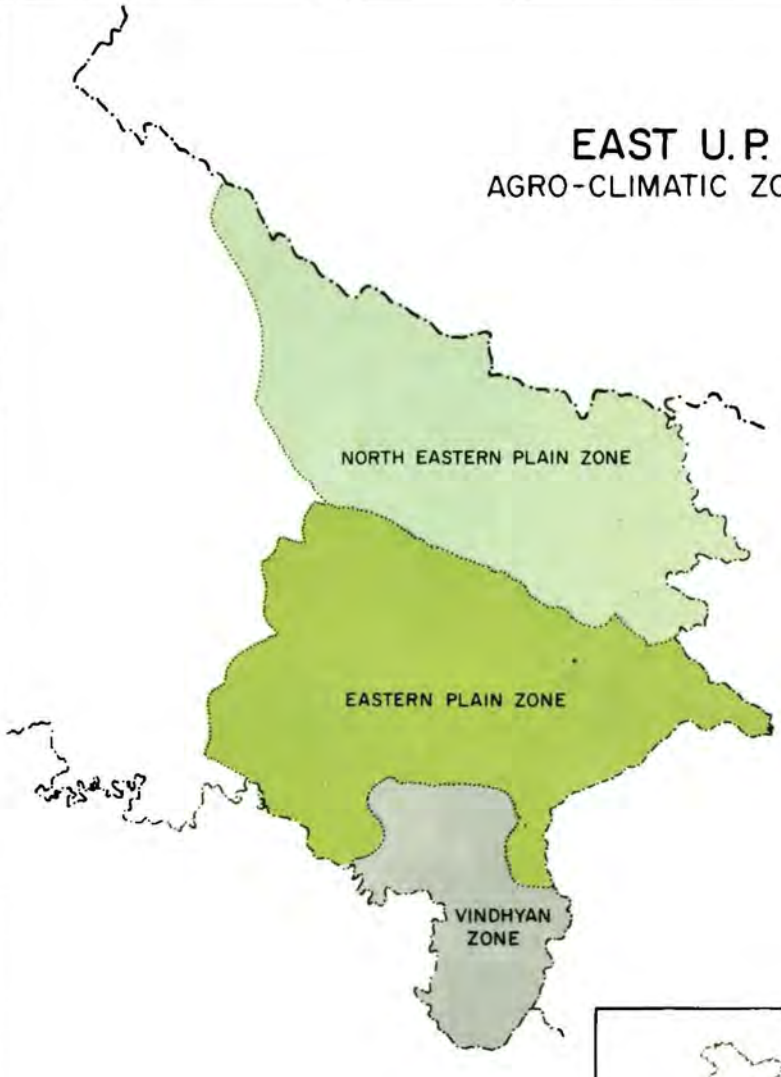
Annexure 23.3

Annual Compound Growth Rate

(Per cent)

Crop	Area			Production			Productivity		
	1961-71	1971-81	1961-81	1961-71	1971-81	1961-81	1961-71	1971-81	1961-81
Rice	0.3	1.4	0.9	1.4	2.9	2.2	1.1	1.5	1.3
Wheat	4.3	6.4	5.3	8.4	8.6	8.5	4.0	2.1	3.1
Other cereals	— 0.6	— 4.8	— 2.7	0.4	— 6.2	— 2.9	1.0	— 1.4	— 0.2
Pulses	— 1.5	— 3.0	— 2.3	— 0.5	— 3.6	— 2.1	1.1	— 0.6	0.2
Total foodgrains	0.3	0.6	0.4	2.0	2.1	2.1	1.7	1.5	1.6
Oilseeds	0.6	1.2	0.9	0.9	— 0.3	0.3	0.3	— 1.4	— 0.6
Sugarcane	0.4	— 0.9	— 0.3	3.5	— 2.5	0.5	3.2	— 1.6	0.8
Jute	— 4.0	— 2.8	— 3.4	— 3.3	— 2.2	— 2.8	0.7	1.4	1.0
Potato	3.8	4.3	4.0	6.5	8.5	7.5	2.5	4.2	3.4

EAST U.P.
AGRO-CLIMATIC ZONES



1 The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line.

2 Based upon Survey of India map with the permission of the Surveyor General of India.

4 Responsibility for the correctness of internal details shown on the maps rests with the publisher.

CHAPTER 24

AGRO-CLIMATIC ZONES

24.1.1 East U.P. is classified into three agro-climatic zones. The classification made by Indian Council of Agricultural Research (ICAR) has been adopted by us with some minor modification. We have included Allahabad in Eastern Plains Districts but excluded Barabanki as this district does not form part of East U.P. The zonal classification adopted by us is given below.

Zone	Districts covered
1. North Eastern Plains Districts	Bahraich, Gonda, Basti, Gorakhpur and Deoria.
2. Eastern Plains Districts	Faizabad, Sultanpur, Pratapgarh, Jaunpur, Azamgarh, Ballia, Ghazipur, Varanasi and Allahabad.
3. Vindhyan District	Mirzapur.

24.2 *North-Eastern Plains Districts*

24.2.1 *General Features*: The total geographical area of the districts of this zone is 33,227 sq. km forming 39 per cent of the total area of East U.P. These districts together constitute Terai area of East U.P. which has abundant surface and groundwater. Two main soil types, namely, alluvial and calcareous are found in this zone.

24.2.2 The average annual rainfall of the zone is 1471 mm. Gorakhpur, Deoria and Basti receive the maximum rainfall whereas Bahraich receives the minimum.

24.2.3 *Socio-Economic Characteristics*: According to 1981 Census, the total population of the districts included in this zone is around 16 million of which nearly 93 per cent is rural. The zone has a population density of 479 per sq. km. The density is higher in

Deoria and Gorakhpur being 648 and 601 per sq. km, respectively. Bahraich has a low density of 323 per sq. km. Scheduled Castes constitute 18.5 per cent of total population. The zone has a total work force of 4.8 million of which 69 per cent are cultivators and 18 per cent agricultural labourers. Thus, pressure of population on land is considerable. The literacy rate is around 20 per cent as against the average of 24 per cent in Uttar Pradesh as a whole.

24.2.4 *Pattern of Land Holdings*: The number and size of operational holdings in the zone based on Agricultural Census conducted during 1976-77 and 1980-81 are indicated in Annexure 24.1. According to 1980-81 Census, Marginal holdings (ie. less than 1 ha) accounted for 77.6 per cent of total holdings and covered 34.9 per cent of operated area. Small holdings (1 to 2 ha) accounted for another 14 per cent and covered 24.8 per cent of operated area. Thus, over 92 per cent are holdings of 2 ha and less and covered only 59.7 per cent of total operated area. The remaining 8 per cent of holdings covered 40 per cent of operated area.

24.2.5 *Land Use Pattern*: Based on the latest available data for 1980-81, the land use pattern of the zone is presented below.

Table 24.1. Land Use Pattern — North Eastern Plains Districts

Classification	Area ('000 ha)	Per cent of total reporting area	Col. 2 as per cent of East U.P. total
(1)	(2)	(3)	(4)
1. **Reporting area**	**3323**	**100.0**	**38.5**
2. Forests	239	7.2	29.0
3. Area not available for cultivation	360	10.8	34.0
(i) Land put to non-agricultural uses	321	9.7	39.2
(ii) Barren and uncultivable land	39	1.1	16.4

(1)	(2)	(3)	(4)
4. Permanent pastures and other grazing land	5	0.2	31.2
5. Land under miscellaneous tree crops and groves	79	2.3	35.4
6. Cultivable waste land	58	1.8	24.8
7. Fallow land			
(i) Current fallows	88	2.7	21.4
(ii) Others	50	1.5	22.2
8. Net area sown	2444	73.5	43.3

24.2.6 Nearly three-fourths of the reporting area in this zone is under cultivation. Scope for bringing more land under cultivation is limited.

24.2.7 *Cropping Pattern*: More than 90 per cent of gross cropped area in this zone is under foodgrains cultivation (Annexure 24.2). Rice, maize, sugarcane and small millets are the important *kharif* crops. The major *rabi* crops are wheat, gram, peas and barley. The cropping intensity is around 150 per cent. Rice-wheat is a common rotation wherver irrigation facilities are available. In the districts of Gonda and Bahraich, double cropping is practised with *utera* system of planting, wherein the standing crop of paddy, lentil is broadcast. These crops are raised on residual moisture and fertility. Turmeric, other spices and tobacco are the cash crops being grown in some parts of the zone. However, area sown to these crops is small.

24.2.8 *Irrigation Pattern*: Data on irrigated area, crop-wise for the years 1970-71 and 1980-81 are given below.

Table 24.2. Net and Gross Irrigated Area-North Eastern Plains Districts

Source	Net Irrigated Area 1970-71	1980-81	Crop	Gross Irrigated Area 1970-71	1980-81
Canals	46.1	210.1	Rice	3.4	37.6
	(5.0)	(17.5)		(0.3)	(3.0)
			Maize	—	1.3
					(0.1)
Tanks	142.5	65.9	Wheat	591.7	959.1
	(15.1)	(5.5)		(61.3)	(75.7)
			Gram	46.4	57.2
				(4.8)	(4.5)
Tube-wells	356.1	732.3	Total pulses	144.0	98.9
	(38.0)	(61.2)		(15.0)	(7.8)
			Total food-grains	857.4	1131.8
				(88.9)	(89.3)
Other wells	240.0	99.9	Sugar-cane	80.0	79.6
	(25.6)	(8.3)		(8.3)	(6.3)
			Potato	—	21.5
					(1.7)
			Total food-crops	954.8	1242.6
Other sources	152.8	89.3		(99.0)	(98.0)
	(16.3)	(7.5)			
			Total non-food crops	9.9	24.6
				(1.0)	(2.0)
Total	937.5	1197.5	Total	964.7	1267.2
	(100.0)	(100.0)		(100.0)	(100.0)

Note: Figures in brackets represent percentage of total.

24.2.9 Between 1970-71 and 1980-81, net irrigated area in this zone increased by nearly 28 per cent mainly on account of tubewells and canals. The percentage of net irrigated area to net sown area in this zone was 50 per cent. The percentage of gross irrigated area to gross sown area of the zone was 35 per cent. Over three-fourths of gross irrigated area is sown to wheat. Nearly 80 per cent of area sown to this crop is irrigated. Irrigation provided to *kharif* crops such as rice and maize is small. The intensity of irrigated cropping is around 105 per cent which is extremely low.

24.2.10 *Fertilizer Consumption*: Consumption of fertilizer nutrients per ha of cropped area in this zone during 1970-71 and 1980-81 is as indicated below.

Table 24.3. Fertilizer Consumption — North Eastern Plains Districts

(Kg/ha)

Districts	1970-71	1980-81
	NPK	NPK
Gonda	19	34
Bahraich	9	28
Basti	25	35
Gorakhpur	26	52
Deoria	32	67
Average	22	43

24.2.11 *Area, Production and Productivity*: Annexure 24.3 presents data on area, production and yield of principal crops in this zone during triennium ending 1972-73 and 1980-81 and for the year 1981-82. The yields of different crops grown in the zone are much lower than Eastern Plains Districts. It may also be mentioned that no significant improvement has taken place in yields during the decade ending 1980-81.

24.3 *Eastern Plain Districts*

24.3.1 *General Features*: In this zone Faizabad, Sultanpur, Pratapgarh, Jaunpur, Azamgarh, Ballia, Ghazipur, Varanasi and Alla-

habad districts have been included. Parts of Varanasi and Allahabad districts appropriately belong to Vindhyan Zone. However these have been included in this zone for want of data below district level. The total geographical area of the district included in this zone according to Surveyor General of India is 41,275 sq. km constituting 48 per cent of total area of East U.P. This zone lies between south of river Ghagra and north of rivers Ganga-Jamuna. It has scanty surface water. However, groundwater resources are plenty. Usar soils are found in the districts of Sultanpur, Pratapgarh, Ballia and Azamgarh. A sizeable area is under 'diara' lands

24.3.2 The average annual rainfall in this zone is 803 mm of which about 96 per cent is received during June to September. Maximum precipitation of 1044 mm is recorded in Ballia district. On the other hand, Sultanpur and Pratapgarh are drier districts having average annual precipitation of 676 mm and 656 mm, respectively. As compared to North Eastern Plain Zone, this zone is less humid. However, among the nine districts, Ballia and Faizabad are more humid. The mean maximum and minimum temperature is 41.4°C and 5.7°C, respectively.

24.3.3 *Socio-Economic Characteristics*: According to 1981 Census, the total population of districts covered under this zone is around 24 million of which more than 87 per cent is rural. Average density of population of the zone is 573 per sq. km. In Varanasi, Jaunpur, Azamgarh and Ballia the population density is 727, 627, 617 and 611 per sq. km., respectively. Scheduled castes constitute around 22 per cent of total population. This zone has a total work force of 6.5 million, of which 75 per cent (55 per cent cultivators and 20 per cent agricultural labourers) are dependent on agriculture. Thus, pressure of population on land is also high in this zone. This region has the highest literacy rate (27 per cent) as compared with other regions of East U.P.

24.3.4 The number and area of operational holdings of the zone according to size classes, as per 1976-77 and 1980-81. Agricultural Census is given in Annexure 24.1. According to 1981 Agricultural Census, 81.6 per cent holdings were less than 1 ha size and covered 37 per cent of total operated area. Holdings of 1 to 2 ha in size accounted for 11.5 per cent and covered 23.2 per cent of operated area. Thus, 92 per cent holdings in the zone are of 2 ha and less in size and covered 60 per cent of total operated area.

24.3.5 *Land Use Pattern*: The land use pattern of the zone based on the latest available data for 1980-81 is given below.

Table 24.4. Land Use Pattern — Eastern Plains Districts

Classification (1)	Area ('000 ha) (2)	Per cent of total reporting area (3)	Col. 2 as per cent of East U.P. total (4)
1. **Reporting area**	**4112**	**100.0**	**47.6**
2. Forests	102	2.5	12.4
3. Area not available for cultivation	567	13.8	53.6
(i) Land put to non-agricul- tural uses	425	10.3	51.8
(ii) Barren and un- cultivable land	142	3.5	60.1
4. Permanent pastures and other grazing land	10	0.2	60.3
5. Land under miscellaneous tree crops and groves	125	3.0	56.1
6. Cultivable waste land	368	9.0	58.0
7. Fallow land			
(i) Current fallows	247	6.0	60.2
(ii) Others	121	3.0	54.0
8. Net area sown	2827	68.7	50.0

24.3.6 In this zone also nearly three-fourths of the total reporting area has been brought under cultivation.

24.3.7 *Cropping Pattern*: Details of the cropping pattern being followed in this zone are given in Annexure 24.2. Rice, maize, bajra, and tur are the important foodgrain crops grown during the *kharif* season and wheat, barley, gram and peas the major *rabi*

foodgrain crops. The important cash crop grown in this zone is sugarcane. Area sown to other cash crops such as oilseeds, fibres fruits and vegetables is insignificant. The alluvial soils of this zone show good response to fertilizers and irrigation.

24.3.8 *Irrigation Pattern*: Data on net and gross irrigated areas in this zone during 1970-71 and 1980-81 are given below.

Table 24.5. Net and Gross Irrigated Area — Eastern Plains Districts

('000 ha)

Source	Net irrigated area		Crop	Gross irrigated area	
	1970-71	1980-81		1970-71	1980-81
Canals	281.1 (21.5)	407.9 (28.0)	Rice	95.1 (6.7)	170.7 (9.1)
			Wheat	440.1 (31.0)	1205.7 (64.5)
Tanks	104.0 (7.9)	23.5 (1.6)	Barley	403.7 (28.5)	94.1 (5.0)
			Total cereals and millets	956.9 (67.5)	1493.8 (79.9)
Tube-wells	386.9 (29.6)	911.8 (62.5)	Gram	60.7 (4.3)	63.2 (3.3)
			Other pulses	97.8 (13.9)	88.1 (4.6)
Other wells	511.6 (39.1)	105.6 (7.2)	Total pulses	258.5 (18.2)	148.8 (7.9)
			Total foodgrains	1215.4 (87.7)	1642.6 (87.8)
Other sources	25.3 (1.9)	9.6 (0.7)	Sugarcane	128.0 (9.0)	122.3 (6.5)
			Fruits and vegetables	40.2 (2.8)	86.4 (4.6)
Total	1308.9 (100.0)	1458.4 (100.0)	Total	1417.9 (100.0)	1869.9 (100.0)

Note: Figures in brackets represent percentage of total.

24.3.9 Between 1970-71 and 1980-81, net irrigated area in this zone increased by 11 per cent and gross irrigated area by around 32 per cent. Area irrigated through tubewells has shown a significant increase. Even though the intensity of irrigated cropping has increased from 108.3 per cent in 1970-71 to 128.2 per cent in 1980-81, the increase is still low. Wheat accounts for around 65 per cent of gross irrigated area. Nearly 95 per cent of area sown to this crop has the benefit of irrigation.

24.3.10 *Fertilizer Consumption*: Progress achieved in the consumption of fertilizer in this zone over the decade ending 1980-81 is indicated below.

Table 24.6. Fertilizer Consumption — Eastern Plains Districts
(Kg/ha)

District	1970-71	1980-81
	NPK	NPK
Faizabad	33	70
Sultanpur	18	50
Pratapgarh	17	56
Jaunpur	21	76
Azamgarh	16	42
Ballia	15	70
Ghazipur	14	75
Varanasi	23	66
Allahabad	16	43
Average	19	61

Over the decade ending 1980-81 consumption of fertilizers in this zone has registered a three-fold increase. The consumption of fertilizers in this zone is highest in East U.P.

24.3.11 *Area, Production and Productivity*: Annexure 24.3 presents data on area, production and productivity of principal crops in this zone during the triennia ending 1972-73 and 1980-81 and for the year 1981-82. It will be seen therefrom that over the decade ended 1980-81 yield levels of various crops, namely, rice, wheat, barley, gram, tur, sugarcane and potato have improved. In the case of bajra, barley, gram, tur and potato average yields are higher than the all-India average. However, sugarcane yields are only around 60 per cent of the all-India average.

24.4 *Vindhyan Zone — Mirzapur District*

24.4.1 *General Features*: In this zone Mirzapur district alone has been included by us. Even though parts of Allahabad and Varanasi districts also fall in this zone, these have not been included due to paucity of data below district level. Nevertheless, our suggestions and recommendations in regard to Mirzapur district apply equally to the concerned parts of Allahabad and Varanasi also. The total geographical area of Mirzapur district according to Surveyor General of India is 11301 sq. km., constituting 13.2 per cent of total geographical area of East U.P. Most of the area of the district is undulating and rocky. In the plains of this district, soils are alluvial whereas in the rest of the zone the soils are black and heavy and red and coarse. The average rainfall in this zone is 1105 mm, around 91 per cent of which is received during June to September. This is the driest among all the three zones of East U.P.

24.4.2 *Socio-Economic Characteristics*: According to 1981 Census, the total population of the district is around 2 million of which nearly 87 per cent is rural. The density of population is very low being 180 per sq. km. Scheduled castes constitute around one-third of total population. The district has a total work force of about 7 lakh of which about 42 per cent are cultivators and another 30 per cent are agricultural labourers. The literacy rate is 24 per cent.

24.4.3 *Pattern of Land Holdings*: The number and area of operational holdings in the district according to size classes based on Agricultural Censuses conducted during 1976-77 and 1980-81 are shown in Annexure 24.1. According to 1980-81 Census, 80.4 per cent of total holdings were less than 2 ha in size but covered about

30 per cent of total operated area. Remaining 20 per cent holdings were 2 ha and more in size but accounted for about 70 per cent of operated area.

24.4.4 *Land Use Pattern*: Table below shows the land use pattern in this district based on the latest available data (1980-81).

Table 24.7. Land Use Pattern — Mirzapur District

Classification	Area ('000 ha)	Per cent of total reporting area	Col. 2 as per cent of East U.P. total
(1)	(2)	(3)	(4)
1. **Reporting area**	**1205**	**100.0**	**14.0**
2. Forests	483	40.1	58.7
3. Area not available for cultivation	130	10.8	12.3
(i) Land put to non-agricultural uses	74	6.2	9.1
(ii) Barren and uncultivable land	56	4.6	23.4
4. Permanent pastures and other grazing land	2	0.1	8.6
5. Land under miscellaneous tree crops and groves	19	1.6	8.5
6. Cultivable waste land	64	5.3	27.4
7. Fallow land			
(i) Current fallows	75	6.3	18.4
(ii) Others	53	4.4	23.8
8. Net Area sown	379	31.4	6.7

24.4.5 In this district around 40 per cent of total reporting area is covered by forests. Area under cultivation constitutes about one-third of total area.

24.4.6 *Cropping Pattern*: Foodgrains account for nearly 93 per cent of gross area sown of the district. Rice, bajra, maize and

small millets are the main *kharif* crops. Major *rabi* crops are wheat barley, gram, tur and linseed. Area sown to cash crops is insignificant. The district is also characterised by single cropping. However, in the plains where irrigation facilities are available double cropping is practised. The cropping intensity is around 136 per cent.

24.4.7 *Irrigation Pattern*: The latest available data on net and gross irrigated area in this district for the year 1980-81 as compared to the corresponding year 1970-71 are presented below.

Table 24.8. Net and Gross Irrigated Area — Mirzapur District

('000 ha)

Source	Net irrigated area 1970-71	1980-81	Crop	Gross irrigated area 1970-71	1980-81
Canals	73.1	101.8	Rice	74.7	100.0
	(73.4)	(82.2)		(67.6)	(57.5)
			Wheat	17.8	61.1
				(16.1)	(35.2)
Tanks	3.0	2.1	Barley	6.3	2.2
	(3.0)	(1.7)		(5.7)	(1.3)
			Total cereals and millets	99.0	163.5
				(89.6)	(84.1)
Tubewells	6.4	12.4			
	(6.4)	(10.0)	Gram	2.8	2.0
				(2.5)	(1.2)
			Other pulses	2.0	0.7
Other wells	8.6	2.9		(1.8)	(0.4)
	(8.6)	(2.3)	Total pulses	4.8	2.7
				(4.3)	(1.5)
			Total foodgrains	103.8	166.2
				(93.9)	(95.6)
Other sources	8.6	4.7	Sugarcane	4.0	2.9
	(8.6)	(3.8)		(3.6)	(1.7)
			Fruits and vegetables	2.5	4.0
				(2.3)	(2.3)
Total	99.7	123.9	Total	110.5	173.8
	(100.0)	(100.0)		(100.0)	(100.0)

Note: Figures in brackets represent percentage of total.

24.4.8 In Mirzapur district, over the decade ending 1980-81, net irrigated area has increased by nearly 25 per cent and gross irrigated area around 60 per cent. The main source of irrigation is canals. However, net irrigated area and gross irrigated area constitute only 33 per cent of net and gross sown area in the district. A noteworthy feature is that the intensity of irrigated cropping has increased from around 110 per cent in 1970-71 to 140 per cent in 1980-81. Rice and wheat account for nearly 93 per cent of gross irrigated area.

24.4.9 *Fertilizer Consumption*: Inspite of a four-fold increase in the consumption of fertilizers over the decade ending 1980-81, the present consumption level in this district is much lower than the average consumption level for East U.P. taken as a whole.

24.4.10 *Area, Production and Productivity*: Almost all the crops in the district show low yields. In the case of principal crops, namely, rice and wheat which receive the maximum benefit from irrigation facilities, the yields are around 50 to 55 per cent of all-India average. Even in the case of cash crops such as sugarcane and oilseeds the yields are much lower than the all-India average.

Annexure 24.1

Number and Size of Operational Holdings

Size Class (ha)	1976-77		1980-81	
	Number ('000)	Area ('000 ha)	Number ('000)	Area ('000 ha)
I. North Eastern Plains Districts				
Below 1.0 (Marginal)	2242 (76.6)	798 (33.2)	2281 (77.6)	785 (34.9)
1.0 — 2.0 (Small)	402 (13.7)	553 (23.0)	410 (14.0)	558 (24.8)
2.0 — 4.0 (Medium)	202 (6.9)	542 (22.5)	183 (6.2)	490 (21.8)
4.0 — 10.0 (Semi-medium)	72 (2.5)	402 (16.7)	59 (2.0)	329 (14.6)
10.0 and above (Large)	7 (0.3)	112 (4.6)	5 (0.2)	87 (3.9)
TOTAL	2925 (100.0)	2407 (100.0)	2938 (100.0)	2249 (100.0)
II. Eastern Plains Districts				
Below 1.0 (Marginal)	3307 (80.8)	1012 (35.3)	3475 (81.6)	1045 (37.0)
1.0 — 2.0 (Small)	469 (11.5)	638 (22.3)	481 (11.3)	656 (23.2)
2.0 — 4.0 (Semi-medium)	227 (5.5)	607 (21.2)	219 (5.2)	590 (21.0)
4.0 — 10.0 (Medium)	82 (2.0)	463 (16.2)	74 (1.7)	418 (14.8)
10.0 and above (Large)	10 (0.2)	142 (5.0)	8 (0.2)	113 (4.0)
TOTAL	4095 (100.0)	2862 (100.0)	4257 (100.0)	2822 (100.0)

Annexure 24.1 (concluded)

Size Class (ha)	1976-77 Number ('000)	1976-77 Area ('000 ha)	1980-81 Number ('000)	1980-81 Area ('000 ha)
III. Vindhyan District				
Below 1.0 (Marginal)	176 (60.3)	63 (13.4)	181 (61.1)	64 (14.4)
1.0 — 2.0 (Small)	55 (18.8)	76 (16.2)	57 (19.3)	76 (17.2)
2.0 — 4.0 (Semi-medium)	34 (11.6)	96 (20.5)	34 (11.5)	92 (20.8)
4.0 — 10.0 (Medium)	21 (7.2)	124 (26.4)	19 (6.4)	114 (25.7)
10.0 and above (Large)	6 (2.1)	110 (23.5)	5 (1.7)	97 (21.9)
TOTAL	229 (100.0)	469 (100.0)	296 (100.0)	443 (100.0)

Annexure 24.2

Cropping Pattern, 1980-81

Crop	Area ('000 ha)	Per cent of gross area sown	Crop	Area ('000 ha)	Per cent of gross area sown
I. North Eastern Plains Districts					
Rice					
Autumn	1129.5	31.1	Sugarcane	140.9	3.9
Winter	269.3	7.4	Total fruits	12.7	0.3
Summer	1.7	—	Potato	23.4	0.6
Total	1400.5	38.5	Total vegetables	40.4	1.1
Wheat	1209.2	33.3	Total food-crops	3520.6	96.9
Maize	137.8	3.8	Groundnut	18.1	0.5
Barley	57.1	1.6	Rapeseed and mustard	41.9	1.2
Gram	132.2	3.6	Total oilseeds	78.0	2.1
Total pulses	280.0	7.8	Total fodder-crops	22.4	0.6
Total food-grains	3321.1	91.4	Gross area sown	3632.8	100.0
II. Eastern Plains Districts					
Rice					
Autumn	811.4	20.0	Sugarcane	128.0	3.2
Winter	471.7	11.7	Total fruits	29.4	0.7
Total	1283.7	31.7	Potato	62.2	1.5
Wheat	1278.8	31.6	Total vegetables	96.6	2.4
Bajra	106.7	2.6	Total oilseeds	17.2	0.4
Maize	131.1	3.2	Total fibres	29.3	0.7
Barley	173.1	4.3	Total fodder-crops	59.0	1.5
Gram	262.9	6.5	Gross cropped area	4055.5	100.0
Tur	137.5	3.4			
Total pulses	564.7	14.0			
Total food-grains	3671.6	90.5			

Annexure 24.2 (concluded)

Crop	Area ('000 ha)	Per cent of gross area sown	Crop	Area ('000 ha)	Per cent of gross area sown
III. Vindhyan District (Mirzapur)					
Rice					
Autumn	37.5	7.3	Sugarcane	3.1	0.6
Winter	120.6	23.4	Potato	2.6	0.5
Total	158.1	30.7	Total vegetables	4.5	0.9
Wheat	110.7	21.5	Total food-crops	485.2	94.3
Maize	15.7	3.1	Groundnut	1.7	0.3
Bajra	13.4	2.6	Seasamum	4.4	0.9
Barley	37.2	7.2	Rapeseed and mustard	3.6	0.7
Gram	34.1	6.6	Linseed	15.7	3.1
Tur	21.9	4.3	Total oilseeds	25.7	5.0
Other pulses	20.8	4.0	Total non-food crops	29.3	5.7
Total pulses	76.8	14.9	Gross area sown	514.5	100.0
Total Food-grains	476.5	92.6			

Annexure 24.3

Area, Production and Yield of Principal Crops — Zone-wise

Crops	Area ('000 ha)			Production ('000 tonnes)			Yield (Kg/ha)		
	Triennium ending 1972-73	Triennium ending 1980-81	1981-82	Triennium ending 1972-73	Triennium ending 1980-81	1981-82	Triennium ending 1972-73	Triennium ending 1980-81	1981-82
1	2	3	4	5	6	7	8	9	10
I. North Eastern Plains Districts									
Rice	1186.7	1334.1	1501.6	792.5	987.1	1292.4	668	740 (59.4)	861
Maize	299.0	250.7	243.8	167.8	129.6	106.3	561	517 (48.3)	436
Ragi	3.1	2.0	2.2	1.9	1.0	1.0	613	500 (47.2)	455
Bajra	3.6	3.2	3.0	3.0	2.1	2.2	833	656 (149.0)	733
Jowar	2.2	2.7	2.6	1.5	3.2	1.6	682	1185 (172.0)	615
Wheat	820.8	1110.0	1183.6	841.8	1438.1	1663.4	1026	1296 (83.9)	1405
Barley	167.7	87.2	57.0	133.6	67.1	53.1	797	770 (68.8)	932
Gram	125.5	126.7	133.4	84.4	80.8	94.6	673	638 (101.6)	709
Tur	16.0	33.0	32.7	11.8	32.3	29.1	738	979 (143.3)	890

Annexure 24.3 (contd.)

Crops	Area ('000 ha)			Production ('000 tonnes)			Yield (Kg/ha)		
	Triennium ending 1972-73	Triennium ending 1980-81	1981-82	Triennium ending 1972-73	Triennium ending 1980-81	1981-82	Triennium ending 1972-73	Triennium ending 1980-81	1981-82
1	2	3	4	5	6	7	8	9	10
Sugarcane (Gur)	172.4	146.8	168.2	653.4	571.1	776.3	3790	3890 (72.8)	4615
Rapeseed and mustard	31.0	40.8	N.A.	11.7	13.5	N.A.	377	330 (66.5)	N.A.
Linseed	10.7	11.0	18.0	1.8	2.2	4.1	168	200 (88.9)	228
Groundnut	13.2	19.0	N.A.	8.2	10.2	N.A.	621	537 (67.8)	N.A.
Dry chillies	1.2	1.4	1.5	0.6	0.9	1.4	500	643 (102.1)	933
Potato	16.3	24.3	25.9	158.6	301.6	275.7	9730	12411 (98.4)	10645
II. Eastern Plains Districts									
Rice	1159.8	1193.0	1347.3	786.5	959.4	1440.7	678	804 (64.5)	1069
Maize	148.3	136.9	131.7	115.4	98.6	91.8	778	720 (67.2)	697
Ragi	15.2	4.9	2.1	8.9	2.2	0.8	586	449 (42.3)	381
Bajra	128.3	119.7	107.9	91.1	65.0	71.4	710	543 (123.4)	662
Jowar	68.9	82.5	72.3	38.7	42.5	47.5	562	515 (74.7)	657

Annexure 24.3 (contd.)

Crops	Area ('000 ha)			Production ('000 tonnes)			Yield (Kg/ha)		
	Triennium ending 1972-73	Triennium ending 1980-81	1981-82	Triennium ending 1972-73	Triennium ending 1980-81	1981-82	Triennium ending 1972-73	Triennium ending 1980-81	1981-82
1	2	3	4	5	6	7	8	9	10
Wheat	**530.1**	1129.0	1250.1	618.3	1623.6	1927.8	1166	1438 (93.1)	1542
Barley	**563.7**	203.3	239.4	503.0	237.3	231.4	892	1167 (104.2)	967
Gram	**298.6**	263.3	432.7	236.6	214.5	386.3	792	815 (129.8)	893
Tur	**157.2**	145.8	192.6	180.6	206.3	257.4	1149	1415 (207.2)	1335
Rapeseed and mustard	**3.8**	7.1	N.A.	1.7	1.8	N.A.	447	254 (51.2)	N.A.
Sugarcane (Gur)	152.5	140.3	314.3	547.6	458.5	1406.2	3591	3268 (61.2)	4474
Linseed	**14.7**	8.6	51.4	3.5	1.6	13.5	238	186 (82.7)	263
Potato	42.5	62.6	65.1	426.0	866.6	947.7	10024	13843 (109.8)	14538
III. Vindhyan District									
Rice	135.7	138.3	161.7	101.5	89.9	162.5	748	650 (52.2)	1005
Maize	18.2	16.5	15.7	12.7	12.7	11.7	697	770 (71.9)	745
Bajra	11.9	13.8	14.4	9.5	9.9	11.6	798	717 (163.0)	806

Annexure 24.3 (concld)

Crops	Area ('000 ha)			Production ('000 tonnes)			Yield (Kg/ha)		
	Triennium ending 1972-73	Triennium ending 1980-81	1981-82	Triennium ending 1972-73	Triennium ending 1980-81	1981-82	Triennium ending 1972-73	Triennium ending 1980-81	1981-82
1	2	3	4	5	6	7	8	9	10
Jowar	6.2	6.8	6.1	4.2	4.3	3.9	677	632 (91.7)	639
Wheat	63.2	95.2	102.8	45.5	80.6	107.5	720	847 (54.8)	1045
Barley	39.6	36.2	36.2	37.1	28.7	35.1	937	793 (70.9)	970
Gram	38.6	37.6	33.9	28.9	30.0	35.4	749	817 (130.1)	1044
Tur	17.5	20.1	21.9	19.6	15.5	17.7	1120	771 (112.9)	808
Sugarcane (Gur)	4.7	4.1	3.7	17.1	12.0	11.9	3638	2927 (54.8)	3216
Groundnut	0.1	1.7	N.A.	0.1	0.9	N.A.	1000	529 (66.8)	N.A.
Rapeseed and mustard	3.0	3.4	N.A.	1.4	1.0	N.A.	467	294 (29.3)	N.A.
Linseed	18.4	13.6	51.4	4.9	2.7	13.6	266	199 (88.4)	265
Sesamum	6.2	3.8	8.2	1.0	0.4	0.9	161	105 (58.3)	110
Potato	2.0	3.3	3.1	19.4	49.2	41.4	9700	14989 (118.3)	13355

N.A. — Not available.
Note: Figures within brackets denote the Relative Yield Index (RYI) i.e. zonal yield as per cent of all-India yield.

CHAPTER 25

CONSTRAINTS TO GROWTH

25·1 *Introduction*

25.1.1 The review of past trends in agriculture in East U.P. showed that during the two decades 1961-81 both agricultural production and productivity had registered moderate growth rates. Considering the need to improve productivity per ha and per capita of the bulk of its farmers who are small and marginal, it is imperative to attain a higher growth rate than witnessed in the last two decades. East U.P. has the necessary potential for achieving a high growth rate in agricultural productivity and production. There are however, some constraints. Special efforts are necessary to overcome these constraints to achieve the objective of accelerated growth.

25.1.2 The constraints faced by East U.P. are common to the region as a whole and are given in detail in Chapter 4, Part I. These are briefly described below, along with some specific constraints of agro-climatic zones.

25.2 *Socio-Economic and Structural Constraints*

25.2.1 *Agrarian Structure*: Small size of holdings is a major constraint in East U.P. About 80 per cent of farm operators are marginal farmers with 1 ha or less whose average size of holding works out to 0.3 ha. The bulk of the farmers have, consequently, a poor resource base, which in turn has resulted in low or negative savings and low capital investment in agriculture. Farmers tend to practise subsistence farming and have no capacity to take risks. The small size of holding and poor resource position of farmers have rendered intensification of agriculture difficult.

25.2.2 *Uncertainty of Rainfall*: The normal annual rainfall varies from 976 mm in Allahabad district to 1304 mm in Gorakhpur district. However, there is considerable year to year variation in the rainfall which contributes to instability in agricultural pro-

duction. Even in years when total rainfall is adequate, drought spells in-between or inadequate rainfall in crucial periods of transplantation or plant growth adversely affect productivity.

25.2.3 *Drought*: Drought is a common feature in some parts of the region, particularly trans-Jamuna areas of Allahabad, Mirzapur and Varanasi districts. Irrigation facilities in these parts are poor. Failure of rain or uneven distribution of rainfall causes serious hardship to the farmers, resulting in considerable damage to the standing crops. For instance, during 1983, about 30 lakh ha were affected by drought.

25.2.4 Floods are a frequent occurrence in rivers like Ghagra, Gandak, Rapti, Gomti and Ganga affecting large parts of Gorakhpur, Bahraich, Gonda, Basti, Azamgarh, Faizabad, Deoria, Ghazipur, Ballia, Sultanpur and Jaunpur districts. Large scale deforestation in upper catchment areas of these rivers has resulted in erosion leading to silting of river beds. This also causes choking of drainage channels and frequent occurrence of floods.

25.2.5 *Waterlogging*: Besides, large areas in East U.P. are affected by waterlogging. The main reasons for this are the following.

(i) Roads have generally been constructed from east to west while the natural drainage is from north to south. Construction of roads with inadequate cross-drainage has obstructed natural drainage.

(ii) Construction of railway lines and canals without adequate cross-drainage has aggravated the problem of waterlogging.

(iii) There was no adequate coordintation between the Railways, Public Works Department, Irrigation Department, etc. in the construction works which has contributed to problems of drainage congestion and waterlogging.

25.2.6 The problem of waterlogging and siltation in river beds is acute particularly in the command areas of the two major irrigation systems of Sharda Sahayak and Gandak. In these canal systems, recharge of sub-surface water in the absence of proper drainage facilities and low utilisation of groundwater has led to a rise in sub-soil water table. It is estimated that about 4.5 lakh ha in Sharda Sahayak and about 2.5 lakh ha in Gandak command

area are affected by waterlogging. Thus, large seepage from canals, over-irrigation of fields by farmers and obstruction of natural drainage by roads, railways and canals have created the problem of waterlogging. This has given rise to salinity and alkalinity and rendered land increasingly unsuitable for cultivation.

25.2.7 Areas affected by flood and waterlogging vary from year to year. In six out of eleven years between 1971-72 and 1981-82 about 20 to 30 per cent of net cropped area was affected by floods and waterlogging, as may be seen below.

Table 25.1. Area Affected by Floods and Waterlogging

(Lakh ha)

	Eastern U.P.	Rest of U.P.
1. Net sown area	56.5	116.5
2. Area affected by floods and water-logging during		
1971-72	16.8	17.5
1972-73	1.3	3.5
1973-74	10.5	11.4
1974-75	6.5	3.3
1975-76	7.6	6.6
1976-77	11.8	7.6
1977-78	1.5	4.5
1978-79	10.6	28.2
1979-80	4.9	0.3
1980-81	14.6	16.3
1981-82	12.9	3.6

25.2.8 *Soil Amelioration and Conservation*: Although East U.P. has mainly fertile alluvial soils, there are certain areas which are faced with problems of salinity and alkalinity. It is estimated that area under "Usar" land (saline land) is around 3 lakh ha mainly in Allahabad, Sultanpur, Azamgarh and Pratapgarh districts. Soil erosion is another problem in the region, which has rendered certain areas almost infertile.

25.3 *Organisational Constraints*

25.3.1 The arrangements for multiplication and distribution of certified seeds of high yielding varieties of crops are not satisfactory. Consequently the rate of replacement of rice and wheat seeds is very low. Production of seeds/planting material of fruits, vegetables and plantation crops and arrangements for their supply to farmers are also not adequate. Fertilizer consumption is increasing. Yet its use is much lower than in West U.P. Moreover, on many occasions, required types of fertilizers are not available in time.

25.3.2 Arrangements for distribution of inputs particularly below the block level are not satisfactory. The sale points are mostly located in cities, towns or in some big villages. In some districts, the sale points for seeds and fertilizers are 20 to 30 kms. away from some villages.

25.3.3 The incidence of pests is generally more in the humid areas of East U.P. and *kharif* crops are more vulnerable to the incidence of pests. The use of pesticides in this region is also relatively low.

25.3.4 The co-operative credit structure, which is the main source for financing inputs and investments in agriculture is weak. The overdues of 15 CCBs of East U.P. taken together were around 47 per cent in 1979-80. The relatively high level of overdues and the financial weaknesses of a number of CCBs have contributed to a lower level of credit disbursements in the region. The short-term loans disbursed by co-operatives during 1982-83 were Rs. 53 crores (Rs. 94 per ha of net cropped area) in East U.P. as against Rs. 75 crores (Rs. 122 per ha of net cropped area) in West U.P. The term loans disbursed by LDB during 1982-83 were Rs. 16 crores, constituting 29.5 per cent of its loan disbursements

for the State as a whole. The share of commercial bank lending in East U.P. is only around 20 per cent of their lending in the State. Commercial banks and RRBs also have been experiencing the problem of overdues.

25.3.5 *Electric Power*: The per ha consumption of electricity in agriculture in East U.P. during 1978-79 was only 133 kwh as against 223 kwh in West U.P. Inadequate and uncertain supply of electric power is a major constraint in East U.P. This has affected the optimum utilisation of installed tubewells and pumpsets and is a major bottleneck for the expansion of investments on minor irrigation to exploit the large groundwater resouces of the region.

25.3.6 *Extension*: Agricultural extension service in East U.P. is weak. T & V system of extension has not yet been introduced in the State. VLW is a multi-purpose official who devotes only a fraction of his time for agricultural extension.

25.3.7 *Marketing*: The market infrastructure is weak in the region. This is particularly an inhibiting factor in case of high value crops such as fruits, vegetables and spices. There is good scope for growing potatoes, but here also the non-availability of supporting infrastructure such as cold storages is a major constraint.

25.3.8 *Coordination*: There are a number of Departments connected with agriculture, irrigation and related activities with poor coordination among them. The coordination arrangements, particularly at the district level is weak and adversely affects agricultural production programmes.

25.4 *Technological Constraints*

25.4.1 *Irrigation*: Irrigated area in East U.P. is relatively smaller than in West U.P. The percentage of net irrigated area to net sown area during 1980-81 was only 54 in East U.P. as against 73 in West U.P. Despite large groundwater resources, only about 32 per cent has been exploited so far as against 70 per cent in West U.P.

25.4.2 The irrigation potential created is also not fully utilized. Utilization is particularly poor in *kharif* season. Data for 1981-82 show that irrigated area in *kharif* season was only 15 per cent of total gross irrigated area in East U.P., as against 33 per cent in West U.P. The main reasons attributed for low utilization of irrigation in *kharif* season are the following.

(i) The demand for *kharif* irrigation is more uncertain than *rabi*, because of the tendency on the part of farmers to depend on rains.

(ii) As regards canal irrigation, upto 1983-84, the canals were closed from May 1 to June 15 for repairs and civil works. Due to uncertainty in release of canal water upto mid-June or so, farmers preferred to plant rice crop only after the commencement of monsoon. However, from the current year, the closure of the canal has been advanced to April and water is run in May and June. With this rescheduling of water release, it should be possible for farmers to use canal water and go in for early planting of rice.

(iii) In regard to tubewell irrigation, about two-thirds of private tubewells/pumpsets are powered by diesel. It is reported that farmers do not use diesel pumpsets because of high operation cost. The benefits from life-saving irrigation by operating pumpsets would still be greater than the cost involved. However, extension work is not adequate to motivate the farmers to operate the pumpsets particularly during the crucial periods of transplantation and plant growth.

25.4.3 Although a large part of the irrigation is received in *rabi* season, it is not adequate to meet water requirements of crops. While wheat crop — the most important *rabi* crop — requires 4 to 5 waterings for good yields, as much as 65 per cent of irrigated area receives only one or two waterings. On the other hand, in Western U.P., about 65 to 75 per cent of the irrigated area receives 3 waterings or more, as may be seen from Table 25.2.

Table 25.2. Distribution of Area Under Wheat According to Number of Waterings

No. of waterings	Percentage of area benefited by waterings in 1982-83		
	Eastern U.P.	Western U.P.	
		Muzaffarnagar	Meerut
One watering	26.9	14.7	16.5
Two waterings	38.5	19.9	10.1
Three waterings	26.0	26.5	29.8
More than three waterings	8.8	39.0	43.7

25.4.4 *Deep Tubewells*: About 50 per cent of deep tubewells are not operational. Even where they are functioning, they are working at a low efficiency level. Water does not reach the entire command area of tubewells, because of their poor maintenance and absence of field channels. As against an average command area of 100 ha per tubewell the average area benefited in 1980-81 was around 40 ha. The main reasons for under-utilisation of capacity are the shortage and uncertainty of electric power supply and poor management. Deep tubewells operated by the Department show large losses.

25.4.5 *Mechanization*: The use of improved machinery and implements would enable farmers to complete their agricultural operations in time and more efficiently. However, these are not used due to small size of holdings, poor resource position of most farmers and their non-availability on a commercial scale.

25.4.6 *Research*: Although various high yielding varieties of wheat and rice have been developed, adequate research has not been done on low land rice as also major pulses and oilseeds.

25.5 *Specific Problems of Agro-climatic Zones*

25.5.1 *North-Eastern Plains Districts*: (i) The zone is flood-prone and a large proportion of it remains inundated for considerable period. Therefore, excepting crops like, paddy, jute and sugarcane, other crops are severely damaged. Besides, large tracts of land become marshy and swampy.

(ii) The intensity of irrigated cropping in this zone is around 105 per cent only. This is due mainly to small area being irrigated during *kharif* season. A major factor resulting in poor utilisation of irrigation facilities is uncertainty about the availability of canal water till the middle of June every year. Even the tubewells in this zone are not used. Extension has failed to persuade farmers to utilise canal and tubewell water in *kharif* and increase production. In the case of groundwater, inspite of the abundant resources available, present utilisation is poor as indicated by the following data.

District	Percentage of groundwater utilisation (April, 1982)
Bahraich	31
Gonda	41
Basti	35
Gorakhpur	33
Deoria	60

(iii) Bhat soils are found in north-eastern part of Gorakhpur and Northern part of Deoria district. These are calcareous soils which contain very high amount of calcium carbonate. These are problem soils which need special management.

25.5.2 *Eastern Plains Zone*

(i) Large areas in the districts of Sultanpur, Pratapgarn, Ballia and Azamgarh have usar soils.

(ii) Large part of this region is flood-prone.

(iii) In the absence of adequate drainage, large areas get water-logged during rainy season which affects sowing and lowers yields.

(iv) This zone has large saline area.

(v) A sizeable area in this zone is also covered under diara lands of Ganga, Ghagra and Gomti rivers. The area under diara lands remains submerged under water during monsoon period and dries afterwards. These lands require special soil and water management techniques and selection of suitable crops.

(vi) Irrigation facilities in the zone are not adequate. The groundwater potential has not been fully exploited as will be seen below.

District	Percentage of ground-water utilisation
Faizabad	42
Sultanpur	20
Pratapgarh	10
Jaunpur	30
Azamgarh	46
Ballia	33
Ghazipur	37
Varanasi	65

(vii) *Kharif* crops are vulnerable to the incidence of pests and diseases.

(viii) Rice crop under semi-deep and deep water conditions is adversely affected due to severe infestation of weeds which reduces yields to a great extent.

25.5.3 *Vindhyan Zone-Mirzapur District*: (i) Lack of adequate irrigation facilities is one of the major factors affecting the productivity and production in this district. Only one third each of net and gross sown areas are benefited by irrigation in this district. Only about 13 per cent of groundwater potential has been exploited so far.

(ii) The black heavy soils become sticky on wetting and develop wide cracks during summer and as a result are difficult to manage.

(iii) Red soils are coarse and have poor water holding capacity. Small millets, barley and gram are grown on these soils. It is necessary to evolve short duration and high yielding varieties of small millets for these soils.

CHAPTER 26

POLICY MEASURES FOR ACCELERATING DEVELOPMENT

26.1 *Introduction*

26.1.1 The constraints discussed in Chapter 25 brings into focus the need for re-orientation of existing policies and programmes to overcome them for accelerating agricultural production in East U.P. The policy measures needed to overcome these constraints and accelerate the growth process are mainly in the spheres of land and farm management, irrigation and drainage and building up a good infrastructure for inputs, custom service, rural industry centres, extension and marketing. These are by and large common to Eastern India as a whole and have been spelt out in detail in Chapters 7 to 16 of Part I of the Report. Salient features of these policy measures which are relevant to East U.P. are briefly re-capitulated below.

26.2 *Land Policy*

26.2.1 Small size and fragmented holdings is a major constraint to improve productivity. Although first round of consolidation is over, owing to continuous sub-division and fragmentation of holdings, there is need for a second round of consolidation. In the second round of consolidation, more emphasis should be given for construction of field channels, field drains and other on-farm development works. In addition to consolidation, the following complementary measures will be helpful:

(i) formation of Farmers' Groups or Associations for dealing with common problems;

(ii) facilitating leasing in and out land by small and marginal farmers; and

(iii) ensuring a "floor" limit for operational holdings.[1]

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[1]. In terms of Uttar Pradesh Zamindari Abolition and Land Reforms Act., 1950, no person shall transfer whether by sale, gift or exchange any fragment situated in a consolidated area except where the transfer is in favour of tenure-holder who has a plot contiguous to the fragment. For the purpose of the Act, fragment is defined as land of extent less than (i) 1.9 ha (4.7 acres) in Trans-Jamuna portions of district of Allahabad and parts of Mirzapur district and (ii) 1.3 ha (3.1 acres) in other areas. However, these provisions of the Act have not been effectively implemented.

26.2.2 Our recommendations in regard to the above policy measures are given in detail in Chapter 8 of Part I.

26.3 *Irrigation and Water Management*

26.3.1 Erratic and uneven rainfall pattern, waterlogging in large areas and frequent recurrence of floods in some areas and drought in some other areas are major constraints which adversely affect agricultural productivity and cause considerable instability in production. The major thrust of development strategy should, therefore be in the sphere of improving irrigation and drainage facilities.

26.3.2 Excepting parts of Mirzapur district, all other districts have large groundwater resources. If these are exploited intensively, in a planned manner, they can help improve crop intensity, promote crop divesification and increase productivity per ha and per capita. Therefore, exploitation of groundwater needs to be given highest priority. Our recommendations to achieve this objective are given in Chapter 9 of Part I. Some of the important recommendations in this regard are indicated below.

(i) Compact areas in "white" and "grey" blocks should be covered by a battery of tubewells, either electric or diesel. This will serve to provide (a) protective irrigation in *rabi*, and (b) vertical drainage in waterlogged areas.

(ii) For exploiting groundwater resources, low cost minor irrigation structures such as filter points or bamboo tubewells by small and marginal farmers may be popularised. Since water table in large parts of East U.P. is high, such less expensive tubewells would serve the purpose.

(iii) For encouraging farmers to use tubewell irrigation, the State Government should provide fresh tubewell bores and electric lines in electrified villages under a 100 per cent Centrally Sponsored Scheme in compact areas. Electric motors/diesel pumpsets may be owned by farmers individually or shared among a group of farmers or obtained on lease from leasing agencies/companies. Bank finance may be arranged for farmers to own pumpsets either on an individual basis or a "Group" basis, as may be appropriate, with refinance from NABARD. Small and marginal farmers may be provided subsidy as admissible at present to own

such pumpsets. Wherever farmers prefer to hire in pumpsets from leasing agency/company, the hire charge component should be included in the short-term loans provided by banks/co-operatives.

(iv) Wherever farmers/farmer groups and private entrepreneurs are not forthcoming to purchase/hire pumpsets, the State Government may provide them recovering lease rent from beneficiary farmers.

(v) In compact areas with good potential for tubewell development, the programme of rural electrification should be stepped up. Priority in power supply should be given to agriculture. The State Government should ensure uninterrupted power supply for at least 8 hours a day through dedicated lines. In case the dedicated lines cannot be provided, a rotational system of power supply on the pattern of Tamil Nadu should be introduced (*vide* paragraph 9.3.13, Chapter 9 of Part I).

(vi) In unelectrified villages or villages where power supply is chronically erratic and uncertain, use of diesel pumpsets should be encouraged. The State Government should, however, make necessary arrangements for regular diesel supply.

(vii) For encouraging the use of diesel pumpsets, oil companies should open fully equipped sale and service stations in rural areas on a 'franchise' basis, on the model of what they are doing now for petrol and servicing of vehicles in urban areas.

(viii) In each block, public sector agencies and private companies may be encouraged to set up leasing agencies/companies for leasing out electric motors, diesel pumpsets and other ancillary equipment. These should operate on a competitive basis.

(ix) For small and marginal farmers, dugwells are ideally suited in some areas. Therefore, in suitable areas, particularly in tribal blocks, a 100 per cent Centrally Sponsored Scheme for construction of dugwells should be taken up. In the construction of dugwells, NREP and RLEGP could be involved. Pumpsets may be owned by farmers or hired by them from leasing agencies/companies as indicated in (iii) and (iv) above.

(x) A failed well compensation scheme for shallow tubewells/ dugwells should be introduced by NABARD in consultation with Government of India and State Governments.

(xi) Before going in for very costly surface irrigation dams in Himalayan region, the State Government may explore the possibility of sinking artesian wells by tapping very deep acquifers, for which the necessary financial and technical support may be made available by the Government of India (*vide* paragraph 9.4.17, Chapter 9 of Part I).

(xii) Water and electricity are optimally used if rates for their use are charged on a volumetric basis. In the case of water, this can be done by charging rates on a per hour/ crop basis. Use of electricity can be regulated through a meter charging the consumer on the basis of actual power consumed and not on the basis of HP of motors as at present. The guiding principle for determining water and electricity charges for irrigation and power should be such that it is related to actual consumption. (*vide* paragraph 9.3.26, Chapter 9 of Part I).

26.3.3 *State Deep Tubewells*: The performance of deep tubewells owned by the State Government is unsatisfactory. Average area served by a State deep tubewell has dropped from 77 ha in 1976-77 to 43 ha in 1982-83 due to inadequate and uncertain power supply, poor maintenance lack of supervision and negligence of tubewell operators. Therefore, to improve efficiency and effectiveness of tubewells including those that may be constructed in future, the running and maintenance should be entrusted, on a contract basis to Farmers' Groups or Associations, Committee of Beneficiaries, Voluntary Organizations or private entrepreneurs, as may be appropriate.

26.3.4 Wherever it is not possible to introduce such contractual arrangements, the Nal-Koop Nigam may continue to operate such tubewells. In such cases, the State Government may meet the shortfall in resources of the Corporation upto a specific period with a provision that within such period, it should improve its resource position through a progressive increase in the water rates and economising on administrative expenses. Alternatively, the State Government may purchase water from the Corporation and sell it to farmers so that the Corporation will not have to incur

losses by selling water at heavily subsidised rates (*vide* paragraph 9.3.29, Chapter 9 of Part I).

26.3.5 The prevailing water rates are highly subsidized. They may be reviewed and restructured on the principle of "value of service" rendered. Water rates should be raised progressively to the economic levels. The State Government may also consider introduction of a differential tariff—basic water rate for the *kharif* season and a basic *plus* additional water rate for *rabi* season.

26.3.6 State Government may make a detailed investigation on the working of the Nal-Koop Nigam and a case by case study of all deep tubewells and adopt appropriate policies to remedy the shortcomings.

26.3.7 *Surface Irrigation*: Lining of canals should be taken up, wherever necessary, to prevent loss of water due to seepage. Steps should be taken to modernise the old irrigation systems and improve their maintenance. Conjunctive use of surface and groundwater should be encouraged in command areas of major and medium irrigation projects. Farmers should supplement water from canals with water from shallow tubewells and dugwells.

26.3.8 *Irrigation Utilisation*: Steps should be taken to improve the utilisation of potential created under major and medium irrigation projects, particularly in *kharif* season. Even shallow tubewells are not optimally used in *kharif* season. The recent decision to advance the closing time of canals from May-June to April and release water in May and June to facilitate early sowing of the crop should lead to a better utilisation of canal water. With better extension service, farmers may be persuaded to utilise both canal and tubewell water for irrigation during *kharif*. This will help improve productivity of *kharif* crops.

26.3.9 *Other Minor Irrigation Structures*: In undulating areas, e.g., Mirzapur district, where exploitation of groundwater is difficult, micro-watershed development and other minor irrigation structures such as check bunds and small tanks should be useful.

26.3.10 *Flood Control*: Floods ravage large parts of East U.P. due to overflow of rivers like Ghagra, Gandak, Rapti, Gomti and Ganga. Effective steps will, therefore, have to be taken for flood control. These should include (i) afforestation and soil conservation to check

soil erosion in upper catchment areas, (ii) desilting of rivers and their main tributaries in a phased manner, to the extent possible, (iii) construction of embankments, and (iv) improvement of drainage facilities. These would require large resources, but are worthwhile, considering the damages floods cause almost every year.

26.3.11 *Waterlogging and Drainage*: Large areas of East U.P. are affected by waterlogging, as natural drainage of the region has been disturbed and sufficient attention has not been given to construction of drainages in the command areas of major irrigation projects. Effective steps are, therefore, necessary to improve drainage facilities. Long-term measures would include the construction of an effective surface drainage system. For this purpose, detailed groundwater studies will have to be conducted to ascertain the sub-soil water strata in the region. In the short-term, desilting and clearing of existing drains should be taken up. The seepage from canals can be reduced through lining, particularly, in areas where soil structure is porous. Besides surface drainage, vertical drainage may be taken up in suitable areas through sinking of augmentation tubewells along canals and more intensive exploitation of groundwater. Farmers should be educated on effective water management practices so as to avoid excessive impounding of water from canals, adoption of appropriate crop rotations so as to optimise water use and better upkeep of field channels, so as to prevent overgrowth of weeds. In waterlogged areas, crops which can withstand waterlogging and flood conditions should be encouraged until effective measures are taken to tackle the drainage problem. We consider that improvement of drainage facilities should get the highest priority. Our recommendations in this regard are given in paragraphs 9.7.3 to 9.7.10, Chapter 9 and paragraph 16.2.10, Chapter 16 of Part I.

26.4 *Specific Problems of Agro-Climatic Zones*

26.4.1 *North-Eastern Plains Zone*: In North-Eastern Plains Zone, the main problems are floods and waterlogging and poor utilisation of irrigation facilities in the *kharif* season. North-eastern parts of Gorakhpur district and northern parts of Deoria district have Bhat soils which are calcareous and contain a high amount of calcium carbonate. Crop technology suited to such soils is not available. Therefore main thrust of development strategy in this region should be on effective flood control measures and adoption of suitable crop patterns and flood-resistant varieties of crops. Ground-

water needs to be exploited more intensively in this zone. Extension service should play a greater role in persuading farmers to utilise available irrigation facilities in *kharif* season. The Agricultural University and Adaptive Research Stations in this zone should develop crop technology suitable for Bhat soils.

26.4.2 *Eastern Plains Zone*: In this zone, besides the problems of floods and waterlogging, there are large areas covered by salinity and alkalinity and diara lands. The problem of weeds, insects and diseases is also widespread. Large areas in the districts of Sultanpur, Pratapgarh, Ballia and Azamgarh have *usar* soils. It is necessary to take steps for reclamation of such lands. Application of gypsum and pyrates should be resorted to. The approach to development in saline soils is to adopt suitable crop varieties.

26.4.3 A large part of this zone is covered by diara lands, on the banks of Ganga, Ghagra and Gomti rivers. These lands require special soil and water management techniques and selection of suitable crops. The cropping pattern suitable for diara lands would include intensive *rabi* cropping after the recession of water with irrigation and raising improved varieties of wheat, potato, peas and mustard and other crops. After *rabi*, short-duration varieties of summer maize, mung, etc., should be taken up which could be harvested before rains. During *kharif*, flood-tolerant varieties of rice may be adopted.

26.4.4 *Kharif* crops in the zone are vulnerable to the incidence of pests and diseases. It is necessary to strengthen the pest surveillance and forecasting units for providing timely warning about the spread of insects, pests and diseases. Pesticides should be made available in adequate quantities.

26.4.5 *Vindhyan Zone-Mirzapur District*: In Mirzapur district the main problems are lack of adequate irrigation facilities and difficulty in raising good yields in black and red soils. Irrigation facilities in the district should be augmented by the construction of check dams etc. on water-shed basis.

26.4.6 The black soils become sticky on wetting and develop wide cracks during summer. Research efforts should be directed towards development of short-duration varieties of rice which can mature before water stress sets in. The dwarf and high yielding varieties of wheat for rainfed and irrigated areas should be deve-

loped. It is also necessary to popularise dry-farming technology in respect of wheat, gram, linseed, lentil, etc., which can be grown under rainfed conditions.

26.4.7 Red soils are coarse and have poor water retention capacity. It is necessary to develop short-duration and high-yielding varieties of small millets for these soils.

26.4.8. It is also necessary to develop soil management practices in black and red soils, with particular reference to land preparation and placement of fertilizers, etc.

26.5. *Crop Planning*

26.5.1 Our recommendations on crop planning are given in Chapter 8 of Part I of the Report. Some of the important recommendations are given below.

(i) Contingency plans should be prepared for each district based on the analysis of rainfall data for last 50-60 years. The All-India Coordinated Research Project for Dryland Agriculture, Hyderabad has recently prepared such a plan for Varanasi district. This may be studied by the State Government for improvement and extension to other districts.

(ii) In areas where rainfall fluctuations are heavy, rice should be mix-cropped or substituted by some other low duty crops. In *rabi*, wheat should be given preference over summer paddy for economising the use of water resources.

(iii) In large parts of East U.P., rice is grown in rainfed conditions. Some of these lands are not suitable for rice cultivation. Consequently rice productivity is low. In such areas, other crops like maize, small millets, oilseeds and pulses, etc., will prove more remunerative than rice.

(iv) In irrigated areas, cultivation of HYV of paddy and wheat should be extended.

(v) In flood-prone areas, suitable early maturing and flood-resistant varieties should be introduced.

(vi) In rainfed areas, some short-duration varieties should be evolved which would be helpful in taking a second crop with the available moisture in the soil.

26.6 *Development of Small and Marginal Farmers*

26·6.1 Socio-economic development of small and marginal farmers in East U.P. can be achieved only through raising their income from farm operations. The present practice of growing staple crops does not provide them adequate savings. Therefore, such farmers particularly living in the vicinity of big cities or industrial towns and where irrigation facilities are available should be encouraged to grow some high value crops like vegetables, spices and fruits, etc., in a part of their holding. This will increase their income.

26·6.2 Along with cultivation of some high value crops, small and marginal farmers can take some ancillary activities like animal husbandry, poultry, fishery, etc. This would also increase the income of small farmers.

26·7 *Input Supply*

26.7.1 Recommendations for strengthening the present weak system of input supply are given in Chapter 10 of Part I of the Report. Steps should be taken to improve the supply of certified seeds by making necessary arrangements for seed multiplication. Farmers should be supplied certified seeds in time and through wide net work of distribution centres. The programme for mini-kits should be stepped up.

26.7.2 *Fertilizers*: Like seeds, fertilizers should be made available to farmers in time. Appropriate technology should also be extended to farmers for obtaining full benefits from fertilizer application. A phased programme of covering every Panchayat by a seed and fertilizer sale centre should be taken up during the Seventh Plan.

26.7.3 *Bio-fertilizers*: Bio-fertilizers like Blue Green Algae (BGA) can supplement nitrogen content of the soil. The State Government should, therefore, take up schemes for producing BGA culture for distribution to farmers. This can be taken up under a Centrally Sponsored Scheme. Steps should be taken to popularise scientific farm practices (Annexure 10.1, Chapter 10 of Part I).

26.7.4 *Pesticides*: In areas affected frequently by pests and diseases, surveillance units should be strengthened. In such areas,

supply of pesticides should also be made available at least at the panchayat level.

26.7.5 The State Government should strengthen its vigilance over the private dealers in inputs.

26.8 *Credit*

26.8.1 Larger flow of credit is a pre-requisite for improving the use of modern inputs like fertilizers, HYV seeds, pesticides and farm implements and for making on-farm investments. Our recommendations for increasing the flow of agricultural credit are given in Chapter 15 of Part I of the Report.

26.9 *Agricultural Research*

26.9.1 The number of adaptive research stations in different agro-climatic zones of East U.P. is inadequate. There is need for opening one adaptive research station in each district of East U.P. Each Regional Research Station should have a separate wing for high value crops.

26.10 *Extension and Transfer of Technology*

26.10.1 The T&V system of extension should be introduced in East U.P. The extension machinery in these areas has to be considerably strengthened and improved so as to act as an effective agent for transfer of technology to the field level. Adequate number of SMS need to be appointed at district/sub-divisional level. At present, the VLWs are entrusted with a variety of jobs and not much attention is given by them to agricultural extension. This practice should be replaced by a system whereby VLWs will be responsible only for agricultural extension. It is also necessary to give proper incentives to VLWs and develop a supplementary line of extension (for details, see Chapter 11 of Part I).

26.11 *Farm Machinery and Implements*

26.11.1 Modern agriculture is capital intensive. The implements currently used in East U.P. are mostly traditional. The use of modern implements and machinery will help improve land productivity as also reduce the drudgery of farm operations. Many new small tools and implements have been developed by research scientists. Efforts should be made to popularise their use by

making suitable arrangements for hiring them to small and marginal farmers. Government, co-operatives and private firms should provide such facilities. Competition among the three categories should be promoted in the interest of efficiency and better service. Banks should extend necessary credit for co-operatives and private firms for acquiring such assets.

26.11.2 Proper maintenance and servicing of agricultural machinery and implements are very important. Agro-service centres and agro-industries corporations have not been successful in meeting this need. It is necessary to encourage through appropriate credit and technical support, more progressive farmers to set up agro-service centres in their respective villages. The private manufacturers, dealers, etc., should also be encouraged to set up servicing network.

26.12 *Transport and Marketing*

26.12·1 From the village to the nearest marketing centre, there should be link roads which should be negotiable by carts and light vehicles such as cycle-rickshaws, tempos and mini-trucks. From the market to the nearest rail heads or secondary marketing centres, there should be motorable roads. With a view to providing better transport facilities as also to improve rural employment opportunities, banks should extend liberal credit to villagers for acquiring improved types of bullock-carts, cycle-rickshaws, tempos and mini-trucks, etc. Tempos and mini-trucks would be particularly useful in areas with good potential for the growth of high value perishable crops.

26.12.2 At market centres, adequate storage facilities should be provided to farmers, specially small and marginal farmers. Steps should be taken to ensure that storage space is not cornered by the traders.

26.12.3 In areas where perishables are grown, adequate cold storage and processing facilities should be provided. In tribal areas where there is good potential for cultivation of fruits, fruit processing factories in the Government sector or private or joint sector should be set up. For transporting perishables, refrigerated vans should be provided to transport operators, assisted by the provision of easy credit facilities. State Government may consider setting up of a Horticultural Marketing and Processsing Company, if

necessary, as a joint venture with a private firm to help process and market various fruits grown in the region.

26.13 *Rural Industry Centres*

26.13.1 Public corporations, private firms, banks and voluntary organizations should be encouraged to adopt villages in specific areas which will serve as growth centres. Further, with a view to providing alternative employment opportunities and reduce pressure of population on land, private sector should be given special facilities to set up industries in no-industry blocks at least 50 kms away from present industrial sites. To promote such industries, necessary infrastructure should be created and liberal fiscal concessions should be provided by the Government alongwith liberal credit facilities from credit institutions.

26.14. *Administrative Reforms*

26.14.1 Within the State Government, there are many ministries and departments dealing with various aspects of agriculture and allied activities. The coordination with them, especially with Irrigation Department needs to be strengthened.

26.14.2 While implementing the programme, it is important to ensure proper sequencing of actions by the concerned departments. Without effective sequential link-up, it will not be possible for farmers to derive optimum benefit from the programmes implemented. (*vide* paragraph 7.10.3, Chapter 7 of Part I).

26.14.3 The State Government should undertake a block by block identification of the constraints to improve productivity and take suitable remedial steps, keeping in view the recommendations made in this Report. Improved weather forecasting facilities should be matched by an alert administrative machinery to cope with problems arising out of natural calamities. There should be contingency planning and close monitoring in the event of such calamities.

26.14.4 The State Government may set up two Standing Committees — one at the Ministerial Level and another at the Level of Secretaries, with representatives of RBI and NABARD to review the progress of various programmes recommended by us. A Monitoring and Evaluation Cell should be set up to monitor

the implementation of programmes. Evaluation of the various programmes for East U.P. should be taken at the time of mid-term appraisal of Seventh and Eighth Plans. This work may be entrusted to independent research bodies.

26.15 *Need for Special Assistance to East U.P.*

26.15.1 Considering the backwardness of East U.P. and its rich resource potential, special efforts will be necessary to improve agricultural productivity and production of this region. State Government should prepare a separate Sub-Plan for East U.P. and make available the resources for the implementation of programmes recommended by us. Central Government assistance should be specifically earmarked for the development of this region.

CHAPTER 27

INVESTMENT AND CREDIT REQUIREMENTS

27.1 *Investments*

27.1·1 *Agriculture and Allied Services*: The strategy for accelerated development set out in our Report would require a substantially higher public outlay in the agricultural sector than hitherto. The anticipated outlay on agriculture and allied services in East U.P. during the Sixth Plan is estimated at Rs. 330 crores. Our estimate of outlay during Seventh and Eighth Plans is Rs. 700 crores and Rs. 1400 crores, respectively.

27.1.2 *Irrigation and Drainage*: On the assumption that (i) no new major irrigation projects will be taken up, but efforts will be made to complete on-going projects and (ii) some new medium irrigation projects will be taken up, our estimate of additional irrigated area that would be created under major and medium irrigation during the Seventh and the Eighth Plan periods would be about 6 lakh ha and 7 lakh ha, respectively.

27.1.3 Under minor irrigation, additional irrigated area of 16 lakh ha is estimated to be created during the Seventh Plan period. Since a large part of the potential would have been utilised by then, the creation of additional irrigated area under the Eighth Plan is estimated to be smaller at 7 lakh ha.

27.1.4 For attaining these targets, substantial investment is necessary in sinking tubewells, installation of pumpsets, etc. We have prepared two estimates, viz., (i) Estimate I which we consider necessary and (ii) Estimate II, based on past performance. These are indicated in Table 27.1.

27.1.5 The additional area that would be brought under major, medium and minor irrigation (after allowing for some time lag in the utilisation of potential created) during the Seventh and Eighth Plan periods would be about 21 lakh ha and 13 lakh ha, respectively, under Estimate I. The additional irrigated area as per Estimate II would be 15 lakh ha each during the Seventh and Eighth Plan periods, respectively.

Table 27.1. Minor Irrigation Structures

(In '000 units)

Type of investment	Estimates			
	Seventh Plan		Eighth Plan	
	Esti-mate I	Esti-mate II	Esti-mate I	Esti-mate II
1. Shallow tubewell bores	300	200	120	150
2. Shallow tubewells with pumpsets	50	40	40	40
3. Medium/deep tubewells	4	3	1	1
4. Dugwells	25	20	15	20
5. Pumpsets	450	300	180	225

27·1.6 The programmes proposed above would call for substantial public investment. Under minor irrigation, the Government investment costs comprise expenditure on sinking of tubewell bores and construction of dugwells under Centrally Sponsored Schemes, subsidies to small and marginal farmers and Government contribution to the construction of deep tubewells. Provision has also to be made for extension of electric lines in the case of electric pumpsets needed for bores and dugwells under Centrally Sponsored Schemes. The estimated investment cost of Centrally Sponsored Schemes for tubewells and dugwells and for energisation of pumpsets needed therefor are given below.

Table 27.2. Investment Cost of Centrally Sponsored Schemes

(Rs. crores)

	Seventh Plan	Eighth Plan
For tubewell bores and dugwells	100	50
For energisation	75	30
Total	175	80

27.1.7 As drainage has been given high priority in our strategy, we have estimated that Government investment on this account will have to be of the order of Rs. 180 crores during the Seventh Plan and Rs. 200 crores during the Eighth Plan.

27.1.8 There should also be a larger provision for command area development than in the Sixth Plan especially for taking up on-farm development works.

27.1.9 Our estimate of cost of public investment on drainage, command area development and minor irrigation during the Seventh and Eighth Plans is summarised below.

Table 27.3. Public Investment on Drainage, CAD and Minor Irrigation

(Rs. crores)

	Seventh Plan	Eighth Plan
Drainage	180	200
CAD	40	40
Minor Irrigation	375*	260*

* Excluding the investment cost of energisation of pumpsets shown under "Rural Electrification".

27.1.10 *Rural Electrification*: On the basis of certain assumptions (paragraph 16.3.1, Chapter 16 of Part I) our estimate of investment cost on rural electrification (including energisation of pumpsets for the Centrally Sponsored Schemes) is Rs. 220 crores during the Seventh Plan and Rs. 200 crores during the Eighth Plan.

27.1.11 *Rural Industry Centres*: Provision has also been made by us for setting up rural industry centres. The investment cost and recurring cost for maintenance, etc., for these rural industry centres are estimated at Rs. 105 crores during the Seventh Plan and Rs. 140 crores during the Eighth Plan.

27.2 *Short-term Credit*

27.2.1 Based on assumptions set out in Chapter 16 of Part I, we feel that a reasonable estimate of short-term credit requirements would be Rs. 790 crores during the terminal year of the Seventh

Plan and Rs. 870 crores in the terminal year of the Eighth Plan. However, bearing in mind various constraints, we have also made a lower estimate of short-term credit requirements at Rs. 450 crores and Rs. 620 crores respectively, for the two reference periods.

27.3 *Medium and Long-term Loans*

27.3.1 Our estimates of medium and long-term loans are shown below.

Table 27.4. Medium and Long-term Loans

(Rs. crores)

	Seventh Plan	Eighth Plan
Minor Irrigation*	350	200
Other purposes@	150	170
Total	500	370

* Including loans to State Electricity Board for energisation of pumpsets.
@ Including land development, soil conservation, dry farming, animal husbandry, fisheries, forestry, farm machinery, storage, rural industry centres etc.

27.4.1 In our view, the above estimates are modest. Credit institutions should make earnest attempt to exceed the above level of disbursements.

27.4.2 To achieve the above targets vigorous efforts will be necessary on the part of Government, credit institutions and NABARD. The approach should be to attain a level of loan disbursements above the lower estimate in the Seventh Plan, but close to the higher estimate in the Eighth Plan. These should be reviewed in the light of experience during mid-term appraisal of each plan.

CHAPTER 28

CONCLUSION

28.1.1 East U.P. has fertile soils in most parts and plenty of surface and groundwater resources. More than 90 per cent of cropped area is under foodgrains. The growth rates in agricultural production during the two decades 1961-81 has been stable at about 2 per cent per annum.

28.1.2 Benefiting from a significant expansion of tubewell irrigation in 1970s, East U.P. has of late, shown signs of accelerated growth. An evidence of this is the impressive growth in wheat production. A new production environment is now visible in East U.P. If policy measures indicated in our Report are vigorously implemented, it is possible for East U.P. to attain an annual compound growth rate of 3-4 per cent in productivity and 4-6 per cent or even more in production during the next ten years.

28.1.3 This will, however, require substantial public investment and credit from the banking system as well as a better coordinated administrative structure.

PART VI

STATISTICS

Statement 1 : Geographical Area, Popu'ation and Work Force (Million)

State	Year	Geographical Area (in sq. kms.)	Population			Scheduled Castes and Scheduled Tribes			Total workers	Agricultural workers		
			Rural	Urban	Total	SCs	STs	Total		Cultivators	Agricultural labourers	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
West Bengal	1961	87,676	26.4	8.5	34.9	6.9	2.0	8.9	11.6	4.4	1.8	6.2
	1971	87,853	33.3	11.0	44.3	8.8	2.5	11.3	12.4	3.9	3.3	7.2
	1981	87,853	40.1	14.5	54.6	12.0	3.1	15.1	16.5	4.6	3.9	8.5
Orissa	1961*	155,860	16.4	1.1	17.5	2.8	4.2	7.0	7.6	4.3	1.3	5.6
	1971	155,782	20.1	1.8	21.9	3.3	5.0	8.3	6.8	3.4	1.9	5.3
	1981*	155,707	23.3	3.1	26.4	3.9	5.9	9.8	10.0	4.0	2.4	6.4
Bihar	1961	174,008	42.5	3.9	46.4	6.5	4.2	10.7	19.2	10.3	4.4	14.7
	1971	173,876	50.7	5.6	56.3	7.9	4.9	12.8	17.5	7.6	6.8	14.4
	1981*	173,877	61.2	8.7	69.9	10.0	5.8	15.8	22.5	9.1	7.3	16.4
East U.P.	1961	85,578	26.2	2.1	28.3	5.8	N.A.	5.8	12.1	7.9	2.0	9.9
	1971	85,803	30.4	2.7	33.1	6.9	†	6.9	10.4	5.7	2.9	8.6
	1981*	85,848	37.1	4.4	41.5	8.8	†	8.8	11.9	7.1	2.4	9.4
Eastern India	1961	503,122	111.5	15.6	127.1	22.0	10.4	32.4	50.5	26.9	9.5	36.4
	1971	503,314	134.5	21.1	155.6	26.9	12.4	39.3	47.1	20.6	14.9	35.5
	1981*	503,359	161.7	30.6	192.3	34.8	14.8	49.6	61.0	24.9	15.9	40.7
All India	1961	3,268,090	360.0	78.9	438.9	64.4	29.9	94.3	188.6	99.5	31.5	131.1
	1971	3,280,483	439.1	109.1	548.2	80.0	38.0	118.0	180.4	78.2	47.5	125.7
	1981*	3,287,782	525.5	159.7	685.2	104.8	51.6	156.4	247.1	92.5	55.5	148.0

* Provisional as on 1st March 1981.

† ST population is less than 25,000.

Statement 2 : Population—Some Selected Ratios

State	Year	PERCENTAGE OF					Growth Rate during 1951-61, 1961-71 and 1971-81 (in percentage)				Density of population (No. per sq.km.)	Density of agricultural workers (No. per 100 ha. of net sown area)
		Rural population to total population	SCs & STs to total population	Workers to total population	Agricultural workers to total rural population	Agricultural workers to total workers	Total population	Rural population	Agricultural workers	SCs & STs		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
West Bengal	1961	75.6	25.5	33.2	23.5	53.4	32.8	N.A.	N.A.	N.A.	398	115
	1971	75.2	25.5	28.0	21.6	58.1	26.9	26.1	16.1	27.0	499	131
	1981	73.6	27.3	30.3	20.9	50.9	23.0	20.4	16.8	33.6	614	152
Orissa	1961	93.7	40.0	43.4	34.1	73.7	19.8	N.A.	N.A.	N.A.	113	97
	1971	91.8	37.9	31.1	26.4	77.9	25.1	22.6	-5.4	18.6	141	95
	1981	88.3	37.1	37.9	27.5	64.0	20.5	15.9	20.8	18.1	169	105
Bihar	1961	91.6	23.1	41.4	34.6	76.6	19.7	N.A.	N.A.	N.A.	267	184
	1971	90.1	22.7	31.1	28.4	82.3	21.3	19.3	-2.1	19.6	324	169
	1981	87.6	22.7	32.3	26.8	72.6	24.2	20.7	13.9	24.2	402	196
East U.P.	1961	92.6	20.5	42.8	37.8	81.8	N.A.	N.A.	N.A.	N.A.	330	171*
	1971	91.8	20.8	31.4	28.3	82.7	16.9	16.0	-13.1	19.0	387	151
	1981	89.4	21.2	28.7	25.6	79.8	25.4	22.0	10.5	27.5	484	165
Eastern India	1961	87.7	25.5	39.7	32.6	72.1	N.A.	N.A.	N.A.	N.A.	254	146
	1971	86.4	25.3	30.3	26.4	75.4	22.4	20.6	-2.5	21.3	311	140
	1981	84.1	25.8	31.7	25.2	66.7	23.6	20.2	14.9	26.2	385	159
ALL INDIA	1961	82.0	21.5	43.0	36.4	69.5	21.5	N.A.	N.A.	N.A.	144†	98
	1971	80.1	21.5	32.9	28.6	69.7	24.8	21.9	-4.0	25.1	177†	89
	1981	76.7	22.8	36.1	28.2	59.9	25.0	19.7	17.7	32.5	221†	105

† Excluding Jammu & Kashmir.

* Based on net sown area for 1959-60.

Statement 3 : Land Utilisation Statistics

('000 Ha)

State	Years	Reporting Area	Forests	Area put to non-agricultural uses	Permanent pastures & other Grazing lands	Land under Miscellaneous tree crops and Groves not included in net area sown	Culturable waste land	Fallow lands other than current fallows	Barren and unculturable land	Current fallows	Net area sown	Gross area sown	Cropping intensity (per cent)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
West Bengal	1960-61	8,852	1,102	1,293	—	639*	—	382**	N.A.	—	5,436	6,354	116.9
	1965-66	8,852	1,108	1,293	—	629*	—	379**	N.A.	—	5,443	6,391	117.4
	1970-71	8,852	1,101	—	—	607*	—	330**	1,272†	—	5,542	7,092	128.0
	1975-76	8,856	1,188	—	—	538*	—	362**	583†	—	6,185	7,958	128.7
	1976-77	8,856	1,188	—	—	538*	—	362**	583†	—	6,185	7,632	123.4
	1977-78	8,856	1,188	—	—	538*	—	362**	583†	—	6,185	7,878	127.4
	1978-79	8,846	1,184	1,245	3	181	382	56	126	67	5,602	7,389	131.9
	1979-80	8,846	1,184	1,296	2	178	394	67	124	161	5,440	7,410	136.2
	1980-81	8,846	1,184	1,293	4	162	374	61	121	82	5,565	7,620	136.9

Statement 3 : (Contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Orissa	1960-61	15,540	3,561	1,143	736	462	1,418	299	1,399	918	5,787	6,137	106.0
	1965-66	15,540	3,591	2,542	799	522	1,248	127	N.A.	724	5,986	7,446	124.4
	1970-71	15,540	4,973	1,803	725	431	771	95	N.A.	621	5,601	6,760	120.7
	1975-76	15,540	6,359	540	537	491	356	225	340	555	6,137	7,733	126.0
	1976-77	15,540	6,655	546	537	489	280	157	281	718	5,877	7,209	122.7
	1977-78	15,540	6,655	546	537	489	268	139	281	628	5,997	7,931	132.2
	1978-79	15,540	6,655	557	534	489	260	138	279	531	6,097	8,275	135.7
	1979-80	15,540	6,640	622	560	420	264	207	268	589	5,970	8,166	136.8
	1980-81	15,540	6,640	632	560	423	249	189	265	452	6,130	8,746	142.7
Bihar	1960-61	17,330	3,758	2,233	222	N.A,	903	843	N.A.	1,339	8,032	11,107	138.3
	1965-66	17,330	2,937	2,543	219	195	639	949	N.A.	1,510	8,338	10,760	129.0
	1970-71	17,330	2,928	1,545	181	197	513	879	1,060	1,573	8,454	11,026	130.4
	1975-76	17,330	2,823	1,650	155	222	465	902	1,041	1,601	8,470	11,287	133.3
	1976-77	17,330	2,780	1,644	155	219	488	954	1,035	1,705	8,350	11,325	135.6
	1977-78	17,330	2,780	1,646	143	217	469	897	1,012	1,582	8,579	11,565	134.8
	1978-79	17,330	2,758	1,660	144	217	468	924	1,008	1,619	8,532	11,381	133.4
	1979-80	17,330	2,826	1,715	145	216	462	952	1,011	2,102	7,901	10,413	131.8
	1980-81	17,330	2,826	1,716	144	212	447	939	1,011	1,720	8,315	11,148	134.1

Statement 3 : (Contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
East U.P.	1960-61‡	8,518	582	726	11	285	474	381	315	158	5,771	7,458	129.2
	1965-66	8,496	576	727	8	279	443	192	303	236	5,732	7,590	132.4
	1970-71	8,738	848	N.A.	14	N.A.	396	196	2,135	230	5,744	7,698	134.0
	1975-76	8,779	853	N.A.	17	N.A.	359	204	1,348	245	5,752	7,701	133.9
	1976-77	8,760	852	N.A.	13	N.A.	336	199	1,335	243	5,782	7,715	133.4
	1977-78	8,743	842	N.A.	13	N.A.	316	196	1,255	263	5,778	7,803	135.0
	1978-79	8,670	835	N.A.	33	N.A.	358	200	1,200	297	5,734	8,081	140.9
	1979-80	8,641	829	N.A.	18	N.A.	235	223	1,291	483	5,561	7,767	139.7
	1980-81	8,641	824	N.A.	17	N.A.	234	224	1,280	411	5,650	8,204	145.2
	1981-82	8,636	826	N.A.	18	N.A.	228	242	1,279	399	5,643	8,389	148.7

* Include permanent pastures and other grazing lands as well as cultivable waste land.
** Includes current fallow.
† Includes area put to non-agricultural use.
‡ Data relates to 1959-60.

Source : 1) Directorate of Economics and Statistics, Department of Agriculture & Co-operation, Ministry of Agriculture.
2) Memoranda supplied by State Governments.

Statement 4 : Number and Area of Operational Holdings, 1970-71, 1976-77 and 1980-81

(Holdings in '000 No.)
(Area in '000 Ha.)

State	Year	Marginal (Below 1 Ha)			Small (Between 1 to 2 Ha)		Semi-Medium (Between 2 to 4 Ha)	
		Number	Area	Average size of holdings (Hectares)	Number	Area	Number	Area
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
West Bengal	1970-71	2529	1090	0.43	942	1302	558	1465
	1976-77	3502	1418	0.40	1083	1490	546	1414
	1980-81	4096	1620	0.40	1149	1734	519	1403
Orissa	1970-71	1476	770	0.52	1121	1714	453	1363
	1976-77	1666	851	0.51	1041	1462	601	1596
	1980-81	1556	793	0.51	893	1220	611	1581
Bihar	1970-71	4874	1845	0.38	1102	1563	915	2537
	1976-77	7215	2578	0.36	1191	1592	928	2496
	1980-81	8521	2952	0.35	1213	1648	951	2594
East U.P.	1970-71	5080	1655	0.33	936	1299	499	1355
	1976-77	5725	1873	0.33	926	1267	463	1245
	1980-81	5937	1894	0.32	942	1290	436	1172
ALL INDIA	1970-71	36200	14558	0.40	13432	19283	10681	30000
	1976-77	45532	17496	0.38	14705	20862	11643	32365

Statement 4 : (Concld.)

State	Year	Medium (4 to 10 Ha)		Large (10 Ha and above)		Total		Average size of holdings (in Ha)
		Number	Area	Number	Area	Number	Area	
		(10)	(11)	(12)	(13)	(14)	(15)	(16)
West Bengal	1970-71	184	974	4	232	4217	5063	1.20
	1976-77	134	692	2	207	5267	5221	0.99
	1980-81	112	595	0.1	204	5877	5556	0.95
Orissa	1970-71	309	1795	49	808	3408	6450	1.89
	1976-77	233	1302	36	521	3577	5732	1.60
	1980-81	239	1318	28	393	3327	5305	1.59
Bihar	1970-71	544	3175	135	2360	7570	11480	1.52
	1976-77	519	2939	83	1468	9936	11073	1.11
	1980-81	472	2709	68	1165	11230	11068	0.99
East U.P.	1970-71	195	1117	33	546	6743	5972	0.89
	1976-77	175	989	23	364	7312	5738	0.78
	1980-81	152	861	18	297	7491	5514	0.74
ALL INDIA	1970-71	7932	48234	2767	50060	71012	162135	2.28
	1976-77	8207	49597	2437	42821	82524	163141	1.98

Statement 5 : Source-wise Irrigated Area

('000 Ha)

Year	Net Irrigated Area						Gross irrigated area	Percentage of gross irrigated area to Gross Area Sown
	Canals	Tubewells	Wells	Tanks	Other sources	Total		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
West Bengal								
1960-61	778	N.A.	16	368	189	1,351	1,367	21.5
1970-71*	960	N.A.	17	303	209	1,489	1.541	21.7
1975-76	1322	N.A.	17	302	614	2,256	N.A.	36.5‡
Orissa								
1960-61	225	N.A.	38	495	219	977	1,141	18.6
1970-71	263	N.A.	45	583	258	1,149	1,624	19.2
1975-76	655	N.A.	127	233	—	1,015	1,481	19.2
1976-77	674	9	95	271	—	1,049	1.383	19.2
1977-78	692	5	95	279	—	1,071	1,449	18.3
1978-79	761	15	132	240	—	1,148	1,586	19.2
1979-80	784	28	163	206	—	1,181	1,647	20.2
1980-81	801	23	184	207	—	1,215	1,711	19.6

Statement 5 : (Concld.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Bihar								
1960-61	650	N.A.	261	323	827	2,062	2,062	18.6
1970-71	814	N.A.	551	169	626	2,160	2,732	24.8
1975-76	896	846	225	118	675	2,760	3,363	29.8
1976-77	952	955	228	126	618	2 879	3,604	31.8
1977-78	996	871	231	132	683	2,913	3,780	32.7
1978-79	1,074	781	236	113	756	2,960	3,707	32.6
1979-80	920	839	198	106	689	2,772	3,390	32.6
1980-81	1,094	793	203	96	767	2,953	3,632	32.6
East U.P.								
1960-61†	190	132	1,160	287	226	1,996	2,075	27.8
1970-71	400	743	760	249	184	2,336	2,493	32.4
1975-76	536	945	575	227	193	2,476	2,706	35.1
1976-77	578	1,098	496	190	172	2,534	2,782	36.1
1977-78	623	1,171	469	174	159	2,596	2,876	36.9
1978-79	677	1,423	384	142	147	2,773	3,097	38.3
1979-80	675	1,703	240	87	88	2,793	3,131	40.3
1980-81	796	1,761	222	96	105	2 980	3.311	40.4
1981-82	829	1,851	183	104	82	3,050	3,367	40.1

Note : Data for West Bengal is not available from 1976-77 onwards.

* Data relates to 1967-68.

‡ Percentage of Net Irrigated Area to Net Area Sown.

† Data relates to 1959-60.

Source : Directorate of Economics and Statistics, Ministry of Agriculture & Co-operation, New Delhi.

Statement 6 : Groundwater Resources of West Bengal

(As of 1982)

(Unit = ha m x 1000)

Zone	District	Gross re-charge	Net re-charge	Net draft	Net ground-water balance	Stage of develop-ment (Per cent)
Hill zone	Darjeeling	62	43	Neg.	43	—
Terai zone	Cooch-behar	273	191	19	172	10
	Jalpaiguri	494	346	9	337	3
Alluvial zone (I)	Malda	94	66	32	34	48
	Murshidabad	167	117	51	66	44
	Nadia	154	108	53	55	49
	West Dinajpur	190	133	42	91	32
Alluvial zone (II)	Birbhum	63	44	9	35	20
	Burdwan	149	104	43	61	41
	Hooghly	88	62	36	26	58
	Howrah	48	34	11	23	32
Red and Laterite Soil zone	Bankura	78	55	16	39	29
	Purulia	37	26	6	20	23
Alluvial -cum-coastal saline zone	Midnapore	254	178	27	151	15
	24-Parganas	106	74	30	44	41
	Total	2257	1581	384	1197	24

Note : Neg = Negligible.

Statement 7 : Groundwater Resources of Orissa

(As of 1982)

(Unit = ha m x 1000)

Zone	District	Gross re-charge	Net re-charge	Net draft	Net ground-water balance	Stage of develop-ment (Per cent)
Northern Plateau	Keonjhar	138	96	4	92	4
	Mayurbhanj	193	135	4	131	3
	Sundergarh	143	100	4	96	4
Central Table Land	Bolangir	143	100	12	88	12
	Dhenkanal	144	101	14	87	14
	Sambalpur	325	227	4	223	2
Eastern Ghat	Kalahandi	172	120	5	115	4
	Koraput	487	341	4	337	1
	Phulbani	199	140	4	136	3
Central Plain	Balasore	143	100	18	82	18
	Cuttack	354	248	18	230	7
	Ganjam	279	195	25	170	13
	Puri	226	158	12	146	8
	Total	2946	2062	128	1934	6

Statement 8 : Groundwater Resources of Bihar

(As of 1982)

(Unit = ha m x 1000)

Zone	District	Gross re-charge	Net re-charge	Net draft	Net ground-water balance	Stage of develop-ment (Per cent)
North-West Alluvial Plains	Champaran West	180	126	21	105	17
	Champaran East	127	89	27	62	30
	Darbhanga	60	42	13	29	31
	Gopalganj	60	42	20	22	48
	Madhubani	94	66	9	57	14
	Muzaffarpur	86	60	36	24	60
	Samastipur	97	68	18	50	26
	Saran	68	48	24	24	50
	Sitamarhi	65	46	13	33	28
	Siwan	65	46	24	22	52
	Vaishali	50	35	20	15	57
East Alluvial Plains	Begusarai	65	46	20	26	43
	Bhagalpur	125	88	16	72	18
	Katihar	101	71	14	57	20
	Monghyr	186	130	40	90	31
	Purnea	405	284	35	249	12
	Saharsa	277	194	41	153	21
South-West Alluvial Plains	Aurangabad	89	62	12	50	19
	Bhojpur	127	89	30	59	34
	Gaya	267	187	95	92	51
	Nalanda	50	35	14	21	40
	Nawada	43	30	18	12	60
	Patna	115	81	33	48	41
	Rohtas	142	99	38	61	38
Plateau	Dhanbad	32	22	8	14	36
	Giridih	81	57	5	52	9
	Hazaribagh	141	99	6	93	6
	Palamau	154	108	10	98	9
	Ranchi	234	164	11	153	7
	Santhal Parganas	169	118	5	113	4
	Singhbhum	143	100	1	99	1
	Total	3898	2729	677	2052	25

Statement 9 : Groundwater Resources of East U.P.

(As of 1982)

(Unit = ha m x 1000)

Zone	District	Gross re-charge	Net re-charge	Net draft	Net ground-water balance	Stage of develop-ment (Per cent)
North-Eastern Plains	Bahraich	157	109	34	75	31
	Basti	294	206	72	134	35
	Deoria	245	172	103	69	60
	Gonda	218	153	62	91	41
	Gorakhpur	346	242	80	162	33
Eastern Plains	Allahabad	239	167	53	114	32
	Azamgarh	216	151	70	81	46
	Ballia	116	81	27	54	33
	Faizabad	210	147	62	85	42
	Ghazipur	150	105	39	66	37
	Jaunpur	293	205	61	144	30
	Pratapgarh	542	379	37	342	10
	Sultanpur	344	241	49	192	20
	Varanasi	133	93	60	33	65
Vindhyan zone	Mirzapur	248	173	22	151	13
	Total	3751	2624	831	1793	32

Statement 10 : List of Dark and Grey Blocks in West Bengal

(As per September 1982 Groundwater Assessment carried out by the State Government)

(Position as on January 1983)

Sr. No.	District	Name and Category of Blocks	
		Dark	Grey
(1)	(2)	(3)	(4)
1.	Murshidabad	1. Nawada	1. Beldanga I 2. Berhampore 3. Burwan 4. Domkal 5. Hariharpara 6. Raninagar I
2.	Nadia	1. Haringhata	1. Chapra 2. Ranaghat I
3.	Burdwan	1. Kalna I 2. Kalna II	1. Jamalpur 2. Memari II
4.	Hooghly	1. Pursurah 2. Tarakeshwar	1. Arambagh 2. Balagarh
5.	Midnapore	NIL	1. Debra
6.	24 Parganas	1. Gaighata	1. Bongaon 2. Deganga 3. Habra I
	Total	7	16

Abstract.

S. No.	Year of Assessment	No. of Districts	Total No. of blocks	Categorisation of blocks				Remarks
				Dark	Grey	White	unassessed	
1	2	3	4	5	6	7	8	9
1.	January 1983	15	335	7	16	226	86	

Notes : 1. A Dark' block is one where the stage of groundwater development is over 80 per cent of the recoverable recharge.

2. A 'Grey' block is one where the stage of groundwater development is between 60 to 80 per cent of the recoverable recharge. Below that is the 'White' category.

Statement 11 : List of Dark and Grey Blocks in Bihar

(As per 1983 Ground water assessment carried out by the State Government)

(Position as on April 1, 1984)

No.	District	Category of Blocks	
		Dark	Grey
(1)	(2)	(3)	(4)
1.	Champaran, East	Nil	1. Madhubani 2. Maheshi 3. Pakridayal 4. Turkaulia
2.	Darbhanga	1. Jale 2. Mandigachi	1. Baheri 2. Benipur 3. Darbhanga 4. Hayaghat 5. Keotirunway
3.	Gopalganj	1. Gopalganj 2. Hathwa 3. Uchkagaon	1. Baikunthpur 2. Barauli 3. Bhore 4. Bijaipur 5. Kateye 6. Kuchaikot 7. Manjha
	Madhepura	Nil	1. Chausa
4.	Madhubani	Nil	1. Madhepur 2. Rajnagar
5.	Muzaffarpur	1. Boehhaha 2. Sakra	1. Maraul 2. Sahebganj 3. Kurhani 4. Minapur 5. Muzaffarpur
6.	Samastipur	1. Kalyanpur 2. Pusa 3. Samastipur 4. Singhia 5. Ujairpur	1. Bibhutipur 2. Dalsinghsarai 3. Mohinddinnagar 4. Shahpur Patrol 5. Rosera 6. Sarairanjan 7. Morwa

Statement 11 : (Contd.)

(1)	(2)	(3)	(4)
7.	Saran	1. Dariapur	1. Amanaur 2. Baniapur 3. Garkha 4. Jalalpur 5. Manjhi 6. Marhaura 7. Sonpur 8. Taraiya
8.	Sitamarhi	1. Bajpatti 2. Bathnala 3. Majorganj	1. Bargania 2. Belsand 3. Dumra 4. Riga 5. Sursand
9.	Siwan	1. Bhagwanpur 2. Darauli 3. Guthani 4. Maharajganj 5. Siswan	1. Andir 2. Barharia 3. Daraunda 4. Goreya Kothi 5. Hussainganj 6. Mairwa 7. Pachrukhi 8. Raghunathpur 9. Siwan
10.	Vaishali	Nil	1. Desri 2. Mahnar 3. Mahua
11.	Begusarai	1. Begusarai	1. Bachhwara 2. Bakhari 3. Balia 4. Cheria Beriarpur 5. Khudawandpur
12.	Bhagalpur	Nil	1. Nathnagar
13.	Katihar	Nil	1. Falka 2. Katihar 3. Pranpur
14.	Monghyr	Nil	1. Jamui 2. Monghyrsadar
15.	Purnea	Nil	1. Kursakanta

Statement 11 : (Concld.)

(1) (2)	(3)	(4)
16. Saharsa	Nil	1. Mahesi 2. Nauhata 3. Saur Bazar
17. Aurangabad	Nil	1. Deo 2. Kutumha 3. Nabinagar
18. Bhojpur	Nil	1. Jagdishpur
19. Gaya	1. Manpur	1. Gaya town 2. Ghoshi 3. Khizirsarai 4. Kako 5. Paraiya
20. Patna	1. Masaurhi	1. Bakhtiarpur 2. Danapur 3. Kurhani 4. Minapur 5. Muzaffarpur
Total	24	85

Abstract.

Year of assessment	No. of Districts	Total of blocks No.	Categorisation of blocks		
			Dark	Grey	White
March 1984	38	587	24	85	478

Note: See footnotes to Statement 10.

Statement 12 : List of Dark and Grey Blocks in East Uttar Pradesh

(As per December 1983 Groundwater Assessment carried out by the Government of Uttar Pradesh)

(Position as on April 1. 1984)

No.	District	Category of Blocks	
		Dark	Grey
(1)	(2)	(3)	(4)
1.	Bahraich	Nil	1. Chitaura
2.	Basti	1. Bastisadar 2. Saltauwa 3. Saunahat	1. Bankati 2. Gaur 3. Kaptanganj 4. Kharilabad 5. Parasarampur 6. Semariyawan
3.	Deoria	1. Selampur	1. Jaitalpur 2. Bankata 3. Bhagalpur 4. Bhaluwani 5. Bhatni 6. Bhatpurrani 7. Deoria 8. Gauribazar 9. Lar
4.	Gonda	1. Chhipia 2. Ithiathok 3. Mankapur 4. Mujhena 5. Pandrikripal 6. Sriduttganj	1. Gondsa Buzurg 2. Jhanjhari 3. Utraula 4. Wazirganj
5.	Gorakhpur	1. Gola	1. Basgaon 2. Barhalganj 3. Bhathat 4. Belghat 5. Brahpur 6. Gagaha 7. Kauriram 8. Khajani 9. Piprauli 10. Sardarnagar 11. Urwa

Statement 12 : Contd.)

(1)	(2)	(3)	(4)
6.	Allahabad	1. Pratappur	1. Bahadurpur 2. Chail 3. Dhanupur 4. Phoolpur 5. Muratganj 6. Saidabad 7. Sirathu
7.	Azamgarh	1. Alraulia 2. Azamtgarh 3. Bilariganj 4. Harraiya 5. Jahanganj 6. Mohamadabad 7. Pardaha 8. Pawai 9. Palhani 10. Sathion	1. Ahiraula 2. Bhadraon 3. Koilsa 4. Kopaganj 5. Lalganj 6. Maharajganj 7. Mehnagar 8. Mirzapur 9. Phoolpur 10. Ranipur 11. Taheberpur 12. Tarwa 13. Thekma
8.	Ballia	1. Rasra	1. Beruarbari 2. Hanumanganj 3. Sahaon
9.	Faizabad	1. Akbarpur 2. Bikapur 3. Jalalpur 4. Tarun	1. Baskhari 2. Bhiaon 3. Bhiti 4. H. Ganj 5. Jahangeerganj 6. Milkipur 7. Ramnagar
10.	Ghazipur	1. Ghazipur 2. Mohammedabad 3. Saidpur	1. Bhararkhole 2. Birno 3. Deokali 4. Jakhania 5. Karandah 6. Mardah 7. Reotipur 8. Sadat

Statement 12 : (Concld.)

(1)	(2)	(3)	(4)
11.	Jaunpur	1. Dobhi 2. Khuttan 3. Machhalishahr 4. Ramnagar 5. Rampur	1. Badlapur 2. M. Badshahpur 3. Barsathi 4. Buxa 5. Dharmpur 6. Jalalpur 7. Karnjakalan 8. Karkat 9. Maharajganj 10. Mariahr 11. Muftiganj 12. Shahganj 13. Sikara 14. Sujanganj
12.	Pratapgarh	Nil	1. Aspur Deosarai 2. S. Chandrika 3. Gauri 4. Mandahata 5. Mangraura 6. Patti 7. Sadar 8. Shivgarh
13.	Sultanpur	Nil	1. Pratappur
14.	Varanasi	1. Aurai 2. Baragaon 3. Gangpur 4. Harahua 5. Kashi Vidyapeeth 6. Suriyavan	1. Bhadohi 2. Chadapur 3. Chiraigaon 4. Deegh 5. Pindra 6. Sewapuri
15.	Mirzapur	Nil	1. Kone 2. Sikher

Abstract.

S. No.	Year of assessment	No. of district	Total No. of blocks	Categorisation of blocks			Remarks
				Dark	Grey	White	
1	2	3	4	5	6	7	8
1.	April 1984	15	876	41	100	509	

Note : Please see note to Statement 10.

Statement 13 : Area Under High Yielding Varieties

('000 Ha)

	West Bengal		Orissa			Bihar			East U.P.		
Year	Rice	Wheat	Rice	Wheat	Maize	Rice	Wheat	Maize	Rice	Wheat	Maize
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1970-71	528	336	182	7	3	346	886	100	412	575	14
1971-72	704	385	197	13	5	440	1,213	157	584	747	3
1972-73	659	341	301	42	6	452	1,640	110	610	914	5
1973-74	764	319	359	46	13	600	1,650	300	701	1,144	2
1974-75	871	411	313	49	18	645	890	157	850	1,184	2
1975-76	1,052	562	483	60	30	768	1,229	357	941	1,296	4
1976-77	1,189	514	557	53	33	998	1,417	314	930	1,632	4
1977-78	1,393	484	647	66	36	1,300	1,418	350	1,257	1,706	5
1978-79	1,538	475	867	60	36	1,365	1,440	360	1,298	1,822	8
1979-80	1,256	506	942	49	41	1,060	1,400	370	1,308	1,490	9
1980-81	1,564	470	1,207	67	54	1,400	1,800	450	1,443	2,059	10
1981-82	1,628	423	1,166	66	63	N.A.	N.A.	N.A.	1,475	2,177	12

Source : 1) Memoranda Supplied by West Bengal and UP Governments.
2) Fertiliser statistics 3) Orissa position paper on Agricultural Development prepared by Government of Orissa.

Statement 14: Consumption of NPK

('000 Metric tonnes)

Year	West Bengal				Orissa				Bihar			
	N	P	K	Total	N	P	K	Total	N	P	K	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1960-61	12	3	3	18	5	—	—	5	14	3	—	17
1965-66	32	8	8	48	16	1	1	18	32	3	1	36
1970-71	47	12	14	73	20	6	2	28	75	18	7	100
1971-72	56	18	22	96	37	9	4	50	88	14	7	109
1972-73	53	16	23	92	41	10	6	57	89	19	11	119
1973-74	54	18	27	99	44	12	8	64	70	16	11	97
1974-75	86	19	20	125	34	9	6	49	89	16	12	117
1975-76	86	24	20	130	36	7	5	48	113	14	8	135
1976-77	102	27	24	153	44	11	7	62	128	18	10	156
1977-78	114	29	29	172	46	12	6	64	138	23	13	174
1978-79	146	53	44	243	50	14	8	72	155	26	14	195
1979-80	145	63	33	241	47	13	7	67	145	26	13	184
1980-81	167	71	45	283	52	16	9	77	160	30	15	205
1981-82	157	63	39	259	54	18	10	82	160	30	16	206
1982-83P	164	57	40	261	59	19	11	89	160	34	17	211

Statement 14 (concld.)

	East U.P.				Eastern India			
	N	P	K	Total	N	P	K	Total
(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
1960-61	9	1	—	10	40	7	3	50
1965-66	29	3	—	32	109	15	10	134
1970-71	104	28	19	151	246	64	42	352
1971-72	120	25	21	166	302	65	54	421
1972-73	124	21	19	164	306	66	60	432
1973-74	107	28	19	154	276	74	64	414
1974-75	109	15	12	136	318	59	50	427
1975-76	139	21	14	174	375	66	46	487
1976-77	209	37	22	268	483	93	63	639
1977-78	237	51	30	318	535	115	78	728
1978-79	282	75	33	390	634	167	99	900
1979-80	266	64	30	360	603	166	83	852
1980-81	296	73	32	401	676	189	101	966
1981-82	319	82	36	437	690	192	102	984
1982-83P	364	119	56	539	747	228	125	1100

P = Provisional.

Source : 1) Fertilizer Statistics.
2) Memorandum supplied by U.P. State Government.

Statement 15 : Consumption of Fertilizer per unit of Gross Cropped Area

(Kg/ha)

Year	West Bengal	Orissa	Bihar	East U.P.	All-India
(1)	(2)	(3)	(4)	(5)	(6)
1960-61	2.9	0.9	1.5	1.3*	1.9
1965-66	6.9	2.2	3.1	4.2	5.1
1970-71	13.6	3.8	9.0	19.7	13.6
1971-72	14.3	5.9	9.8	21.6*	16.1
1972-73	13.0	6.7	10.7	21.7	17.1
1973-74	13.6	9.1	9.1	20.3*	16.7
1974-75	17.7	7.1	11.3	18.0	15.7
1975-76	18.3	7.4	12.0	22.6	16.9
1976-77	19.2	8.0	13.8	34.7	20.4
1977-78	22.5	9.0	15.3	40.8	24.9
1978-79	31.9	9.9	17.2	48.3	29.2
1979-80	30.5	8.3	17.7	46.3	30.0
1980-81	37.1	8.7	18.4	48.9	31.5
1981-82	33.9*	9.5*	18.4*	52.2	34.6
1982-83	34.2†	10.2†	18.9†	64.3*	36.6

* Gross cropped area relates to the previous year.

† Gross cropped area relates to 1980-81.

Source : 1) Fertilizer Statistics.
2) Memorandum supplied by Uttar Pradesh State Government.

Statement 16: Consumption of Electricity in Agricultural Sector and its percentage share to total consumption

(Consumption : GWH)

Year	West Bengal			Orissa			Bihar			Uttar Pradesh		
	Agri-cul-ture	Total	Per-cen-tage	Agri-cul-ture	Total	Per-cen-tage	Agri-cul-ture	Total	Per-cen-tage	Agri-cul-ture	Total	Per-cen-tage
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1962-63	3	3,043	0.1	3	666	0.4	20	1,280	1.6	201	1,379	14.6
1970-71	21	4,754	0.4	11	1,599	0.7	69	2,585	2.7	721	4,285	16.8
1971-72	20	4,842	0.4	5	1,740	0.3	56	2,749	2.0	704	4,377	16.1
1972-73	35	5,236	0.7	8	1,657	0.5	75	2,709	2.8	810	4,677	17.3
1973-74	30	5,064	0.6	8	1,558	0.5	74	2,687	2.7	841	4,152	20.2
1974-75	40	5,095	0.8	9	1,630	0.5	75	2,881	2.6	1,233	4,682	26.3
1975-76	52	5,504	0.9	9	2,095	0.4	454@	3,764	12.1	1,702	5,925	28.7
1976-77	68	5,857	1.2	15	2,147	0.7	449@	4,095	11.0	1,855	7,072	26.2
1977-78	65	5,729	1.1	22	2,278	1.0	299	4,210	7.1	2,056	6,770	30.4
1978-79	68	5,820	1.2	35	2,335	1.5	205	4,537	4.5	2,415	7,688	31.4
1979-80	77£	5,664	1.4	33	2,252	1.5	2,700£	3,941	6.8	2,548	7,611	33.5

@ Includes consumption of Agricultural Process Industries.

£ Includes DVC's sales to ultimate consumers in Bihar and West Bengal States.

Source: Indian Agriculture in Brief Published by Directorate of Economics & Statistics, Dept. of Agriculture and Co-operation, Ministry of Agriculture.

Statement 17: Yield of Rice and Wheat

(Kg/ha)

States	Rice				States	Wheat			
	Triennium ending 1980-81	1981-82	1982-83	1983-84		Triennium ending 1980-81	1981-82	1982-83	1983-84
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Eastern Region					**Eastern Region**				
West Bengal	1349	1120	1018	1478	West Bengal	1709	1819	2275	2596
Orissa	917	926	737	1157	Orissa	1754	1894	1906	1906
Bihar	907	793	681	1016	Bihar	1272	1342	1400	1554
East U.P.	773	975	N.A.	N.A.	East U.P.	1347	1468	N.A.	N.A.
Western Region					**Western Region**				
Madhya Pradesh	653	790	710	970	Gujarat	1895	2000	2091	2195
Maharashtra	1424	1607	1311	1618	Madhya Pradesh	862	1002	1058	1140
					Maharashtra	842	876	785	965
					Rajasthan	1398	1659	1830	1594

Statement 17 (concld.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Southern Region					**Northern Region**				
Andhra Pradesh	1878	2058	2109	2106	Haryana	2295	2357	2524	2499
Karnataka	2002	2025	1891	1953					
Kerala	1600	1660	1678	1666	Himachal Pradesh	1085	1216	1184	760
Tamil Nadu	1966	2273	1855	1949	Punjab	2747	2932	3005	3015
Northern Region									
Haryana	2360	2470	2607	2486	Delhi	2598	2697	2701	2563
Punjab	2754	2957	3144	3063					
ALL INDIA	1247	1308	1231	1458	ALL INDIA	1545	1691	1816	1851

Source : Area and Production of Principal Crops in India, Directorate of Economics and Statistics, Department of Agriculture and Co-operations, Ministry of Agriculture, GOI, New Delhi.

Statement 18: Yield of Maize and Pulses

(Kg/ha)

States	Maize				Pulses			
	Triennium ending 1980-81	1981-82	1982-83	1983-84	Triennium ending 1980-81	1981-82	1982-83	1983-84
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Eastern Region								
West Bengal	811	1,132	1,160	1.315	492	535	525	655
Orissa	849	1,112	1,065	1,020	454	534	561	620
Bihar	1.013	904	1,174	1,165	538	611	591	591
East U.P.	598	489	N.A.	N.A.	799	707	N.A.	N.A.
Western Region								
Gujarat	867	1,269	999	1,493	421	522	652	697
Madhya Pradesh	831	977	1,013	1.385	403	509	508	534
Maharashtra	1,722	1,694	1.397	1,500	351	378	374	425
Rajasthan	828	823	741	1.376	399	405	444	455
Southern Region								
Andhra Pradesh	1,597	1,906	2,233	1,506	271	326	401	373
Karnataka	2.676	2,639	2,200	2,818	380	397	327	411
Northern Region								
Haryana	843	1,054	1,000	1,186	762	311	565	505
Punjab	1,644	1,838	1,777	1,830	674	496	585	656
ALL INDIA	1,073	1.162	1,145	1,346	459	483	519	541

Statement 19: Yield of Groundnut and Other Oil Seeds

(Kg/ha)

States	Groundnut				Other Oil Seeds			
	Triennium ending 1980-81	1981-82	1982-83	1983-84	Triennium ending 1980-81	1981-82	1982-83	1983-84
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Eastern Region								
West Bengal	583	1000	310	310	439	505	480	521
Orissa	1111	1352	1317	1358	396	474	483	470
Bihar	919	679	647	985	405	468	479	489
East U.P.	538	971	N.A.	N.A.	264	342	N.A.	N.A.
Western Region								
Gujarat	850	996	638	886	664	679	954	1105
Madhya Pradesh	555	755	513	716	329	396	367	467
Maharashtra	703	843	769	1028	307	435	398	434
Rajasthan	444	669	572	948	327	462	452	588
Southern Region								
Andhra Pradesh	800	990	753	1041	167	212	224	207
Karnataka	668	755	652	886	367	397	383	385
Tamil Nadu	1036	1222	936	1011	348	333	333	369
Northern Region								
Punjab	987	978	808	724	589	611	697	782
ALL INDIA	794	972	732	953	364	428	447	500

Statement 20: Yield of Sugarcane and Potato

(Kg/ha)

States	Sugarcane (Gur)				States	Potato			
	Triennium ending 1980-81	1981-82	1982-83	1983-84		Triennium ending 1980-81	1981-82	1982-83	1983-84
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Eastern Region					**Eastern Region**				
West Bengal	5600	6134	5143	5037	West Bengal	16695	16496	20015	20988
Orissa	6155	6440	6190	6766	Orissa	6815	6989	7024	8505
Bihar	3033	3382	3423	3044	Bihar	8022	9376	9336	9336
East U.P.	3645	4478	N.A.	N.A.	East U.P.	13625	14923	N.A.	N.A.
Western Region					**Western Region**				
Gujarat	5753	5958	7033	7550	Gujarat	24765	22358	25342	28255
Madhya Pradesh	2609	2839	2874	3180	Madhya Pradesh	12441	11028	11205	11852
Maharashtra	9131	9687	9626	9030	**Southern Region**				
Southern Region					Karnataka	8392	6950	7204	7113
Andhra Pradesh	7087	8326	7429	6880	Tamil Nadu	7670	12109	7484	8073
Karnataka	7422	8150	7972	7317	**Northern Region**				
Tamil Nadu	10147	10039	8716	9225	Haryana	16837	15628	15000	17776
Northern Region					Punjab	16930	18856	18540	19588
Haryana	3590	3973	3742	4425	**North Eastern Region**				
Punjab	5461	5774	6096	6191	Assam	5396	6934	6120	6122
All India	5197	5836	5644	5590	Meghalaya	7047	7279	7989	7811
					All India	12661	12996	13549	15206

Statement 21 : Average Yields in National Demonstrations and State Averages Under Irrigated Conditions.

(Yield in Quintal/Hectare)

States	Paddy 1978-79 Average yield			Wheat 1978-79 Average yield			Maize 1978-79 Average yield			Bajra 1978-79 Average yield		
	National Demonstration	State	Ratio	National Demonstration	State	Ratio	National Demonstration	State	Ratio	National Demonstration		Ratio
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Eastern Region												
1. West Bengal	28.40 (9)	—	—	30.09 (10)	15.24	1.97	—	—	—	—	—	—
2. Orissa	56.95 (43)	17.17	3.32	—	—	—	—	—	—	—	—	—
3. Bihar	54.48 (57)	15.55	3.50	47.58 (49)	11.98	3.97	58.00£ (15)	22.02£	2.63	—	—	—
4. Uttar Pradesh	52.89 (88)	23.97	2.20	46.49 (116)	16.81	2.76	—	—	—	32.00 (2)	—	—
Western Region												
5. Maharashtra	50.40 (71)	23.82	2.12	29.76 (97)	11.57	2.57	—	—	—	—	—	—
6. Gujarat	75.48 (9)	25.62	2.94	36.86 (16)	23.42	1.57	—	—	—	25.65 (14)	8.40	3.05

Statement 21. (Concld.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
7. Madhya Pradesh	42.54 (48)	15.58	2.73	37.53 (35)	14.77	2.54	—	—	—	—	—	—
8. Rajasthan	—	—	—	48.01 (64)	15.44	3.11	32.86 (15)	13.48	2.43	25.66 (29)	—	—
Southern Region												
9. Andhra Pradesh	60.00 (90)	30.30	2.00	—	—	—	41.50 (1)	17.50	2.37	—	—	—
10. Tamil Nadu	54.46 (26)	31.09	1.75	—	—	—	—	—	—	29.12 (3)	21.94	1.32
11. Karnataka	51.63 (44)	35.84	1.44	—	—	—	52.50 (10)	30.07	1.74	—	—	—
12. Kerala	45.88 (23)	24.22	1.89	—	—	—	—	—	—	—	—	—
Northern Region												
13. Punjab	66.37 (49)	44.88	1.48	41.99 (49)	28.21	1.49	17.91 (3)	16.62	1.08	—	—	—
14. Haryana	—	—	—	49.39 (48)	24.21	2.04	—	—	—	20.27 (24)	8.58	2.36

£ These yield figures are for Rabi and Maize.

Source : Agricultural Situation in India Feb. 1983 P. 693-698.

Note : The figures in brackets indicate the number of demonstrations conducted.

Statement 22: Livestock Census 1961, 1966, 1972 & 1977

('000)

State	Year	Cattle over 3 years		Buffaloes over 3 years		Sheep	Goats	Others	Total live-stock	Poultry
		Total Males	Breed-ing Cows	Total Males	Breed-ing Cows					
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
West Bengal	1961	4,583	3,776	526	263	535	4.513	25	17,670	11,771
	1966	4,909	4,083	532	277	640	4,835	27	19,266	12,818
	1972	4,739	3,643	522	189	793	5,211	15	19,085	15,492
	1977	4,739	3,643	522	189	793	5,211	15	19,085	15,492
Orissa	1961	4,341	2,789	546	253	994	2,381	58	14,528	6,548
	1966	4,397	3,159	598	338	1,182	3,081	67	16.422	7,698
	1972	4,664	3,781	630	387	1,369	2,884	29	17.538	8,452
	1977	4,869	4,064	594	415	1,432	3,417	4	18.627	9,490
Bihar	1961	7,098	3.978	682	1,553	1,156	8.641	133	30,580	12,248
	1966	6,931	3,814	732	1,574	1,247	7.801	116	28,655	10,849
	1972	7,295	3,851	718	1,817	983	7,364	99	27.946	12,560
	1977	7,135	3,933	779	1,999	1,121	9.661	92	31,285	14,311
East Uttar @ Pradesh	1961	5,677	2,591	137	1,549	1,044	3,422	4,143	18,563	1,493
	1966	5,784	2,622	147	1,565	1,020	3.161	3,812	18,111	2,022
	1972	6,054	2,616	169	1,740	887	2,501	3,870	17.837	1,776
	1977	6,324	2,618	196	1,949	912	3,326	4.087	19,412	2,816

@ Data for East Uttar Pradesh is collected from the Memoranda supplied by Agricultural Dept. Govt. of U.P.
Source: Indian Agriculture in Brief Directorate of Eco. & Stat., Dept. of Agriculture & Co-op. Ministry of Agriculture, New Delhi.

Statement 23: Production of Silk

(Tonnes)

Year	West Bengal			Orissa			Bihar			Uttar Pradesh		
	Mulberry	Non-mulberry	Total	Mulberry	Non-mulberry	Total	Mulberry	Non-mulberry*	Total	Mulberry	Non-mulberry	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1971	263	13	276	—	16	16	—	187	187	4	—	4
1975	332	28	360	—	18	18	—	253	253	5	—	5
1976	388	28	416	—	22	22	1	247	248	6	—	6
1977	450	15	465	—	22	22	1	339£	340	6	—	6
1978	460	15	475	—	24	24	—	279	279	5	—	5
1979	508	16	524	—	10	10	1	280	281	9	—	9
1980	355	16	371	—	2	2	1	215	216	5	—	5
1981	600	19	619	—	2	2	7	230	237	5	—	5

* Includes Spun Silk Yarn

£ Estimates

Source: Indian Agriculture in brief published by Directorate of Economics & Statistics, Department of Agriculture and Co-operation, Ministry of Agriculture.

Statement 24: Outturn and Value of Forest Produce

Quantity — '000 cubic metres
Value — Rs. '000

Year	Timber*		Fuel wood**		Total	
	Quantity	Value	Quantity	Value	Quantity	Value
(1)	(2)	(3)	(4)	(5)	(6)	(7)
West Bengal						
1960-61	180	8,762	577	4,609	757	13,371
1970-71	266	15,146	197	2,034	463	17,180
1978-79	261	54,900	530	18,200	791	73,100
Orissa						
1960-61	408	13,824	521	2,958	929	16,782
1970-71	1,681	22,814	1,436	4,703	3,117	27,517
1978-79	453	122,263	679	30,804	1,132	155,067
Bihar						
1960-61	271	7,765	234	6,690	505	14,455
1970-71	407	18,555	351	7,725	758	26,280
1978-79	464	65,292	327	25037	791	90,329
Uttar Pradesh						
1960-61	527	50,499	2,119	11,994	2,646	68,493
1970-71	991	130,768	2,478	14,883	3,469	145,651
1978-79	1,150	361,946	2,355	14,241	3,505	376,187

* Includes Timber, Roundwood and Pulpwood, etc.

** Includes Firewood and charcoal wood.

Source: Indian Agriculture in Brief Published by Directorate of Economics and Statistics, Department of Agriculture and Co-operation, Ministry of Agriculture.

Statement 25: Institutional Credit for Agriculture

(Rs lakhs)

State	Type of credit	Credit disbursed during						
		1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
West Bengal	**Short-term**							
	Co-operatives	2066	3286	3286	4935	5162	3818	3857
	Commercial banks	350	494	502	1516	1727	1218	1755
	TOTAL	2416	3780	3788	6451	6889	5036	5612
	Term loans							
	Co-operatives	166	599	902	1259	2442	1126	907
	Commercial banks	256	535	629	1169	1384	930	1345
	TOTAL	422	1134	1531	2428	3826	2056	2252
	Grand Total	2838	4914	5319	8879	10715	7092	7864
Orissa	**Short-term**							
	Co-operatives	1440	1682	2169	2449	3148	4106	5458
	Commercial banks	207	347	516	676	848	995	3122
	TOTAL	1647	2029	2685	3125	3996	5101	8580

Statement 25 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Term loans							
	Co-operatives	794	688	1688	1218	1752	3334	2250
	Commercial banks	133	213	375	580	1044	756	3933
	TOTAL	927	901	2063	1798	2796	4090	6183
	Grand total	2574	2930	4748	4923	6792	9191	14763
Bihar	**Short-term**							
	Co-operatives	1299	1800	1785	1785*	2096	2096†	1459
	Commercial banks	121	426	540	606	487	549	567
	TOTAL	1420	2226	2325	2391	2583	2645	2026
	Term loans							
	Co-operatives	1484	2022	2020	860	913	1245	1626
	Commercial banks	376	525	1370	1192	1888	1953	1470
	TOTAL	1860	2547	3390	2052	2801	3198	3096
	Grand Total	3280	4773	5715	4443	5384	5843	5122

Statement 25 (concld.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Uttar Pradesh	**Short-term**							
	Co-operatives	7103	9135	12390	14272	15739	14758	16261
	Commercial banks	605	994	1459	1332	1918	1986	3524
	TOTAL	7708	10129	13849	15604	17657	16744	19785
	Term loan							
	Co-operatives	3420	3417	5110	6636	6611	12860	7892
	Commercial banks	1647	1980	2866	3778	5540	6233	8399
	TOTAL	5067	5397	7976	10414	12151	19093	16291
	GRAND TOTAL	12775	15526	21825	26018	29808	35837	36076

* 1976-77 repeated.
† 1979-80 repeated.

Statement 26: Co-operative Banks and Primary Societies — Number and Membership in Eastern Region

(As at the end of June)

	State Co-operative Banks	District Central Co-operative Banks	Central Land Development Banks	Primary Land Development Banks	Primary Agricultural Credit Societies	Membership of Primary Land Development Banks (in '000s)	Membership of Primary Agricultural Credit Societies (in '000s)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
West Bengal							
1971	1 (3)	21 (82)	1 (3)	21 (21)	11329	33	1034
1977	1 (29)	17 (145)	1 (3)	24 (38)	9247	70	1514
1978	1 (29)	17 (163)	1 (2)	24 (40)	7948	88	1983
1979	1 (29)	17 (171)	1 (2)	24 (49)	7739	112	2221
1980	1 (30)	17 (179)	1 (3)	24 (49)	7589	130	2291
Orissa							
1771	1 (2)	17 (92)	1 (3)	54 (54)	3759	175	1410
1977	1 (2)	17 (112)	1 (10)	55 (55)	3355	344	2190
1978	1 (2)	17 (120)	1 (9)	55 (55)	3151	348	2192
1979	1 (2)	17 (140)	1 (10)	55 (55)	3010	411	2200
1980	1 (2)	17 (171)	1 (11)	54 (54)	2793	454	2251

Statement 26. (Concld.)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Bihar							
1971	1 (9)	28 (132)	1 (58)	—	17171	—	2750
1977	1 (9)	28 (207)	1 (130)	—	16500	—	2740
1978	1 (10)	28 (209)	1 (129)	—	16500	—	2740
1979	1 (10)	28 (226)	1 (130)	—	6605	—	4600
1980	1 (10)	28 (241)	1 (130)	—	6605	—	4600
Uttar Pradesh							
1971	1 (12)	56 (306)	1 (186)	4 (4)	25922	1	5527
1977	1 (17)	56 (771)	1 (216)	4 (4)	9257	1	7253
1978	1 (19)	56 (868)	1 (222)	—	8701	—	7631
1979	1 (19)	56 (953)	1 (228)	—	8654	—	7948
1980	1 (20)	56 (1019)	1 (248)	—	8611	—	8221
All-India							
1971	25 (185)	341 (3775)	19 (537)	865 (865)	160780	3537	30963
1977	26 (325)	344 (5898)	19 (1008)	892 (1296)	123356	5152	44832
1978	26 (351)	338 (6321)	19 (1018)	889 (1248)	116125	5554	47860
1979	27 (384)	338 (6890)	19 (1048)	890 (1274)	95782	5554@	52569
1980	27 (408)	337 (7275)	19 (1010)	896 (1293)	94592	6205	54836

@ Figures relate for 1978.
Figures in brackets represent number of branches inclusive of Head Office.

Statement 27: Progress of Primary Agricultural Credit Societies — West Bengal

Particulars	1960-61	1970-71	1977-78	1978-79	1979-80
1. Number of Societies	12575	11329	7918	7739	7492
2. Number of villages covered	21945	30195	35559	35702	28074
3. Percentage of dormant societies to total societies	26.1	N.A.	13.6	16.5	11.5
4. Membership ('000s)	629	1034	1983	2221	2182
Of which SC/ST member ('000s)	N.A.	N.A.	571	662	758
5. Percentage of borrowing members to total membership	39.6	26.1	26.2	49.4	41.7
6. Owned funds (Rs. lakhs)	138	465	1373	1726	1943
7. Deposits (Rs. lakhs)	24	70	181	240	221
8. **Loans Issued**					
(i) Short-term (Rs. lakhs)	N.A.	541	4934	5162	3818
(ii) Medium-term (Rs. lakhs)	N.A.	19	227	1236	344
(iii) Total loans issued (Rs. lakhs)	327	560	5161	6398	4162
9. **Loans outstanding** (Rs. lakhs)	378	1763	7472	9557	10116
10. Percentage of over-dues to demand	N.A.	72	47	49	61
11. Loans advanced per borrowing members (Rs.)	131	207	100	583	457
12. **Average per Society**					
(i) Membership	50	91	250	287	291
(ii) Share capital (Rs.)	732	3239	14894	18534	20801
(iii) Deposits (Rs.)	191	615	2286	3101	2950
(iv) Loans Advanced (Rs.)	3006	4939	65181	82671	55553

Source: Statistical Statements Relating to the Co-operative Movement in India, RBI/NABARD.

Statement 28: Progress of Primary Agricultural Credit Societies — Orissa

Particulars	1960-61	1970-71	1977-78	1978-79	1979-80
1. Number of Societies	6630	3759	3151	3010	2793
2. Number of villages covered	23586	46466	46466	46466	46466
3. Percentage of dormant Societies to total societies	29.2	24.7	1.3	1.4	2.3
4. Membership ('000s)	409	1410	2192	2200	2251
Of which SC/ST members ('000s)	N.A.	N.A.	878	906	1307
5. Percentage of borrowing members to total membership	40.1	22.1	21.8	29.2	36.7
6. Owned funds (Rs. lakhs)	122	746	1827	1957	2237
7. Deposits (Rs. lakhs)	13	149	190	202	208
8. **Loans issued**					
(i) Short-term (Rs. lakhs)	N.A.	780	2449	3148	4105
(ii) Medium-term (Rs. lakhs)	N.A.	93	595	957	2164
(iii) Total loans issued (Rs. lakhs)	256	873	3044	4107	6269
9. Loans outstanding (Rs. lakhs)	411	2107	5258	6725	9112
10. Percentage of over-dues to demand	N.A.	61	49	38	41
11. Loans advanced per borrowing member (Rs.)	156	280	637	872	759
12. **Average per society**					
(i) Membership	61	375	696	731	806
(ii) Share Capital (Rs.)	1506	14233	13989	49036	61292
(iii) Deposits (Rs.)	196	3964	6030	6711	7447
(iv) Loans Advanced (Rs.)	3861	23224	96604	136445	224453

Source: Statistical Statements Relating to the Co-operative Movement in India, RBI/NABARD.

Statement 29: Progress of Primary Agricultural Credit Societies — Bihar

Particulars	1960-61	1970-71	1977-78@	1978-79	1979-80*
1. Number of Socieies	17086	17171	16500	6605	6605
2. Number of villages covered	38822	64954	66719	67602	67602
3. Percentage of dormant societies to total societies	22.1	7.3	7.3	N.A.	N.A.
4. Membership ('000s)	961	2750	2740	4600	4600
Of which SC/ST members ('000s)	N.A.	N.A.	449	779	779
5. Percentage of borrowing members to total membership	25.9	33.1	26.2	36.1	34.5
6. Owned Funds (Rs. lakhs)	120	578	880	1161	1161
7. Deposits (Rs. lakhs)	56	298	43	239	239
8. **Loans issued**					
(i) Short-term (Rs. lakhs)	N.A.	1152	1785	2096	2096
(ii) Medium-term (Rs. lakhs)	N.A.	94	147	389	389
(iii) Total loans issued (Rs. lakhs)	184	1246	1932	2485	2485
9. **Loans outstanding** (Rs. lakhs)	255	1992	3648	5345	5345
10. Percentage of over-dues to demand	N.A.	56	69	63	63
11. Loans advanced per borrowing member (Rs.)	74	137	269	150	150
12. **Average per Society**					
(i) Membership	56	160	166	696	696
(ii) Share capital (Rs.)	592	2912	1964	16033	16033
(iii) Deposits (Rs.)	328	1735	261	3618	3618
(iv) Loans Advanced (Rs.)	1077	7256	1171	37613	37613

@ Data relate to 1976-77.

* Data relate to 1978-79.

Source: Statistical Statements Relating to the Co-operative Movement in India, RBI/NABARD.

Statement 30: Progress of Primary Agricultural Credit Societies — Uttar Pradesh

Particulars	1960-61	1970-71	1977-78	1978-79	1979-80
1. Number of Societies	55130	25922	8701	8654	8611
2. Number of villages covered	104390	112624	112561	112561	112561
3. Percentage of dorment societies to total societies	4.7	10.5	6.2	4.0	4.4
4. Membership ('000s)	3340	5527	7631	7948	8221
Of which SC/ST membership ('000s)	N.A.	N.A.	1433	1495	2192
5. Percentage of borrowing members to total membership	39.6	24.6	37.6	40.8	42.3
6. Owned funds (Rs. lakhs)	1097	2772	5817	6426	7089
7. Deposits (Rs. lakhs)	121	504	1098	1426	1259
8. **Loans issued**					
(i) Short-term (Rs. lakhs)	N.A.	4836	14272	15739	14758
(ii) Medium-term (Rs. lakhs)	N.A.	298	1525	2235	7031
(iii) Total loans issued (Rs. lakhs)	3098	5134	15797	17974	21789
9. **Loans outstanding** (Rs. lakhs)	2574	8556	19193	22071	24935
10. Percentage of over-dues to demand	N.A.	49	42	40	43
11. Loans advanced per borrowing member (Rs.)	396	380	550	555	544
12. **Average per society**					
(i) Membership	61	213	877	918	955
(ii) Share Capital (Rs.)	851	8460	9443	62214	69330
(iii) Deposits (Rs.)	219	1944	12619	16498	21705
(iv) Loans Advanced (Rs.)	5619	19806	181554	207696	219858

Source: Statistical Statements Relating to the Co-operative Movement in India, RBI/NABARD.

Statement 31 : Brief Particulars of Primary Agricultural Credit Societies in Eastern India

Year	Total PACS	Of which viable	No. of PACS working at profit	No. of PACS working at loss	No. of PACS without loss or profit	No. of PACS having fulltime Secere-tary
(1)	(2)	(3)	(4)	(5)	(6)	(7)
West Bengal						
1960-61	12575	5430	6966	2833	2776	N.A.
1970-71	11329	7501	5615	3756	1958	106
1977-78	7918	5613	4606	2232	1080	5474
1978-79	7739	6207	3989	2443	1307	5241
1979-80	7589	6233	3640	3019	930	5615
1980-81	7589	6233	3640	3019	930	5615
Orissa						
1960-61	6630	3681	4115	2010	505	N.A.
1970-71	3759	2832	2593	1028	138	2778
1977-78	3151	1778	2146	963	42	2967
1978-79	3010	2174	2024	962	24	2867
1979-80	2793	2494	1803	925	65	2758
1980-81	2793	2322	1986	793	14	2763
Bihar						
1960-61	17086	11043	8034	6597	2455	N.A.
1970-71	17171	15919	13415	1805	1951	2250
1977-78	16500	15291	5141	9558	1801	2264
1978-79	6605	588	4111	2372	122	3453
1979-80	6605	588	4111	2372	122	3453
1980-81	6757	504	3391	3134	232	3720
Uttar Pradesh						
1960-61	55130	46274	41929	4367	8834	N.A.
1970-71	25922	23195	20984	2201	2737	2910
1977-78	8701	6146	6495	1568	638	7703
1978-79	8654	6411	6040	1888	726	7822
1979-80	8611	6467	5797	2040	774	7963
1980-81	8618	6866	5856	1832	930	7901
All India						
1960-61	212129	171124	146433	42735	22908	N.A.
1970-71	160780	140546	107099	41122	12559	53429
1977-78	116125	49453	60292	46621	8936	61585
1978-79	95782	53582	52634	36712	6436	63786
1979-80	94592	56393	50331	36125	7422	66490
1980-81	94866	58464	52188	36636	6042	67017

Source : RBI and NABARD. N.A. Not Available.

Statement 32: Classification of loans issued by PACS (ST and MT) according to size of ownership holding — West Bengal

(Number in '000s and amount in Rs. lakhs)

Size of holding	1977-78		1978-79		1979-80	
	No.	Amt.	No.	Amt.	No.	Amt.
1. **Land holders**						
(i) 1 ha and less	414	1350	399	1443	327	983
(ii) Between 1 and 2 ha	403	2061	390	2178	328	1654
(iii) Between 2 and 4 ha	120	1171	155	1655	151	930
(iv) Between 4 and 8 ha	22	295	53	775	28	279
(v) Above 8 ha	5	195	12	245	12	186
TOTAL	964	5072	1009	6296	846	4032
2. Tenant Cultivators	56	55	55	63	42	88
3. Agricultural labourers	33	33	33	38	22	42
4. Others	1	1	1	1	—	—
TOTAL	90	89	89	102	64	130
5. Grand Total	1054	5161	1098	6398	910	4162

Statement 33: Classification of loans issued by PACS (ST and MT) according to size of ownership holding — Orissa

(Number in '000s and amount in Rs. lakhs)

Size of holding	1977-78		1978-79		1979-80	
	No.	Amt.	No.	Amt.	No.	Amt.
1. **Land Holders**						
(i) 1 ha and less	142	694	187	708	280	1512
(ii) Between 1 and 2 ha	155	922	221	1435	221	1493
(iii) Between 2 and 4 ha	110	755	124	884	174	1515
(iv) Between 4 and 8 ha	53	460	85	696	119	894
(v) Above 8 ha	16	213	23	367	31	846
TOTAL	476	3044	640	4090	825	6260
2. Tenant cultivators	—	49	1	6	1	0.5
3. Agricultural Labourers	—	90	2	6	—	3
4. Others	—	—	1	4	—	7
TOTAL	—	139	4	16	1	10
5. Grand Total	476	3183	644	4106	826	6270

Statement 34 : Classification of loans issued by PACS (ST and MT) according to size of ownership holding — Bihar

(Number in '000 and amount in Rs. lakhs)

Size of holding	1977-78		1978-79		1979-80@	
	No.	Amt.	No.	Amt.	No.	Amt.
1. **Land Holders**						
(i) 1 ha and less	—	650	249	172		
(ii) Between 1 and 2 ha	—	406	482	390		
(iii) Between 2 and 4 ha	—	298	465	852		
(iv) Between 4 and 8 ha	—	292	282	633		
(v) Above 8 ha	—	8	184	438		
TOTAL	—	1654	1662	2485		
2. Tenant cultivators	—	118	—	—		
3. Agricultural Labourers	—	104	—	—		
4. Others	—	56	—	—		
TOTAL	—	278	—	—		
5. Grand Total	—	1932	1662	2485		

@ 1978-79 figures are repeated in 1979-80.

Statement 35 : Classification of loans issued by PACS (ST and MT) according to size of ownership holding — Uttar Pradesh

(Number in '000s and amount in Rs. lakhs)

Size of holding	1977-78		1978-79		1979-80	
	No.	Amt.	No.	Amt.	No.	Amt.
1. **Land Holders**						
(i) 1 ha and less	904	3295	1128	3637	1265	5103
(ii) Between 1 and 2 ha	830	4200	940	4456	850	6065
(iii) Between 2 and 4 ha	615	4190	434	4679	678	4702
(iv) Between 4 and 8 ha	373	2836	333	3002	443	3879
(v) Above 8 ha	112	1140	104	1117	151	1599
TOTAL	2834	15661	2939	16891	3387	21348
2. Tenant cultivators	12	50	51	203	11	54
3. Agricultural labourers	16	59	92	125	13	62
4. Others	10	28	157	755	68	325
TOTAL	38	137	300	1083	92	440
5. Grand Total	2872	15798	3239	17974	3479	21788

Statement 36: Overdues of State Co-operative Banks, Central Co-operative Banks and Primary Agricultural Credit Societies

	1980-81		1981-82		1982-83	
	Over-dues (Rs. lakhs)	Per-cent-age of over-dues to de-mand	Over-dues (Rs. lakhs)	Per-cent-age of over-dues to de-mand	Over-dues (Rs. lakhs)	Per-cent-age of over-dues to de-mand
1. **State Co-operative Banks**						
West Bengal	2483	38.4	2117	21.6	3398	51.7
Orissa	2	—	2	—	2	—
Bihar	2150	51.6	2176	48.3	3286	51.4
Uttar Pradesh	895	6.1	2173	41.4	1413	6.6
ALL INDIA	16178	9.8	17498	10.0	18285	8.2
2. **District Central Co-operative Banks**						
West Bengal	4135	40.1	4492	45.4	5475	64.0
Orissa	2247	29.8	2609	29.1	4181	30.6
Bihar	4155	62.3	4642	67.4	5417	80.3
Uttar Pradesh	13552	40.2	16208	41.7	19389	49.7
ALL INDIA	93969	37.0	108294	35.3	123232	38.5
3. **Primary Agricultural Credit Societies**						
West Bengal	5707	61.3	5239	53.1	6968	69.0
Orissa	3193	39.9	3906	43.0	4613	41.3
Bihar	3241	45.5	4992	66.4	5864	74.8
Uttar Pradesh	14363	47.0	15861	45.7	20158	50.4
ALL INDIA	109911	41.4	121190	43.0	131823	40.9

Source : NABARD.

Statement 37: Classification of loans advanced by LDBs and PLDBs according to size of land holding

(Rs. lakhs)

	Upto 1 hectare		1-2 hectares		2-4 hectares		4-8 hectares		Above 8 hectares		Total	
	No.	Amt.	No.	Amt.	No.	Amt.	No.	Amt.	No.	Amt.	No.	Amt.
West Bengal												
1977-78	9,576	357	6,381	282	5,663	280	395	28	138	13	22,153	960
1978-79	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	24,650	1,127
1979-80	8,290	298	7,196	297	1,559	96	611	45	133	8	17,786	743
Bihar												
1977-78	2,652	80	3,549	166	4,132	162	2,413	103	565	201	13,311	713
1978-79	1,875	55	2,352	142	3,065	128	1,623	62	279	136	9,194	524
1979-80	1,632	46	3,708	190	5,687	379	2,895	102	290	139	14,212	859
Uttar Pradesh												
1977-78	28,156	1,159	30,265	1,500	20,289	1090	7,362	750	913	162	86,985	4,661
1978-79	27,031	1,100	23,612	1,207	12,611	734	4,893	440	609	74	68,756	3,556
1979-80	36,796	1,485	38,583	1,938	23,110	1,205	4,685	302	1,277	899	1,04,451	5,829
All India												
1977-78	90,248	2,921	80,597	3,765	72,206	3,859	35,974	2,456	91,402	4,933	5,03,517	23,790
1978-79	35,512	1,258	36,009	1,764	22,667	1,217	11,078	821	5,231	1,463	4,49,230	24,057
1979-80	1,01,049	3,679	1,23,318	5,287	96,638	4,507	46,902	2,479	16,329	3,912	5,69,225	31,882

Note: Size-wise classification of loans advanced in Orissa is not available.
Source: Statistical Statements, RBI.

Statement 38: Recovery Performance of LDBs and PLDBs/branches of LDBs

(Rs. lakhs)

	1980-81				1981-82				1982-83			
	Demand	Collection	Balance	Percentage of overdues to demand	Demand	Collection	Balance	Percentage of overdues to demand	Demand	Collection	Balance	Percentage of overdues to demand
I. **At LDB level**												
West-Bengal	1187	557	630	53.1	1600	545	1055	65.9	1639	632	1007	61.4
Orissa	1019	664	355	34.8	1376	635	741	53.9	1758	632	1126	64.1
Bihar	3885	3159	726	18.7	3187	1747	1440	45.2	4161	1707	2454	59.0
Uttar Pradesh	8831	6204	2627	29.7	9914	6550	3364	33.9	10103	6681	3422	33.9
ALL INDIA	55096	32391	22705	41.2	56637	36577	20060	35.4	60464	36467	23997	39.7
II. **At PLDB/branch of LDB level**												
West-Bengal*	1427	589	838	58.7	1874	630	1244	66.4	1965	810	1155	58.7
Orissa*	1212	734	478	39.4	1438	728	710	49.4	1713	705	1008	58.8
Bihar@	3831	3105	726	18.9	3136	1696	1440	45.9	4114	1660	2454	59.6
Uttar Pradesh@	8384	5767	2617	31.2	9205	5851	3354	36.4	9439	6026	3413	36.2
ALL INDIA	55823	31149	24674	44.2	57408	35225	22183	38.6	62926	35952	26974	42.9

* PLDBs. @ Branches of LDB.

Note: Figures under demand adjusted for rephasements and collections include Government contributions towards interest subsidy and shortfall in Blocked Accounts.

Source: NABARD.

Statement 39: Distribution of Commercial Bank Offices

State	Year	Population Group-wise Bank Offices				Population per Bank Office	Rural population per Rural Bank office
		Rural	Semi-urban	Urban & Metro-politan	Total		
West Bengal	June 1975	239	268	586	1,093	40,541	1,39,518
	„ 1981	834	461	972	2,267	24.076	48,122
	„ 1982	1,019	497	949	2,465	22,142	39,385
	„ 1983	1,085	538	1,002	2,625	20,793	36,990
Orissa	June 1975	137	96	67	300	73,150	1,46,708
	„ 1981	670	183	122	975	27,046	34,716
	„ 1982	902	190	129	1,228	21,473	25,787
	„ 1983	968	215	139	1.322	19,947	24,029
Bihar	June 1975	332	293	166	791	71,242	1,52,771
	„ 1981	1,604	538	316	2,458	28,444	38,152
	„ 1982	1,971	530	306	2,807	24.907	31,048
	„ 1983	2,119	589	331	3,039	23,006	28,880
Uttar Pradesh	June 1975	756	530	593	1,879	47,014	1,00,465
	„ 1981	2,252	838	1,050	4,140	26,778	40,392
	„ 1982	2,812	850	1,085	4,747	23,354	32,348
	„ 1983	3,321	920	1,138	5,379	20,610	27,390
ALL-INDIA	June 1975	6,616	5,643	6,316	18,575	29,510	66.364
	„ 1981	17,306	8,841	9,891	36,038	19,012	30,362
	„ 1982	20,394	8,764	10,019	39,177	17,489	25,765
	„ 1983	21,857	9,800	10,499	42,156	16,254	24,041

Source: Basic Statistical Returns, RBI.

Statement 40: Loans Disbursed by Scheduled Commercial Banks — Direct Finance

(Rs. lakhs)

State	Category	During						
		1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81
West Bengal	Short-term	350	494	502	1516	1727	1218	1755
	Term loans	256	535	629	1169	1384	930	1345
	TOTAL	606	1029	1131	2685	3111	2148	3100
Orissa	Short-term	207	347	516	676	848	995	3122
	Term loans	133	213	375	580	1044	756	3933
	TOTAL	340	560	891	1256	1892	1751	7055
Bihar	Short-term	121	426	540	606	487	549	567
	Term loans	376	525	1370	1192	1888	1953	1470
	TOTAL	497	951	1910	1798	2375	2502	2037
Uttar Pradesh	Short-term	605	994	1459	1332	1918	1986	3524
	Term loans	1647	1980	2866	3778	5540	6233	8399
	TOTAL	2252	2974	4325	5110	7458	8219	11923
Percentage Share of Four Eastern States in All India Total	Short-term	8.8	10.6	11.9	14.3	13.6	10.5	17.4
	Term loans	26.1	25.3	27.9	33.1	32.4	27.3	30.5
	TOTAL	15.5	16.2	18.7	22.1	22.2	17.9	23.8

Source : Reserve Bank of India.

Statement 41 : Scheduled Commercial Banks' Direct Finance (ST and Term Loans) to Farmers According to Size of Land holding (1979-80 and 1980-81, April-March)

(Rs. lakhs)

State	Upto 1 ha				Above 1 to 2 ha			
	Short-term loan		Term loan		Short-term loan		Term loan	
	No. of accounts	Amount	No. of accounts	Amount	No. of accounts	Amount	No. of accounts	Amount
West Bengal								
1979-80	69851	595	11844	144	31644	355	7785	224
1980-81	57949	1281	9891	175	20351	302	5916	290
Orissa								
1979-80	28002	501	8514	158	15220	329	4419	105
1980-81	80569	1175	23588	949	47662	822	12523	543
Bihar								
1979-80	29359	145	19795	409	16762	182	17103	469
1980-81	22390	178	17512	438	15991	199	10255	381
U.P.								
1979-80	67511	378	20250	718	60696	512	20369	1073
1980-81	79160	654	27862	977	53274	709	24673	1292
ALL-INDIA								
1979-80	1327538	15329	159978	4073	576702	10165	134592	4835
1980-81	1383355	18922	203513	6317	549409	10347	143226	6480

Statement 41 (concld.)

(Rs. lakhs)

State	Above 2 to 4 ha				Above 4 ha				Total			
	Short-term loan		Term loan		Short-term loan		Term loan		Short-term loan		Term loan	
	No. of accounts	Amt.	No. of accounts	Amt.	No. of accounts	Amt.	No. of accounts	Amt.	No. of accounts	Amt.	No. of accounts	Amt.
West Bengal												
1979-80	7879	104	2555	124	1910	104	1187	219	11284	1218	23371	712
1980-81	5238	110	1222	135	820	62	752	298	84358	1755	17781	898
Orissa												
1979-80	6067	108	1764	64	2229	56	655	39	51518	994	15352	367
1980-81	37282	587	9565	510	33986	537	8201	458	199499	3122	53877	2461
Bihar												
1979-80	8030	125	5606	219	3078	97	2885	856	57229	549	45389	1983
1980-81	7148	127	3819	196	2084	62	2114	456	47613	567	33700	1470
U.P.												
1979-80	34803	602	10005	870	23733	495	12629	3571	186743	1986	63253	6233
1980-81	32153	758	12945	986	20235	1404	14266	5144	184822	3524	79746	8399
ALL-INDIA												
1979-80	356182	9462	96974	6239	226750	10495	105022	20961	1182412	45451	496566	36108
1980-81	333416	9798	103482	7712	230341	12634	123012	29234	2496521	51702	573233	49745

Source : Reserve Bank of India.

Statement 42: Recovery Performance of Scheduled Commercial Banks — Direct Finance to Agriculture

(Percentage of Recoveries to Demand)

State	West Bengal	Orissa	Bihar	Uttar Pradesh	All-India
YEAR					
June 1977	40.1	41.2	40.6	56.4	50.0
June 1978	40.9	41.8	35.8	56.5	51.2
June 1979	39.8	45.5	31.7	57.1	53.1
June 1980	31.3	44.7	35.5	53.5	52.1
June 1981	30.3	34.9	37.8	54.9	52.9
June 1982	27.3	40.6	39.5	51.5	52.3

Source: Rural Planning and Credit Department, R.B.I.

Statement 43 : Progress of Regional Rural Banks

(As at the end of December)

State	1975			1980			1981			1982			1983		
	No. of RRBs	No. of Branches	No. of districts covered	No. of RRBs	No. of Branches	No. of districts covered	No. of RRBs	No. of Branches	No. of districts covered	No. of RRBs	No. of Branches	No. of districts covered	No. of RRBs	No. of Branches	No. of districts covered
West Bengal	1	4	3	7	182	14	7	295	14	8	405	16	8	460	15
Orissa	—	—	—	7	226	9	9	380	11	9	484	11	9	568	12
Bihar	1	2	2	14	622	22	17	996	27	17	1200	27	17	1298	27
Uttar Pradesh	2	4	3	22	516	25	27	837	30	29	1255	35	35	1697	43
All-India	6	13	11	85	3279	144	107	4795	182	124	6191	214	150	7795	265

Source : Reserve Bank of India.

Statement 44: Operations of Regional Rural Banks in Eastern India

(Rs. lakhs)

End December	No. of RRBs	No. of districts covered	No. of branches	Deposits	Outstanding Advances			Advances overdues	Percentage of overdues to outstanding loans
					Direct	Indirect	Total		
West Bengal									
1981	7	14	295	16,71	12,50	3,33	15.83	5,48	34.6
1982	8	16	405	23,93	22,14	3,76	25,90	8,34	32.2
1983	8	15	460	37,67	35,87	4,22	40,09	14,60	36.4
Orissa									
1981	9	11	380	25,96	35,56	2,57	38,13	9,48	24.9
1982	9	11	484	32,25	53,50	2,99	56,49	13,28	23.5
1983	9	12	568	38.31	71,96	3.76	75,72	21,24	28.0
Bihar									
1981	17	27	996	53,38	44,78	—	44,78	5,74	12.8
1982	17	27	1200	82,72	67,91	Neg.	67,91	13,76	20.3
1983	17	27	1298	110,73	94,67	8	94.75	18,45	19.5
Uttar Pradesh									
1981	27	30	837	85,66	59,00	1,08	60,08	7,66	12.7
1982	29	35	1255	138,14	104,06	1,24	105,30	21,15	20.1
1983	35	43	1697	186,29	135,90	1.50	137,40	30,59	22.3
ALL-INDIA									
1981	107	182	4795	336,00	385,25	21,34	406,59	68,11	16.8
1982	124	214	6191	502,26	551,70	25,40	577,10	128.07	22.2
1983	150	265	7795	677.85	722,42	28,42	750,84	191,72	25.5

Source : Reserve Bank of India.

Statement 45: Recovery Performance of Regional Rural Banks

(Rs. lakhs)

State	As on June 30, 1981			As on June 30, 1982			As on June 30, 1983		
	Loans outstanding	Overdues	Percentage of overdues to loans outstanding	Loans outstanding	Overdues	Percentage of overdues to loans outstanding	Loans outstanding	Overdues	Percentage of overdues to loans outstanding
West Bengal	1089	412	37.8	2029	671	33.1	3303	1199	36.3
Orissa	3129	735	23.5	4612	1127	24.4	6652	1832	27.5
Bihar	3037	303	10.0	5382	896	16.6	8048	1724	21.4
Uttar Pradesh	4112	624	15.2	7346	1234	16.8	11628	2129	18.3
ALL-INDIA	30244	5422	18.0	46257	8910	19.3	62358	15841	25.4

Source: National Bank for Agriculture and Rural Development.

Statement 46: RBI Credit to Co-operative Sector — Short-term Seasonal Agricultural Operations

(Rs. lakhs)

State	1979-80				1980-81				1981-82			
	Limit sanctioned	Drawals	Repayment	Outstanding (end June)	Limit sanctioned	Drawals	Repayment	Outstanding (end June)	Limit sanctioned	Drawals	Repayment	Outstanding (end June)
West Bengal	3860	3291	2679	2194	2970	1074	2289	979	3140	1788	1175	1593
Orissa	2735	4501	4029	1929	3560	5682	4613	2997	4330	5412	4855	3555
Bihar	1320	821	1498	443	1090	509	764	189	1490	1231	710	710
Uttar Pradesh	12745	13855	17335	1161	13205	14098	10500	4759	13755	14672	10741	8689
ALL-INDIA	78273	93517	100275	18452	79767	96769	86075	29146	89153	142245	118641	52750

Source: Reserve Bank of India.

Statement 47: Refinance Disbursed by NABARD — West Bengal

(Rs. lakhs)

	Purpose	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	Upto June 1983 (Cumulative)
A.	**Land based Investment**							
1.	Minor Irrigation	731	781	536	509	560	372	4247
2.	Land Development	—	—	—	—	—	—	—
3.	Farm Mechanisation	26	56	78	21	168	39	450
	TOTAL	757	837	614	530	728	411	4697
B.	**Others**							
1.	Plantation and Horticulture	62	145	270	216	246	206	1181
2.	Fisheries	—	3	13	42	76	44	199
3.	Animal Husbandry@	—	—	—	—	39	21	92
4.	IRDP	—	—	—	—	77	66	143
5.	Others	177	60	84	196	127	83	564
	TOTAL	239	208	367	454	565	420	2179
	TOTAL OF A + B	996	1045	981	984	1293	831	6876

@ Includes Dairy Development only.

Statement 48: Refinance Disbursed by NABARD — Orissa

(Rs. lakhs)

	Purpose	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	Upto June 1983 (Cumulative)
A.	**Land based Investments**							
1.	Minor Irrigation	693	682	1059	1185	1258	723	6487
2.	Land Development	6	6	3	36	19	9	125
3.	Farm Mechanisation	28	15	34	28	112	110	463
	TOTAL	727	703	1096	1249	1389	842	7075
B.	**Others**							
1.	Plantation and Horticulture	44	68	53	91	174	114	620
2.	Fisheries	19	63	91	220	269	121	796
3.	Animal Husbandry@	2	37	36	79	147	15	312
4.	IRDP	—	—	—	153	1445	1949	3547
5.	Others	—	4	37	187	306	351	522
	TOTAL	89	172	217	730	2341	2550	5797
	TOTAL OF A + B	816	875	1313	1979	3730	3392	12872

@ Includes Dairy Development only.

Statement 49: Refinance Disbursed by NABARD — Bihar

(Rs. lakhs)

	Purpose	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	Upto June 1983 (Cumulative)
A.	**Land based Investments**							
1.	Minor Irrigation	958	1190	1677	1782	1703	1391	12686
2.	Land Development	—	—	—	51	64	28	227
3.	Farm Mechanisation	201	368	491	403	496	185	2537
	TOTAL	1159	1558	2168	2236	2263	1604	15450
B.	**Others**							
1.	Plantation and Horticulture	—	—	—	—	40	2	48
2.	Fisheries	—	—	—	—	14	1	15
3.	Animal Husbandry@	—	—	—	35	67	55	192
4.	IRDP	—	—	—	33	1198	2848	4079
5.	Others	705	695	300	142	378	230	2845
	TOTAL	705	695	300	210	1697	3136	7179
	TOTAL OF A + B	1864	2253	2468	2446	3960	4740	22629

@ Includes Dairy Development only.

Statement 50: Refinance Disbursed by NABARD — Uttar Pradesh

(Rs. lakhs)

	Purpose	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	Upto June 1983 (Cumulative)
A.	**Land based Investment**							
1.	Minor Irrigation	2693	2758	3494	3915	4290	2922	29374
2.	Land Development	6	180	—	—	24	16	419
3.	Farm Mechanisation	829	1139	1822	1650	2196	1420	11229
	TOTAL	3528	4077	5316	5565	6510	4358	41022
B	**Others**							
1.	Plantation and Horticulture	—	—	—	—	20	4	85
2.	Fisheries	—	—	—	—	3	12	20
3.	Animal Husbandry@	—	—	—	—	87	43	511
4.	IRDP	—	—	48	85	861	4578	5512
5.	Others	789	800	296	1599	1523	1635	4390
	TOTAL	789	800	344	1684	2494	6272	10518
	TOTAL OF A + B	4317	4877	5660	7249	9004	10630	51540

@ Includes Dairy Development only.

Statement 51: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State: WEST BENGAL **Station:** DARJEELING (Observatory) **District:** DARJEELING

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	76	2.9	13.4	457.6	76	0.1	0.5	332.9
2	77	4.0	27.2	677.4	77	0.2	0.5	292.2
3	77	2.5	5.4	218.6	77	0.2	0.5	209.5
4	76	5.6	13.5	240.1	76	0.5	0.9	185.7
5	75	4.7	10.2	217.7	75	0.5	0.8	175.0
6	76	5.8	11.0	191.1	76	0.6	1.0	172.9
7	76	7.4	10.7	143.5	76	0.6	0.8	141.1
8	75	7.6	12.8	169.4	75	0.7	1.0	145.0
9	74	6.2	11.2	181.4	74	0.5	0.8	152.6
10	77	10.1	17.0	169.1	77	0.8	1.1	130.6
11	77	8.7	16.3	187.7	77	0.7	1.0	151.4
12	77	14.4	20.4	141.5	77	1.3	1.4	113.0
13	74	16.1	23.2	144.6	74	1.2	1.4	114.4
14	74	18.0	26.3	145.8	74	1.3	1.4	105.8
15	75	19.1	22.9	120.4	75	1.5	1.6	102.8
16	75	26.7	30.8	115.3	75	2.0	1.6	81.2
17	74	31.2	32.4	104.0	74	2.2	1.7	74.1
18	73	39.3	28.9	73.5	73	2.9	1.7	57.3
19	78	41.5	33.1	79.7	78	3.0	1.5	50.4
20	78	48.5	32.1	79.2	78	3.0	1.7	55.7
21	76	46.6	31.9	69.2	76	3.4	1.5	43.0
22	75	53.4	46.0	86.0	75	3.4	1.7	50.0
23	77	85.8	60.2	70.2	77	4.0	1.5	38.5
24	76	133.4	133.2	99.8	76	4.9	1.7	34.9

Statement 51 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	77	144.8	103.1	71.2	77	5.2	1.5	28.5
26	16	163.8	94.2	57.5	76	5.6	1.2	20.4
27	77	164.1	82.7	50.4	77	5.8	1.1	18.5
28	78	175.3	87.6	50.2	78	5.9	1.2	20.4
29	76	177.2	88.8	50.1	76	5.8	1.0	17.4
30	75	168.5	90.9	53.9	75	5.5	1.4	24.7
31	73	146.4	77.1	52.6	73	5.7	1.4	34.5
32	76	162.3	80.8	49.8	76	5.9	1.2	19.9
33	75	133.8	79.5	59.4	75	5.3	1.4	26.7
34	76	121.2	66.5	54.9	76	5.1	1.5	29.9
35	73	106.7	66.7	62.5	73	4.6	1.5	33.0
36	75	117.0	82.3	70.3	75	4.7	1.4	30.4
37	76	116.2	99.0	85.2	76	4.4	1.7	39.1
38	76	82.1	71.2	86.8	76	3.7	1.6	42.7
39	74	76.7	93.5	121.9	74	3.0	1.6	53.5
40	74	63.7	101.9	155.1	74	2.5	1.8	73.6
41	76	26.1	41.1	157.5	76	1.4	1.4	98.0
42	76	24.8	69.9	281.8	76	1.1	1.2	116.0
43	75	8.2	27.6	251.6	75	0.5	0.8	167.9
44	73	8.8	36.4	415.5	73	0.4	0.9	228.8
45	74	6.5	21.8	333.9	74	0.4	0.8	217.4
46	74	2.3	7.8	337.6	74	0.2	0.4	255.6
47	75	2.5	7.6	305.9	75	0.2	0.6	257.2
48	72	2.3	9.1	390.2	72	0.2	0.4	233.8
49	72	1.2	3.5	296.4	72	0.2	0.4	261.4
50	73	1.3	5.7	434.8	73	0.1	0.5	381.0
51	73	1.0	3.0	293.1	73	0.1	0.4	280.5
52	71	1.1	4.2	390.1	71	0.1	0.6	403.3

Note : Data Cover the Period 1901 to 1980.
Source : Assistant Director General of Meteorology, Pune.

Statement 52: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State: WEST BENGAL **Station:** JALPAIGURI (Observatory) **District:** JALPAIGURI

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	77	0.6	3.3	565.8	77	0.1	0.4	499.9
2	77	1.9	8.5	451.2	77	0.2	0.5	346.3
3	79	1.4	4.2	302.2	79	0.2	0.5	282.5
4	78	2.4	6.3	264.2	79	0.2	0.5	240.4
5	76	5.7	7.5	203.5	76	0.4	0.7	192.4
6	78	2.2	5.1	226.2	78	0.3	0.6	213.1
7	77	5.4	13.5	249.7	77	0.4	0.7	192.8
8	77	4.1	9.4	228.7	77	0.4	0.7	183.4
9	75	2.5	8.0	316.6	75	0.2	0.5	224.4
10	78	7.1	15.3	215.9	78	0.4	0.8	178.3
11	77	4.9	12.1	247.7	77	0.3	0.7	218.1
12	76	7.6	16.2	212.9	76	0.5	0.9	164.2
13	75	11.9	23.6	199.4	75	0.8	1.2	155.1
14	77	12.8	20.4	158.7	77	0.9	1.2	116.1
15	78	19.7	30.3	154.0	78	1.1	1.5	135.3
16	79	29.1	34.9	120.1	79	1.6	1.4	87.6
17	79	36.6	43.8	118.6	79	1.8	1.6	89.5
18	78	58.2	74.1	127.3	78	2.6	1.5	58.8
19	78	62.1	52.3	84.3	78	2.8	1.7	61.1
20	78	59.1	40.2	68.1	78	3.0	1.5	49.0
21	77	84.6	71.5	84.4	77	3.3	1.7	50.3
22	76	92.2	82.7	89.7	76	3.5	1.7	48.5
23	77	107.9	70.8	65.6	77	3.8	1.5	39.5
24	78	164.9	118.0	71.5	78	4.8	1.5	31.4

Statement 52 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	79	189.8	119.7	63.1	79	4.8	1.6	32.7
26	78	184.4	129.4	70.2	78	5.1	1.7	32.8
27	79	197.5	129.5	65.6	79	5.2	1.6	30.5
28	77	183.0	137.1	74.4	77	5.0	1.5	30.8
29	79	180.0	132.1	73.4	79	4.8	1.7	35.7
30	78	155.1	122.8	79.2	78	4.4	1.8	41.1
31	78	167.5	136.7	81.6	78	4.8	1.6	33.9
32	79	148.8	109.6	73.6	79	4.9	1.7	34.8
33	80	149.4	127.4	85.3	80	4.4	1.7	38.1
34	78	136.5	106.6	78.1	78	4.3	1.7	38.3
35	77	144.3	113.7	78.8	77	4.3	1.8	41.0
36	80	138.4	110.2	79.6	80	4.3	1.7	39.3
37	80	138.7	131.1	94.5	80	4.2	1.9	44.7
38	78	115.5	96.3	83.4	78	3.8	1.8	48.3
39	77	91.2	85.8	94.1	77	2.8	1.8	64.0
40	75	70.7	84.0	119.0	75	2.4	1.7	70.2
41	78	46.9	54.7	120.7	78	1.6	1.5	89.1
42	76	27.4	50.9	185.8	76	1.2	1.4	116.8
43	76	11.0	25.3	229.5	76	0.6	0.9	160.2
44	75	5.8	13.0	224.1	75	0.4	0.7	197.2
45	76	5.6	21.4	380.9	76	0.3	0.7	251.0
46	78	1.1	4.9	451.5	78	0.1	0.3	348.7
47	76	0.9	3.7	398.6	76	0.1	0.4	403.4
48	75	1.7	8.7	517.9	75	0.1	0.4	329.6
49	77	0.5	1.8	353.7	77	0.1	0.3	346.3
50	77	1.3	5.7	445.7	77	0.1	0.3	364.9
51	76	0.3	1.3	502.0	76	0.0	0.3	646.3
52	77	1.1	6.7	604.0	76	0.1	0.3	332.0

Note : Data Cover the Period 1901 to 1980.
Source : Assistant Director General of Meteorology, Pune.

Statement 53 : Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : WEST BENGAL **Station :** COOCH BEHAR (Observatory) **District :** COOCH BEHAR

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	68	1.1	7.2	638.5	68	0.1	0.3	498.7
2	68	1.7	8.8	521.8	68	0.1	0.7	443.7
3	67	1.0	4.1	392.0	67	0.1	0.3	375.5
4	67	2.3	7.5	320.7	67	0.2	0.5	292.2
5	67	3.7	8.2	222.1	67	0.3	0.7	212.4
6	69	2.3	4.9	214.6	69	0.3	0.5	204.2
7	70	5.2	13.9	266.7	70	0.4	0.7	193.9
8	70	4.7	9.5	200.7	70	0.4	0.8	192.2
9	69	3.8	8.0	212.7	69	0.3	0.5	204.2
10	70	9.1	13.2	216.2	70	0.5	0.9	178.5
11	70	3.9	9.1	235.2	70	0.3	0.7	218.1
12	70	10.7	21.3	198.7	70	0.6	0.9	142.7
13	69	18.2	32.1	177.1	69	0.9	1.3	141.5
14	68	21.3	29.2	136.9	68	1.2	1.2	101.7
15	68	26.9	41.1	152.5	68	1.2	1.6	127.5
16	68	39.2	49.7	126.7	68	1.9	1.5	76.3
17	67	44.4	42.8	97.1	67	2.3	1.8	77.2
18	66	61.9	51.7	83.6	66	3.1	1.5	49.8
19	67	81.6	86.4	105.9	67	3.1	1.5	50.1
20	66	92.1	85.5	92.9	66	3.3	1.7	52.2
21	68	130.5	136.1	104.3	68	3.6	1.8	50.8
22	66	121.8	89.9	73.8	66	3.8	1.8	47.2
23	67	142.4	104.4	73.3	67	4.1	1.5	36.2
24	66	219.7	167.6	76.3	66	4.7	1.7	36.7

Statement 53 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	67	199.7	140.0	70.1	67	4.9	1.6	33.2
26	65	197.7	151.7	76.7	65	4.6	1.7	36.4
27	65	178.2	131.5	73.8	65	4.6	1.6	34.1
28	67	210.6	188.9	89.7	67	4.8	1.7	34.4
29	66	168.6	140.4	83.2	66	4.5	1.7	38.1
30	66	140.4	132.3	94.2	66	4.0	1.8	45.6
31	66	135.7	164.2	121.0	66	3.8	1.9	50.4
32	66	146.2	125.3	85.8	66	4.2	1.7	41.3
33	65	140.4	139.4	99.3	65	4.0	1.8	43.6
34	66	121.3	120.9	99.6	66	3.8	1.8	49.0
35	66	134.3	120.0	89.4	66	3.9	1.9	47.9
36	66	128.2	120.5	94.0	66	3.6	1.7	45.4
37	66	148.3	156.7	105.6	66	3.8	1.9	49.7
38	65	106.3	100.4	94.4	65	3.4	2.0	59.7
39	66	113.1	135.2	119.6	66	2.9	1.8	62.6
40	66	83.5	94.0	112.6	66	2.5	1.8	71.5
41	66	62.0	95.0	153.3	66	1.7	1.6	94.9
42	65	26.1	48.1	184.4	65	1.0	1.1	114.2
43	67	14.2	32.8	231.9	67	0.5	0.8	150.4
44	63	6.5	14.3	222.2	63	0.4	0.7	179.4
45	63	2.8	10.8	388.9	63	0.2	0.5	303.8
46	63	0.6	2.2	346.9	63	0.1	0.3	343.3
47	63	0.8	4.0	504.1	63	0.0	0.2	450.8
48	61	1.1	3.8	341.5	61	0.2	0.6	337.4
49	65	0.5	3.5	389.2	65	0.0	0.2	656.6
50	66	0.7	4.1	607.2	65	0.1	0.3	287.2
51	64	0.2	0.8	487.8	64	0.0	0.1	800.0
52	65	0.4	1.7	145.8	65	0.1	0.3	487.2

Note : Data Cover the Period 1901 to 1980.
Source : Assistant Director General of Meteorology, Pune.

Statement 54: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State: WEST BENGAL **Station:** BALURHAT **District:** WEST DINAJPUR

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	60	1.1	5.3	465.8	60	0.1	0.3	467.6
2	60	4.3	15.8	367.2	60	0.3	0.6	228.5
3	60	3.4	11.3	331.2	60	0.2	0.5	257.1
4	60	5.0	14.4	285.7	60	0.3	0.6	228.5
5	58	5.7	11.1	296.2	58	0.3	0.6	223.1
6	59	4.6	7.0	265.0	59	0.3	0.5	187.5
7	59	4.5	11.6	259.1	59	0.4	0.7	198.6
8	59	5.6	11.3	203.1	59	0.4	0.8	194.3
9	55	1.8	5.1	290.1	55	0.1	0.4	304.5
10	57	7.2	17.3	239.1	57	0.4	0.8	172.4
11	57	3.7	14.5	386.6	57	0.2	0.5	207.6
12	57	7.0	19.7	280.2	57	0.4	0.8	203.4
13	56	3.1	7.1	227.7	56	0.3	0.7	216.9
14	57	7.3	14.6	200.3	57	0.5	0.8	166.1
15	57	8.0	13.3	166.3	57	0.6	0.9	165.0
16	57	11.8	20.4	172.5	57	0.8	1.2	157.0
17	57	16.4	28.4	172.8	57	0.9	1.1	132.7
18	56	30.7	42.1	132.9	56	1.2	1.2	102.6
19	57	32.7	40.8	124.9	57	1.5	1.5	110.6
20	57	39.9	56.1	140.8	57	1.4	1.1	76.6
21	58	42.4	41.8	98.6	58	1.5	1.1	71.4
22	56	68.6	81.3	118.4	56	2.3	1.7	75.4
23	59	59.2	61.6	104.1	59	2.2	1.5	66.1
24	59	94.5	86.2	91.3	59	3.3	1.9	58.6

Statement 54 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	59	101.8	92.7	91.1	59	3.6	1.8	49.8
26	55	74.9	91.3	121.9	55	3.3	1.7	53.2
27	57	111.5	129.8	116.5	57	3.8	1.6	42.2
28	57	109.0	83.8	76.9	57	4.1	1.6	39.2
29	57	76.9	72.5	94.2	57	3.5	1.8	51.1
30	57	73.1	88.9	121.7	57	3.2	1.7	54.3
31	55	61.1	56.7	92.7	55	3.1	1.8	58.3
32	58	103.0	89.8	87.2	58	4.0	1.8	44.4
33	58	64.9	58.5	90.2	58	3.0	2.0	64.7
34	58	85.3	122.0	143.0	58	3.0	1.7	54.5
35	54	86.5	73.3	84.8	54	3.2	1.7	51.6
36	57	84.4	99.0	117.3	57	3.1	1.7	56.2
37	57	81.0	89.0	109.9	57	2.9	1.8	61.5
38	56	62.8	73.0	116.1	56	2.5	1.6	65.2
39	57	71.7	151.5	211.4	57	2.3	1.6	70.2
40	56	72.9	139.7	187.5	56	1.8	1.7	92.0
41	56	30.8	62.0	201.6	56	1.1	1.5	138.5
42	56	32.9	64.1	194.9	56	0.9	1.2	137.9
43	57	9.4	31.1	330.1	57	0.4	0.9	223.1
44	54	6.3	19.0	302.0	54	0.3	0.6	225.7
45	56	3.8	10.9	290.2	56	0.3	0.6	255.8
46	56	0.6	2.1	336.9	56	0.1	0.3	291.3
47	56	2.4	10.1	420.1	56	0.1	0.4	343.2
48	55	0.5	2.5	455.5	55	0.0	0.2	519.5
49	59	0.0	0.0	0.0	59	0.0	0.0	0.0
50	59	0.2	1.7	713.3	59	0.0	0.1	768.1
51	59	0.2	0.8	506.7	59	0.0	0.2	538.4
52	59	0.2	1.5	455.1	59	0.1	0.3	508.6

Note : Data Cover the Period 1901 to 1970.
Source : Assistant Director General of Meteorology, Pune.

Statement 55: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State: WEST BENGAL **Station:** MALDA (Observatory) **District:** MALDA

Week	Rainfall				Rainy Day			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	76	1.6	6.7	410.0	76	0.1	0.4	336.9
2	77	3.1	13.3	431.0	77	0.2	0.5	263.8
3	77	2.7	7.5	275.4	77	0.2	0.5	225.0
4	77	4.1	11.0	270.7	77	0.3	0.7	224.3
5	74	4.4	10.4	237.0	74	0.4	0.7	178.3
6	77	2.6	5.0	215.9	77	0.3	0.6	196.3
7	77	4.4	11.3	253.5	77	0.4	0.8	213.5
8	77	6.3	12.3	196.8	77	0.5	0.7	161.8
9	76	2.0	5.0	245.0	76	0.2	0.5	236.7
10	76	4.6	11.0	239.9	76	0.3	0.6	194.9
11	77	2.0	5.3	267.0	77	0.3	0.7	252.9
12	77	4.9	12.5	256.4	77	0.4	0.7	192.8
13	74	3.9	11.0	281.8	74	0.2	0.5	234.0
14	73	4.5	11.3	248.0	73	0.3	0.7	201.9
15	74	5.4	11.9	219.8	74	0.5	0.9	187.8
16	74	10.5	20.9	199.3	74	0.7	1.1	158.6
17	74	9.5	16.6	173.9	74	0.7	0.9	129.2
18	72	10.3	29.9	183.6	72	1.0	1.1	113.8
19	76	18.1	20.3	112.2	76	1.2	1.1	89.4
20	76	25.4	37.0	145.7	76	1.2	1.1	98.0
21	76	23.3	23.8	115.4	76	1.3	1.1	81.9
22	75	39.2	60.0	153.0	75	1.6	1.4	88.2
23	75	36.8	38.0	103.3	75	1.8	1.3	73.8
24	76	50.6	52.2	103.0	76	2.6	2.0	75.8

Statement 55 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	76	66.8	63.2	94.5	76	2.9	1.8	62.1
26	75	73.7	72.4	98.2	75	3.2	1.8	59.5
27	75	66.2	52.0	78.4	75	3.3	1.5	46.1
28	76	69.6	56.9	81.8	76	3.5	1.6	45.9
29	75	68.7	61.9	90.0	75	3.4	1.8	53.0
30	75	68.4	58.8	85.9	75	3.3	1.7	52.8
31	73	55.3	56.1	101.4	73	3.3	1.7	51.4
32	76	69.9	50.6	72.4	76	3.9	1.5	39.5
33	76	60.8	52.8	86.4	76	3.3	1.7	51.3
34	76	58.7	81.7	139.1	76	2.8	1.6	55.2
35	74	65.1	61.8	94.9	74	3.0	1.6	51.6
36	74	58.8	51.3	104.2	74	2.8	1.6	56.6
37	75	69.4	72.6	105.0	75	2.8	1.7	58.2
38	75	54.3	63.1	116.3	75	2.4	1.4	57.0
39	74	58.6	77.8	132.6	74	2.3	1.5	63.0
40	74	52.6	70.6	134.1	74	2.0	1.6	82.7
41	75	29.9	48.2	151.3	75	1.2	1.2	96.4
42	76	20.9	38.6	184.5	76	0.8	1.2	142.6
43	76	10.7	30.4	284.4	76	0.4	0.9	191.1
44	73	7.9	24.2	306.4	73	0.4	0.8	197.4
45	73	3.7	12.5	336.8	73	0.2	0.6	321.2
46	72	2.1	7.4	355.6	72	0.2	0.4	261.4
47	72	2.9	10.9	372.0	72	0.2	0.5	341.4
48	73	1.7	8.5	501.0	73	0.1	0.5	470.3
49	73	0.1	0.5	563.7	73	0.0	0.1	854.4
50	76	0.9	4.0	470.1	76	0.1	0.3	343.8
51	73	0.3	1.3	452.7	73	0.1	0.3	517.1
52	74	0.3	1.5	459.6	74	0.0	0.2	489.8

Note : Data Cover the Period 1901 to 1980.
Source : Assistant Director General of Meteorology, Pune.

Statement 56: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State: WEST BENGAL **Station:** BERHAMPUR (Observatory) **District:** MURSHIDABAD

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	78	1.3	4.7	367.3	78	0.1	0.4	311.7
2	79	3.1	11.7	382.8	79	0.2	0.5	299.8
3	79	2.2	6.8	315.9	79	0.2	0.4	224.3
4	79	2.8	6.8	243.7	79	0.4	0.8	214.5
5	78	3.2	6.7	209.7	78	0.3	0.6	179.3
6	80	4.3	9.7	225.6	80	0.4	0.6	150.8
7	80	5.8	15.2	260.8	80	0.4	0.7	185.9
8	80	4.8	10.6	222.1	80	0.4	0.8	193.7
9	79	2.6	7.7	298.2	79	0.3	0.7	234.3
10	80	6.3	14.3	226.2	80	0.5	0.9	189.4
11	80	3.9	7.7	196.3	80	0.4	0.7	190.4
12	80	5.2	11.4	219.3	80	0.4	0.7	180.5
13	79	4.8	10.6	222.0	79	0.4	0.9	193.8
14	79	4.5	9.8	217.6	79	0.4	0.7	191.9
15	79	10.9	15.8	144.7	79	0.8	1.0	130.7
16	79	13.4	22.4	166.3	79	0.8	1.1	131.7
17	79	11.7	19.2	165.1	79	0.7	1.0	133.0
18	78	17.9	22.4	125.6	78	1.2	1.2	106.5
19	79	29.4	34.6	118.4	79	1.6	1.3	31.0
20	79	24.7	34.3	138.5	79	1.3	1.2	93.1
21	79	29.2	32.7	111.7	79	1.7	1.4	81.4
22	76	35.4	40.4	114.1	76	1.8	1.5	84.1
23	79	43.4	36.8	84.9	79	2.4	1.6	67.3
24	78	52.3	51.3	97.7	78	2.8	1.8	64.6

Statement 56 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	79	67.1	57.3	65.4	79	3.2	1.5	48.4
26	78	65.7	50.4	76.7	78	3.5	1.8	50.4
27	80	67.2	53.8	80.0	80	3.5	1.6	44.5
28	80	69.5	61.1	87.9	80	3.8	1.6	41.9
29	80	66.0	56.2	85.1	80	3.8	1.5	38.8
30	80	68.8	52.0	74.5	80	4.0	1.6	39.1
31	78	70.7	72.9	103.2	78	3.7	1.4	37.3
32	79	62.7	47.4	75.5	79	3.9	1.4	36.4
33	78	70.5	53.5	75.9	78	3.7	1.5	40.3
34	79	61.8	62.0	100.3	79	3.4	1.4	41.2
35	77	53.9	59.1	109.7	77	3.0	1.5	51.7
36	80	64.1	56.5	88.2	80	3.2	1.6	51.3
37	80	53.8	41.6	77.3	80	3.0	1.6	53.5
38	80	46.4	46.3	99.9	80	2.5	1.4	54.0
39	80	50.4	50.8	100.7	80	2.4	1.6	66.4
40	79	43.6	64.6	148.0	79	2.1	1.7	80.8
41	80	28.4	39.1	137.6	80	1.3	1.3	98.9
42	80	20.4	44.3	217.3	80	0.9	1.1	124.5
43	79	11.7	28.2	240.0	79	0.7	1.1	155.3
44	79	15.2	49.6	325.5	79	0.5	0.8	169.6
45	78	3.6	11.8	386.8	78	0.2	0.5	294.3
46	79	2.1	7.6	353.2	79	0.2	0.4	246.8
47	79	3.9	12.7	324.0	79	0.2	0.5	267.4
48	76	2.6	10.4	377.6	76	0.2	0.7	341.3
49	78	0.6	5.3	703.6	78	0.1	0.4	503.2
50	77	1.2	4.6	381.0	77	0.1	0.4	309.5
51	77	0.7	4.4	608.6	77	0.1	0.4	443.7
52	78	0.7	3.3	483.3	78	0.1	0.2	432.9

Note : Data Cover the Period 1901 to 1980.
Source : Assistant Director General of Meteorology, Pune.

Statement 57: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State: WEST BENGAL **Station:** KRISHNA NAGAR (Observatory) **District:** NADIA

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	77	1.1	5.1	454.1	77	0.1	0.4	406.2
2	78	3.7	10.8	293.7	78	0.2	0.5	252.0
3	78	1.4	3.7	266.4	78	0.2	0.5	280.5
4	78	3.0	7.7	255.1	78	0.3	0.6	221.1
5	75	4.1	8.5	206.4	75	0.3	0.6	180.5
6	78	5.6	10.7	191.0	78	0.4	0.7	167.8
7	76	7.6	29.6	272.3	76	0.4	0.9	213.9
8	78	6.2	13.2	212.6	78	0.4	0.7	178.3
9	77	4.4	11.5	260.4	77	0.3	0.6	177.2
10	78	6.3	26.0	314.2	78	0.4	0.9	192.2
11	78	0.7	14.7	219.4	78	0.4	0.9	192.2
12	78	0.1	17.2	211.2	78	0.5	0.7	154.7
13	75	9.5	20.3	214.2	75	0.5	0.8	109.0
14	74	5.1	9.2	179.7	74	0.4	0.7	162.9
15	75	15.2	29.2	192.3	75	0.8	1.1	140.6
16	75	21.8	31.6	145.3	75	1.2	1.2	105.1
17	75	10.9	26.1	154.3	75	1.2	1.3	131.3
18	74	22.2	29.5	133.0	74	1.4	1.3	94.4
19	76	35.2	33.3	94.4	76	1.8	1.4	74.2
20	76	25.3	29.8	118.0	76	1.6	1.3	81.1
21	76	30.7	29.5	96.3	76	1.7	1.3	76.1
22	73	37.1	46.7	125.9	73	1.8	1.3	69.6
23	78	47.7	41.9	87.7	78	2.5	1.7	65.6
24	78	56.1	56.4	106.6	78	2.7	1.8	66.2

Statement 57 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	78	80.1	72.6	90.7	78	3.4	1.6	48.1
26	78	64.1	53.6	83.6	78	3.5	1.5	43.8
27	77	54.7	44.0	80.4	77	3.3	1.5	45.9
28	78	80.6	75.3	93.4	78	3.8	1.6	41.4
29	78	62.2	47.0	75.6	78	3.5	1.6	45.9
30	78	66.9	64.9	97.1	78	3.7	1.5	40.7
31	75	64.7	69.4	107.3	75	3.9	1.5	38.4
32	78	62.1	46.9	75.6	78	3.8	1.5	39.5
33	78	70.3	54.0	76.8	78	3.4	1.4	41.6
34	78	45.5	37.9	83.4	78	3.1	1.5	49.5
35	75	55.4	54.3	98.0	75	3.1	1.4	46.0
36	78	50.6	53.0	106.0	78	2.8	1.5	54.0
37	78	45.4	41.7	91.9	78	2.7	1.5	55.6
38	78	42.1	38.1	90.5	78	2.5	1.5	61.4
39	78	50.8	55.8	109.2	78	2.4	1.5	62.3
40	76	47.7	64.7	135.6	76	2.1	1.6	73.5
41	78	27.7	37.2	134.6	78	1.5	1.5	103.8
42	78	22.0	30.7	139.3	78	1.1	1.2	167.9
43	78	14.2	35.6	246.6	78	0.6	1.1	170.4
44	73	12.0	27.5	229.7	73	0.6	1.0	178.4
45	77	3.6	9.6	216.1	77	0.2	0.5	203.6
46	77	3.2	10.0	308.7	77	0.2	0.6	250.5
47	77	5.2	18.6	357.1	77	0.2	0.6	258.7
48	75	3.0	12.6	421.0	75	0.1	0.5	355.9
49	76	0.5	2.4	513.2	76	0.1	0.3	527.9
50	76	1.0	3.7	373.4	76	0.1	0.4	403.4
51	77	1.1	5.8	550.4	77	0.1	0.3	456.4
52	75	0.8	5.9	707.0	75	0.1	0.3	524.3

Note : Data Cover the Period 1901 to 1980.
Source : Assistant Director General of Meteorology, Pune.

Statement 58: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State: WEST BENGAL **Station:** SURI **District:** BIRBHUM

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	66	1.9	6.6	353.6	66	0.2	0.4	289.3
2	66	4.9	16.5	403.3	66	0.2	0.6	229.5
3	66	3.2	10.2	318.2	66	0.2	0.6	229.5
4	66	3.0	7.8	256.3	66	0.3	0.8	243.1
5	65	3.6	6.3	175.6	65	0.4	0.7	189.0
6	65	5.1	11.2	217.2	65	0.5	0.8	167.3
7	65	7.2	15.4	214.5	65	0.6	1.0	171.3
8	65	7.0	12.5	178.4	65	0.6	0.9	158.1
9	64	2.8	10.5	372.6	64	0.3	0.9	298.2
10	66	7.8	17.7	227.3	66	0.5	0.8	170.6
11	66	5.3	10.9	207.3	66	0.4	0.7	189.6
12	66	5.7	12.2	214.0	66	0.4	0.8	187.8
13	65	3.0	7.0	232.4	65	0.3	0.6	227.0
14	65	3.0	9.8	323.4	65	0.3	0.7	212.7
15	65	7.4	14.9	200.7	65	0.6	0.9	152.0
16	65	8.3	14.9	180.2	65	0.6	0.9	159.7
17	65	8.8	14.5	165.3	65	0.7	0.9	131.7
18	65	16.6	22.2	133.7	65	1.1	1.1	93.8
19	66	20.9	20.7	99.2	66	1.5	1.2	82.0
20	65	19.0	27.5	145.2	65	1.2	1.1	96.3
21	66	21.2	25.7	121.3	66	1.3	1.1	87.8
22	65	25.2	38.5	152.7	65	1.4	1.2	88.0
23	64	30.7	43.2	111.0	64	2.1	1.6	77.7
24	64	54.9	64.7	118.0	64	2.6	1.8	68.4

Statement 58 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	65	62.0	61.1	98.5	65	3.1	1.6	50.0
26	63	67.0	59.0	87.6	63	3.4	1.5	44.9
27	64	66.7	58.0	6.9	64	3.5	1.4	40.7
28	64	76.8	59.6	75.6	64	4.0	1.5	37.3
29	64	66.1	52.6	79.6	64	3.7	1.6	42.4
30	64	67.2	51.6	76.7	64	4.1	1.6	40.2
31	61	70.8	46.7	66.0	61	4.2	1.5	36.6
32	63	81.8	55.3	67.6	63	4.0	1.5	36.4
33	63	71.6	56.0	78.3	63	3.9	1.4	34.7
34	63	69.7	51.3	73.5	63	3.7	1.3	34.1
35	61	58.6	43.7	74.5	61	3.4	1.4	41.8
36	61	69.1	44.8	64.9	61	3.4	1.6	46.2
37	61	53.4	51.1	95.7	61	3.0	1.7	35.8
38	61	50.2	50.7	101.1	61	2.4	1.4	58.9
39	61	46.8	58.6	143.6	61	2.1	1.4	68.0
40	60	36.7	41.4	112.7	60	2.1	1.8	87.1
41	61	29.4	46.0	156.5	61	1.3	1.4	108.9
42	61	21.6	33.0	152.7	61	1.1	1.4	125.9
43	61	8.0	23.9	297.6	61	0.4	0.9	204.3
44	57	12.2	29.2	239.9	57	0.5	1.0	177.4
45	62	3.2	10.7	331.7	62	0.3	0.8	273.6
46	62	1.3	5.4	412.8	62	0.1	0.4	324.9
47	62	4.1	15.1	366.8	62	0.2	0.5	261.9
48	61	1.5	7.8	503.7	61	0.1	0.5	380.6
49	64	0.1	0.4	472.6	64	0.0	0.0	0.0
50	64	0.7	2.6	391.4	64	0.1	0.3	414.6
51	65	0.9	3.9	425.4	65	0.1	0.4	416.2
52	65	1.0	4.3	420.3	65	0.1	0.3	369.5

Note : Data Cover the Period 1901 to 1970.
Source : Assistant Director General of Meteorology, Pune.

Statement 59: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State: WEST BENGAL **Station:** SURI (Observatory) **District:** BIRBHUM

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	25	2.2	8.9	405.2	25	0.1	0.3	346.1
2	25	6.8	29.8	439.2	25	0.2	0.6	322.7
3	25	0.7	1.6	242.8	25	0.1	0.3	346.1
4	25	3.7	7.4	203.1	25	0.4	0.7	161.8
5	25	4.5	9.9	218.7	25	0.6	1.2	213.0
6	26	6.9	15.5	225.0	26	0.5	0.8	162.5
7	26	1.2	3.4	289.8	26	0.1	0.3	282.4
8	26	3.2	7.9	246.8	26	0.3	0.7	247.7
9	26	2.9	5.1	177.6	26	0.3	0.7	199.2
10	25	4.0	6.6	165.1	25	0.4	0.7	147.9
11	26	1.6	3.5	219.1	26	0.3	0.7	220.8
12	26	6.2	13.1	209.5	26	0.4	0.7	166.1
13	26	7.4	15.2	205.4	26	0.6	0.9	156.4
14	26	2.3	3.7	162.0	26	0.3	0.5	153.0
15	25	7.5	13.4	178.7	25	0.4	0.8	190.9
16	26	11.6	18.4	158.8	26	0.6	1.1	172.4
17	26	9.2	13.9	151.1	26	0.6	0.9	138.5
18	26	14.2	19.1	134.4	26	1.2	1.2	98.3
19	26	15.7	18.1	114.9	26	1.2	1.3	114.2
20	26	16.0	23.5	146.9	26	0.9	1.2	129.7
21	26	12.3	12.4	101.4	26	1.0	0.8	85.7
22	26	23.5	28.9	123.0	26	1.3	1.1	87.9
23	26	34.5	36.5	105.8	26	1.8	1.5	82.8
24	26	45.1	38.2	84.7	26	2.5	1.6	65.2

Statement 59 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	26	59.8	49.2	82.3	26	2.8	1.5	55.2
26	26	71.0	67.7	95.4	26	3.5	1.7	47.3
27	26	49.4	38.6	78.0	26	3.3	1.7	50.0
28	26	95.5	63.7	66.7	26	4.3	1.4	31.2
29	26	71.3	52.1	73.1	26	3.6	1.5	41.2
30	26	52.4	42.7	81.5	26	3.1	1.6	50.0
31	25	64.4	46.3	71.9	25	3.6	1.5	41.7
32	25	82.1	45.5	55.4	25	4.1	1.5	35.3
33	25	78.3	56.9	72.6	25	4.0	1.8	44.9
34	25	54.8	52.3	65.4	25	2.9	1.7	57.6
35	25	64.2	53.4	83.3	25	3.4	1.6	47.5
36	25	66.7	46.1	69.2	25	3.2	1.6	50.6
37	25	65.6	42.9	65.5	25	3.2	1.4	44.5
38	25	49.0	45.6	93.1	25	2.1	1.4	67.9
39	25	78.5	115.8	147.6	25	2.6	1.2	46.6
40	25	62.8	84.4	134.4	25	2.8	1.6	56.6
41	24	22.8	29.3	128.3	24	1.5	1.4	92.6
42	24	12.7	20.6	162.3	24	1.9	1.0	113.4
43	25	13.1	42.3	246.7	25	0.6	1.0	173.5
44	25	18.5	32.5	175.2	25	0.8	1.1	136.1
45	25	4.7	14.1	298.0	25	0.2	0.5	217.8
46	25	1.2	3.9	328.3	25	0.1	0.3	276.4
47	25	2.5	9.0	356.5	25	0.2	0.6	346.1
48	25	2.0	7.0	347.4	25	0.2	0.5	295.4
49	25	0.3	1.0	288.9	25	0.0	0.2	500.0
50	25	0.4	2.0	485.0	25	0.1	0.4	500.0
51	25	0.0	0.2	500.0	25	0.0	0.0	0.0
52	25	2.7	9.2	342.7	25	0.1	0.4	366.4

Note : Data Cover the Period 1955 to 1980.
Source : Assistant Director General of Meteorology, Pune.

Statement 60: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State: WEST BENGAL **Station:** BURDWAN (Observatory) **District:** BURDWAN

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	77	1.4	5.7	406.5	77	0.1	0.5	420.8
2	74	3.7	11.0	297.4	74	0.2	0.5	242.4
3	74	1.9	5.8	309.0	74	0.2	0.4	270.6
4	76	3.2	8.5	263.0	76	0.3	0.7	251.1
5	76	5.3	11.8	221.7	76	0.4	0.8	194.4
6	75	5.8	13.2	226.8	75	0.4	0.7	173.9
7	75	12.3	27.2	221.2	75	0.6	1.1	192.7
8	74	5.1	11.1	218.7	74	0.4	0.8	185.4
9	76	5.4	15.2	279.4	76	0.4	0.7	181.9
10	75	8.4	22.5	268.0	75	0.4	0.8	210.1
11	75	6.6	17.3	260.0	75	0.5	0.8	177.3
12	74	3.0	16.8	279.6	74	0.4	0.9	205.3
13	76	7.8	16.8	215.3	76	0.5	0.9	188.2
14	75	3.9	9.2	238.2	75	0.3	0.5	198.2
15	75	13.2	22.5	170.2	75	0.9	1.1	133.0
16	74	14.8	25.4	171.5	74	0.9	1.2	125.8
17	77	14.7	21.0	143.3	77	0.9	1.1	121.6
18	76	17.6	22.6	128.5	76	1.0	1.1	109.3
19	74	30.0	28.5	95.1	74	1.5	1.2	80.5
20	74	24.2	23.7	98.0	74	1.4	1.2	84.8
21	74	28.3	37.6	132.9	74	1.3	1.1	84.2
22	74	27.2	28.0	102.8	74	1.6	1.2	79.1
23	74	44.9	47.9	106.6	74	2.1	1.6	75.0
24	73	55.4	49.1	88.6	73	2.7	1.7	62.0

Statement 60 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	73	68.2	87.3	127.9	73	3.0	1.5	51.1
26	76	65.8	60.4	91.8	76	3.1	1.7	55.2
27	71	66.5	54.0	81.1	71	3.3	1.7	51.1
28	72	84.3	66.6	79.0	72	3.6	1.3	36.1
29	71	74.1	60.4	81.6	71	3.6	1.9	51.9
30	73	76.7	78.5	89.2	73	3.8	1.7	43.7
31	74	71.3	58.6	52.1	74	3.6	1.5	42 4
32	72	76.5	49.1	64.2	72	4.0	1.5	37.8
33	73	75.2	60.2	80.1	73	3.4	1.4	39.5
34	72	57.2	43.8	76.6	72	3.3	1.5	45 6
35	75	70.9	77.8	109.7	75	3.3	1.5	44.9
36	73	60.5	72.9	120.5	73	3.0	1.6	53.0
37	75	58.5	43.5	74.0	75	2.8	1.5	51.8
38	73	45.1	41.9	72.8	73	2.3	1.5	67.4
39	75	43.4	64.3	148.2	75	2.0	1.4	70.9
40	73	38.5	59.4	154.5	73	1.7	1.6	94.6
41	71	22.1	30.4	138.0	71	1.2	1.2	104.3
42	72	17.3	32.8	189.4	72	1.0	1.3	131.1
43	73	11.8	27.2	230.1	73	0.6	0.9	149.6
44	73	13.8	29.7	216.0	73	0.6	1.0	162.0
45	72	5.0	16.1	321.7	72	0.2	0.5	254.0
46	73	4.5	16.3	358.8	73	0.2	0.5	253.6
47	70	5.7	19.5	344.5	70	0.2	0.6	249.0
48	72	2.1	9.2	439.8	72	0.1	0.6	423.9
49	74	1.2	8.4	711.3	74	0.0	0.3	637.7
50	74	0.9	4.2	447.5	74	0.1	0.3	395.7
51	72	0.9	5.5	580.0	72	0.1	0.4	438.9
52	75	0.6	2.7	441.4	75	0.1	0.2	424.1

Note : Data Cover the Period 1901 to 1980.
Source : Assistant Director General of Meteorology, Pune.

Statement 61: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State: WEST BENGAL **Station:** ARAMBAGH **District:** HOOGLY

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	60	1.8	6.6	361.5	60	0.2	0.6	369.1
2	60	3.8	9.6	253.2	60	0.3	0.6	228.5
3	60	1.7	4.0	240.2	60	0.2	0.5	226.3
4	61	3.6	8.0	268.7	61	0.3	0.6	240.1
5	57	4.1	7.7	186.0	57	0.4	0.6	259.2
6	60	4.8	8.5	176.6	60	0.5	0.7	160.1
7	60	10.2	21.6	212.2	60	0.6	1.1	171.9
8	60	5.6	11.6	208.4	60	0.5	0.8	172.4
9	58	5.2	8.0	247.5	58	0.3	0.7	224.3
10	61	6.3	17.2	273.6	61	0.4	0.9	233.0
11	62	6.1	13.7	223.7	62	0.4	0.8	208.4
12	62	8.1	14.2	175.2	62	0.6	0.9	141.7
13	61	8.4	14.2	220.7	61	0.6	0.9	168.7
14	64	5.6	11.9	210.5	64	0.4	0.7	151.7
15	64	12.1	16.8	139.3	64	0.9	1.0	119.6
16	64	18.0	31.8	176.8	64	1.1	1.3	120.5
17	64	15.2	22.7	149.1	64	1.1	1.2	117.2
18	62	18.1	24.3	134.0	62	1.2	1.2	96.9
19	62	29.4	31.3	106.5	62	1.7	1.8	80.5
20	62	23.9	28.7	119.7	62	1.3	1.2	88.3
21	62	23.9	29.5	123.3	62	1.3	1.1	86.9
22	60	28.0	31.5	112.6	60	1.7	1.3	80.2
23	64	42.0	45.0	104.7	64	2.2	1.7	75.9
24	64	53.3	56.9	106.7	64	2.8	1.7	61.3

Statement 61 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	63	58.7	75.6	128.7	63	3.0	1.5	49.5
26	60	55.2	44.2	78.5	60	3.3	1.5	46.6
27	63	69.6	71.4	102.6	63	3.2	1.6	51.6
28	65	71.0	48.5	68.3	65	3.7	1.3	35.5
29	64	66.3	60.8	91.7	64	3.3	1.6	48.5
30	64	70.5	66.9	94.9	64	3.7	1.5	40.8
31	60	74.4	77.5	104.2	60	3.9	1.6	40.5
32	62	65.9	44.1	67.0	62	3.8	1.5	40.3
33	61	66.6	65.3	98.1	61	3.6	1.7	46.7
34	61	58.9	31.0	52.7	61	3.4	1.3	38.2
35	58	58.4	62.7	107.4	58	3.1	1.4	44.7
36	61	49.8	44.9	90.1	61	3.1	1.6	51.8
37	62	49.1	42.9	85.5	62	2.9	1.4	46.1
38	61	41.9	39.9	95.2	61	2.4	1.7	79.1
39	62	39.0	35.9	91.9	62	2.2	1.3	60.8
40	61	35.1	46.3	131.6	61	1.9	1.7	89.8
41	61	22.8	33.8	148.2	61	1.6	1.7	110.9
42	61	20.1	35.3	175.5	61	1.8	1.4	139.5
43	61	16.2	18.8	184.5	61	0.6	1.0	166.2
44	56	14.1	34.5	243.8	56	0.6	1.1	179.5
45	57	3.8	11.4	298.4	57	0.2	0.5	248.5
46	57	2.8	7.6	271.2	57	0.2	0.5	249.7
47	57	4.9	15.9	323.0	57	0.3	0.7	273.7
48	56	4.0	19.4	487.3	56	0.2	0.6	328.1
49	57	0.7	3.9	557.0	57	0.1	0.3	558.7
50	57	0.9	5.6	601.7	57	0.1	0.3	458.4
51	57	1.4	6.2	435.6	57	0.1	0.3	367.2
52	55	0.3	2.0	741.6	55	0.0	0.1	741.6

Note : Data Cover the Period 1901 to 1979.
Source : Assistant Director General of Meteorology, Pune.

Statement 62: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State: WEST BENGAL **Station:** AMTA **District:** HOWRAH

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	55	1.0	4.1	399.4	55	0.1	0.4	381.3
2	55	2.2	7.3	329.6	55	0.2	0.7	301.6
3	55	2.1	5.0	233.3	55	0.2	0.5	214.9
4	55	4.5	12.6	279.2	55	0.3	0.7	226.0
5	53	6.8	13.6	201.5	53	0.5	0.7	165.3
6	56	6.6	19.8	231.6	56	0.6	0.9	168.5
7	56	10.3	24.2	234.7	56	0.5	1.1	220.9
8	56	7.1	15.6	220.9	56	0.4	0.8	198.3
9	55	5.4	11.6	216.8	55	0.3	0.7	204.2
10	56	6.1	18.4	303.7	56	0.4	0.9	252.9
11	56	7.0	17.2	244.4	56	0.5	0.8	174.1
12	56	7.9	19.8	250.0	56	0.5	0.7	153.5
13	54	15.8	34.6	218.6	54	0.6	1.0	164.1
14	58	6.5	13.1	208.2	58	0.4	0.6	144.9
15	58	14.2	19.9	140.0	58	0.9	1.1	115.9
16	57	14.0	18.6	132.7	57	0.9	1.1	117.0
17	58	15.7	30.2	191.8	58	0.7	1.0	138.8
18	55	21.1	26.1	123.5	58	1.2	1.2	103.1
19	56	39.5	48.4	122.5	56	1.6	1.4	87.2
20	55	22.6	23.3	103.2	55	1.4	1.2	86.4
21	56	39.4	50.7	128.7	56	1.8	1.4	76.0
22	55	41.1	50.2	122.1	55	1.7	1.4	78.1
23	62	62.1	69.5	112.0	62	2.4	1.8	74.4
24	62	73.7	69.7	94.5	62	2.8	1.6	58.0

Statement 62 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	63	83.7	88.0	105.1	63	3.3	1.7	51.5
26	61	71.6	63.1	88.1	61	3.1	1.5	49.4
27	65	82.2	77.1	93.8	65	3.3	1.6	48.9
28	64	66.1	43.5	65.8	64	3.5	1.5	42.8
29	64	75.3	63.3	84.2	64	3.5	1.7	48.5
30	65	89.6	69.1	77.1	65	3.5	1.5	38.8
31	61	85.3	76.7	90.6	61	4.0	1.4	35.3
32	63	85.4	67.9	79.5	63	3.8	1.5	40.5
33	63	68.1	58.9	86.5	63	3.8	1.5	39.5
34	63	70.0	44.0	462.9	63	3.7	1.4	38.6
35	59	77.1	64.4	83.5	59	3.6	1.5	41.3
36	62	54.8	48.4	88.5	62	3.1	1.5	48.8
37	63	60.9	57.8	94.4	63	3.0	1.7	56.1
38	61	52.8	53.7	101.7	61	2.5	1.6	64.1
39	62	49.1	58.8	99.4	62	2.4	1.5	61.0
40	59	39.2	47.4	120.8	59	1.9	1.5	81.1
41	60	33.7	53.9	159.7	60	1.4	1.4	103.4
42	59	24.8	40.3	162.4	59	1.2	1.3	111.4
43	58	13.8	25.5	184.8	58	0.8	1.1	136.1
44	53	13.4	31.7	237.6	53	0.5	1.1	212.0
45	56	4.3	12.2	287.7	56	0.3	0.7	261.5
46	56	5.0	22.1	442.9	56	0.2	0.5	304.1
47	56	6.4	23.5	365.3	56	0.2	0.5	284.7
48	52	5.1	21.8	423.4	52	0.2	0.6	279.6
49	57	0.3	2.3	755.0	57	0.0	0.3	755.0
50	57	0.8	4.4	533.3	57	0.1	0.3	455.4
51	57	1.2	4.3	369.2	57	'0.1	0.3	367.2
52	56	0.6	3.5	542.4	56	0.1	0.3	553.7

Note : Data Cover the Period 1901 to 1979.
Source : Assistant Director General of Meteorology, Pune.

Statement 63: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State: WEST BENGAL **Station:** PURULIA **District:** MANBHUM

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	31	1.8	6.5	368.6	31	1.1	0.4	331.3
2	31	2.3	5.8	257.0	31	0.2	0.5	220.2
3	31	2.7	5.8	215.9	31	0.3	0.5	191.3
4	31	4.1	10.5	254.3	31	0.4	0.8	236.3
5	31	7.8	16.1	205.5	31	0.7	1.0	149.5
6	31	6.3	10.4	166.2	31	0.5	0.7	131.8
7	32	2.1	4.4	205.1	32	0.3	0.6	206.6
8	32	3.4	8.8	257.5	32	0.3	0.6	225.5
9	32	3.2	6.3	195.0	32	0.5	0.9	176.0
10	32	3.2	6.7	211.3	32	0.3	0.7	203.8
11	32	3.3	65.3	162.0	32	0.4	0.6	151.3
12	32	6.7	10.5	156.9	32	0.6	0.8	141.0
13	32	7.0	11.9	168.8	32	0.5	0.8	171.2
14	32	5.8	13.7	236.3	32	0.4	0.9	260.6
15	32	3.4	6.4	184.9	32	0.4	0.7	188.6
16	32	9.0	12.9	143.8	32	0.9	1.1	121.3
17	32	11.6	18.9	163.0	32	0.7	0.9	118.4
18	31	11.1	17.5	157.8	31	0.6	0.8	130.0
19	31	12.0	15.7	131.1	31	0.9	1.0	112.0
20	32	8.3	9.7	117.0	32	0.9	1.0	111.5
21	32	10.8	16.1	149.2	32	0.7	0.8	113.1
22	31	17.1	22.7	132.4	31	1.2	1.3	115.7
23	32	46.3	48.4	104.6	32	2.1	1.5	71.5
24	32	38.5	36.2	94.0	32	2.2	1.9	78.3

Statement 63 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	32	43.6	32.6	75.7	32	2.4	1.6	64.2
26	32	68.2	55.2	80.9	32	3.4	1.4	41.0
27	32	68.4	53.7	78.6	32	3.8	1.5	40.2
28	32	75.5	55.6	67.0	32	3.7	1.7	46.4
29	32	76.4	44.4	63.0	32	4.1	1.5	37.3
30	32	52.6	37.0	70.2	32	3.5	1.5	43.3
31	32	69.2	51.3	74.2	32	3.8	1.7	45.4
32	32	77.0	49.0	63.6	32	3.6	1.4	39.3
33	32	73.9	40.9	55.3	32	3.8	1.3	35.4
34	32	53.9	33.3	61.9	32	3.3	1.7	52.6
35	32	85.8	74.2	87.1	32	3.7	1.9	51.8
36	32	63.0	57.7	88.7	32	3.3	1.8	53.0
37	32	74.2	62.5	84.2	32	3.1	1.6	49.9
38	32	46.0	47.9	104.2	32	2.5	2.0	79.0
39	32	54.7	66.0	120.6	32	2.4	1.6	67.5
40	32	39.4	44.6	113.1	32	1.9	1.6	83.9
41	32	18.4	31.7	172.2	32	1.3	1.3	95.7
42	32	11.8	27.2	230.7	32	0.6	1.0	164.9
43	32	10.7	21.3	198.8	32	0.7	1.1	171.4
44	30	8.5	18.2	213.9	30	0.5	0.8	155.4
45	32	4.8	15.7	329.6	32	0.3	0.6	227.2
46	32	1.2	3.6	246.7	32	0.2	0.5	224.4
47	32	2.1	6.8	317.9	32	0.2	0.7	301.3
48	32	2.6	8.1	306.6	32	0.3	0.6	248.9
49	31	0.9	2.8	322.8	31	0.1	0.3	310.6
50	32	0.3	1.4	565.7	32	0.0	0.2	565.7
51	32	0.0	0.1	565.7	32	0.0	0.0	0.0
52	30	1.1	3.4	297.8	30	0.2	0.6	275.4

Note : Data Cover the Period 1949 to 1980.
Source : Assistant Director General of Meteorology, Pune.

Statement 64: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State: WEST BENGAL **Station:** RAGHUNATHPUR **District:** MANBHUM

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	64	2.2	6.7	299.1	64	0.2	0.5	265.4
2	64	3.3	8.4	257.6	64	0.2	0.5	222.6
3	64	5.8	28.2	486.8	64	0.2	0.5	306.4
4	64	3.6	7.5	210.9	64	0.5	0.9	204.1
5	64	7.2	11.8	164.4	64	0.5	0.8	157.2
6	65	5.7	13.3	234.3	65	0.4	0.8	196.7
7	65	10.2	25.1	247.1	65	0.6	1.2	195.0
8	65	5.5	11.4	206.4	65	0.5	1.0	163.0
9	65	3.6	7.2	237.6	65	0.3	0.6	216.6
10	65	6.9	21.4	311.3	65	0.3	0.7	210.7
11	65	5.5	15.0	274.3	65	0.4	0.7	193.3
12	65	4.3	10.6	244.8	65	0.3	0.6	198.1
13	64	3.7	9.3	253.1	64	0.3	0.6	204.6
14	64	2.1	4.5	213.4	64	0.3	0.5	203.9
15	64	3.1	13.7	222.8	64	0.6	1.0	170.2
16	64	6.7	11.9	195.6	64	0.4	0.7	162.3
17	64	0.3	13.6	216.3	64	0.4	1.0	218.8
18	62	9.1	14.6	159.8	62	0.7	0.9	131.2
19	64	14.0	20.8	148.6	64	0.9	0.9	101.0
20	64	1.3	21.2	206.6	64	0.7	0.8	121.2
21	64	13.8	19.5	141.0	64	0.9	0.9	99.7
22	64	16.2	22.1	135.9	64	1.1	1.3	117.2
23	66	36.8	50.4	137.0	66	1.8	1.7	94.1
24	66	44.6	52.9	118.8	66	2.4	1.7	72.5

Statement 64 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	66	56.3	60.6	107.7	66	2.7	1.6	60.3
26	65	44.9	30.9	88.8	65	2.7	1.6	59.5
27	66	64.4	52.8	82.0	66	3.5	1.6	47.3
28	66	64.7	43.8	67.2	66	3.6	1.6	44.9
29	66	66.1	49.5	74.9	66	3.7	1.6	42.8
30	66	68.7	46.0	67.0	66	4.0	1.7	42.6
31	67	79.4	63.3	79.8	67	4.0	1.7	43.2
32	67	78.5	61.6	78.5	67	3.9	1.6	41.2
33	66	58.1	31.1	53.5	66	3.7	1.5	41.5
34	66	58.8	46.6	79.3	66	3.3	1.4	41.8
35	66	71.4	57.0	79.8	66	3.6	1.5	41.7
36	67	60.4	65.1	107.8	67	2.9	1.7	58.2
37	66	47.1	48.9	103.7	66	2.6	1.7	63.8
38	66	45.2	45.4	100.3	66	2.3	1.5	65.6
39	66	37.5	49.8	132.6	66	1.8	1.6	83.9
40	68	20.6	42.4	159.7	68	1.7	1.7	101.7
41	67	19.3	29.9	154.8	67	1.2	1.3	106.4
42	67	17.2	34.5	200.4	67	0.8	1.2	156.7
43	67	8.4	27.5	325.5	67	0.4	0.8	196.7
44	65	11.4	30.6	269.6	65	0.5	1.0	187.7
45	66	3.6	10.2	286.3	66	0.2	0.6	298.3
46	66	0.9	'2.6	300.7	66	0.1	0.3	292.5
47	66	4.1	14.5	351.6	66	0.2	0.5	271.3
48	66	1.9	6.7	355.0	66	0.2	0.6	346.6
49	66	0.1	6.6	735.9	66	0.0	0.1	812.4
50	66	0.9	3.5	384.7	66	0.1	0.3	318.7
51	66	0.7	3.6	477.9	66	0.0	0.2	461.8
52	64	0.6	2.5	414.5	64	0.1	0.3	414.6

Note : Data Cover the Period 1901 to 1978.
Source : Assistant Director General of Meteorology, Pune.

Statement 65: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State: WEST BENGAL **Station:** BANKURA (Observatory) **District:** BANKURA

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	69	1.9	7.3	381.8	69	0.2	0.6	131.7
2	69	3.5	10.1	284.6	69	0.2	1.5	234.9
3	69	1.6	4.5	278.1	69	0.2	0.5	315.9
4	69	3.7	9.3	254.7	69	0.3	0.7	260.1
5	68	6.6	13.9	211.5	68	0.5	0.8	170.1
6	68	5.4	11.0	203.7	68	0.5	0.8	157.2
7	68	8.1	20.9	259.1	68	0.4	0.9	264.9
8	68	4.3	9.3	216.0	68	0.4	0.8	262.3
9	68	5.6	13.9	247.3	68	0.4	0.7	181.4
10	69	5.0	11.8	237.9	69	0.3	0.6	205.5
11	69	5.9	13.0	221.5	69	0.5	0.8	179.6
12	69	7.0	14.9	206.8	69	0.5	0.8	145.1
13	68	5.9	14.7	249.3	68	0.4	0.8	191.4
14	67	5.3	10.0	188.0	67	0.4	0.7	167.6
15	67	5.6	10.5	187.0	67	0.6	0.8	143.9
16	67	11.6	18.8	162.4	67	0.8	1.0	128.5
17	67	11.6	19.5	168.7	67	0.8	1.0	129.3
18	67	15.7	26.4	167.6	67	0.9	1.0	112.7
19	67	22.8	31.8	139.7	67	1.2	1.2	98.2
20	67	17.4	27.1	156.1	67	1.1	1.0	91.3
21	66	18.3	21.5	117.0	66	1.3	0.9	74.2
22	67	22.0	25.8	117.4	67	1.4	1.2	85.1
23	68	46.3	57.3	124.4	68	2.1	1.7	80.6
24	68	52.8	53.3	101.3	68	2.5	1.7	69.3

Statement 65 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	68	70.8	88.0	124.3	68	2.9	1.5	51.1
26	68	66.6	54.9	82.3	68	3.4	1.5	43.3
27	68	69.6	62.8	90.3	68	3.4	1.5	42.9
28	68	74.9	52.0	69.5	68	3.7	1.4	39.1
29	68	62.3	49.8	80.0	68	3.4	1.7	48.5
30	68	70.1	51.7	73.8	68	3.7	1.5	42.1
31	68	64.9	76.4	93.3	68	4.0	1.5	38.9
32	67	74.2	49.9	67.3	67	3.6	1.4	39.8
33	67	65.7	33.5	53.5	67	3.5	1.4	38.9
34	67	56.9	48.8	85.7	67	3.3	1.6	49.1
35	67	73.8	67.6	91.7	67	3.5	1.5	42.5
36	68	60.9	59.7	91.5	68	3.3	1.6	48.0
37	67	50.2	55.6	70.9	67	2.9	1.3	43.4
38	66	46.1	41.3	102.9	66	2.2	1.5	68.4
39	67	50.7	63.7	126.1	67	2.1	1.4	66.2
40	67	39.3	46.9	118.3	67	2.1	1.8	85.3
41	67	21.9	34.7	158.3	67	1.1	1.2	113.3
42	67	19.9	31.1	156.5	67	1.1	1.3	112.7
43	67	11.7	28.3	241.4	67	0.6	1.1	194.7
44	64	11.2	24.3	216.6	64	0.5	0.9	172.2
45	64	4.0	12.3	304.1	64	0.2	0.6	137.3
46	64	3.0	8.8	296.2	64	0.2	0.5	250.9
47	64	3.5	11.2	323.8	64	0.2	0.6	260.5
48	63	1.6	7.0	432.3	63	0.2	0.6	349.4
49	65	0.6	2.8	500.4	65	0.0	0.2	458.1
50	65	0.8	4.0	483.0	65	0.1	0.4	477.0
51	65	0.4	1.3	380.4	65	0.1	0.2	393.6
52	65	1.1	5.0	445.7	65	0.1	0.4	371.5

Note : Data Cover the Period 1901 to 1979.
Source : Assistant Director General of Meteorology, Pune.

Statement 66: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State: WEST BENGAL **Station:** MIDNAPORE (Observatory) **District:** MIDNAPORE

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	79	2.2	9.6	430.2	79	0.2	0.6	356.6
2	80	3.2	11.3	353.1	80	0.2	0.6	295.1
3	79	2.3	6.6	283.6	79	0.2	0.5	231.4
4	80	4.0	9.7	243.3	80	0.3	0.6	208.5
5	78	5.2	11.7	223.7	78	0.4	0.7	168.9
6	80	7.0	12.2	173.6	80	0.5	0.8	159.9
7	80	11.7	26.1	222.2	80	0.5	1.0	178.1
8	79	5.5	11.7	213.0	79	0.5	0.8	170.4
9	79	5.9	12.6	214.9	79	0.4	0.7	185.3
10	80	7.0	16.9	242.4	80	0.4	0.8	197.3
11	80	6.4	15.2	238.3	80	0.5	0.9	190.3
12	79	7.5	14.9	197.3	79	0.6	0.7	131.0
13	79	9.7	21.7	223.2	79	0.6	1.0	167.0
14	79	7.8	12.9	166.1	79	0.6	0.7	124.5
15	80	12.2	20.3	167.3	80	0.8	1.1	131.2
16	79	14.7	21.9	149.0	79	0.9	1.0	117.1
17	80	13.9	20.0	143.6	80	0.9	1.0	111.7
18	79	17.4	25.6	147.4	79	1.0	1.2	112.8
19	80	26.4	33.4	126.3	80	1.5	1.3	88.8
20	79	21.9	30.6	139.8	79	1.2	1.2	98.3
21	80	23.9	28.5	119.6	80	1.4	1.3	88.4
22	78	32.0	48.3	150.8	78	1.7	1.2	73.4
23	80	45.3	47.2	104.3	80	2.3	1.4	61.1
24	80	52.5	64.7	123.2	80	2.4	1.7	70.0

Statement 66 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	79	65.6	50.7	77.3	79	3.3	1.8	53.5
26	80	69.4	56.0	80.7	80	3.4	1.5	42.9
27	79	69.9	46.7	66.8	79	3.5	1.5	42.1
28	80	64.1	42.7	66.6	80	3.5	1.3	36.7
29	79	71.9	51.9	72.2	79	3.7	1.5	40.2
30	80	87.0	59.3	68.1	80	3.9	1.6	40.7
31	77	84.6	65.5	77.4	77	3.8	1.6	43.1
32	80	76.0	49.7	65.3	80	3.9	1.4	36.2
33	79	77.4	67.7	87.5	79	3.6	1.6	45.4
34	80	64.7	48.5	74.9	80	3.5	1.4	40.0
35	79	76.7	71.5	93.3	79	3.4	1.6	46.3
36	79	60.2	45.8	76.1	79	3.5	1.6	44.5
37	80	70.0	63.2	90.3	80	3.0	1.5	51.3
38	79	45.7	48.5	106.1	79	2.6	1.7	66.3
39	80	54.3	52.1	96.0	80	2.6	1.4	55.5
40	79	43.6	49.8	114.3	79	2.3	1.8	79.0
41	80	27.7	40.5	146.2	80	1.4	1.3	97.2
42	78	22.5	47.8	212.1	78	1.1	1.3	125.0
43	80	13.9	25.6	184.0	80	0.7	1.0	141.6
44	78	12.7	33.3	261.9	78	0.7	1.3	189.0
45	80	7.4	25.4	342.2	80	0.3	0.7	266.2
46	80	3.8	13.7	357.9	80	0.2	0.6	266.8
47	79	6.1	19.8	326.2	79	0.3	0.7	246.9
48	80	5.3	30.0	567.3	80	0.1	0.6	398.3
49	79	0.4	2.2	516.0	79	0.1	0.3	462.5
50	80	1.0	6.2	600.8	80	0.1	0.3	530.6
51	79	1.6	8.0	505.6	79	0.1	0.3	409.5
52	78	1.4	6.9	488.6	78	0.1	0.3	459.5

Note : Data Cover the Period 1901 to 1980.
Source : Assistant Director General of Meteorology, Pune.

Statement 67: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State: WEST BENGAL **Station**: ALIPUR (Observatory) **District**: 24 PARGANAS

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	78	1.9	5.8	300.6	78	0.1	0.4	296.3
2	79	4.1	15.0	384.0	79	0.2	0.7	289.3
3	79	1.2	3.2	258.1	79	0.1	0.4	293.1
4	79	4.0	11.1	275.1	79	0.2	0.6	251.0
5	79	3.6	8.8	243.2	79	0.3	0.7	205.8
6	79	0.4	12.0	188.0	79	0.5	0.8	157.7
7	80	9.5	22.1	232.3	80	0.5	1.0	184.3
8	79	7.1	14.8	207.8	79	0.4	0.7	183.4
9	80	5.9	14.7	249.0	80	0.4	0.8	213.7
10	78	7.2	17.9	246.3	78	0.4	0.9	202.1
11	80	6.0	15.0	259.2	80	0.4	0.7	166.9
12	80	6.7	15.5	178.8	80	0.5	0.8	141.8
13	80	7.6	16.5	217.6	80	0.6	1.1	175.2
14	79	5.1	10.8	210.6	79	0.4	0.6	180.9
15	80	11.2	17.6	156.8	80	0.7	1.0	135.2
16	79	17.9	27.5	153.5	79	1.0	1.3	123.8
17	80	13.6	22.1	162.5	80	0.9	1.3	135.1
18	79	10.3	20.7	126.5	79	1.0	1.1	114.1
19	80	30.1	43.6	120.5	80	1.6	1.3	82.6
20	80	20.6	25.5	123.7	80	1.2	1.0	81.0
21	80	28.5	37.6	132.1	80	1.7	1.3	80.0
22	80	30.1	44.5	123.4	80	1.7	1.3	72.5
23	79	53.7	72.9	134.1	79	2.3	1.8	75.2
24	80	62.7	60.0	95.7	80	2.9	1.9	65.5

Statement 67 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	80	78.9	80.9	103.4	80	3.4	1.7	48.6
26	80	75.7	63.3	83.6	80	3.7	1.5	41.2
27	79	76.8	58.5	82.6	79	3.7	1.5	40.7
28	80	72.8	54.5	74.8	80	3.8	1.4	36.6
29	80	76.2	67.5	88.6	80	3.8	1.8	46.7
30	80	82.8	64.2	77.5	80	4.1	1.6	39.1
31	80	81.3	60.6	75.3	80	4.2	1.5	36.4
32	79	80.7	60.8	75.4	79	3.9	1.2	31.6
33	80	70.8	54.0	70.2	80	4.0	1.4	36.2
34	80	67.4	42.2	64.1	80	3.7	1.4	37.6
35	80	76.3	59.8	78.3	80	3.8	1.5	39.6
36	79	64.3	60.7	94.4	79	3.6	1.5	41.3
37	80	66.9	58.6	87.5	80	3.4	1.6	47.9
38	80	52.9	50.3	95.1	80	2.6	1.6	59.8
39	80	62.8	93.1	148.3	80	2.7	1.5	56.3
40	79	44.8	51.2	114.2	79	2.3	1.7	72.3
41	80	33.1	42.3	129.8	80	1.7	1.4	82.3
42	80	38.6	82.5	217.2	80	1.5	1.4	97.3
43	80	20.5	36.8	179.8	80	1.0	1.3	120.2
44	80	16.0	32.9	205.6	80	0.7	1.1	158.0
45	79	4.8	15.7	323.6	79	0.3	0.7	236.6
46	80	5.2	14.1	269.5	80	0.3	0.6	215.7
47	80	4.9	14.8	302.6	80	0.2	0.5	256.0
48	80	3.5	10.7	361.0	80	0.2	0.6	291.2
49	79	1.1	6.7	619.8	79	0.1	0.3	462.5
50	80	0.7	2.5	371.4	80	0.1	0.4	346.3
51	79	1.7	6.3	379.0	79	0.1	0.3	409.5
52	80	1.3	6.7	509.6	80	0.1	0.4	374.0

Note : Data Cover the Period 1901 to 1980.
Source : Assistant Director General of Meteorology, Pune.

Statement 68 : Weekly Mean Rainfall and Rainy Days on Celendar Year Basis

State : ORISSA **Station :** BARIPADA **District :** MAYURBHANJ

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	49	3.3	12.1	362.8	49	0.2	0.6	299.7
2	50	2.7	9.6	350.2	50	0.2	0.7	273.6
3	50	1.9	6.1	331.5	50	0.2	0.5	267.7
4	50	4.9	10.4	209.9	50	0.5	0.9	194.0
5	48	6.4	15.4	239.6	48	0.4	0.6	161.6
6	48	6.6	13.2	200.6	48	0.5	0.8	165.0
7	50	15.6	41.4	265.9	50	0.7	1.3	193.6
8	49	6.6	15.3	179.0	49	0.8	1.1	142.7
9	49	2.9	5.9	200.5	49	0.4	0.8	209.4
10	49	7.7	22.5	291.1	49	0.4	1.0	233.3
11	50	6.5	12.4	189.0	50	0.6	1.1	172.1
12	50	6.4	10.8	168.1	50	0.6	0.8	135.3
13	49	10.2	17.6	172.8	49	0.7	0.9	145.1
14	49	7.8	15.7	201.1	49	0.4	0.6	156.3
15	50	17.9	32.3	180.3	50	0.9	1.2	125.8
16	50	15.4	19.3	125.8	50	1.2	1.2	103.7
17	50	13.2	19.7	149.0	50	0.8	1.0	122.3
18	50	23.7	39.3	166.3	50	1.1	1.3	112.1
19	49	23.1	25.4	101.3	49	1.8	1.3	75.8
20	50	22.3	32.8	147.3	50	1.2	1.1	90.7
21	50	21.7	26.4	121.8	50	1.2	1.2	97.2
22	49	34.1	37.9	111.2	49	2.0	1.4	71.1
23	49	51.2	60.1	117.3	49	2.6	1.8	71.6
24	50	49.2	44.4	90.3	50	2.6	1.9	74.3

Statement 68 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	50	72.3	58.5	80.8	50	3.4	1.7	49.2
26	50	71.8	52.4	73.0	50	3.5	1.8	50.8
27	49	70.7	46.9	66.3	49	3.5	1.5	42.1
28	50	89.1	61.6	69.1	50	3.7	1.4	38.5
29	50	79.9	52.0	65.1	50	3.7	1.5	39.6
30	50	107.5	93.0	86.5	50	4.2	1.7	39.7
31	49	89.5	78.3	87.5	49	3.9	1.6	41.9
32	49	74.2	41.0	55.2	49	3.8	1.6	41.7
33	50	77.5	59.6	76.8	50	3.7	1.6	44.0
34	50	74.2	42.2	56.9	50	3.8	1.3	35.5
35	48	73.8	55.0	74.5	48	3.8	1.5	38.6
36	47	62.2	44.8	72.0	47	3.4	1.5	45.8
37	48	66.0	53.5	81.2	48	3.0	1.8	59.9
38	49	56.3	58.0	103.0	49	2.6	1.7	63.2
39	48	46.8	39.4	84.2	48	2.4	1.6	65.9
40	47	48.8	62.2	127.6	47	2.2	2.0	93.5
41	49	30.9	51.0	165.1	49	1.5	1.5	102.2
42	49	30.1	53.8	179.0	49	1.4	1.8	128.0
43	49	14.9	31.8	212.6	49	1.0	1.5	151.9
44	48	17.2	38.8	226.3	48	0.8	1.4	187.6
45	47	3.9	11.2	285.7	47	0.2	0.6	239.3
46	48	5.2	20.3	391.9	48	0.3	0.7	271.9
47	48	10.1	33.0	326.8	48	0.3	0.7	208.3
48	48	3.6	14.2	397.2	48	0.1	0.5	316.0
49	48	0.8	4.0	486.2	48	0.1	0.4	484.7
50	49	1.4	6.4	466.3	49	0.1	0.5	378.0
51	49	2.0	6.9	347.7	49	0.2	0.4	260.7
52	49	0.2	1.5	591.5	49	0.0	0.1	700.0

Note : Data Cover the Period 1901 to 1964.
Source : Assistant Director General of Meteorology, Pune.

Statement 69 : Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : ORISSA **Station :** BARIPADA (Observatory) **District :** MAYURBHANJ

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	24	3.0	10.2	341.3	24	0.2	0.5	288.9
2	24	2.4	12.6	368.2	24	0.2	0.5	288.9
3	24	2.2	6.2	276.3	24	0.2	0.4	228.4
4	23	7.4	3.8	266.8	23	0.1	0.3	264.0
5	23	9.4	16.4	174.1	23	0.6	0.9	158.5
6	25	8.6	17.1	198.2	25	0.5	0.8	148.1
7	25	6.3	15.7	250.2	25	0.4	0.8	210.3
8	24	3.6	6.1	171.0	24	0.5	0.8	170.0
9	25	12.3	21.6	175.8	25	0.8	1.2	144.5
10	25	6.9	14.3	206.2	25	0.6	1.2	206.7
11	25	4.7	13.0	273.9	25	0.4	0.9	239.0
12	24	8.0	18.1	225.7	24	0.5	1.0	180.4
13	24	8.0	12.3	153.2	24	0.5	1.0	134.8
14	25	10.8	15.6	144.8	25	0.7	0.8	118.0
15	25	10.2	12.2	119.0	25	0.8	0.8	102.1
16	25	11.2	14.5	129.2	25	1.0	1.1	108.0
17	24	17.6	22.9	129.6	24	1.1	1.1	105.1
18	25	13.2	20.6	156.1	25	1.2	1.6	132.3
19	25	13.3	21.0	137.0	25	1.0	1.3	122.5
20	25	20.0	23.6	117.9	25	1.2	1.3	107.4
21	24	34.6	37.1	107.3	24	1.6	1.1	69.8
22	24	35.8	61.2	170.8	24	1.5	1.5	95.6
23	25	49.7	50.0	100.6	25	2.4	1.8	76.1
24	25	46.0	36.6	79.6	25	2.4	1.5	64.6

Statement 69 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	25	68.3	51.0	74.7	25	3.2	1.8	36.3
26	24	77.6	57.7	74.3	24	3.6	1.6	44.3
27	24	64.3	37.9	39.0	24	3.7	1.5	41.5
28	24	77.3	48.1	62.2	24	3.8	1.5	38.9
29	24	85.9	45.4	52.8	24	4.3	1.4	32.4
30	23	71.6	58.9	82.3	23	3.3	1.6	49.0
31	23	90.2	95.2	105.5	23	3.6	1.8	50.6
32	25	114.1	72.5	63.5	25	4.2	1.5	35.7
33	25	105.2	108.3	102.9	25	3.4	1.6	47.3
34	24	77.4	60.3	77.9	24	3.7	1.6	43.9
35	23	90.8	85.7	94.4	23	4.2	1.6	37.1
36	24	86.1	90.5	105.2	24	3.6	1.7	46.5
37	24	86.1	67.3	78.2	24	3.8	1.5	41.0
38	24	60.5	61.7	102.1	24	2.8	1.9	69.7
39	23	71.6	41.7	66.6	23	2.8	1.7	59.3
40	25	66.2	72.4	109.3	25	2.8	1.8	64.0
41	25	42.1	95.0	225.5	25	1.4	1.2	85.0
42	25	27.2	50.4	185.5	25	1.2	1.5	126.1
43	24	20.0	35.0	175.1	24	1.2	1.7	140.1
44	24	26.2	50.8	193.8	24	0.9	1.3	139.9
45	25	3.0	6.5	214.1	25	0.4	0.8	190.9
46	25	1.8	5.0	278.6	25	0.2	0.6	248.8
47	23	4.4	15.3	344.5	23	0.2	0.6	331.3
48	25	1.1	3.0	275.3	25	0.1	0.3	346.1
49	25	0.3	0.9	272.6	25	0.0	0.2	500.0
50	25	1.2	5.5	445.5	25	0.1	0.3	346.1
51	25	1.2	0.6	425.1	25	0.0	0.2	500.0
52	24	2.0	0.2	306.5	24	0.1	0.3	270.3

Note : Data Cover the Period 1956 to 1980.
Source : Assistant Director General of Meteorology, Pune.

Statement 70 : Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : ORISSA **Station :** KEONJHARGARH **District :** KEONJHAR

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	54	4.6	12.5	272.8	54	0.2	0.6	241.2
2	53	2.1	6.1	285.0	53	0.2	0.6	224.8
3	54	4.3	13.0	300.0	54	0.3	0.8	259.2
4	53	5.1	12.6	245.6	53	0.4	1.0	219.2
5	51	11.4	24.8	217.8	51	0.7	1.0	145.9
6	50	7.8	16.6	212.1	50	0.5	1.0	194.8
7	51	11.3	25.2	223.4	51	0.7	1.2	158.4
8	50	8.3	17.9	215.2	50	0.5	0.8	152.5
9	49	3.0	9.2	306.6	49	0.2	0.6	276.8
10	53	4.4	12.7	288.3	53	0.3	0.7	207.7
11	53	6.3	11.2	176.6	53	0.5	0.7	165.3
12	52	4.0	8.4	209.6	52	0.3	0.7	197.2
13	52	5.1	10.2	200.3	52	0.4	0.8	191.6
14	54	5.9	12.2	207.2	54	0.6	0.8	142.7
15	55	14.7	34.4	234.0	55	0.9	0.2	143.0
16	55	14.2	22.4	157.4	55	0.9	1.0	118.9
17	53	8.1	14.2	175.5	53	1.0	1.0	144.0
18	53	19.4	29.7	153.2	53	1.0	1.0	105.8
19	53	19.2	21.9	114.2	53	1.2	1.1	90.9
20	55	19.1	20.5	107.4	55	1.3	1.2	89.3
21	53	19.1	22.4	117.4	53	1.5	1.4	98.8
22	53	26.9	31.6	117.2	53	1.6	1.3	80.5
23	52	36.1	40.3	111.5	52	2.2	1.7	78.8
24	54	43.8	48.0	109.6	54	2.4	1.6	63.9

Statement 70 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	53	59.7	40.3	79.6	53	2.6	1.6	61.4
26	52	56.9	43.0	75.5	52	3.0	1.5	51.8
27	52	71.1	69.1	97.2	52	3.5	1.6	46.1
28	53	77.0	63.4	82.3	53	3.7	1.6	44.3
29	52	61.8	46.8	75.8	52	3.5	1.5	42.3
30	51	91.4	71.4	78.1	51	4.2	1.6	36.8
31	52	87.8	91.2	103.9	52	3.5	1.9	53.2
32	54	59.0	43.2	73.2	54	3.3	1.6	48.3
33	55	67.8	47.7	70.4	55	3.7	1.6	43.8
34	54	68.8	55.4	80.4	54	3.4	1.5	44.1
35	53	61.6	43.8	71.1	53	3.6	1.5	42.3
36	52	58.4	39.6	67.9	52	3.6	1.5	42.1
37	53	61.9	47.2	76.3	53	3.3	1.7	51.2
38	53	46.3	45.4	97.7	53	2.7	1.5	54.7
39	53	33.5	31.8	94.8	53	2.2	1.5	69.9
40	52	33.7	46.5	138.1	52	1.9	1.9	96.9
41	51	19.7	26.7	135.3	51	1.4	1.6	114.1
42	52	17.2	28.5	166.3	52	1.0	1.3	129.9
43	51	9.1	16.0	175.0	51	0.7	1.2	158.6
44	52	14.3	29.2	204.5	52	0.9	1.3	147.9
45	53	4.3	14.5	336.0	53	0.2	0.6	264.0
46	55	5.0	12.5	230.7	55	0.3	0.7	240.1
47	54	7.4	22.5	304.8	54	0.4	0.7	207.7
48	52	2.6	9.8	370.0	52	0.2	0.5	349.8
49	52	0.5	2.5	515.9	52	0.1	0.3	533.3
50	53	0.3	1.9	592.0	53	0.1	0.3	538.4
51	52	2.0	7.3	359.4	52	0.1	0.4	328.1
52	52	1.4	5.5	391.5	52	0.1	0.4	371.8

Note: Data Cover the Period 1901 to 1967.
Source : Assistant Director General of Meteorology, Pune.

Statement 71 : Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : ORISSA **Station :** KEONJHARGARH (Observatory) **District :** KEONJHAR

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	21	4.1	11.1	274.4	21	0.3	0.6	196.2
2	20	3.2	9.9	312.6	20	0.3	0.8	314.6
3	22	0.8	2.1	255.4	22	0.1	0.3	323.7
4	22	3.0	6.5	215.2	22	0.3	0.6	178.5
5	22	3.8	9.6	251.3	22	0.2	0.5	232.5
6	20	4.3	17.3	402.7	20	0.2	0.7	347.9
7	21	5.0	16.8	337.5	21	0.3	0.7	251.0
8	21	5.5	10.7	196.0	21	0.6	1.0	165.3
9	21	11.1	22.0	197.2	21	0.6	1.0	157.3
10	21	5.6	12.2	219.3	21	0.3	0.7	197.5
11	22	5.1	12.4	242.0	22	0.2	0.4	217.1
12	21	6.7	11.1	164.8	21	0.6	1.0	157.3
13	21	6.1	11.6	189.1	21	0.3	0.6	173.2
14	22	5.3	9.6	181.3	22	0.5	0.7	148.0
15	21	5.5	10.4	189.2	21	0.6	0.9	152.3
16	20	8.6	12.0	139.1	20	0.6	0.8	123.0
17	22	10.8	16.4	152.0	22	0.9	1.1	130.3
18	20	14.3	18.7	131.3	20	1.1	1.3	113.9
19	21	17.9	21.9	122.2	21	1.1	1.1	99.6
20	22	16.1	17.5	108.7	22	1.4	1.3	94.8
21	22	14.4	13.4	93.1	21	1.7	1.2	69.6
22	22	17.1	27.6	161.8	20	1.2	1.7	137.6
23	22	28.8	37.4	130.0	22	2.0	1.5	76.5
24	23	32.9	32.2	97.9	20	2.0	1.2	58.0

Statement 71 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	23	57.0	54.2	95.2	21	2.5	1.5	60.7
26	22	48.5	31.5	64.9	22	3.0	1.3	43.7
27	22	64.3	43.1	67.1	22	3.6	1.8	49.1
28	22	53.4	31.2	58.4	22	3.4	1.4	40.1
29	23	66.7	61.8	92.6	22	3.2	1.6	50.0
30	23	46.1	46.1	99.9	23	2.6	1.9	72.9
31	23	62.6	40.6	64.9	23	3.3	1.3	39.5
32	22	83.0	68.9	83.0	22	3.3	1.6	50.1
33	22	89.8	90.6	100.9	22	3.5	1.5	43.9
34	23	52.1	41.1	78.8	23	3.3	1.7	52.2
35	22	55.2	41.7	75.1	22	3.1	1.8	55.9
36	23	60.2	52.8	83.5	23	3.1	1.7	56.0
37	21	80.3	66.0	82.2	21	3.6	1.3	36.0
38	23	43.7	52.6	120.4	23	2.6	1.9	72.3
39	22	58.9	54.6	92.6	22	2.2	1.3	59.4
40	22	20.2	24.8	94.8	22	1.9	1.8	95.5
41	20	17.4	27.3	157.2	20	1.3	1.3	106.6
42	21	20.7	41.7	201.9	21	1.4	1.5	111.0
43	22	12.2	25.2	206.1	22	0.9	1.4	164.9
44	21	12.9	25.0	193.0	21	0.5	0.7	157.4
45	21	2.9	6.4	218.0	21	0.3	0.7	219.1
46	22	1.7	3.4	205.0	22	0.2	0.5	232.5
47	22	6.3	15.4	243.1	22	0.3	0.6	231.4
48	21	0.2	0.6	256.6	21	0.0	0.0	0.0
49	22	3.1	8.5	278.6	22	0.2	0.4	417.1
50	21	0.1	0.7	458.3	21	0.0	0.2	458.3
51	22	0.1	0.2	342.9	22	0.0	0.0	0.0
52	22	1.9	5.5	280.4	22	0.1	0.4	257.6

Note: Data Cover the Period 1957 to 1980.
Source : Assistant Director General of Meteorology. Pune.

Statement 72 : Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : ORISSA **Station :** UJJALPUR **District :** SUNDARGARH

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	22	2.7	11.5	424.5	22	0.1	0.5	342.9
2	22	3.3	7.5	226.3	22	0.4	0.8	217.1
3	22	3.2	7.7	236.9	22	0.1	0.4	257.6
4	22	3.7	8.4	231.2	22	0.4	0.9	248.1
5	21	8.1	17.4	215.9	21	0.4	0.8	189.2
6	21	4.6	8.4	180.4	21	0.5	0.8	170.9
7	21	0.4	1.0	282.6	21	0.1	0.3	315.8
8	21	6.3	13.0	206.5	21	0.5	0.9	183.3
9	21	7.5	12.7	170.3	21	0.6	0.9	152.3
10	22	3.0	8.7	292.4	22	0.2	0.5	232.5
11	22	3.7	6.4	174.1	22	0.4	0.7	162.8
12	22	7.3	16.5	226.9	22	0.4	0.7	180.9
13	21	8.7	22.6	260.4	21	0.4	1.0	228.3
14	21	1.5	3.2	207.4	21	0.3	0.7	197.5
15	21	6.2	19.9	332.3	21	0.3	0.7	251.0
16	21	3.8	10.4	273.1	21	0.3	0.7	197.5
17	21	2.2	4.3	200.2	21	0.3	0.7	197.5
18	21	7.2	16.1	224.7	21	0.4	0.7	157.8
19	22	4.0	7.9	199.4	22	0.5	1.0	211.8
20	22	3.9	9.5	239.4	22	0.5	1.1	211.6
21	22	3.9	6.5	166.6	22	0.4	0.6	159.8
22	22	10.5	20.0	194.0	22	0.5	1.1	209.6
23	22	41.0	65.2	159.2	22	1.5	1.6	106.4
24	22	47.4	52.5	110.7	22	2.1	1.8	84.6

Statement 72 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	22	59.8	48.2	80.7	22	2.6	1.8	69.8
26	22	76.0	63.7	83.8	22	3.0	1.4	48.2
27	22	97.7	84.1	86.1	22	4.2	1.7	39.3
28	22	71.7	60.9	84.9	22	3.8	1.9	48.9
29	22	81.2	42.6	52.4	22	4.4	1.4	32.8
30	22	77.3	55.5	71.7	22	3.4	1.8	54.7
31	22	96.0	85.7	89.3	22	4.0	1.8	46.5
32	22	87.9	47.4	53.9	22	4.2	1.6	37.4
33	22	95.0	63.6	66.9	22	4.3	1.6	38.3
34	22	74.4	41.7	55.5	22	4.1	1.5	36.0
35	22	75.1	56.7	75.5	22	3.8	1.4	37.6
36	22	87.0	53.3	61.2	22	3.3	1.5	45.4
37	22	65.0	51.5	79.1	22	3.0	1.7	55.0
38	22	49.4	50.2	101.5	22	2.5	1.4	58.6
39	22	31.9	33.6	105.5	22	1.9	1.4	76.4
40	22	22.6	27.1	120.3	22	1.7	1.8	102.9
41	22	20.6	36.1	175.0	22	1.1	1.4	129.4
42	22	8.4	14.2	169.1	22	0.7	1.1	154.1
43	22	5.4	9.7	178.8	22	0.6	1.0	170.5
44	22	1.8	4.7	262.8	22	0.1	0.4	257.6
45	22	0.0	0.0	464.0	22	0.0	0.0	0.0
46	22	0.0	0.0	0.0	22	0.0	0.0	0.0
47	22	0.4	1.5	345.4	22	0.1	0.3	323.7
48	21	2.2	5.6	258.2	21	0.2	0.5	268.7
49	21	0.6	2.6	458.3	21	0.0	0.2	458.3
50	21	0.6	2.6	458.3	21	0.0	0.2	458.3
51	21	0.0	0.0	0.0	21	0.0	0.0	0.0
52	21	0.8	3.8	438.3	21	0.0	0.2	458.3

Note : Data Cover the Period 1951 to 1972.
Source : Assistant Director General of Meteorology, Pune.

Statement 73 : Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : ORISSA **Station :** HEMGIR (Hydro) **District :** SUNDARGARH

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	21	4.2	11.9	280.3	21	0.3	0.6	225.3
2	21	2.4	7.6	320.1	21	0.2	0.5	268.7
3	21	7.0	17.3	245.9	21	0.5	0.7	157.4
4	20	2.2	5.7	260.9	20	0.3	0.6	255.5
5	21	6.0	13.3	223.3	21	0.4	0.7	175.6
6	21	3.3	8.3	254.6	21	0.2	0.5	226.4
7	21	0.7	2.8	425.1	21	0.1	0.4	458.3
8	20	4.7	11.6	247.6	20	0.3	0.8	232.2
9	21	5.8	10.8	187.7	21	0.6	0.7	130.6
10	21	3.7	8.9	244.4	21	0.2	0.5	226.4
11	21	4.3	9.5	221.5	21	0.5	0.8	170.9
12	20	4.5	13.4	300.9	20	0.4	0.8	183.5
13	20	10.9	28.8	263.1	20	0.6	1.0	174.4
14	21	2.8	5.1	178.6	21	0.3	0.5	144.9
15	21	2.5	6.9	272.2	21	0.3	0.7	219.1
16	21	3.6	9.8	268.1	21	0.4	0.7	175.6
17	20	2.5	9.9	396.8	20	0.2	0.7	347.9
18	21	5.8	11.8	203.6	21	0.5	0.7	157.4
19	21	5.3	7.6	144.5	21	0.6	0.9	162.0
20	21	4.3	7.7	178.7	21	0.6	1.0	171.2
21	20	1.1	2.6	223.1	20	0.2	0.4	205.2
22	21	8.6	19.8	229.1	21	0.3	0.6	173.2
23	21	39.6	55.5	140.1	21	1.6	1.6	100.5
24	21	47.4	81.9	172.8	21	2.0	1.3	65.7

Statement 73 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	20	59.5	37.6	63.2	20	2.8	1.7	60.0
26	21	80.5	71.9	89.2	21	3.2	1.8	56.0
27	21	121.5	87.5	72.1	21	4.5	1.5	33.2
28	21	88.8	77.9	87.8	21	4.2	2.0	47.7
29	21	88.4	45.8	51.8	21	4.4	1.5	34.7
30	20	83.9	74.4	88.7	20	4.0	2.0	50.7
31	21	119.3	106.3	89.1	21	4.3	1.6	37.4
32	21	87.5	55.0	62.9	21	4.1	1.2	28.9
33	21	124.0	93.3	75.2	21	4.3	1.6	36.7
34	20	89.3	60.9	68.3	20	4.3	1.3	30.4
35	21	90.4	60.7	67.1	21	3.9	1.9	48.7
36	21	75.5	54.4	72.1	21	3.9	1.6	41.2
37	21	96.9	91.1	94.0	21	3.4	2.0	58.8
38	20	47.6	38.9	81.8	20	2.4	1.5	61.1
39	21	31.7	39.6	124.9	21	1.7	1.6	93.6
40	21	25.7	26.2	102.0	21	1.5	1.4	92.4
41	21	19.0	23.0	120.6	21	1.2	1.2	98.6
42	21	13.7	26.5	194.2	21	0.8	1.2	149.4
43	20	9.5	22.0	232.5	20	0.6	1.1	197.6
44	21	1.9	5.8	306.6	21	0.2	0.6	262.4
45	21	0.6	2.9	458.3	21	0.1	0.4	458.3
46	21	0.8	3.5	438.3	21	0.1	0.4	458.3
47	20	0.2	0.9	447.2	20	0.0	0.2	447.2
48	20	0.9	2.4	265.8	20	0.1	0.4	244.2
49	20	0.0	0.0	0.0	20	0.0	0.0	0.0
50	20	0.8	3.1	409.0	20	0.1	0.4	447.2
51	19	0.0	0.0	0.0	19	0.0	0.0	0.0
52	20	1.4	4.2	307.9	19	0.1	0.5	326.2

Note: Data Cover the Period 1951 to 1971.
Source : Assistant Director General of Meteorology, Pune.

Statement 74 : Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : ORISSA **Station :** RAJGANGPUR **District :** SUNDARGARH

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	34	2.1	5.3	247.6	34	0.2	0.5	259.9
2	34	1.2	4.7	378.0	34	0.1	0.4	347.9
3	33	2.7	8.5	313.1	33	0.3	0.7	220.8
4	34	5.5	14.1	255.0	34	0.3	0.7	244.5
5	33	7.0	12.5	179.5	33	0.5	0.8	161.8
6	34	5.6	12.6	224.6	34	0.6	1.1	178.3
7	34	11.8	29.4	248.5	34	0.6	1.3	207.2
8	33	11.6	23.9	207.2	33	0.6	1.0	161.1
9	33	2.0	5.6	278.0	33	0.2	0.4	240.3
10	34	3.8	10.6	275.0	34	0.3	0.7	244.5
11	34	5.2	14.6	278.9	34	0.4	1.0	247.4
12	33	4.1	7.8	193.3	33	0.4	0.7	192.2
13	34	2.1	6.4	297.6	34	0.2	0.5	261.4
14	34	6.0	12.9	215.3	34	0.4	1.0	247.4
15	34	2.4	6.4	260.8	34	0.3	0.7	251.4
16	31	2.8	8.2	287.6	31	0.3	0.6	223.0
17	32	2.6	6.6	255.6	32	0.3	0.6	225.5
18	31	2.3	4.5	193.3	31	0.3	0.6	185.8
19	34	7.0	12.8	183.6	34	0.5	0.9	162.7
20	34	11.7	19.5	167.1	34	0.9	1.0	110.8
21	34	7.2	15.3	213.3	34	0.5	1.0	187.4
22	34	12.9	17.8	137.8	34	1.0	1.2	115.9
23	34	32.4	47.0	144.8	34	1.8	1.8	99.7
24	34	49.7	60.2	121.3	34	2.4	1.8	75.1

Statement 74 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	33	74.4	50.5	63.6	33	3.8	1.6	41.1
26	33	69.5	79.7	114.6	33	3.2	2.1	66.0
27	34	95.4	64.1	67.2	34	4.4	1.9	31.8
28	34	113.6	86.5	76.2	34	4.0	1.6	40.3
29	34	100.4	85.0	84.6	34	4.1	1.8	44.0
30	36	117.2	73.7	62.9	36	4.6	1.5	32.3
31	33	105.7	72.1	68.2	33	4.4	1.6	35.8
32	35	87.4	62.7	71.7	35	4.2	1.8	42.1
33	34	112.0	91.8	81.9	34	4.2	1.8	43.3
34	33	99.1	60.5	61.1	33	4.1	1.8	43.9
35	33	81.6	57.0	69.8	33	3.8	1.6	41.7
36	34	55.4	32.2	58.2	34	3.4	1.5	45.1
37	34	50.6	45.9	90.7	34	3.0	1.8	61.7
38	34	44.8	47.4	105.9	34	2.3	1.9	82.6
39	35	25.9	40.0	154.2	35	1.7	1.4	85.3
40	35	39.6	60.3	152.5	35	1.7	1.8	111.4
41	35	16.4	34.0	209.4	35	0.9	1.5	168.3
42	33	9.7	18.2	188.1	33	0.6	1.0	195.7
43	34	6.6	19.3	290.9	34	0.4	0.9	224.6
44	33	6.9	21.2	238.9	33	0.5	1.0	200.5
45	33	5.2	15.8	304.8	33	0.2	0.6	321.1
46	33	6.3	1.4	405.1	33	0.1	0.2	399.8
47	33	5.0	9.0	300.5	33	0.2	0.5	255.6
48	32	0.6	2.2	370.2	32	0.1	0.4	337.0
49	32	0.1	0.4	565.7	32	0.0	0.2	565.7
50	32	0.2	0.8	394.9	32	0.0	0.2	568.7
51	32	2.1	7.6	358.1	32	0.2	0.6	367.4
52	33	1.9	7.8	414.7	33	0.1	0.3	273.4

Note: Data Cover the Period 1911 to 1967.
Source : Assistant Director General of Meteorology, Pune.

Statement 75 : Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : ORISSA **Station :** BOLANGIR **District :** BOLANGIR (Patna)

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	46	4.4	15.6	351.7	46	0.2	0.5	279.2
2	46	1.4	6.1	420.2	46	0.1	0.3	327.6
3	46	1.5	4.4	292.8	46	0.2	0.4	251.5
4	46	4.4	13.8	315.8	46	0.2	0.6	267.2
5	46	4.4	11.8	266.0	46	0.3	0.6	194.3
6	48	7.0	16.7	239.1	48	0.5	1.2	254.7
7	48	6.9	16.0	233.0	48	0.5	0.9	174.3
8	48	4.6	9.9	214.4	48	0.5	0.9	187.6
9	46	2.5	5.8	235.9	46	0.2	0.6	236.3
10	48	1.0	2.1	210.6	48	0.2	0.4	237.4
11	48	5.2	14.6	283.2	48	0.3	0.7	261.0
12	48	4.3	12.2	285.9	48	0.3	0.7	230.2
13	47	3.3	7.4	224.0	47	0.3	0.6	176.2
14	49	4.8	9.1	190.9	49	0.4	0.7	165.0
15	49	8.6	14.5	169.3	49	0.7	1.0	148.4
16	49	8.0	16.8	208.0	49	0.6	1.1	175.8
17	49	3.9	7.1	183.1	49	0.3	0.6	181.8
18	49	7.5	13.3	177.6	49	0.5	0.8	149.5
19	49	10.4	16.9	162.1	49	0.8	1.1	139.9
20	49	9.6	18.1	188.1	49	0.6	1.7	124.0
21	49	6.4	13.2	204.9	49	0.5	0.8	162.1
22	49	14.6	22.2	152.2	49	1.0	1.2	127.6
23	50	20.9	40.5	193.5	50	1.3	1.4	108.3
24	50	66.0	101.7	154.2	50	2.3	1.8	80.3

Statement 75 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	50	65.0	53.0	81.5	50	3.1	1.6	51.5
26	49	85.0	76.8	90.3	49	3.5	1.8	46.5
27	49	76.8	58.6	76.3	49	3.3	1.3	39.5
28	49	85.7	63.6	74.2	49	3.7	1.6	44.3
29	49	84.8	67.8	80.0	49	3.7	1.7	47.0
30	48	103.1	71.1	69.0	48	4.4	1.6	36.8
31	47	96.7	89.0	90.2	47	3.5	1.5	41.7
32	49	83.3	65.4	78.5	49	3.8	1.5	38.5
33	48	90.6	84.5	93.3	48	3.8	1.5	45.7
34	49	93.0	68.4	73.5	49	3.9	1.8	39.6
35	48	81.0	52.7	65.0	48	3.6	1.4	44.8
36	48	86.7	80.3	92.6	48	3.7	1.7	40.0
37	48	44.5	45.1	101.4	48	3.6	1.9	71.7
38	47	48.9	54.8	112.1	47	2.6	1.5	64.9
39	48	25.9	23.3	89.7	48	2.3	1.3	77.9
40	48	35.5	53.2	158.7	48	1.6	1.8	116.5
41	49	15.4	26.5	172.8	49	0.8	1.0	117.9
42	48	8.3	17.2	208.5	48	0.7	1.1	159.2
43	48	6.3	18.2	289.1	48	0.5	1.1	205.8
44	47	11.0	29.5	268.4	47	0.5	1.0	208.2
45	49	1.3	4.3	327.3	49	0.1	0.4	285.8
46	49	1.2	3.0	244.0	49	0.2	0.5	244.6
47	49	3.6	11.7	321.3	49	0.2	0.7	331.4
48	48	2.7	8.2	309.4	48	0.2	0.5	261.7
49	48	0.1	0.5	405.1	48	0.0	0.1	692.8
50	48	1.3	6.6	500.7	48	0.0	0.2	484.7
51	48	1.7	5.0	288.8	48	0.2	0.4	226.0
52	47	0.9	3.7	416.6	47	0.1	0.4	352.5

Note : Data Cover the Period 1902 to 1964.
Source : Assistant Director General of Meteorology, Pune.

Statement 76 : Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : ORISSA **Station :** BOLANGIR (Observatory) **District :** BOLANGIR

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	23	2.1	4.5	213.2	23	0.3	0.7	205.3
2	23	2.2	6.8	306.2	23	0.3	0.5	207.3
3	23	2.4	2.0	479.6	23	0.0	0.2	479.6
4	23	2.7	2.0	267.7	23	0.1	0.4	479.6
5	23	2.2	5.7	255.1	23	0.1	0.3	264.0
6	23	6.5	19.1	294.9	23	0.3	0.7	261.0
7	23	3.9	9.3	236.9	23	0.3	0.7	231.0
8	23	3.8	9.7	257.6	23	0.3	0.7	205.3
9	22	1.8	3.7	208.2	22	0.3	0.6	201.8
10	22	0.8	2.3	274.5	22	0.1	0.3	323.7
11	22	2.7	8.2	302.0	22	0.2	0.7	365.5
12	23	6.6	17.1	258.7	23	0.4	0.9	240.5
13	21	4.4	9.6	216.0	21	0.3	0.7	251.0
14	21	5.8	12.1	209.9	21	0.5	0.7	157.4
15	21	5.2	5.9	182.9	21	0.3	0.7	197.5
16	20	6.5	8.2	127.3	20	0.6	0.8	125.0
17	20	4.7	10.4	219.3	20	0.4	0.7	170.1
18	21	2.6	5.6	218.0	21	0.3	0.7	197.5
19	22	6.4	16.6	260.8	22	0.5	0.3	244.8
20	22	7.2	11.9	165.6	22	0.6	0.7	114.2
21	22	3.0	5.9	194.8	22	0.3	0.6	178.5
22	22	7.3	12.7	173.9	22	0.4	0.5	123.0
23	22	18.4	22.6	123.0	22	1.5	1.7	113.7
24	21	27.0	33.4	123.7	21	1.8	1.2	66.8

Statement 76 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	21	64.5	71.9	111.6	21	2.7	1.6	58.5
26	21	80.9	49.2	60.8	21	3.7	1.7	46.7
27	21	91.0	68.4	75.2	21	3.6	1.7	48.1
28	21	102.7	102.3	99.6	21	3.9	1.9	47.8
29	21	104.2	74.1	71.1	21	4.1	1.9	46.9
30	22	79.9	54.0	67.6	22	3.4	1.5	43.1
31	20	83.3	48.6	58.4	20	3.9	1.8	44.6
32	21	73.3	56.3	76.8	21	3.5	1.6	44.5
33	21	78.4	59.4	75.8	21	3.8	1.6	55.7
34	21	58.4	37.2	63.6	21	2.9	1.6	64.3
35	21	49.5	43.4	87.6	21	2.8	1.8	56.4
36	23	74.6	63.5	85.1	23	3.3	1.8	64.4
37	23	68.2	57.4	84.1	23	2.7	1.8	84.4
38	23	28.4	36.6	128.6	23	1.7	1.5	86.1
39	22	25.4	34.3	136.6	22	1.5	1.5	101.1
40	21	19.8	28.8	145.3	21	1.4	1.8	130.5
41	21	13.7	22.7	166.0	21	1.0	1.3	138.8
42	21	13.9	26.6	191.3	21	0.9	1.2	130.3
43	22	14.6	30.1	205.3	22	0.7	1.2	170.7
44	22	5.9	14.2	240.3	22	0.4	0.7	162.8
45	23	1.3	4.2	318.5	23	0.1	0.5	350.9
46	23	0.0	0.0	0.0	23	0.0	0.0	0.0
47	23	3.3	14.3	427.5	23	0.1	0.5	350.9
48	20	2.1	8.4	396.3	20	0.1	0.5	326.2
49	22	1.4	4.1	289.5	22	0.1	0.4	257.6
50	22	1.0	8.1	309.2	22	0.2	0.5	275.6
51	22	0.0	0.2	469.0	22	0.0	0.0	0.0
52	22	0.3	1.1	354.9	22	0.0	0.2	469.0

Note: Data Cover the Period 1956 to 1980.
Source : Assistant Director General of Meteorology, Pune.

Statement 77 : Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : ORISSA **Station :** MALLIPUND **District :** BOLANGIR (Patna)

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	16	11.4	33.7	295.8	16	0.6	1.2	215.0
2	16	5.4	9.3	276.7	16	0.2	0.5	290.1
3	16	1.4	5.4	400.0	16	0.1	0.5	400.0
4	16	1.7	5.1	295.1	16	0.1	0.3	273.3
5	16	3.0	9.8	325.5	16	0.2	0.5	290.1
6	16	3.8	13.2	342.7	16	0.4	1.0	273.3
7	16	6.0	17.3	288.7	16	0.3	0.6	192.7
8	16	2.6	6.4	246.7	16	0.3	0.6	230.9
9	15	8.2	20.4	250.3	15	0.8	1.8	222.6
10	15	1.6	6.2	387.3	15	0.2	0.8	387.3
11	14	0.7	2.7	374.2	14	0.1	0.3	374.2
12	15	1.2	15.3	212.2	15	0.4	0.7	184.2
13	14	3.7	13.9	374.2	14	0.1	0.5	374.2
14	14	0.3	1.1	374.2	14	0.1	0.3	374.2
15	14	2.8	5.4	193.9	14	0.3	0.5	164.1
16	14	7.4	19.5	265.0	14	0.4	0.1	254.2
17	14	1.9	3.2	166.8	14	0.3	0.5	164.1
18	14	8.3	17.7	214.0	14	0.6	0.3	207.9
19	14	9.2	29.9	325.8	14	0.3	0.6	213.9
20	14	7.9	15.1	192.0	14	0.5	0.8	151.9
21	14	9.4	18.6	198 6	14	0.5	0.7	130.1
22	14	7 4	15.7	212.4	14	0.5	1.0	203.8
23	14	46.8	74.4	158.9	14	2.2	1.9	87.1
24	14	52.6	48.3	91.8	14	2.2	1.5	66.7

Statement 77 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	14	72.1	73.1	101.4	14	2.8	1.7	61.7
26	14	88.2	101.2	114.7	14	3.0	1.7	55.5
27	14	81.5	60.7	74.5	14	3.4	1.6	46.8
28	14	104.3	93.8	89.8	14	4.0	1.5	56.7
29	14	90.0	54.0	59.4	14	3.6	2.0	56.8
30	14	105.3	77.1	73.2	14	3.9	2.3	57.8
31	14	81.4	65.7	80.7	14	3.3	2.2	65.8
32	14	124.8	123.7	99.1	14	3.9	1.6	41.8
33	14	60.4	44.3	73.3	14	3.3	1.5	45.3
34	14	78.3	44.5	56.9	14	3.1	1.7	54.9
35	14	107.1	211.5	197.5	14	2.6	2.4	89.8
36	14	82.5	73.1	88.6	14	2.8	1.7	61.7
37	14	72.1	107.9	149.5	14	2.3	1.6	69.6
38	14	39.0	45.2	115.9	14	1.9	1.3	69.6
39	15	31.1	44.9	144.5	15	1.6	1.4	84.5
40	14	25.3	46.9	185.6	14	1.1	1.9	181.1
41	14	6.4	8.2	129.1	14	0.6	0.7	115.9
42	14	19.4	36.2	186.1	14	0.8	1.2	151.2
43	14	10.3	19.7	190.8	14	0.6	1.1	168.3
44	14	2.2	8.1	374.2	14	0.1	0.5	374.2
45	14	0.0	0.0	0.0	14	0.0	0.0	0.0
46	14	0.0	0.0	0.0	14	0.0	0.0	0.0
47	14	0.2	0.6	374.2	14	0.0	0.0	0.0
48	14	0.0	0.0	0.0	14	0.0	0.0	0.0
49	14	1.3	3.6	267.0	14	0.1	0.4	254.2
50	13	0.0	0.0	0.0	13	0.0	0.0	0.0
51	13	0.0	0.0	0.0	13	0.0	0.0	0.0
52	13	0.3	0.8	244.2	13	0.0	0.0	0.0

Note: Data Cover the Period 1957 to 1972.
Source : Assistant Director General of Meteorology, Pune.

Statement 78 : Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : ORISSA **Station :** TITLAGARH (Observatory) **District :** BOLANGIR (Patna)

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	34	1.0	4.3	414.3	34	0.1	0.4	347.9
2	34	2.3	10.2	450.9	34	0.1	0.3	326.3
3	34	1.2	5.2	448.9	34	0.1	0.3	326.3
4	34	3.2	7.3	239.9	34	0.3	0.7	224.7
5	34	3.7	10.0	270.6	34	0.3	0.5	193.1
6	34	2.9	10.2	354.1	34	0.2	0.6	287.5
7	33	2.8	8.4	301.6	33	0.2	0.5	290.2
8	34	2.6	6.2	240.1	34	0.3	0.6	214.3
9	34	5.7	14.2	249.6	34	0.4	0.8	219.3
10	34	2.2	7.5	345.6	34	0.2	0.6	257.5
11	34	4.8	12.4	259.8	34	0.4	0.7	180.5
12	34	9.4	20.9	222.3	34	0.6	0.3	208.0
13	33	6.2	13.7	219.8	33	0.5	0.1	206.6
14	32	4.3	7.3	170.7	32	0.4	0.6	147.6
15	32	4.4	8.0	180.7	32	0.4	0.7	163.8
16	32	3.8	6.4	167.5	32	0.3	0.6	206.2
17	32	5.8	8.7	226.5	32	0.5	0.8	179.6
18	32	6.8	10.9	160.0	32	0.6	0.8	142.3
19	33	7.4	12.8	172.9	33	0.8	0.1	133.7
20	33	4.2	8.6	202.7	33	0.4	0.7	178.8
21	33	5.3	10.3	196.2	33	0.8	0.7	189.7
22	33	11.6	24.4	210.8	33	0.8	0.9	123.6
23	33	29.4	32.4	110.3	33	1.8	1.6	90.4
24	33	33.2	31.5	95.2	33	1.8	2.3	70.4

Statement 78 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	33	66.1	63.9	96.6	33	3.0	2.1	68.7
26	33	86.0	55.7	64.8	33	3.8	1.5	59.5
27	33	104.2	102.6	98.5	33	3.5	1.5	42.5
28	33	83.6	79.6	95.3	33	3.8	1.6	43.6
29	33	80.5	59.3	73.8	33	3.6	1.3	37.0
30	33	88.0	59.9	68.7	33	3.7	1.6	42.6
31	32	90.8	81.8	90.1	32	3.5	2.2	61.6
32	32	80.2	53.2	66.3	32	3.7	1.4	36.7
33	32	89.0	76.5	86.0	32	3.7	1.8	47.9
34	32	76.5	56.2	73.4	32	3.3	1.4	42.1
35	32	89.3	93.8	104.9	32	3.3	1.8	53.5
36	33	71.3	65.3	91.6	33	3.3	1.7	49.6
37	33	67.9	63.6	93.7	33	2.9	1.6	54.4
38	33	46.0	66.3	144.1	33	2.1	1.6	78.7
39	32	31.0	32.6	105.2	32	2.0	1.4	73.5
40	32	26.9	28.6	106.5	32	1.5	1.3	86.4
41	32	15.8	17.8	112.7	32	1.1	1.0	91.0
42	32	20.8	29.3	141.1	32	1.1	0.3	119.2
43	32	13.9	27.8	200.6	32	0.8	0.2	162.4
44	32	4.9	12.2	250.1	32	0.3	0.6	227.2
45	33	2.1	6.4	302.9	33	0.2	0.5	255.6
46	33	1.5	6.4	439.8	33	0.1	0.2	399.8
47	33	3.0	9.7	318.2	33	0.3	0.6	229.6
48	30	2.6	11.0	427.3	30	0.1	0.4	325.6
49	31	0.1	0.7	556.8	31	0.0	0.2	556.8
50	31	0.8	3.2	389.4	31	0.1	0.4	331.3
51	31	0.1	0.5	373.2	31	0.0	0.0	0.0
52	31	1.3	4.6	341.4	31	0.1	0.3	310.6

Note : Data Cover the Period 1947 to 1980.
Source : Assistant Director General of Meteorology, Pune.

Statement 79 : Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : ORISSA **Station :** SAMBALPUR (Observatory) **District :** SAMBALPUR

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	78	2.2	7.2	322.1	78	0.2	0.4	258.2
2	77	1.5	5.4	357.6	77	0.2	0.4	276.7
3	79	3.2	12.8	396.1	79	0.2	0.5	317.8
4	78	4.5	13.0	290.5	78	0.3	0.7	262.5
5	78	5.5	13.6	247.3	78	0.4	0.8	190.2
6	78	5.6	13.7	242.4	78	0.4	0.9	197.7
7	78	6.5	14.7	227.0	78	0.5	0.9	194.4
8	78	6.4	16.1	250.1	78	0.5	1.0	220.0
9	79	4.1	9.2	222.9	79	0.5	1.0	221.7
10	78	2.8	6.9	246.7	78	0.2	0.5	220.0
11	78	5.0	13.5	271.5	78	0.3	0.8	227.3
12	78	5.6	13.0	231.8	78	0.4	0.8	208.4
13	79	4.9	18.1	372.0	79	0.4	0.9	212.1
14	79	2.5	5.5	219.4	79	0.3	0.6	206.9
15	78	3.3	7.6	228.0	78	0.4	0.7	183.8
16	79	4.2	11.3	267.1	79	0.3	0.7	217.9
17	79	1.9	5.0	268.7	79	0.2	0.5	259.7
18	77	2.0	5.8	284.1	77	0.2	0.7	264.2
19	76	4.0	7.3	180.8	76	0.4	0.6	151.5
20	77	4.0	9.2	229.1	77	0.4	0.7	194.0
21	79	5.4	9.7	181.1	79	0.4	0.7	160.7
22	77	11.1	21.5	194.1	77	0.8	1.2	138.6
23	77	20.8	36.7	176.0	77	1.2	1.4	122.1
24	76	51.9	71.7	138.2	76	2.3	1.6	72.3

Statement 79 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	77	66.0	63.5	95.9	77	3.0	1.8	61.9
26	77	90.9	89.4	98.3	77	3.5	1.9	55.5
27	78	107.3	79.7	74.3	78	4.1	1.6	38.9
28	77	102.1	74.4	72.9	77	4.0	1.7	44.0
29	78	107.8	79.3	73.5	78	4.3	1.8	41.3
30	78	117.3	90.8	77.4	78	4.5	1.6	35.4
31	78	120.8	85.7	70.9	78	4.5	1.6	35.4
32	76	111.7	62.3	55.7	76	4.5	1.4	29.8
33	79	128.2	106.6	83.1	79	4.3	1.7	39.4
34	79	95.1	82.4	86.7	79	3.9	1.8	45.7
35	78	83.1	70.7	85.1	78	3.7	1.6	44.6
36	77	76.3	70.2	92.0	77	3.5	1.6	46.5
37	77	63.0	60.7	96.3	77	2.9	1.8	61.1
38	78	47.3	47.8	101.2	78	2.5	1.7	68.5
39	78	30.3	40.3	133.0	78	1.6	1.4	88.1
40	78	25.1	40.6	161.7	78	1.5	1.6	107.3
41	75	11.9	19.9	166.5	75	0.9	1.2	137.1
42	78	11.8	22.4	189.9	78	0.7	1.0	143.6
43	79	6.2	14.9	239.7	79	0.4	0.8	190.2
44	79	6.3	17.5	278.9	79	0.5	0.9	191.8
45	77	1.7	5.5	312.9	77	0.2	0.5	295.6
46	79	1.2	4.4	373.7	79	0.1	0.3	351.0
47	78	2.2	6.1	274.2	78	0.2	0.6	263.0
48	77	2.0	6.5	327.4	77	0.2	0.5	294.6
49	78	0.5	2.2	429.3	78	0.1	0.2	432.9
50	77	0.7	3.7	495.7	77	0.1	0.3	456.4
51	79	1.0	3.8	381.8	79	0.1	0.3	322.8
52	78	0.5	2.1	440.3	78	0.1	0.3	459.5

Note: Data Cover the Period 1901 to 1980.
Source : Assistant Director General of Meteorology, Pune.

Statement 80 : Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : ORISSA **Station :** ANGUL (Observatory) **District :** DHENKANAL

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	72	3.3	8.0	240.4	72	0.3	0.6	227.9
2	73	1.5	5.2	356.0	73	0.1	0.4	329.6
3	73	0.9	3.8	411.7	73	0.1	0.3	371.3
4	71	5.0	12.7	253.7	71	0.3	0.8	232.0
5	73	6.5	16.0	246.8	73	0.5	0.8	180.8
6	72	10.8	32.6	303.0	72	0.6	1.0	173.9
7	73	6.3	12.8	202.0	73	0.5	1.0	187.4
8	74	6.1	15.0	244.8	74	0.4	0.8	220.3
9	73	3.3	7.6	232.9	73	0.3	0.7	215.4
10	73	3.7	11.6	315.7	73	0.3	0.7	260.0
11	74	5.9	13.4	228.9	74	0.4	0.9	199.2
12	75	5.0	12.6	249.4	75	0.5	0.9	179.1
13	73	4.2	10.2	242.6	73	0.5	0.9	196.3
14	71	5.3	12.0	227.7	71	0.5	0.7	153.6
15	74	6.0	12.8	214.9	74	0.5	0.8	152.6
16	75	7.8	12.5	160.2	75	0.6	0.9	145.0
17	72	7.2	11.2	155.7	72	0.6	0.9	142.2
18	72	8.6	15.4	179.5	72	0.7	0.9	141.2
19	74	13.6	19.9	146.0	74	0.9	1.1	120.6
20	73	11.4	17.0	149.0	73	0.9	1.0	121.1
21	72	11.7	19.7	168.2	72	1.0	1.1	114.1
22	73	17.9	23.9	133.3	73	1.2	1.3	109.0
23	71	26.3	36.7	139.5	71	1.7	1.5	90.6
24	72	49.3	56.3	114.3	72	2.5	1.9	73.9

Statement 80 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	74	50.9	45.6	89.5	74	2.9	1.6	55.9
26	71	71.0	65.0	91.5	71	3.3	1.6	47.9
27	72	63.0	51.3	81.4	72	3.1	1.3	40.9
28	73	71.6	48.5	67.8	73	3.4	1.5	43.4
29	73	61.0	43.9	72.0	73	3.2	1.5	46.4
30	71	80.3	60.9	75.8	71	3.7	1.6	43.1
31	73	73.8	63.4	86.0	73	3.5	1.4	41.4
32	73	64.7	51.2	79.1	73	3.1	1.6	49.8
33	73	69.8	66.9	95.8	73	3.4	1.5	45.3
34	74	67.4	67.7	100.3	74	3.4	1.7	49.5
35	74	55.8	45.2	81.0	74	3.0	1.7	58.0
36	73	59.5	56.0	94.1	73	3.1	1.7	53.9
37	74	56.4	47.4	84.0	74	2.9	1.5	52.5
38	75	39.8	34.7	87.0	75	2.4	1.7	69.5
39	73	36.2	36.6	101.0	73	2.2	1.5	68.7
40	71	35.7	43.6	122.1	71	2.0	1.8	90.7
41	72	29.8	30.8	148.2	72	1.3	1.6	121.9
42	73	23.9	38.9	162.7	73	1.2	1.5	120.2
43	70	14.8	35.2	237.9	70	0.8	1.4	172.8
44	72	15.5	28.1	181.4	72	0.8	1.2	146.5
45	70	3.2	8.4	262.9	70	0.3	0.7	236.4
46	73	6.5	22.1	339.2	73	0.3	0.7	245.3
47	73	5.2	16.8	322.3	73	0.3	0.6	239.8
48	71	2.7	10.0	371.5	71	0.1	0.3	264.3
49	72	1.0	4.5	440.9	72	0.1	0.3	390.0
50	72	0.6	2.9	515.0	72	0.1	0.3	502.7
51	73	0.8	2.8	349.8	73	0.1	0.4	358.7
52	71	1.0	3.5	360.7	71	0.1	0.3	387.2

Note: Data Cover the Period 1906 to 1980.
Source : Assistant Director General of Meteorology, Pune.

Statement 81 : Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : ORISSA **Station : KORAPUT** **District : KORAPUT**

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	52	0.7	2.8	407.0	52	0.1	0.4	425.1
2	51	1.0	4.1	397.6	51	0.1	0.3	346.2
3	51	3.9	18.3	465.6	51	0.2	0.6	314.6
4	52	0.7	2.6	378.0	52	0.1	0.4	371.8
5	51	1.6	5.7	351.0	51	0.1	0.3	306.3
6	53	1.4	3.8	277.8	53	0.2	0.4	233.7
7	51	2.5	8.7	342.9	51	0.3	0.7	263.5
8	53	2.3	5.0	214.3	53	0.3	0.6	200.6
9	51	1.9	6.2	331.1	51	0.2	0.6	334.4
10	52	1.3	4.9	384.0	52	0.2	0.5	325.2
11	50	3.6	10.3	289.6	50	0.3	0.6	216.9
12	52	6.8	13.7	200.9	52	0.5	0.8	172.3
13	52	6.8	12.4	181.7	52	0.6	0.9	154.8
14	52	5.3	9.6	181.4	52	0.5	0.9	174.9
15	52	10.8	14.4	133.5	52	0.9	1.2	123.3
16	52	12.6	18.4	145.7	52	1.0	1.1	110.8
17	53	13.9	18.5	133.1	53	1.0	1.1	106.8
18	50	10.8	14.1	130.6	50	0.8	0.9	112.1
19	51	15.3	17.9	117.4	51	1.3	1.2	98.0
20	52	13.4	22.0	164.2	52	1.1	1.1	104.9
21	52	11.3	16.9	149.4	52	1.0	1.3	136.2
22	51	26.2	37.5	143.0	51	1.5	1.5	104.4
23	54	19.8	23.6	119.4	54	1.6	1.3	83.2
24	53	44.7	53.1	118.7	53	2.3	1.9	80.4

Statement 81 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	53	58.2	54.4	93.4	53	3.1	1.7	56.5
26	53	81.0	79.2	97.7	53	3.6	1.9	53.1
27	52	91.0	81.6	89.7	52	4.4	1.7	37.8
28	52	90.0	64.4	71.5	52	4.6	1.9	41.1
29	52	106.4	79.3	74.6	52	4.8	1.9	38.9
30	53	112.5	69.6	61.9	52	5.2	1.6	31.3
31	52	109.0	89.6	82.2	52	5.1	1.8	35.8
32	52	86.6	61.1	70.6	52	4.5	1.8	40.1
33	52	87.0	67.0	77.0	52	4.8	1.7	36.1
34	53	102.9	81.0	78.7	53	4.8	1.8	36.5
35	52	96.0	65.0	67.7	52	4.3	1.5	35.9
36	52	83.7	51.7	61.7	52	4.4	1.5	35.4
37	52	64.5	47.0	72.9	52	3.6	1.6	43.8
38	52	52.8	41.8	79.1	52	3.3	1.7	52.3
39	53	51.4	58.8	114.5	53	2.6	1.8	68.0
40	52	25.8	37.3	144.5	52	1.7	1.7	103.0
41	52	33.6	48.5	144.3	52	1.6	1.5	90.2
42	52	21.8	27.5	125.9	52	1.4	1.7	115.2
43	53	15.7	23.8	151.7	53	1.0	1.2	116.0
44	51	15.2	24.6	161.7	51	0.9	1.3	138.7
45	52	7.5	16.8	223.2	52	0.5	0.9	179.3
46	50	4.2	9.2	218.8	50	0.5	0.9	189.4
47	52	5.3	13.6	255.0	52	0.4	0.7	203.0
48	52	6.9	18.9	272.6	52	0.4	0.9	236.4
49	52	1.4	8.6	605.4	52	0.1	0.3	434.3
50	52	1.4	6.1	432.5	52	0.2	0.7	423.8
51	52	2.9	8.0	278.1	52	0.2	0.6	266.1
52	53	2.7	11.1	417.1	53	0.1	0.4	374.0

Note : Data Cover the Period 1901 to 1958.
Source : Assistant Director General of Meteorology, Pune.

Statement 82 : Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : ORISSA **Station :** KORAPUT **District :** KORAPUT

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	25	0.8	4.0	492.3	25	0.1	0.4	500.0
2	25	1.7	7.3	427.2	25	0.1	0.3	346.1
3	25	0.0	0.2	500.0	25	0.0	0.0	0.0
4	25	2.2	10.6	484.0	25	0.0	0.2	500.0
5	24	7.4	4.5	319.9	24	0.1	0.3	338.8
6	25	0.2	0.6	370.6	25	0.0	0.2	500.0
7	25	0.0	0.0	0.0	25	0.0	0.0	0.0
8	24	1.9	4.5	234.6	24	0.3	0.6	214.0
9	22	2.6	7.8	301.4	22	0.2	0.5	232.5
10	24	1.1	3.2	293.3	24	0.1	0.3	270.3
11	22	3.9	9.3	238.3	22	0.3	0.6	201.8
12	23	4.0	10.3	256.4	23	0.3	0.7	264.0
13	23	9.8	18.2	185.4	23	0.7	1.1	164.2
14	24	12.2	22.1	181.4	24	0.9	0.9	108.2
15	24	7.2	8.0	111.4	24	0.7	0.8	106.0
16	25	15.9	19.5	123.2	25	1.2	1.3	107.4
17	23	13.4	14.5	107.9	23	1.2	1.0	87.7
18	24	22.0	23.9	108.5	24	1.5	1.3	88.1
19	25	15.2	20.5	135.1	25	1.0	1.0	98.1
20	23	11.1	13.7	123.7	25	1.0	1.1	110.4
21	24	15.9	17.5	110.1	23	1.3	0.9	71.0
22	23	20.2	19.5	96.6	24	1.4	1.1	77.7
23	24	31.6	28.0	88.6	23	2.0	1.6	78.3
24	25	34.5	34.8	100.8	24	1.9	1.6	84.2

Statement 82 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	25	67.0	80.7	120.4	25	2.5	1.6	64.9
26	23	87.1	85.2	97.8	23	4.0	1.2	30.0
27	25	100.1	100.9	100.8	25	4.3	1.8	42.4
28	26	77.9	90.9	116.7	26	3.7	1.9	52.4
29	26	79.8	63.3	79.4	26	4.0	2.2	55.5
30	25	115.1	91.4	79.4	25	4.8	1.7	55.0
31	24	88.4	70.6	79.4	24	4.6	1.9	40.7
32	26	86.7	60.1	69.3	26	4.3	2.0	47.2
33	27	75.0	68.2	91.0	27	4.0	1.5	58.6
34	26	80.5	71.1	88.3	26	3.9	1.9	48.5
35	25	74.7	53.0	71.0	25	4.5	1.2	27.2
36	24	77.5	47.4	61.1	24	4.2	1.7	41.7
37	26	75.6	65.2	86.2	26	3.3	1.9	55.4
38	24	41.4	45.7	110.3	24	2.9	2.1	72.1
39	24	29.5	32.9	111.4	24	2.0	1.7	83.4
40	22	21.5	25.7	119.5	22	1.7	1.4	82.9
41	25	22.7	28.0	123.0	25	1.8	1.5	85.7
42	24	30.1	31.6	104.9	24	1.9	1.3	70.4
43	22	15.6	19.8	128.9	22	1.2	1.4	121.5
44	24	11.8	21.3	180.1	24	0.8	1.6	200.5
45	26	7.6	11.5	150.0	26	0.7	0.9	127.7
46	26	1.2	3.1	262.2	26	0.2	0.4	239.2
47	25	10.1	30.6	304.3	25	0.5	1.1	215.9
48	25	3.3	9.5	208.7	25	0.3	0.6	248.8
49	24	0.2	0.5	271.1	24	0.0	0.0	0.0
50	25	3.3	9.1	276.7	25	0.3	0.8	300.9
51	24	0.8	3.4	442.2	24	0.1	0.4	489.9
52	23	0.0	0.0	0.0	23	0.0	0.0	0.0

Note : Data Cover the Period 1950 to 1980.
Source : Assistant Director General of Meteorology, Pune.

Statement 83 : Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : ORISSA **Station :** KOMNA (Hydro) **District :** KALAHANDI

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	21	1.6	4.9	301.8	21	0.2	0.6	315.8
2	22	0.7	1.9	276.0	22	0.1	0.5	342.9
3	22	2.9	10.3	358.3	22	0.2	0.6	323.7
4	22	1.4	5.4	391.6	22	0.1	0.3	323.7
5	20	2.7	8.6	319.1	20	0.2	0.5	261.6
6	21	2.5	9.9	394.3	21	0.1	0.5	334.7
7	21	0.1	0.4	458.3	21	0.0	0.0	0.0
8	21	3.4	7.2	210.8	21	0.2	0.4	183.3
9	20	6.6	12.1	183.0	20	0.6	1.1	190.4
10	22	5.3	12.8	243.3	22	0.3	0.8	245.1
11	22	5.2	9.3	179.0	22	0.5	0.7	162.5
12	22	11.3	28.6	253.6	22	0.5	0.9	200.6
13	21	3.7	9.2	252.0	21	0.3	0.8	274.3
14	22	2.1	3.7	175.5	22	0.4	0.6	159.8
15	22	10.5	17.8	169.7	22	0.5	0.8	160.4
16	22	6.2	11.6	188.0	22	0.3	0.6	178.5
17	22	5.4	11.9	219.1	22	0.4	0.6	144.3
18	21	12.2	25.0	204.8	21	0.5	1.2	222.8
19	22	2.6	7.0	273.0	22	0.2	10.5	232.5
20	22	6.5	12.0	185.8	22	0.5	0.8	160.4
21	22	4.4	7.6	172.5	22	0.4	0.6	159.8
22	21	13.1	34.1	260.2	21	0.7	1.1	166.6
23	22	24.6	32.9	133.3	22	1.3	1.7	129.1
24	22	38.8	31.4	80.9	22	1.9	1.2	64.8

Statement 83 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	22	60.8	43.7	71.8	22	2.9	1.6	56.3
26	21	84.1	71.9	85.5	21	3.2	1.8	55.7
27	22	100.5	94.6	94.1	22	3.5	2.0	55.5
28	22	63.3	66.1	96.9	22	2.9	1.7	60.3
29	22	75.3	53.8	71.4	22	3.2	1.7	62.3
30	22	77.8	64.4	82.7	22	3.2	2.0	68.6
31	21	70.1	41.5	59.2	21	3.1	1.8	58.0
32	22	59.0	34.3	58.0	22	2.9	1.5	52.0
33	22	80.0	71.6	89.5	22	3.5	1.7	47.3
34	22	77.4	50.0	64.6	22	3.3	1.6	49.2
35	21	52.3	53.4	102.0	21	2.7	1.6	58.5
36	22	74.9	68.0	90.8	22	3.0	1.6	52.5
37	22	62.0	62.6	100.9	22	2.5	2.1	82.9
38	22	49.6	54.6	109.9	22	2.0	1.3	63.1
39	22	29.6	37.0	124.9	22	1.2	1.3	103.5
40	21	11.5	19.9	174.0	21	0.9	1.1	123.9
41	22	9.9	12.2	123.9	22	0.6	0.7	114.2
42	22	17.0	35.5	197.0	22	0.8	1.2	144.3
43	22	7.7	14.0	181.2	22	0.5	0.9	157.3
44	21	3.9	9.4	238.5	21	0.3	0.7	197.5
45	22	0.8	3.3	427.9	22	0.1	0.4	469.0
46	22	0.0	0.0	469.0	22	0.0	0.0	0.0
47	22	3.7	17.3	463.1	22	0.1	0.4	469.0
48	21	6.3	20.5	328.1	21	0.1	0.5	334.7
49	22	0.7	3.1	455.9	22	0.0	0.2	469.0
50	22	1.1	3.4	307.0	22	0.2	0.5	275.6
51	22	0.1	0.4	333.9	22	0.0	0.0	0.0
52	22	0.0	0.1	469.0	22	0.0	0.0	0.0

Note : Data Cover the Period 1951 to 1972.
Source : Assistant Director General of Meteorology, Pune.

Statement 84 : Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : ORISSA **Station :** BHAWANI PATNA (Observatory) **District :** KALAHANDI

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	47	1.8	6.8	377.4	47	0.1	0.4	310.6
2	47	2.1	8.4	406.0	47	0.1	0.5	312.4
3	46	1.4	4.2	307.2	46	0.1	0.4	307.0
4	47	2.4	9.5	400.8	47	0.2	0.6	270.4
5	47	3.2	8.6	266.2	47	0.3	0.7	257.9
6	48	4.5	14.7	328.9	48	0.3	0.8	302.2
7	48	7.0	20.0	283.1	48	0.3	0.7	210.4
8	47	3.2	6.5	204.3	47	0.3	0.6	184.1
9	48	2.0	6.1	298.3	48	0.2	0.6	279.3
10	48	2.5	6.2	251.0	48	0.2	0.5	220.5
11	48	3.3	10.1	305.6	48	0.3	0.6	240.6
12	47	4.7	9.5	201.9	47	0.5	0.9	182.0
13	48	3.9	9.5	243.1	48	0.4	0.6	179.4
14	48	5.7	9.8	264.9	48	0.4	0.7	187.6
15	48	8.4	18.1	215.9	48	0.5	0.8	156.8
16	47	7.3	15.3	208.3	47	0.6	0.2	183.1
17	48	8.5	20.5	240.7	48	0.4	0.7	178.6
18	48	5.8	9.7	167.6	48	0.5	0.8	154.4
19	48	9.9	15.6	158.0	48	0.7	0.8	112.6
20	47	7.2	12.6	175.7	47	0.6	0.7	129.5
21	48	11.6	22.9	197.7	48	0.7	1.1	146.3
22	48	17.5	28.1	160.4	48	1.1	1.2	108.8
23	48	26.9	36.0	133.5	48	1.6	1.4	92.3
24	48	65.6	94.7	144.3	48	2.4	1.8	77.5

Statement 84 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	47	68.2	59.3	86.9	47	2.9	1.8	60.8
26	47	79.2	67.1	84.7	47	3.3	1.6	48.7
27	47	86.1	74.0	85.9	47	3.3	1.5	46.4
28	47	78.0	57.7	73.9	47	3.5	1.5	42.5
29	46	82.9	67.5	81.4	46	3.7	1.9	52.3
30	46	85.0	55.4	65.1	46	4.0	1.5	58.0
31	45	107.5	113.4	105.4	45	3.8	1.6	42.9
32	46	71.8	65.2	90.8	46	3.8	1.8	47.6
33	46	91.1	80.9	88.8	46	3.9	1.8	47.3
34	45	88.6	53.4	65.4	45	3.8	1.7	43.3
35	45	87.8	77.0	87.9	45	3.6	1.7	46.1
36	46	77.5	68.1	87.8	46	3.3	1.3	39.3
37	46	47.6	51.2	107.6	46	2.8	1.4	49.6
38	45	54.4	60.2	110.6	45	2.4	1.6	63.8
39	46	36.2	40.8	112.8	46	1.9	1.6	83.6
40	45	29.3	42.4	144.8	45	1.6	1.7	103.6
41	45	25.4	47.2	185.7	45	1.1	1.3	118.4
42	44	12.5	20.1	160.9	44	1.0	1.4	140.7
43	45	9.6	21.9	227.3	45	0.6	1.1	186.3
44	45	14.4	33.9	234.4	45	0.7	1.1	159.9
45	47	2.8	8.8	316.7	47	0.2	0.5	258.1
46	47	3.1	8.0	256.8	47	0.2	0.5	222.1
47	46	2.4	9.0	367.9	46	0.1	0.5	347.0
48	44	3.8	10.4	275.4	44	0.3	0.7	225.9
49	44	9.1	0.4	663.3	44	0.0	0.2	663.3
50	44	0.2	0.4	663.3	44	0.0	0.2	663.3
51	43	3.1	11.8	382.8	43	0.2	0.4	265.7
52	44	0.3	1.2	428.9	44	0.0	0.2	463.6

Note : Data Cover the Period 1902 to 1949.
Source : Assistant Director General of Meteorology, Pune.

Statement 85 : Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : ORISSA **Station : PHULBANI** **District : PHULBANI**

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	51	4.1	10.4	252.0	51	0.3	0.6	246.2
2	52	2.9	8.3	291.3	52	0.2	0.6	270.3
3	52	2.1	5.9	285.8	52	0.2	0.4	248.6
4	51	4.5	13.2	291.6	51	0.4	0.9	264.7
5	49	6.9	16.0	232.0	49	0.4	0.8	227.0
6	51	7.1	17.6	247.1	51	0.5	1.0	190.2
7	51	9.3	19.6	210.3	51	0.5	1.0	186.9
8	50	7.2	15.3	211.3	50	0.6	1.1	188.0
9	50	4.2	13.6	320.9	50	0.3	0.8	239.9
10	52	5.6	17.0	301.9	52	0.3	0.7	231.1
11	51	5.4	13.1	243.9	51	0.4	0.9	203.4
12	50	5.5	9.2	168.0	50	0.5	0.8	157.8
13	51	5.8	10.9	188.4	51	0.5	0.8	152.8
14	51	2.9	5.6	192.5	51	0.4	0.7	186.4
15	52	6.1	14.1	174.8	52	0.6	0.7	121.0
16	51	8.5	19.2	225.9	51	0.5	1.0	190.4
17	52	6.7	14.6	217.5	52	0.6	0.8	124.9
18	51	8.1	12.8	158.1	51	0.6	0.8	126.8
19	53	13.8	20.2	146.8	53	1.0	1.1	107.4
20	53	16.2	24.2	149.2	53	0.9	0.9	96.9
21	52	11.8	17.5	148.2	52	0.9	1.2	133.7
22	50	21.7	29.1	134.1	50	1.3	1.5	113.4
23	52	24.1	36.4	151.0	52	1.5	1.5	102.3
24	52	67.4	110.3	163.8	52	2.5	1.6	62.1

Statement 85 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	51	63.9	67.4	105.5	51	3.2	1.8	54.9
26	51	82.8	105.0	126.8	51	3.5	1.6	47.2
27	50	84.1	72.6	86.2	50	3.7	1.4	37.9
28	51	81.9	65.9	80.5	51	3.8	1.7	44.9
29	50	76.0	73.8	97.1	50	3.5	1.6	46.3
30	51	95.4	65.8	69.0	51	4.5	1.3	29.9
31	49	101.9	80.1	78.6	49	4.4	1.5	32.8
32	53	59.4	62.8	105.7	53	3.5	2.0	56.7
33	52	84.3	92.7	110.0	52	3.9	1.6	41.0
34	51	94.6	78.2	82.6	51	3.9	1.6	41.4
35	50	68.3	48.6	71.2	50	3.7	1.6	42.4
36	52	75.8	63.1	83.2	52	3.7	1.6	44.1
37	52	53.6	49.7	92.8	52	3.2	1.9	60.7
38	51	57.9	55.5	95.5	51	2.8	1.5	53.3
39	52	33.5	29.8	89.0	52	2.3	1.5	66.8
40	51	37.0	51.5	139.2	51	1.9	1.7	89.3
41	53	23.1	35.1	151.8	53	1.2	1.5	121.9
42	53	23.6	31.8	134.8	53	1.4	1.6	120.0
43	52	10.7	22.1	206.7	52	0.8	1.1	149.1
44	51	16.3	30.7	188.7	51	0.8	1.3	152.6
45	53	3.0	8.9	297.0	53	0.3	0.7	258.8
46	53	5.2	13.2	253.1	53	0.4	0.9	204.7
47	52	5.1	12.1	236.5	52	0.3	0.7	241.1
48	52	2.7	7.0	257.8	52	0.3	0.7	216.0
49	53	0.5	2.6	570.8	53	0.1	0.4	509.8
50	53	1.8	8.0	434.5	53	0.1	0.5	412.2
51	52	2.5	6.8	272.2	52	0.2	0.6	286.0
52	52	1.8	6.6	361.8	52	0.1	0.4	329.9

Note : Data Cover the Period 1901 to 1967.
Source : Assistant Director General of Meteorology, Pune.

Statement 86 : Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : ORISSA **Station :** PHULBANI (Observatory) **District :** PHULBANI

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	20	4.1	8.0	194.4	20	0.4	0.8	168.7
2	20	3.0	7.9	262.6	20	0.3	0.7	244.2
3	20	1.3	5.6	447.2	20	0.0	0.2	447.2
4	20	1.3	3.5	266.3	20	0.2	0.5	261.6
5	20	3.3	5.6	171.3	20	0.3	0.6	190.4
6	20	7.3	16.3	223.8	20	0.4	0.8	183.5
7	20	3.6	8.9	244.7	20	0.3	0.8	267.1
8	20	3.5	7.5	213.4	20	0.3	0.7	219.0
9	20	7.2	13.7	190.8	20	0.4	0.7	152.5
10	21	2.8	8.9	318.6	21	0.3	0.9	273.9
11	21	2.7	6.7	244.8	21	0.3	0.7	197.5
12	21	7.2	13.6	188.2	21	0.5	0.8	155.3
13	21	3.4	8.8	259.9	21	0.4	0.6	154.8
14	21	6.2	15.8	254.7	21	0.4	0.8	169.2
15	21	3.5	6.3	178.4	21	0.4	0.8	189.2
16	21	5.9	14.0	237.8	21	0.5	1.0	187.2
17	21	5.0	7.0	138.5	21	0.6	0.7	130.6
18	21	6.9	16.5	240.3	21	0.6	1.1	196.2
19	21	7.3	13.3	181.9	21	0.7	1.1	159.7
20	21	13.5	17.3	127.8	21	0.8	0.9	107.8
21	21	7.3	14.7	201.1	21	0.3	0.6	173.2
22	20	9.1	10.9	119.2	20	1.0	0.9	91.8
23	20	31.6	50.0	158.4	20	1.9	1.7	86.9
24	20	26.2	31.2	119.1	20	1.8	1.3	71.5

Statement 86 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	20	53.0	55.3	104.3	20	2.7	1.8	68.1
26	20	63.6	40.1	63.0	20	3.1	1.6	51.8
27	20	99.7	85.4	85.7	20	3.5	1.6	44.3
28	20	60.9	41.9	68.7	20	3.4	1.6	47.1
29	20	84.1	69.5	82.6	20	4.3	1.5	35.2
30	20	76.5	66.5	86.9	20	3.6	1.6	44.5
31	20	94.0	63.8	67.8	20	3.9	1.7	42.3
32	21	72.3	70.6	97.6	21	3.3	1.5	43.8
33	21	79.4	61.6	77.6	21	3.4	1.6	45.7
34	21	48.7	34.7	71.2	21	3.0	1.7	56.1
35	19	45.4	33.5	73.7	19	3.0	1.6	52.1
36	19	70.5	58.3	79.3	19	3.3	1.8	54.9
37	19	84.0	81.4	96.9	19	2.9	1.4	47.3
38	20	28.9	19.7	68.0	20	2.3	1.3	56.6
39	20	30.5	24.0	78.6	20	2.1	1.4	68.9
40	21	24.8	24.4	98.3	21	1.8	1.6	89.6
41	21	15.8	17.7	112.2	21	1.3	1.3	101.8
42	21	19.0	23.3	122.8	21	1.3	1.1	89.2
43	21	17.3	38.9	224.2	21	1.0	1.7	177.2
44	21	6.3	11.8	189.1	21	0.7	1.1	147.8
45	21	3.7	9.7	262.2	21	0.4	0.8	211.2
46	21	0.4	0.9	245.6	21	0.0	0.2	458.3
47	21	13.7	51.6	377.0	21	0.4	1.2	291.2
48	21	3.8	8.7	226.8	21	0.4	0.7	157.8
49	20	0.6	1.3	217.8	20	0.1	0.3	307.8
50	21	1.9	5.2	270.5	21	0.2	0.5	268.7
51	21	0.3	0.9	317.5	21	0.1	0.3	315.8
52	21	1.5	6.1	397.5	21	0.1	0.3	315.8

Note : Data Cover the Period 1959 to 1980.
Source : Assistant Director General of Meteorology, Pune.

Statement 87 : Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : ORISSA **Station : BALASORE (Observatory)** **District : BALASORE**

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	73	3.1	9.7	313.9	73	0.2	0.5	255.7
2	75	2.8	12.0	420.4	75	0.2	0.5	292.6
3	74	3.3	7.0	305.7	74	0.2	0.6	289.2
4	74	4.2	11.3	267.4	74	0.3	0.6	206.3
5	73	8.1	18.7	231.0	73	0.5	0.8	163.5
6	74	7.9	17.3	220.6	74	0.6	0.8	152.7
7	75	11.2	22.5	201.4	75	0.6	1.0	160.6
8	74	9.6	21.4	224.0	74	0.6	1.0	174.6
9	72	9.1	16.8	274.8	72	0.4	0.7	175.1
10	75	7.1	15.8	223.7	75	0.4	1.0	228.5
11	76	9.6	20.7	215.6	76	0.5	0.9	180.4
12	75	6.6	11.2	169.2	75	0.7	0.9	136.7
13	73	13.1	25.4	193.7	73	0.7	1.2	164.4
14	74	7.2	11.3	157.2	74	0.6	0.8	135.6
15	75	13.3	24.0	179.9	75	0.9	1.3	146.0
16	75	13.1	18.3	139.5	75	0.9	0.9	102.3
17	75	15.5	19.9	128.6	75	1.1	1.1	106.3
18	74	19.0	33.7	177.1	74	1.2	1.2	96.3
19	76	23.2	28.4	122.2	76	1.5	1.3	88.3
20	75	29.3	39.9	196.2	75	1.1	1.2	112.6
21	76	29.4	27.9	136.9	76	1.2	1.1	93.8
22	72	29.2	47.0	161.2	72	1.6	1.4	87.7
23	74	49.4	69.6	141.0	74	2.2	1.6	71.4
24	75	45.5	40.6	93.5	75	2.5	1.6	65.4

Statement 87 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	74	56.3	47.2	83.8	74	2.8	1.7	59.4
26	72	62.2	54.1	87.0	72	3.0	1.6	51.9
27	72	58.6	60.5	103.3	72	3.0	1.5	50.2
28	74	67.1	54.4	81.1	74	3.3	1.6	50.1
29	73	66.6	57.9	87.0	73	3.4	1.7	48.9
30	73	82.2	67.1	81.6	73	3.6	1.5	40.9
31	72	77.1	69.0	89.5	72	3.6	1.6	45.2
32	74	71.8	58.2	81.2	74	3.2	1.4	43.6
33	74	76.8	69.2	90.1	74	3.3	1.5	47.1
34	73	67.9	46.2	68.0	73	3.4	1.5	44.6
35	73	69.0	46.8	67.8	73	3.3	1.4	42.2
36	72	69.5	52.4	75.4	72	3.5	1.6	47.1
37	74	80.2	64.3	80.1	74	3.2	1.6	50.0
38	73	58.5	62.4	106.7	73	2.8	1.8	63.7
39	73	63.2	55.3	87.5	73	2.7	1.6	59.5
40	71	58.9	66.7	113.2	71	2.5	2.0	79.4
41	74	51.5	81.6	158.4	74	1.7	1.8	103.2
42	72	43.3	77.2	178.3	72	1.5	1.7	108.8
43	73	24.8	51.9	209.3	73	0.9	1.4	158.3
44	72	29.6	63.4	214.4	72	0.9	1.3	150.5
45	72	9.7	29.5	304.0	72	0.4	0.8	221.2
46	73	12.2	37.3	305.3	73	0.4	0.9	240.3
47	72	9.1	32.3	355.8	72	0.3	0.7	250.7
48	71	3.1	10.6	342.3	71	0.2	0.4	281.3
49	68	0.9	4.7	512.7	68	0.1	0.4	468.9
50	71	0.6	3.2	537.4	71	0.1	0.3	509.8
51	71	2.7	11.7	430.1	71	0.1	0.4	351.0
52	71	2.3	11.2	494.3	71	0.1	0.4	320.0

Note : Data Cover the Period 1901 to 1980.
Source : Assistant Director General of Meteorology, Pune.

Statement 88 : Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : ORISSA **Station :** CUTTACK (Observatory) **District :** CUTTACK

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	79	3.8	12.8	339.3	79	0.2	0.6	264.9
2	79	1.9	5.8	310.2	79	0.2	0.7	339.0
3	78	0.7	3.1	415.5	78	0.1	0.3	406.8
4	79	3.2	11.4	351.5	79	0.2	0.5	296.4
5	78	5.5	14.3	261.5	78	0.3	0.5	186.2
6	78	6.8	18.8	278.1	78	0.5	1.0	198.0
7	78	7.9	17.9	225.8	78	0.5	0.8	172.3
8	77	6.3	16.3	261.0	77	0.4	0.8	227.1
9	77	3.3	11.6	351.2	77	0.2	0.5	262.9
10	77	4.8	17.6	364.0	77	0.2	0.6	258.7
11	77	4.0	13.5	336.5	77	0.2	0.4	211.5
12	76	5.2	13.3	256.1	76	0.4	0.9	205.5
13	77	6.7	16.7	248.1	77	0.4	0.9	211.5
14	77	4.9	10.8	219.4	77	0.4	0.6	177.8
15	77	5.8	14.3	244.8	77	0.5	0.9	185.5
16	76	8.4	15.8	187.7	76	0.6	1.0	156.9
17	77	9.3	16.6	178.0	77	0.6	0.9	150.4
18	73	12.8	19.4	151.1	73	0.8	0.9	116.0
19	72	18.2	26.2	143.8	72	1.1	1.3	113.6
20	72	13.8	16.5	119.5	72	1.0	1.0	95.8
21	75	17.5	22.4	127.7	75	1.1	1.1	100.3
22	77	24.7	29.8	121.0	77	1.3	1.2	91.0
23	79	34.9	37.0	105.8	79	1.9	1.5	61.1
24	79	50.4	48.6	96.4	79	2.6	1.6	60.6

Statement 88 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	78	60.7	53.4	88.0	78	3.1	1.5	47.3
26	79	71.4	73.1	102.4	79	3.3	1.5	47.0
27	79	75.3	64.5	85.6	79	3.4	1.5	44.8
28	79	79.8	67.5	84.6	79	3.6	1.4	39.4
29	78	60.7	46.4	69.5	78	3.5	1.4	40.2
30	78	86.3	62.6	72.5	78	3.9	1.6	40.4
31	78	87.6	77.1	88.0	78	3.7	1.4	38.1
32	79	81.2	64.6	79.6	79	3.6	1.6	44.1
33	78	72.3	66.4	91.8	78	3.4	1.5	45.5
34	79	76.0	62.7	82.5	79	3.4	1.4	41.5
35	79	71.5	43.3	60.6	79	3.8	1.6	41.6
36	78	72.1	64.8	89.5	78	3.4	1.4	42.6
37	79	62.8	50.1	79.7	79	3.2	1.5	47.4
38	77	45.7	42.8	93.5	77	2.6	1.6	60.6
39	79	51.1	45.1	88.3	79	2.7	1.7	65.0
40	77	46.3	54.2	117.6	77	2.4	1.8	77.9
41	76	39.5	47.1	119.3	76	2.0	1.7	87.9
42	76	28.8	44.0	153.6	76	1.5	1.7	107.9
43	78	21.4	39.8	185.7	78	1.0	1.4	137.7
44	76	22.8	46.9	206.2	76	0.9	1.4	161.7
45	77	5.2	14.8	282.5	77	0.4	1.0	239.3
46	76	12.7	41.1	324.2	76	0.3	0.8	226.7
47	77	9.8	31.2	317.5	77	0.4	0.9	240.0
48	77	3.0	8.4	276.4	77	0.2	0.5	248.6
49	74	0.7	4.1	601.2	74	0.1	0.2	421.2
50	70	1.0	4.7	482.2	70	0.1	0.4	476.0
51	76	2.8	11.3	404.2	76	0.1	0.5	332.9
52	78	0.3	1.2	414.8	78	0.0	0.2	503.2

Note : Data Cover the Period 1901 to 1980.
Source : Assistant Director General of Meteorology, Pune.

Statement 89 : Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : ORISSA **Station :** PURI (Observatory) **District :** PURI

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	79	3.9	14.7	372.6	79	0.2	0.6	264.9
2	79	1.7	8.1	463.8	79	0.2	0.6	395.7
3	79	1.9	8.1	416.0	79	0.1	0.4	371.5
4	77	3.8	14.3	376.9	77	0.2	0.6	285.1
5	78	5.2	15.9	308.7	78	0.2	0.5	211.2
6	79	4.8	11.9	247.2	79	0.3	0.5	206.1
7	79	5.1	14.1	277.1	79	0.3	0.6	240.6
8	77	4.3	13.2	306.3	77	0.3	0.8	277.3
9	76	2.8	10.4	370.4	76	0.2	0.5	261.6
10	78	2.8	9.5	344.4	78	0.2	0.5	296.7
11	78	2.9	9.9	336.9	78	0.2	0.6	263.0
12	77	2.8	8.5	302.3	77	0.2	0.7	287.7
13	76	1.7	7.2	416.5	76	0.1	0.5	389.5
14	79	1.7	5.9	339.8	79	0.2	0.5	282.5
15	79	4.3	14.2	327.1	79	0.3	0.6	214.7
16	78	4.7	12.6	265.6	78	0.3	0.7	230.2
17	76	5.0	8.2	269.7	76	0.3	0.7	240.8
18	77	6.9	13.7	198.5	77	0.4	0.6	172.5
19	78	11.0	20.3	183.8	78	0.6	0.9	160.4
20	78	10.6	17.6	166.0	78	0.6	0.9	148.7
21	77	12.2	29.6	242.5	77	0.6	0.9	160.4
22	77	14.8	22.7	153.1	77	0.9	1.2	125.6
23	79	24.7	34.1	138.0	79	1.4	1.3	94.6
24	78	41.5	53.2	128.3	78	2.0	1.5	78.6

Statement 89 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	77	52.9	61.9	116.9	77	2.2	1.6	72.1
26	78	59.7	79.0	132.5	78	2.6	1.5	58.5
27	79	70.3	72.3	102.8	79	2.4	1.6	64.8
28	79	58.3	59.3	101.6	79	2.7	1.5	56.4
29	78	55.0	54.7	99.4	78	2.6	1.8	66.6
30	77	70.0	67.3	96.2	77	2.8	1.4	50.7
31	78	60.0	63.6	105.7	78	2.8	1.6	58.2
32	79	56.9	53.9	94.6	79	2.5	1.7	66.2
33	79	66.3	62.1	93.6	79	2.8	1.5	53.1
34	78	57.5	55.2	96.1	78	2.7	1.6	58.5
35	75	64.1	55.3	86.3	75	3.0	1.7	55.2
36	79	67.9	57.9	85.3	79	3.1	1.6	51.6
37	79	61.0	42.3	69.3	79	3.0	1.4	45.3
38	78	47.6	49.6	104.2	78	2.6	1.8	67.3
39	78	45.6	40.9	89.6	78	2.6	1.7	69.5
40	78	53.3	63.8	119.6	78	2.3	1.8	77.4
41	77	43.0	56.3	131.1	77	1.9	1.7	92.3
42	77	44.7	64.1	143.3	77	1.8	1.9	104.9
43	76	41.9	65.2	155.7	76	1.2	1.5	118.7
44	75	37.3	62.7	168.1	75	1.2	1.6	128.4
45	77	17.0	49.3	289.9	77	0.5	1.0	186.8
46	77	26.1	75.6	289.3	77	0.5	1.2	215.6
47	76	16.0	45.1	282.7	76	0.5	0.9	184.2
48	77	2.9	10.0	343.5	77	0.2	0.5	295.6
49	76	2.9	16.3	564.7	76	0.1	0.4	427.1
50	78	1.7	7.4	424.8	78	0.1	0.5	374.2
51	77	2.8	12.8	457.2	77	0.2	0.5	346.3
52	76	0.7	3.3	497.2	76	0.1	0.3	527.9

Note : Data Cover the Period 1901 to 1980.
Source : Assistant Director General of Meteorology, Pune.

Statement 90 : Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : ORISSA **Station :** GOPALPUR (Observatory) **District :** GANJAM

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	80	2.1	10.8	520.3	80	0.1	0.5	368.4
2	80	3.6	15.6	436.3	80	0.2	0.7	341.3
3	80	1.6	5.1	319.0	80	0.1	0.4	295.1
4	80	3.2	10.4	319.3	80	0.2	0.6	291.2
5	75	6.1	17.1	281.1	75	0.3	0.6	225.1
6	79	5.2	17.0	327.1	79	0.3	0.6	214.7
7	79	7.2	23.1	321.4	79	0.4	0.9	247.6
8	78	6.0	21.6	361.3	78	0.3	0.6	219.4
9	78	3.8	13.9	366.0	78	0.2	0.5	252.2
10	78	4.5	17.6	393.9	78	0.3	0.7	277.1
11	78	2.1	7.5	353.9	78	0.1	0.4	317.0
12	78	3.4	8.8	261.3	78	0.3	0.6	230.4
13	78	5.1	14.1	274.8	78	0.3	0.7	232.6
14	79	3.9	10.3	262.0	79	0.3	0.7	203.6
15	79	4.6	9.5	207.0	79	0.4	0.7	195.9
16	79	5.5	18.8	339.8	79	0.4	0.8	214.5
17	79	3.5	9.1	257.8	79	0.3	0.7	205.8
18	79	6.6	14.4	217.9	79	0.5	0.8	171.4
19	80	7.9	15.7	197.9	80	0.6	0.9	157.1
20	80	9.4	16.7	178.1	80	0.6	0.8	139.3
21	80	13.0	35.9	276.1	80	0.7	1.0	139.0
22	79	14.0	22.4	160.3	79	1.0	1.2	120.9
23	80	15.2	20.8	136.9	80	1.0	1.2	114.9
24	80	34.2	39.7	116.3	80	1.8	1.5	83.4

Statement 90 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	80	37.4	44.8	119.6	80	2.0	1.5	74.5
26	80	47.6	52.3	110.0	80	2.2	1.3	61.1
27	80	49.8	43.4	109.0	80	2.1	1.3	59.9
28	80	34.3	34.0	99.3	80	2.2	1.4	60.9
29	80	47.8	51.2	107.1	80	2.2	1.4	65.4
30	79	41.3	54.5	131.9	79	2.3	1.5	65.5
31	77	50.6	45.5	89.9	77	2.5	1.4	55.8
32	78	40.2	41.8	104.1	78	2.2	1.6	70.0
33	77	40.5	43.1	106.4	77	2.4	1.6	67.2
34	79	43.9	54.8	124.8	79	2.4	1.6	66.7
35	77	46.9	40.2	36.0	77	2.4	1.6	66.9
36	78	52.6	53.1	100.8	78	2.4	1.6	64.4
37	79	45.7	61.6	134.9	79	2.0	1.4	68.7
38	79	42.5	54.5	128.2	79	2.2	1.7	77.1
39	78	52.7	61.9	117.5	78	2.3	1.6	71.3
40	80	46.8	56.3	120.5	80	2.1	1.9	91.5
41	79	53.7	81.6	151.9	79	1.9	2.0	100.2
42	80	62.5	95.4	152.6	80	1.9	2.1	106.0
43	79	57.5	119.7	208.2	79	1.3	1.7	133.1
44	78	44.9	76.7	170.8	78	1.3	1.6	119.0
45	79	18.5	41.5	223.9	79	0.7	1.2	163.0
46	79	30.5	84.6	277.5	79	0.5	1.2	217.8
47	79	20.5	50.8	247.2	79	0.6	1.1	177.6
48	80	4.5	15.2	339.8	80	0.3	0.8	295.4
49	78	4.8	23.8	494.9	78	0.2	0.6	364.0
50	78	3.3	15.5	466.5	78	0.2	0.6	340.7
51	79	2.2	12.8	585.9	79	0.2	0.6	395.7
52	78	0.7	4.9	685.4	78	0.0	0.2	620.4

Note : Data Cover the Period 1901 to 1980.
Source : Assistant Director General of Meteorology, Pune.

Statement 91: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State: BIHAR **Station:** MOTIHARI (Observatory) **District:** CHAMPARAN

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	75	2.2	7.4	329.4	75	0.2	0.5	288.0
2	75	2.9	8.5	290.3	75	0.3	0.7	233.5
3	73	2.4	7.8	320.7	73	0.2	0.6	232.0
4	72	3.8	7.6	200.7	72	0.3	0.5	170.5
5	72	4.1	8.4	206.0	72	0.4	0.7	175.6
6	74	3.4	8.7	256.3	74	0.3	0.6	213.7
7	75	4.9	10.7	220.1	75	0.4	0.8	197.1
8	75	3.9	8.7	222.0	75	0.3	0.7	192.6
9	72	1.4	4.4	321.0	72	0.1	0.4	322.4
10	73	3.1	7.4	237.2	73	0.3	0.6	213.0
11	71	1.8	6.1	342.8	71	0.1	0.3	28.6
12	72	3.9	9.8	250.9	72	0.3	0.6	210.9
13	71	3.5	10.1	293.2	71	0.3	0.6	236.0
14	71	1.3	3.6	288.6	71	0.1	0.4	276.2
15	71	4.4	14.6	335.0	71	0.3	0.8	264.3
16	70	5.6	13.0	231.4	70	0.5	0.8	177.4
17	70	8.4	17.4	206.8	70	0.5	0.7	156.3
18	70	8.2	14.9	182.4	70	0.5	0.7	139.4
19	71	13.7	21.7	158.7	71	0.8	0.9	119.9
20	72	12.6	21.6	171.1	72	0.7	0.9	127.1
21	71	12.6	18.3	144.6	71	0.8	0.9	106.6
22	71	23.6	32.2	136.2	71	1.3	1.2	91.7
23	73	27.8	27.6	99.2	73	1.5	1.5	96.9
24	72	41.2	48.4	117.4	72	1.8	1.6	92.5

Statement 91 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	71	57.7	52.5	91.1	71	2.4	1.5	62.3
26	68	72.0	66.1	61.8	68	2.7	1.6	61.0
27	71	79.6	85.4	107.2	71	3.0	1.7	58.4
28	71	85.3	70.3	82.4	71	3.3	1.8	55.7
29	70	89.5	77.7	86.9	70	3.4	1.7	50.1
30	71	78.2	95.8	122.5	71	2.9	1.9	65.7
31	71	83.4	77.8	63.3	71	3.1	1.8	57.8
32	73	81.3	75.7	93.2	73	3.1	1.8	58.8
33	73	67.5	64.8	95.9	73	3.0	1.7	55.0
34	72	62.5	55.1	88.1	72	2.9	1.6	56.8
35	69	57.3	53.1	92.6	69	2.4	1.6	69.6
36	69	61.1	61.6	100.8	69	2.3	1.6	70.3
37	71	62.9	74.6	118.5	71	2.8	1.8	65.5
38	70	50.8	68.4	134.5	70	1.8	1.5	79.5
39	69	35.3	51.0	144.6	69	1.3	1.2	89.8
40	71	33.8	54.4	160.8	71	1.4	1.4	100.8
41	69	10.1	23.1	228.3	69	0.5	0.8	179.6
42	66	10.9	25.1	230.8	66	0.5	0.8	172.0
43	69	3.6	15.4	424.9	69	0.2	0.6	305.7
44	69	2.7	14.1	524.2	69	0.1	0.6	397.4
45	70	1.9	8.4	450.9	70	0.1	0.4	381.1
46	71	1.5	8.0	537.3	71	0.1	0.4	519.5
47	70	0.4	2.3	597.0	70	0.0	0.3	620.0
48	69	0.4	1.8	414.5	69	0.1	0.2	406.1
49	70	0.3	1.9	700.2	70	0.0	0.1	836.7
50	69	0.4	2.8	753.0	69	0.0	0.2	830.7
51	70	0.9	4.0	424.3	70	0.1	0.3	346.8
52	66	1.7	6.0	404.3	66	0.1	0.4	409.4

Note : Data Cover the Period 1901 to 1979.
Source : Assistant Director General of Meteorology, Pune.

Statement 92: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State: BIHAR **Station:** BETTIAH **District:** CHAMPARAN

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	65	2.5	8.6	342.5	65	0.3	0.6	246.3
2	64	3.0	9.3	314.4	64	0.2	0.6	263.5
3	65	3.4	10.8	322.6	65	0.3	0.7	236.3
4	65	3.6	7.1	197.4	65	0.4	0.6	176.1
5	64	5.1	8.1	157.4	64	0.5	0.7	151.6
6	67	3.1	7.9	250.0	67	0.3	0.6	201.9
7	67	3.5	7.5	215.7	67	0.4	0.9	216.2
8	67	3.9	8.6	218.8	67	0.4	0.6	179.9
9	67	1.9	8.3	434.5	67	0.1	0.5	314.1
10	67	3.9	9.6	246.9	67	0.3	0.5	189.8
11	67	1.4	4.8	336.4	67	0.2	0.5	292.2
12	67	2.7	8.5	307.2	67	0.2	0.4	250.8
13	65	3.6	14.1	390.9	65	0.2	0.5	285.5
14	66	1.4	4.0	285.6	66	0.1	0.3	253.6
15	66	2.6	7.9	306.8	66	0.3	0.9	289.3
16	66	6.2	13.7	221.1	66	0.4	0.7	171.4
17	66	6.2	11.8	189.9	66	0.5	0.8	172.0
18	66	9.7	20.1	207.0	66	0.5	0.8	162.8
19	68	10.6	18.5	173.7	68	0.7	0.9	123.3
20	68	10.1	18.1	179.1	68	0.6	0.8	131.3
21	68	11.3	14.1	124.3	68	0.8	0.8	103.6
22	68	22.8	28.1	123.1	68	1.2	1.2	100.4
23	68	27.3	28.7	105.3	68	1.4	1.2	86.8
24	67	38.0	49.2	129.3	67	1.7	1.3	83.6

Statement 92 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	67	62.0	65.7	106.0	67	2.4	1.6	66.8
26	67	60.4	62.3	103.2	67	2.3	1.7	72.3
27	68	89.5	76.4	85.3	68	3.2	1.5	47.9
28	67	78.6	69.0	87.8	67	2.9	1.8	64.4
29	68	84.1	75.8	90.2	68	2.8	1.8	63.7
30	68	69.1	76.3	110.5	68	2.7	1.9	70.3
31	66	77.2	73.4	95.1	66	2.9	1.7	60.8
32	66	86.6	76.3	92.4	66	3.3	1.9	57.8
33	66	81.5	84.8	104.0	66	3.2	1.8	56.5
34	66	72.4	72.2	99.8	66	2.7	1.7	62.2
35	65	58.7	52.5	89.5	65	2.7	1.5	57.6
36	66	60.7	73.1	120.5	66	2.3	1.4	62.5
37	66	54.8	74.2	135.4	66	2.1	1.6	76.8
38	66	55.2	72.0	130.5	66	1.8	1.3	75.4
39	66	29.0	45.4	156.2	66	1.2	1.1	93.2
40	67	35.7	68.8	192.6	67	1.1	1.4	121.4
41	67	17.1	39.8	232.0	67	0.6	0.9	155.8
42	67	11.9	30.1	252.5	67	0.6	0.9	161.6
43	67	1.4	4.8	257.3	67	0.1	0.4	310.0
44	65	3.7	16.0	432.7	65	0.1	0.4	309.5
45	66	2.4	16.1	663.6	66	0.1	0.4	409.4
46	66	1.3	7.5	571.9	66	0.1	0.5	570.0
47	66	0.8	4.0	516.2	66	0.1	0.4	480.7
48	65	0.3	1.5	554.3	65	0.0	0.2	458.1
49	67	0.2	1.0	553.0	67	0.0	0.2	574.4
50	67	0.3	2.0	679.5	67	0.0	0.2	818.5
51	67	1.1	4.5	411.2	67	0.1	0.4	338.8
52	67	1.1	4.1	364.0	67	0.1	0.3	321.3

Note : Data Cover the Period 1901 to 1970.
Source : Assistant Director General of Meteorology, Pune.

Statement 93: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State: BIHAR **Station:** MAHUA **District:** MUZAFFARPUR

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	59	1.6	7.3	469.3	59	0.1	0.4	351.0
2	59	3.6	11.2	314.5	59	0.2	0.5	224.1
3	59	3.1	8.2	265.9	59	0.3	0.7	254.7
4	58	3.7	7.8	208.7	58	0.4	0.7	190.2
5	55	7.5	14.9	197.6	55	0.5	0.8	144.7
6	59	4.1	10.1	246.5	59	0.4	0.6	178.9
7	59	3.3	6.8	202.8	59	0.4	0.7	179.8
8	57	5.5	11.5	210.2	57	0.5	0.9	185.0
9	58	0.5	1.6	306.6	58	0.1	0.3	297.0
10	62	2.7	6.9	253.6	62	0.3	0.7	257.2
11	62	2.0	7.0	357.7	62	0.1	0.4	297.2
12	61	1.3	5.0	401.6	61	0.1	0.5	346.4
13	59	1.8	5.8	315.3	59	0.2	0.6	280.4
14	61	0.4	1.5	344.7	61	0.1	0.2	380.6
15	61	2.3	5.1	221.6	61	0.2	0.5	218.4
16	61	2.1	6.2	289.3	61	0.1	0.4	272.1
17	59	2.6	6.6	249.1	59	0.2	0.5	226.0
18	60	4.4	10.5	235.5	60	0.3	0.7	188.4
19	62	7.0	13.1	186.5	62	0.6	0.9	151.3
20	62	6.2	13.2	213.7	62	0.4	0.7	170.9
21	61	7.8	14.1	180.2	61	0.5	0.6	135.3
22	58	15.8	24.6	155.2	58	0.8	1.0	125.6
23	63	28.8	51.0	176.8	63	1.3	1.4	107.0
24	63	40.1	56.4	140.8	63	1.6	1.4	91.0

Statement 93 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	64	45.4	49.1	108.3	64	2.2	1.6	74.9
26	61	61.9	69.1	111.7	61	2.1	1.6	79.0
27	65	59.3	63.0	106.1	65	2.7	1.6	59.7
28	64	79.6	71.4	89.7	64	3.0	1.7	57.4
29	65	63.6	54.8	86.2	65	3.0	1.8	60.6
30	63	53.3	51.0	95.7	63	2.7	1.6	58.3
31	64	67.8	63.1	93.1	64.	3.1	1.9	61.3
32	64	87.2	70.1	80.4	64	3.6	1.6	43.6
33	64	66.7	62.3	93.3	64	3.1	1.8	57.8
34	63	59.6	58.2	97.6	63	2.7	1.5	56.7
35	63	67.0	73.3	109.5	63	2.9	1.8	64.2
36	64	62.6	70.3	112.3	64	2.6	1.5	57.7
37	63	61.3	67.2	109.6	63	2.6	1.9	72.0
38	63	47.9	56.3	117.5	63	2.2	1.6	70.6
39	61	39.1	52.2	133.4	61	1.5	1.4	89.1
40	61	31.1	67.1	216.0	61	1.1	1.3	119.3
41	59	9.7	21.0	217.1	59	0.6	1.0	165.0
42	58	11.2	27.0	241.2	58	0.5	0.9	183.0
43	58	3.8	13.6	355.3	58	0.2	0.6	264.8
44	57	4.2	16.9	400.0	57	0.2	0.5	288.0
45	62	2.6	12.9	494.7	62	0.1	0.5	349.4
46	62	1.7	9.2	544.3	62	0.1	0.5	532.2
47	61	1.4	7.0	488.4	61	0.1	0.3	471.6
48	59	0.3	2.0	789.6	59	0.1	0.4	768.1
49	61	0.0	0.0	0.0	61	0.0	0.0	0.0
50	62	0.2	1.1	449.2	62	0.0	0.2	552.2
51	61	1.2	7.5	607.1	61	0.1	0.4	461.6
52	60	1.2	3.7	309.2	60	0.1	0.3	257.1

Note : Data Cover the Period 1901 to 1970.
Source : Assistant Director General of Meteorology, Pune.

Statement 94: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State: BIHAR **Station: MUZAFFARPUR (Observatory)** **District: MUZAFFARPUR**

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	65	3.5	11.5	328.2	65	0.2	0.6	316.0
2	64	1.6	4.0	245.4	64	0.2	0.4	218.1
3	65	4.0	11.2	279.7	65	0.3	0.8	223.3
4	65	2.3	4.5	194.2	65	0.3	0.5	168.1
5	64	5.0	12.4	249.2	64	0.4	0.7	185.9
6	67	4.1	11.7	284.4	67	0.3	0.7	201.1
7	67	3.5	8.4	237.1	67	0.4	0.9	241.7
8	67	3.4	7.2	212.3	67	0.4	0.8	176.3
9	67	1.3	4.1	318.1	67	0.1	0.4	314.7
10	67	1.4	4.5	312.8	67	0.2	0.6	287.1
11	67	1.5	4.9	334.5	67	0.2	0.4	250.8
12	67	3.2	8.1	256.6	67	0.3	0.7	216.6
13	65	1.9	6.8	365.1	65	0.1	0.5	366.4
14	65	1.0	3.8	399.1	65	0.1	0.3	369.5
15	65	1.2	3.7	303.2	65	0.1	0.4	281.9
16	65	4.9	12.3	252.2	65	0.3	0.7	221.9
17	64	4.1	8.3	204.7	64	0.4	0.7	180.3
18	63	8.0	16.0	200.1	63	0.6	0.8	143.1
19	64	11.1	18.3	164.6	64	0.6	0.8	135.9
20	64	12.0	26.4	220.0	64	0.6	0.9	146.8
21	64	13.6	20.7	152.1	64	0.7	0.8	118.0
22	61	20.8	26.2	126.2	61	1.0	1.1	107.4
23	63	26.1	39.5	151.5	63	1.2	1.3	102.3
24	63	34.6	49.0	141.9	63	1.6	1.5	93.4

Statement 94 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	63	49.7	56.6	113.9	63	2.3	1.7	73.1
26	61	64.0	77.5	112.4	61	2.6	1.7	63.9
27	63	56.4	52.2	92.5	63	2.7	1.9	67.8
28	63	69.8	65.7	94.1	63	3.5	1.8	52.9
29	63	81.8	73.3	89.7	63	3.0	1.9	64.5
30	61	72.5	84.1	115.9	61	2.8	1.8	63.3
31	63	73.0	81.3	111.5	63	3.0	1.7	57.4
32	65	96.2	92.7	96.4	65	3.6	2.0	56.0
33	65	61.4	63.0	102.6	65	2.9	1.7	59.7
34	65	64.7	57.5	88.9	65	2.8	1.4	49.0
35	63	67.8	54.6	80.5	63	2.8	1.7	60.2
36	65	55.9	61.0	109.0	65	2.5	1.5	60.1
37	64	73.0	89.2	122.1	64	2.9	1.8	62.7
38	65	43.0	53.8	124.4	65	2.2	1.4	63.7
39	64	42.1	49.2	116.8	64	1.7	1.3	78.1
40	63	37.3	62.2	167.0	63	1.5	1.6	102.9
41	64	15.4	31.1	202.3	64	0.6	1.0	154.8
42	64	10.1	29.2	288.9	64	0.3	0.7	215.1
43	64	2.4	9.5	397.9	64	0.2	0.6	320.4
44	60	3.9	17.4	448.0	60	0.2	0.6	256.2
45	62	1.5	7.9	515.2	62	0.1	0.4	465.5
46	61	1.9	10.3	531.8	61	0.1	0.4	443.3
47	62	0.7	3.3	448.5	62	0.1	0.3	475.5
48	61	0.5	2.7	523.6	61	0.0	0.3	578.2
49	62	0.6	3.5	572.7	62	0.0	0.3	583.0
50	63	0.2	1.0	516.1	63	0.0	0.2	556.7
51	62	0.3	2.0	561.0	62	0.0	0.3	583.0
52	62	0.6	2.7	437.0	62	0.1	0.4	406.1

Note : Data Cover the Period 1901 to 1979.
Source : Assistant Director General of Meteorology, Pune.

Statement 95: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : BIHAR **Station :** SITAMARHI **District :** MUZAFFARPUR

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	63	3.9	14.8	378.6	63	0.3	0.7	291.3
2	62	4.0	11.9	297.8	62	0.3	0.5	197.7
3	63	3.4	10.8	316.8	63	0.2	0.6	258.2
4	61	4.0	9.2	230.5	61	0.3	0.6	190.6
5	62	5.8	15.2	262.6	62	0.5	0.8	168.6
6	62	4.2	11.0	263.1	62	0.3	0.5	200.0
7	62	4.3	9.0	208.9	62	0.4	0.9	197.8
8	61	4.3	9.3	216.2	61	0.4	0.8	184.0
9	61	1.9	5.1	269.9	61	0.2	0.5	242.4
10	61	4.2	11.6	276.1	61	0.2	0.5	230.5
11	60	1.6	5.0	317.7	60	0.2	0.5	255.9
12	60	3.6	12.1	332.6	60	0.2	0.6	256.2
13	61	3.9	10.5	269.7	61	0.2	0.6	268.5
14	63	1.7	5.7	336.1	63	0.2	0.4	228.2
15	62	4.0	9.6	241.8	62	0.3	0.7	208.3
16	62	4.4	7.9	179.4	62	0.4	0.6	150.5
17	63	7.9	17.3	218.2	63	0.5	0.7	145.2
18	63	10.6	18.4	172.8	63	0.7	0.9	132.0
19	62	22.2	28.9	130.3	62	1.0	1.0	98.4
20	63	16.4	24.2	147.8	63	0.8	0.9	112.1
21	62	18.4	24.1	130.8	62	1.1	1.1	99.0
22	63	33.7	39.6	117.5	63	1.5	1.2	79.5
23	63	31.1	33.3	107.0	63	1.6	1.3	79.8
24	61	50.6	60.6	119.9	61	2.0	1.6	76.9

Statement 95 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	61	57.3	64.9	113.3	61	2.2	1.6	69.8
26	62	72.6	72.5	99.8	62	2.6	1.6	63.4
27	63	83.6	90.5	108.3	63	2.8	1.6	55.6
28	62	92.9	92.6	99.7	62	3.2	1.9	58.4
29	61	77.2	88.5	114.6	61	2.9	1.7	60.9
30	62	66.7	85.4	128.0	62	2.5	1.7	68.6
31	62	80.1	106.3	132.7	62	2.6	1.7	64.6
32	61	89.1	93.8	105.2	61	3.4	2.0	59.3
33	62	77.5	78.7	101.5	62	3.0	1.7	57.0
34	61	66.9	67.7	101.3	61	2.8	1.8	64.5
35	61	58.8	64.6	109.8	61	2.4	2.0	81.0
36	62	65.9	70.2	106.5	62	2.8	1.6	57.8
37	61	56.2	72.7	129.5	61	2.4	1.9	78.0
38	61	57.7	100.0	173.3	61	2.3	1.5	66.5
39	62	45.2	74.0	163.6	62	1.3	1.2	97.5
40	62	31.9	50.7	158.7	62	1.2	1.3	100.7
41	61	12.8	24.7	193.0	61	0.6	0.8	141.0
42	62	14.6	30.3	207.4	62	0.5	0.8	153.7
43	61	4.0	12.4	310.1	61	0.3	0.6	219.0
44	62	4.3	19.6	460.4	62	0.2	0.5	321.3
45	62	2.3	9.2	407.0	62	0.1	0.4	324.9
46	61	1.2	6.6	534.6	61	0.1	0.4	547.6
47	61	0.8	3.2	419.3	61	0.1	0.3	404.3
48	62	1.0	6.3	616.2	62	0.0	0.2	447.1
49	62	0.1	1.1	787.4	62	0.0	0.3	787.4
50	61	0.7	3.9	545.9	61	0.1	0.3	404.3
51	61	1.3	4.4	339.1	61	0.1	0.4	294.5
52	61	1.4	5.8	417.9	61	0.1	0.3	337.4

Note : Data Cover the Period 1901 to 1968.
Source : Assistant Director General of Meteorology, Pune.

Statement 96: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State: BIHAR **Station:** MADHUBANI **District:** DARBHANGA

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	65	2.1	8.7	407.2	65	0.2	0.6	367.5
2	65	2.7	9.7	360.0	65	0.2	0.5	237.2
3	65	2.4	8.2	347.8	65	0.2	0.6	308.7
4	64	4.1	11.1	270.1	64	0.3	0.6	214.7
5	62	4.9	10.1	206.8	62	0.4	0.7	164.7
6	63	2.8	7.5	270.7	63	0.2	0.6	235.1
7	63	12.9	64.7	501.1	63	0.5	0.9	188.0
8	63	3.6	7.7	216.2	63	0.4	0.9	207.1
9	60	1.3	4.2	332.4	60	0.1	0.4	319.2
10	62	4.4	11.6	265.1	62	0.4	0.7	177.6
11	62	2.2	6.1	276.6	62	0.2	0.5	260.7
12	62	5.6	16.7	296.4	62	0.3	0.8	267.4
13	61	2.1	6.6	312.5	61	0.2	0.5	295.3
14	64	1.8	5.3	300.0	64	0.2	0.5	249.2
15	64	4.3	8.5	197.9	64	0.4	0.7	206.6
16	64	5.3	9.8	185.8	64	0.4	0.7	151.7
17	63	7.8	18.4	235.2	63	0.5	0.7	140.8
18	64	9.3	12.8	136.9	64	0.7	0.8	114.4
19	64	15.1	17.7	117.4	64	0.9	0.9	102.8
20	64	11.1	18.7	168.3	64	0.6	0.8	135.2
21	63	17.7	22.9	129.8	63	1.0	0.9	92.1
22	63	30.7	31.4	102.2	63	1.4	1.1	76.4
23	65	34.1	51.0	149.4	65	1.6	1.4	83.7
24	64	45.8	45.5	99.3	64	2.0	1.5	73.9

Statement 96 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	65	49.1	48.1	98.0	65	2.4	1.5	63.9
26	63	64.0	70.8	110.7	63	2.6	1.7	65.0
27	65	76.3	72.3	94.7	65	3.2	1.7	53.7
28	65	80.8	76.2	94.3	65	3.2	1.7	54.2
29	65	76.5	68.6	89.7	65	3.0	1.8	59.1
30	63	79.3	89.1	112.4	63	3.0	1.7	55.1
31	65	68.6	73.0	106.4	65	2.8	1.8	65.5
32	66	91.2	84.5	92.7	66	3.4	1.8	52.5
33	66	81.9	108.0	131.9	66	2.9	1.6	56.4
34	65	63.8	60.6	95.0	65	2.8	1.7	60.5
35	64	51.8	61.4	118.5	64	2.5	1.7	67.3
36	64	57.4	54.6	95.0	64	2.4	1.4	60.1
37	63	57.8	78.8	136.4	63	2.7	1.8	67.6
38	63	53.7	66.9	124.7	63	2.2	1.7	75.2
39	62	51.7	80.0	154.6	62	1.6	1.2	78.2
40	61	34.1	56.9	166.8	61	1.3	1.5	112.7
41	61	16.4	33.7	205.4	61	0.7	0.9	127.8
42	61	14.0	28.1	201.1	61	0.6	0.9	138.0
43	60	4.4	13.9	317.8	60	0.3	0.7	257.1
44	59	3.4	13.7	399.8	59	0.2	0.5	253.4
45	63	2.1	8.4	411.5	63	0.2	0.6	296.0
46	63	0.6	3.3	571.7	63	0.0	0.3	587.8
47	63	1.3	7.6	606.0	63	0.1	0.3	479.5
48	60	1.0	5.1	537.0	60	0.1	0.3	377.3
49	63	0.0	0.4	793.7	63	0.0	0.1	793.7
50	63	0.4	2.5	648.8	63	0.0	0.3	587.8
51	63	1.2	5.0	414.9	63	0.1	0.4	409.5
52	62	0.7	2.7	376.9	62	0.1	0.3	340.4

Note : Data Cover the Period 1901 to 1970.
Source : Assistant Director General of Meteorology, Pune.

Statement 97: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State: BIHAR **Station:** DHARBHANGA (Observatory) **District:** DHARBHANGA

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	77	2.7	9.7	352.1	77	0.2	0.6	330.6
2	77	2.1	5.7	274.3	77	0.2	0.6	274.2
3	77	2.5	8.5	338.8	77	0.2	0.6	276.7
4	75	3.2	6.5	204.9	75	0.3	0.6	193.1
5	76	4.2	9.7	228.9	76	0.4	0.7	176.3
6	76	3.8	9.5	248.1	76	0.3	0.6	188.3
7	75	4.5	8.6	190.0	75	0.5	0.9	175.9
8	75	3.4	7.3	218.8	75	0.3	0.7	212.8
9	75	1.7	5.9	356.3	75	0.1	0.4	310.3
10	77	2.4	5.9	247.3	77	0.2	0.6	250.5
11	77	1.9	4.9	262.9	77	0.3	0.6	235.2
12	77	3.3	9.8	299.5	77	0.3	0.7	237.1
13	77	2.7	8.2	306.5	77	0.2	0.5	276.7
14	77	1.2	3.8	320.5	77	0.1	0.4	294.2
15	77	4.6	11.5	251.4	77	0.3	0.6	196.3
16	77	5.7	10.1	178.3	77	0.4	0.7	158.0
17	77	6.8	13.1	192.2	77	0.5	0.7	153.6
18	76	8.9	14.4	161.1	76	0.6	0.8	140.4
19	76	15.2	20.8	137.1	76	0.9	1.0	104.7
20	76	8.7	18.1	207.4	76	0.5	0.8	152.7
21	76	16.4	19.7	120.2	76	0.9	0.9	93.8
22	76	26.9	26.8	99.6	76	1.3	1.0	81.7
23	77	27.0	49.5	183.3	77	1.3	1.2	88.0
24	77	38.3	46.4	121.1	77	1.9	1.5	79.9

Statement 97 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	77	50.9	51.2	100.6	77	2.4	1.6	69.6
26	77	56.4	64.4	114.1	77	2.5	1.5	58.6
27	77	69.0	60.6	87.8	77	2.7	1.6	59.4
28	77	74.0	62.7	84.7	77	3.2	1.8	54.9
29	77	68.6	60.0	87.5	77	3.0	1.6	53.1
30	77	66.5	71.0	106.8	77	3.0	1.8	60.9
31	77	70.5	76.3	108.2	77	3.0	1.7	56.9
32	77	85.7	90.4	105.5	77	3.4	1.9	55.7
33	77	69.0	65.9	95.5	77	3.0	1.5	51.4
34	77	65.5	52.3	79.8	77	3.1	1.4	46.0
35	75	57.0	62.8	110.2	75	2.5	1.5	61.6
36	76	63.4	67.2	106.0	76	2.5	1.6	65.8
37	75	52.8	66.0	125.0	75	2.8	1.7	60.4
38	75	43.9	66.0	150.2	75	2.1	1.6	75.7
39	74	55.7	71.5	128.3	74	1.7	1.3	73.1
40	75	37.6	70.9	188.4	75	1.3	1.4	109.0
41	74	12.3	22.8	185.3	74	0.7	1.0	141.0
42	75	10.1	24.1	239.6	75	0.5	0.8	165.5
43	73	3.1	10.9	346.2	73	0.2	0.6	328.8
44	76	5.1	23.7	459.9	76	0.2	0.6	237.5
45	75	2.2	9.6	426.5	75	0.1	0.5	330.5
46	76	1.6	8.4	532.4	76	0.1	0.4	537.9
47	76	1.6	7.6	480.4	76	0.1	0.4	403.4
48	73	0.8	3.6	467.0	73	0.1	0.3	336.5
49	73	0.2	0.8	487.7	73	0.0	0.2	486.4
50	67	0.5	3.2	617.2	67	0.0	0.3	606.4
51	73	0.9	5.5	579.7	73	0.1	0.4	465.2
52	72	1.1	3.6	336.7	72	0.1	0.4	856.0

Note : Data Cover the Period 1901 to 1979.
Source : Assistant Director General of Meteorology, Pune.

Statement 98: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State: BIHAR **Station:** SAMATHIPUR **District:** DARBHANGA

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	68	2.6	13.5	515.3	68	0.1	0.5	507.4
2	68	3.2	9.5	299.7	68	0.2	0.5	219.4
3	68	3.0	8.5	285.2	68	0.3	0.8	245.5
4	67	2.8	6.7	215.2	67	0.3	0.6	210.4
5	66	6.9	13.4	194.7	66	0.5	0.8	177.6
6	69	5.8	17.6	305.1	69	0.3	0.7	197.0
7	67	4.2	9.7	228.7	67	0.3	0.7	193.4
8	70	6.3	14.6	229.8	70	0.4	0.8	188.7
9	69	1.0	3.0	304.8	69	0.2	0.5	333.7
10	69	3.1	9.1	289.8	69	0.3	0.7	240.3
11	68	3.0	12.0	393.7	68	0.3	0.6	243.1
12	69	3.9	12.4	314.9	69	0.3	0.7	260.1
13	69	2.4	8.1	344.8	69	0.1	0.5	345.7
14	70	1.5	5.1	342.2	70	0.1	0.3	302.2
15	70	3.2	10.6	336.9	70	0.2	0.5	264.0
16	70	5.7	15.6	273.5	70	0.4	0.7	189.9
17	70	4.7	11.8	251.2	70	0.4	0.6	166.4
18	69	8.9	22.7	255.5	69	0.4	0.8	173.0
19	69	14.2	25.7	181.4	69	0.7	0.9	119.8
20	69	6.8	14.8	216.5	69	0.4	0.7	175.1
21	69	13.2	23.0	174.7	69	0.7	0.8	113.8
22	66	17.0	26.7	157.1	66	0.8	0.8	97.5
23	68	32.2	54.5	169.0	68	1.2	1.3	111.9
24	68	46.0	55.1	120.0	68	1.8	1.6	90.0

Statement 98 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	68	63.4	65.8	103.8	68	1.4	1.7	71.1
26	67	57.6	69.7	120.9	67	2.3	1.9	81.8
27	69	76.9	73.7	95.9	69	3.0	1.6	55.2
28	69	78.3	69.5	88.7	69	3.4	1.8	54.2
29	69	79.0	77.0	97.5	69	3.1	1.7	54.5
30	69	70.9	68.4	96.4	69	3.2	1.8	57.6
31	69	83.9	85.3	101.7	69	3.3	1.9	58.6
32	69	114.8	118.0	102.8	69	3.8	1.7	45.3
33	69	79.7	72.6	91.0	69	3.3	1.8	52.9
34	69	78.0	70.2	90.0	69	3.3	1.6	47.9
35	67	78.9	86.2	109.3	67	3.1	1.9	61.1
36	68	79.7	96.7	121.3	68	3.0	1.6	54.4
37	68	69.1	82.9	120.0	68	2.9	1.9	65.3
38	68	53.5	66.4	124.2	68	2.3	1.7	76.1
39	68	50.8	67.7	133.3	68	1.8	1.4	79.8
40	69	38.6	83.3	215.6	69	1.3	1.3	106.8
41	69	11.1	22.4	201.3	69	0.7	1.0	142.3
42	69	12.0	27.5	229.8	69	0.5	0.8	148.6
43	69	5.1	17.0	330.0	69	0.2	0.6	260.1
44	68	3.2	13.2	412.0	68	0.2	0.5	308.7
45	68	3.2	13.7	429.9	68	0.2	0.6	347.9
46	68	1.3	7.2	545.0	68	0.1	0.4	508.2
47	68	1.6	6.5	401.4	68	0.1	0.3	378.4
48	67	0.4	2.5	578.4	67	0.1	0.4	644.2
49	69	0.1	0.8	544.4	69	0.0	0.2	583.0
50	68	0.4	2.0	504.4	68	0.1	0.3	498.7
51	68	1.3	6.4	481.9	68	0.1	0.3	378.4
52	66	0.7	2.5	374.1	66	0.1	0.3	352.0

Note : Data Cover the Period 1901 to 1970.
Source : Assistant Director General of Meteorology, Pune.

Statement 99: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State: BIHAR **Station:** CHAPRA **District:** SARAN

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	60	2.6	8.5	328.4	60	0.1	0.5	343.4
2	60	3.2	11.3	355.9	60	0.2	0.4	235.3
3	59	3.4	10.1	298.9	59	0.3	0.7	288.4
4	60	4.3	6.9	162.8	60	0.5	0.6	133.6
5	60	5.0	11.4	225.9	60	0.4	0.7	167.0
6	60	4.6	10.7	230.9	60	0.4	0.8	170.8
7	59	3.6	8.2	228.2	59	0.3	0.7	211.4
8	59	4.4	9.7	220.1	59	0.4	0.8	194.3
9	59	1.3	3.4	263.9	59	0.1	0.4	289.1
10	59	2.5	5.7	222.0	59	0.3	0.6	225.3
11	58	2.0	6.0	305.0	58	0.2	0.4	246.3
12	59	2.9	7.2	246.2	59	0.3	0.6	193.9
13	59	2.2	8.2	374.0	59	0.2	0.7	326.4
14	58	0.3	1.4	417.3	58	0.1	0.2	431.9
15	58	2.0	8.2	406.5	58	0.2	0.5	269.2
16	57	2.5	9.2	362.0	57	0.2	0.6	265.3
17	58	3.2	7.3	231.8	58	0.3	0.7	219.3
18	58	3.7	9.0	246.0	58	0.2	0.4	217.3
19	58	6.7	11.2	166.9	58	0.5	0.7	151.7
20	58	4.2	9.1	216.2	58	0.3	0.6	212.0
21	59	4.7	10.7	224.6	59	0.3	0.6	186.3
22	59	10.7	16.0	149.2	59	0.6	0.8	132.7
23	59	17.4	26.7	153.8	59	1.1	1.4	130.2
24	58	22.8	30.8	135.0	58	1.3	1.4	105.5

Statement 99 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	59	40.5	53.8	132.9	59	1.8	1.6	92.6
26	58	46.7	52.4	112.2	58	2.3	2.0	86.1
27	59	48.5	46.3	95.6	59	2.5	1.6	64.3
28	59	74.8	64.4	86.1	59	3.2	1.9	58.0
29	58	71.3	57.9	81.2	58	3.4	1.6	46.8
30	58	58.2	55.1	94.7	58	2.7	1.8	66.4
31	59	69.0	61.3	88.8	59	2.9	1.5	52.6
32	59	73.4	53.6	73.1	59	3.5	1.8	50.6
33	58	60.5	69.9	115.6	58	2.8	1.5	54.0
34	59	52.6	42.0	79.7	59	2.7	1.5	55.7
35	59	56.7	56.0	98.8	59	2.9	1.8	61.9
36	59	72.8	174.3	239.4	59	2.4	1.5	61.4
37	59	77.4	91.7	118.4	59	2.8	2.0	69.9
38	56	36.2	50.5	139.5	56	1.8	1.4	77.3
39	58	42.4	50.5	118.9	58	1.7	1.3	76.8
40	57	34.8	58.0	166.7	57	1.4	1.6	111.2
41	59	12.2	32.1	262.8	59	0.6	1.1	165.0
42	56	9.9	32.0	324.9	56	0.3	0.7	222.8
43	57	2.5	9.7	382.1	57	0.2	0.5	288.0
44	58	3.3	13.4	412.1	58	0.1	0.4	317.0
45	57	3.4	17.6	514.7	57	0.1	0.5	341.7
46	57	0.9	4.2	449.7	57	0.1	0.4	388.6
47	58	0.7	3.9	554.0	58	0.1	0.2	431.9
48	59	0.6	3.4	532.9	59	0.1	0.2	435.8
49	58	0.1	1.1	761.0	58	0.0	0.1	761.6
50	58	0.1	0.5	635.9	58	0.0	0.1	761.6
51	57	0.9	3.2	337.4	57	0.2	0.6	325.4
52	57	0.9	2.7	297.6	57	0.1	0.4	314.0

Note : Data Cover the Period 1901 to 1978.
Source : Assistant Director General of Meteorology, Pune.

Statement 100: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State: BIHAR **Station:** SIWAN (Observatory) **District:** SARAN

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	65	3.4	10.3	303.7	65	0.2	0.6	259.2
2	65	2.8	7.6	276.2	65	0.3	0.6	225.8
3	65	3.2	12.0	374.2	65	0.3	0.6	236.8
4	65	5.3	10.8	202.2	65	0.4	0.6	147.8
5	60	3.5	6.6	188.2	60	0.4	0.7	180.8
6	61	3.7	8.3	223.0	61	0.4	0.7	168.9
7	61	4.7	9.4	198.6	61	0.4	0.8	184.0
8	61	5.8	11.2	194.1	61	0.6	0.9	163.7
9	61	1.8	4.8	261.1	61	0.2	0.4	223.9
10	62	2.9	6.3	218.0	62	0.3	0.7	222.9
11	62	1.6	4.0	248.9	62	0.3	0.7	252.4
12	62	1.4	3.9	277.8	62	0.1	0.4	274.6
13	61	3.4	12.2	361.1	61	0.2	0.7	301.8
14	63	1.1	4.2	376.0	63	0.1	0.3	310.7
15	63	2.5	8.9	363.5	63	0.2	0.6	310.7
16	63	2.2	7.4	341.1	63	0.2	0.7	289.4
17	63	2.6	5.9	222.9	63	0.2	0.5	195.5
18	62	4.7	9.9	212.3	62	0.3	0.5	162.8
19	63	7.1	16.1	227.4	63	0.6	0.9	156.3
20	63	4.7	9.5	203.9	63	0.4	0.7	172.8
21	63	6.0	10.6	175.4	63	0.5	0.7	136.0
22	61	12.2	18.3	149.6	61	0.8	0.9	112.5
23	63	17.7	26.1	147.1	63	1.0	1.2	120.2
24	63	31.1	51.2	164.8	63	1.4	1.4	105.5

Statement 100 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	63	41.4	53.1	128.3	63	1.9	1.6	85.1
26	63	57.2	59.7	104.5	63	2.4	1.8	73.9
27	65	63.0	59.9	95.2	65	3.0	1.8	58.8
28	65	78.0	83.7	107.3	65	3.0	1.9	62.4
29	65	73.2	68.9	94.2	65	2.9	1.6	54.6
30	65	63.6	59.6	93.7	65	3.0	1.7	58.9
31	64	72.2	60.2	83.4	64	3.2	1.8	55.3
32	65	83.6	75.3	90.2	65	3.4	1.7	51.6
33	65	65.8	67.3	102.2	65	3.0	1.7	57.3
34	65	90.8	200.5	220.9	65	2.9	1.7	59.3
35	64	66.8	69.8	104.5	64	2.7	1.9	69.3
36	65	63.5	63.5	100.0	65	2.7	1.8	66.8
37	65	56.8	79.6	140.2	65	2.4	1.8	74.2
38	65	48.9	81.6	166.8	65	2.0	1.6	78.1
39	65	31.0	44.2	142.5	65	1.3	1.2	95.3
40	65	28.0	44.2	158.0	65	1.3	1.5	115.8
41	65	11.5	25.8	225.0	65	0.6	0.9	158.1
42	65	12.5	29.8	237.8	65	0.4	0.8	191.6
43	65	4.5	17.8	390.7	65	0.2	0.5	329.7
44	64	2.9	12.3	423.4	64	0.2	0.6	298.6
45	65	1.5	7.4	482.5	65	0.2	0.4	286.8
46	65	2.2	9.9	459.4	65	0.1	0.5	438.1
47	65	1.0	4.1	402.5	65	0.1	0.5	334.8
48	65	0.0	0.1	806.2	65	0.0	0.0	0.0
49	65	0.2	1.8	476.6	65	0.0	0.2	458.1
50	65	0.6	2.6	459.0	65	0.1	0.3	418.0
51	65	2.3	8.1	346.8	65	0.2	0.5	309.0
52	64	1.4	4.1	300.7	64	0.1	0.3	266.7

Note : Data Cover the Period 1901 to 1968.
Source : Assistant Director General of Meteorology, Pune.

Statement 101: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : BIHAR **Station :** GOPALGANJ **District :** SARAN

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	66	1.7	5.5	317.8	66	0.2	0.4	289.3
2	65	3.4	9.1	266.3	65	0.4	0.7	189.8
3	66	3.8	11.9	310.8	66	0.3	0.7	221.6
4	66	4.5	9.9	220.8	66	0.4	0.7	170.8
5	65	4.9	8.4	169.3	65	0.5	0.7	143.7
6	65	4.1	11.7	286.7	65	0.3	0.6	215.7
7	65	4.7	9.5	202.7	65	0.5	0.8	178.2
8	66	4.1	8.4	205.5	66	0.4	0.7	188.3
9	65	1.5	5.0	336.0	65	0.1	0.4	281.9
10	65	2.3	5.5	342.2	65	0.2	0.5	239.2
11	65	2.4	6.8	288.4	65	0.2	0.5	252.9
12	66	1.7	4.8	280.0	66	0.2	0.4	234.5
13	63	2.4	9.9	412.8	63	0.2	0.6	361.5
14	63	0.6	2.5	383.9	63	0.1	0.3	343.3
15	62	2.2	6.6	306.3	62	0.2	0.7	293.8
16	63	3.2	12.3	385.8	63	0.2	0.6	290.8
17	63	3.8	8.2	214.0	63	0.3	0.5	202.0
18	63	5.8	12.6	216.2	63	0.4	0.6	160.3
19	64	8.4	16.6	198.1	64	0.6	0.9	149.2
20	64	5.7	12.0	209.2	64	0.4	0.7	179.3
21	65	8.7	14.3	164.3	65	0.9	0.7	120.2
22	64	14.3	20.8	144.8	64	0.8	1.0	127.9
23	65	24.7	35.9	145.2	65	1.2	1.2	104.2
24	65	42.0	70.4	167.7	65	1.4	1.2	83.4

Statement 101 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	66	39.9	45.0	112.8	66	2.0	1.4	72.3
26	65	64.1	66.2	103.2	65	2.2	1.6	73.8
27	65	70.6	64.3	91.1	65	2.9	1.6	55.8
28	64	66.7	60.2	90.3	64	3.0	1.8	57.7
29	65	66.0	54.2	82.1	65	2.5	1.6	63.9
30	65	57.1	54.0	94.5	65	2.5	1.7	67.3
31	64	73.4	67.2	91.6	64	2.9	1.7	59.4
32	65	70.8	72.2	102.1	65	3.2	1.8	57.5
33	65	58.4	64.3	110.1	65	2.8	1.7	62.2
34	66	52.1	48.9	93.9	66	2.8	1.8	62.4
35	64	54.5	50.6	92.8	64	2.8	1.6	56.0
36	64	54.5	52.8	97.0	64	2.4	1.4	61.1
37	63	56.8	70.8	124.7	63	2.3	1.8	75.7
38	65	43.3	65.3	150.9	65	1.8	1.5	83.1
39	65	30.4	41.5	136.3	65	1.3	1.2	93.2
40	65	30.0	56.0	186.6	65	1.2	1.4	115.9
41	64	13.7	30.8	225.4	64	0.6	1.0	163.6
42	65	11.6	27.9	240.6	65	0.5	0.9	187.9
43	65	2.0	7.8	395.2	65	0.1	0.3	251.4
44	63	2.1	11.1	542.5	63	0.1	0.4	299.5
45	62	2.2	13.2	585.0	62	0.1	0.5	427.5
46	62	1.9	9.6	499.4	62	0.1	0.5	456.6
47	63	0.9	4.4	515.8	63	0.1	0.3	479.5
48	62	0.2	1.6	787.4	62	0.0	0.1	787.4
49	63	0.4	1.6	416.3	63	0.1	0.2	387.1
50	63	0.4	2.5	621.5	63	0.1	0.3	479.5
51	64	1.3	5.9	448.6	64	0.1	0.3	366.5
52	64	1.1	3.8	356.7	64	0.1	0.3	313.4

Note : Data Cover the Period 1901 to 1968.
Source : Assistant Director General of Meteorology, Pune.

Statement 102: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State: BIHAR **Station:** BHAGALPUR **District:** BHAGALPUR

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	59	1.6	6.5	397.2	59	0.1	0.4	316.3
2	59	1.3	4.7	352.3	59	0.1	0.4	316.3
3	60	2.7	7.7	282.9	60	0.2	0.5	257.1
4	61	5.4	14.0	261.4	61	0.3	0.7	223.5
5	58	4.4	11.8	269.7	58	0.3	0.6	233.2
6	59	3.7	9.2	250.1	59	0.3	0.7	203.4
7	61	4.2	11.9	285.9	61	0.3	0.7	234.3
8	61	5.7	13.9	243.0	61	0.4	0.9	195.8
9	60	1.5	5.0	324.1	60	0.1	0.4	296.2
10	57	2.8	5.9	209.6	57	0.3	0.5	197.0
11	61	1.9	5.2	275.1	61	0.2	0.6	272.5
12	61	2.6	10.7	413.5	61	0.2	0.5	258.3
13	59	1.8	5.0	275.8	59	0.2	0.6	270.5
14	58	1.6	6.3	393.2	58	0.1	0.5	344.9
15	60	4.9	11.0	223.7	60	0.3	0.6	197.0
16	60	3.7	8.2	219.3	60	0.3	0.6	188.3
17	60	4.0	10.0	253.3	60	0.3	0.7	202.5
18	54	7.9	13.5	171.4	54	0.6	1.0	150.3
19	57	12.7	19.3	152.5	57	0.7	0.9	138.5
20	58	11.9	20.5	173.1	58	0.6	0.8	131.9
21	57	10.6	14.8	139.5	57	0.7	0.7	100.6
22	55	23.9	30.6	127.9	55	1.2	1.2	99.5
23	55	30.6	48.5	158.6	55	1.3	1.4	103.6
24	58	45.4	52.7	116.0	58	2.1	1.6	76.6

Statement 102 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	58	47.7	62.5	131.0	58	2.3	1.8	78.4
26	56	42.0	52.4	124.8	56	2.3	1.8	80.3
27	52	57.4	52.9	92.2	52	3.2	1.5	47.6
28	52	63.0	51.3	81.3	52	2.9	1.9	64.7
29	56	51.1	43.1	84.3	56	3.1	1.6	52.3
30	54	50.5	44.2	87.6	54	3.1	1.6	51.7
31	48	61.8	57.8	93.6	48	3.4	1.7	52.0
32	50	72.7	83.0	114.3	50	3.5	1.8	52.3
33	53	54.6	53.0	97.1	53	3.3	1.8	53.8
34	55	53.3	58.0	111.0	55	2.6	1.5	57.2
35	47	49.6	50.5	101.8	47	2.5	1.6	61.5
36	47	55.5	58.0	104.4	47	2.6	1.7	63.4
37	47	59.5	75.2	126.5	47	2.8	1.6	57.4
38	53	34.4	43.9	127.6	53	1.6	1.2	79.7
39	52	35.1	48.1	137.3	52	1.6	1.5	93.4
40	45	38.5	117.5	305.4	45	1.1	1.4	127.6
41	47	23.5	42.6	181.0	47	0.8	1.2	152.0
42	49	7.5	22.4	300.8	49	0.4	0.6	173.0
43	46	3.7	19.9	533.1	46	0.2	0.4	275.9
44	43	3.5	8.2	230.6	43	0.3	0.7	219.5
45	42	1.7	9.5	559.0	42	0.1	0.5	423.2
46	38	0.8	4.0	516.1	38	0.1	0.4	454.5
47	40	2.7	12.4	453.8	40	0.1	0.4	378.9
48	39	0.2	0.9	549.9	39	0.0	0.2	624.5
49	36	0.0	0.2	352.5	36	0.0	0.0	0.0
50	33	1.6	8.4	536.3	33	0.0	0.2	574.5
51	36	0.4	1.5	343.1	36	0.1	0.4	358.6
52	34	0.3	1.0	316.1	34	0.1	0.2	406.0

Note : Data Cover the Period 1901 to 1964.
Source : Assistant Director General of Meteorology, Pune.

Statement 103: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State: BIHAR **Station:** BHAGALPUR (Observatory) **District:** BHAGALPUR

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	28	1.5	5.1	336.3	28	0.1	0.4	249.4
2	27	5.3	21.9	412.9	27	0.2	0.5	227.9
3	28	3.7	8.9	240.0	28	0.2	0.6	265.1
4	28	4.9	11.0	225.5	28	0.4	0.8	200.1
5	28	4.8	14.1	291.2	28	0.4	0.8	211.7
6	28	3.5	6.8	191.3	28	0.5	0.9	198.6
7	29	1.9	6.2	332.8	29	0.1	0.3	299.6
8	29	1.7	2.9	176.1	29	0.3	0.5	164.9
9	29	1.5	4.8	310.9	29	0.1	0.3	373.9
10	28	1.8	3.9	210.1	28	0.3	0.5	207.3
11	29	0.6	1.5	270.3	29	0.1	0.3	299.6
12	29	2.3	5.2	224.0	29	0.3	0.6	235.3
13	29	1.8	4.9	272.2	29	0.2	0.6	270.3
14	29	0.3	0.8	299.7	29	0.0	0.2	538.5
15	28	1.6	5.8	371.4	28	0.2	0.7	320.5
16	29	9.4	33.1	351.8	29	0.4	0.7	164.9
17	29	5.9	10.5	179.2	29	0.5	0.8	162.5
18	29	10.9	16.3	149.3	29	0.8	1.1	140.5
19	28	10.9	13.2	121.4	28	1.0	1.0	99.7
20	29	9.4	24.8	264.0	29	0.6	1.0	163.5
21	29	12.6	16.2	128.1	29	0.9	0.9	101.5
22	28	17.6	24.5	139.2	28	1.0	1.0	99.7
23	28	27.1	48.2	144.3	28	1.1	1.2	105.7
24	29	35.9	44.7	124.6	29	1.7	1.2	81.9

Statement 103 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	29	73.3	78.5	107.0	29	3.0	1.6	53.7
26	29	59.2	57.7	97.5	29	2.9	1.8	62.8
27	30	56.3	57.9	102.8	30	2.9	1.7	59.9
28	29	64.6	57.9	89.6	29	3.1	1.4	45.0
29	30	58.3	46.7	80.0	30	3.1	1.6	51.8
30	30	54.0	58.9	109.1	30	3.1	1.8	47.0
31	29	59.3	49.1	82.8	29	3.1	2.0	63.0
32	28	47.2	36.0	76.2	28	3.3	1.8	56.1
33	29	57.7	62.7	108.7	29	3.0	2.1	67.9
34	29	57.4	53.4	93.0	29	2.6	1.4	52.4
35	28	53.9	69.7	129.3	28	2.5	1.9	73.2
36	28	47.2	59.0	124.9	28	2.3	1.6	68.4
37	29	57.2	54.4	91.6	29	2.0	1.6	54.4
38	29	46.6	61.9	132.8	29	2.1	1.3	76.8
39	29	55.5	91.4	164.7	29	1.9	1.6	82.6
40	29	48.6	68.5	138.0	29	1.8	1.7	99.3
41	28	18.0	33.0	133.4	28	0.8	1.2	148.4
42	29	10.3	34.3	332.1	29	0.4	0.8	188.5
43	29	7.7	28.3	366.2	29	0.3	0.7	209.1
44	28	4.5	12.1	271.2	28	0.3	0.7	224.9
45	27	0.6	3.1	500.5	27	0.0	0.2	519.6
46	28	0.6	2.3	396.8	28	0.1	0.4	529.2
47	28	0.1	0.4	379.3	28	0.0	0.0	0.0
48	28	0.6	2.0	367.2	28	0.1	0.3	367.2
49	28	0.1	0.2	383.9	28	0.0	0.0	0.0
50	29	0.1	0.3	354.5	29	0.0	0.0	0.0
51	29	0.6	2.7	435.4	29	0.1	0.3	373.9
52	29	2.0	7.0	357.7	29	0.2	0.6	299.6

Note : Data Cover the Period 1950 to 1979.
Source : Assistant Director General of Meteorology, Pune.

Statement 104: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State: BIHAR **Station:** MONGHYR **District:** MONGHYR

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	61	2.1	7.7	357.7	61	0.1	0.5	392.9
2	62	3.3	14.4	432.8	62	0.2	0.4	226.1
3	62	2.0	4.6	226.6	62	0.2	0.5	220.6
4	62	4.2	9.7	229.6	62	0.4	0.8	200.4
5	60	5.0	13.5	268.4	60	0.4	0.6	173.7
6	60	4.1	8.6	208.3	60	0.4	0.8	203.9
7	61	3.7	8.4	227.2	61	0.3	0.6	207.6
8	61	5.7	11.6	204.0	61	0.6	0.9	162.2
9	60	1.6	4.5	279.4	60	0.1	0.4	269.6
10	62	3.3	8.2	245.6	62	0.4	0.8	202.6
11	63	1.4	4.2	297.3	63	0.2	0.5	300.6
12	63	2.1	6.3	301.8	63	0.2	0.6	290.8
13	62	1.1	2.8	268.9	62	0.1	0.8	261.9
14	60	1.6	5.3	338.2	60	0.1	0.3	277.5
15	62	2.9	11.2	383.1	62	0.2	0.5	246.3
16	62	5.9	15.3	259.9	62	0.3	0.7	199.6
17	62	4.5	10.2	226.6	62	0.4	0.6	164.4
18	60	7.3	13.4	182.4	60	0.4	0.8	175.6
19	62	13.0	17.9	137.5	62	0.6	0.8	122.6
20	62	6.5	15.1	231.4	62	0.4	0.6	152.0
21	62	9.6	12.2	127.0	62	0.7	0.6	88.9
22	60	17.1	22.1	129.5	60	1.1	1.2	195.7
23	61	27.5	50.7	183.9	61	1.2	1.3	107.6
24	62	48.0	63.2	131.7	62	2.0	1.6	78.0

Statement 104 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	62	51.7	69.2	134.0	62	2.2	1.8	81.1
26	60	46.4	49.5	106.7	60	2.6	1.8	68.9
27	59	59.4	49.4	83.2	59	3.0	1.7	57.0
28	61	71.4	63.2	88.6	61	3.3	1.6	47.3
29	61	53.5	49.7	92.9	61	3.0	1.6	55.8
30	61	53.3	53.0	99.5	61	3.0	1.9	61.9
31	56	57.0	55.2	96.8	56	3.2	1.7	53.5
32	60	84.4	66.7	79.0	60	4.0	1.7	42.2
33	61	67.9	67.8	99.9	61	3.1	1.6	52.8
34	60	60.8	72.3	119.0	60	2.8	1.6	56.8
35	55	69.7	99.6	142.8	55	2.9	1.9	63.9
36	59	65.9	60.0	91.0	59	3.0	1.6	52.8
37	60	55.4	58.0	104.8	60	2.4	1.7	70.4
38	61	47.0	68.2	145.1	61	1.9	1.7	85.9
39	61	39.5	49.5	125.5	61	1.8	1.4	77.6
40	58	34.6	69.7	201.3	58	1.2	1.3	106.0
41	57	14.0	27.1	193.2	57	0.6	1.0	178.2
42	59	12.0	29.2	244.1	59	0.5	0.8	170.5
43	59	6.3	21.8	348.9	59	0.3	0.6	237.7
44	55	4.3	14.1	324.4	55	0.3	0.6	194.8
45	59	2.0	13.7	680.9	59	0.1	0.4	435.8
46	60	0.9	4.4	499.5	60	0.0	0.2	439.6
47	58	3.8	17.1	444.3	58	0.2	0.5	314.8
48	55	0.7	3.4	484.4	55	0.1	0.3	548.7
49	57	0.0	0.0	0.0	58	0.0	0.0	0.0
50	58	0.1	0.3	595.0	58	0.0	0.0	0.0
51	60	0.9	4.1	495.7	60	0.1	0.5	420.3
52	52	0.9	2.7	290.3	52	0.1	0.4	328.1

Note : Data Cover the Period 1901 to 1970.
Source : Assistant Director General of Meteorology, Pune.

Statement 105 : Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : BIHAR **Station :** BARSOE **District :** PURNEA

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	49	0.1	0.7	700.0	49	0.0	0.1	700.0
2	49	1.4	5.0	365.3	49	0.1	0.3	338.9
3	48	1.4	6.6	459.1	48	0.1	0.4	354.9
4	48	2.2	7.8	353.1	48	0.2	0.5	311.5
5	47	2.3	6.7	287.3	47	0.3	0.6	209.2
6	51	1.8	5.8	331.5	51	0.2	0.5	295.5
7	50	3.9	9.6	245.6	50	0.4	0.8	205.2
8	51	4.2	10.9	262.2	51	0.3	0.8	244.9
9	47	0.9	2.7	306.5	47	0.1	0.3	293.0
10	50	1.7	4.8	286.9	50	0.2	0.4	263.7
11	50	1.1	4.5	416.2	50	0.1	0.3	425.6
12	50	1.8	6.9	373.7	50	0.1	0.4	321.2
13	47	3.1	8.8	287.0	47	0.2	0.5	307.9
14	52	1.8	4.2	237.3	52	0.2	0.4	206.9
15	52	5.6	16.0	287.9	52	0.3	0.7	213.2
16	52	6.2	14.0	226.9	52	0.4	0.7	186.7
17	52	6.1	11.6	189.6	52	0.5	0.9	170.4
18	50	6.7	14.3	214.3	50	0.6	1.2	193.4
19	51	17.6	23.0	131.0	51	0.9	1.0	108.2
20	49	20.8	32.5	156.1	49	0.9	1.0	102.9
21	50	18.3	24.8	135.9	50	0.9	0.8	90.8
22	49	35.8	54.9	153.3	49	1.4	1.6	111.0
23	50	35.7	60.4	169.0	50	1.5	1.6	111.7
24	50	55.0	64.8	117.8	50	2.1	1.8	86.2

Statement 105 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	50	60.0	113.2	188.7	50	2.3	1.7	74.7
26	47	71.5	73.0	102.1	47	3.0	2.2	70.9
27	49	80.1	60.8	75.9	49	3.0	1.6	54.3
28	50	80.3	67.1	83.6	50	3.3	1.9	56.2
29	50	66.6	68.0	102.1	50	3.0	2.1	71.0
30	50	46.9	53.2	113.4	50	2.6	1.9	75.1
31	49	61.9	57.9	93.6	49	3.0	1.9	64.1
32	52	80.4	78.2	97.3	52	3.5	1.9	54.4
33	52	75.7	82.9	109.5	52	3.0	2.0	68.2
34	51	53.4	61.4	115.1	51	2.5	1.7	70.8
35	46	51.7	50.0	96.8	46	2.5	1.7	67.3
36	50	57.6	63.0	109.5	50	2.6	1.8	69.5
37	50	68.5	97.8	142.7	50	2.6	1.7	68.0
38	51	58.5	77.4	132.4	51	2.1	1.7	80.4
39	51	46.6	65.8	141.2	51	1.5	1.2	82.0
40	49	33.6	61.8	184.0	49	1.1	1.6	139.5
41	49	33.7	67.2	199.7	49	0.9	1.3	138.5
42	49	18.8	42.5	226.7	49	0.6	1.0	169.4
43	49	5.7	25.9	454.5	49	0.1	0.5	350.0
44	46	4.0	11.4	282.3	46	0.2	0.5	255.4
45	49	6.4	29.9	465.0	49	0.2	0.6	282.5
46	49	0.6	3.2	553.0	49	0.1	0.3	517.4
47	49	1.3	7.2	562.1	49	0.1	0.3	517.4
48	48	0.2	0.9	434.0	48	0.0	0.2	484.7
49	50	0.0	0.0	0.0	50	0.0	0.0	0.0
50	50	0.9	6.6	695.1	50	0.0	0.1	707.1
51	50	1.3	5.7	452.1	50	0.1	0.4	364.2
52	49	0.3	1.4	448.1	49	0.0	0.2	489.8

Note : Data Cover the Period 1901 to 1966.
Source : Assistant Director General of Meteorology, Pune.

Statement 106: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State: BIHAR **Station:** PURNEA (Observatory) **District:** PURNEA

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	78	0.9	3.7	405.2	78	0.1	0.3	367.4
2	78	3.1	15.5	504.4	78	0.2	0.5	280.5
3	77	2.1	7.2	338.6	77	0.1	0.5	315.4
4	78	3.4	9.6	279.4	78	0.3	0.6	221.3
5	78	3.8	9.0	236.3	78	0.3	0.6	197.9
6	77	2.3	6.4	276.1	77	0.2	0.6	249.2
7	77	3.8	8.0	213.1	77	0.4	0.7	205.7
8	78	4.6	10.6	228.3	78	0.4	0.9	209.5
9	78	1.5	4.1	275.6	78	0.2	0.4	278.7
10	77	2.9	5.9	205.8	77	0.3	0.7	195.8
11	78	2.6	7.5	285.4	78	0.2	0.6	291.0
12	78	4.8	13.3	274.3	78	0.3	0.8	248.9
13	77	2.7	8.5	317.0	77	0.2	0.6	258.7
14	77	2.5	6.9	281.7	77	0.2	0.5	263.8
15	78	7.3	16.1	221.2	78	0.4	0.8	178.3
16	78	9.1	15.7	173.2	78	0.5	0.8	146.5
17	76	11.8	21.8	184.3	76	0.7	0.9	140.6
18	78	17.5	24.8	141.7	78	1.0	1.1	110.1
19	78	20.8	21.1	101.7	78	1.3	1.2	89.3
20	78	15.9	20.3	127.4	78	1.0	1.0	101.2
21	78	22.6	26.8	118.3	78	1.2	1.0	79.0
22	78	34.8	38.7	111.3	78	1.6	1.3	81.0
23	78	43.3	55.1	127.1	78	1.8	1.5	82.5
24	78	58.1	71.4	122.9	78	2.6	1.8	69.0

Statement 106 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	77	63.5	70.9	111.6	77	2.9	1.9	64.4
26	78	71.9	64.6	89.8	78	3.0	1.6	54.2
27	78	80.2	72.0	89.8	78	3.4	1.8	53.7
28	78	86.7	59.6	68.7	78	3.8	1.7	44.6
29	78	93.6	74.4	79.5	78	3.8	1.6	41.3
30	78	67.6	55.4	82.0	78	3.7	1.8	47.9
31	78	65.8	58.1	88.4	78	3.4	1.8	52.4
32	78	81.2	65.6	80.8	78	3.9	1.6	41.3
33	78	67.8	55.1	81.2	78	3.5	1.6	45.6
34	78	74.4	74.9	100.6	78	3.3	1.6	48.6
35	77	67.7	55.5	82.1	77	3.1	1.7	55.7
36	77	62.5	55.6	88.9	77	3.0	1.7	56.4
37	77	75.3	83.3	110.6	77	3.2	1.8	57.3
38	77	55.8	63.0	112.9	77	2.5	1.7	69.3
39	77	51.4	53.7	104.4	77	1.9	1.5	78.8
40	76	45.8	68.8	150.2	76	1.9	1.6	85.9
41	77	21.9	38.1	173.9	77	1.0	1.1	118.7
42	77	17.2	44.2	256.8	77	0.6	0.9	161.7
43	77	6.1	18.0	294.2	77	0.3	0.7	246.6
44	77	4.7	13.9	293.3	77	0.3	0.7	207.3
45	77	5.0	22.5	448.0	77	0.1	0.5	371.7
46	77	0.8	3.7	447.3	77	0.1	0.3	404.0
47	77	1.3	5.2	415.5	77	0.1	0.4	369.0
48	76	0.7	2.9	425.0	76	0.1	0.2	427.1
49	75	0.0	0.2	866.0	75	0.0	0.0	0.0
50	74	0.9	6.2	706.6	74	0.1	0.2	421.2
51	75	1.2	6.2	525.3	75	0.1	0.3	359.8
52	74	0.3	1.3	377.9	74	0.1	0.2	421.2

Note : Data Cover the Period 1901 to 1979.
Source : Assistant Director General of Meteorology, Pune.

Statement 107: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State: BIHAR **Station:** SUPAUL **District:** SAHARSA

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	61	1.7	7.0	418.9	61	0.2	0.6	343.5
2	61	2.7	8.2	301.4	61	0.2	0.5	216.3
3	61	2.0	7.8	389.7	61	0.2	0.5	295.3
4	61	2.9	7.9	273.4	61	0.3	0.6	229.8
5	60	4.8	10.0	208.9	60	0.3	0.7	188.4
6	61	2.3	8.4	364.2	61	0.2	0.5	259.5
7	61	4.5	10.4	232.0	61	0.4	0.7	189.6
8	61	5.4	12.0	220.3	61	0.4	0.9	204.3
9	60	1.1	4.2	388.3	60	0.1	0.4	356.1
10	62	4.7	11.4	241.1	62	0.3	0.6	192.6
11	62	2.2	6.6	301.7	62	0.2	0.4	239.9
12	62	5.6	16.0	286.1	62	0.3	0.8	244.7
13	60	1.9	6.7	361.3	60	0.2	0.5	295.7
14	62	2.1	7.2	339.4	62	0.2	0.5	279.9
15	63	5.1	11.9	235.3	63	0.3	0.7	193.5
16	63	7.0	13.8	167.9	63	0.4	0.7	184.1
17	63	6.1	12.9	211.1	63	0.4	0.7	171.3
18	59	14.9	20.6	138.5	59	0.8	1.0	120.6
19	60	20.3	27.8	136.9	60	1.0	1.0	100.8
20	60	14.1	32.4	229.6	60	0.6	0.8	123.4
21	60	18.1	21.8	120.5	60	1.0	1.0	93.5
22	59	32.9	37.4	113.4	59	1.5	1.3	84.8
23	63	39.1	58.8	150.2	63	1.7	1.5	91.1
24	63	58.0	61.7	106.4	63	2.2	1.6	72.3

Statement 107 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	63	62.1	57.9	93.2	63	2.5	1.5	61.6
26	61	63.6	71.7	112.7	61	2.7	1.7	61.7
27	63	77.5	74.5	96.2	63	3.1	1.9	61.8
28	63	89.5	81.7	91.3	63	3.5	1.9	53.9
29	62	69.4	78.7	113.4	62	3.1	1.6	51.4
30	63	69.1	80.9	117.0	63	3.0	1.6	54.1
31	62	60.5	64.0	105.8	62	2.7	1.7	65.6
32	62	79.1	74.5	94.2	62	3.4	1.8	53.7
33	62	70.4	77.2	109.7	62	3.1	1.8	58.5
34	62	73.3	79.1	108.0	62	2.9	1.6	55.8
35	59	59.3	61.3	103.4	59	2.7	1.4	52.6
36	61	57.2	55.5	96.9	61	2.7	1.5	54.6
37	61	59.3	74.7	126.0	61	2.4	1.8	73.4
38	61	52.3	70.5	134.8	61	2.0	1.8	89.8
39	61	50.9	69.0	135.4	61	1.6	1.3	85.0
40	63	36.2	68.8	189.8	63	1.3	1.4	109.2
41	64	14.6	27.8	189.9	64	0.8	1.1	134.5
42	64	16.3	36.9	226.8	64	0.6	0.9	149.2
43	64	5.8	15.0	258.2	64	0.3	0.6	214.5
44	62	7.0	28.7	407.0	62	0.2	0.7	293.8
45	62	3.4	17.2	509.6	62	0.2	0.6	358.4
46	62	0.9	4.9	543.5	62	0.0	0.3	583.0
47	62	1.5	6.9	461.6	62	0.1	0.3	360.4
48	58	0.3	1.7	553.1	58	0.0	0.2	533.8
49	60	0.0	0.0	0.0	60	0.0	0.0	0.0
50	61	0.7	3.2	471.4	61	0.1	0.3	404.3
51	60	0.8	4.0	501.5	60	0.1	0.3	400.8
52	61	0.7	3.0	451.8	61	0.0	0.2	443.3

Note : Data Cover the Period 1901 to 1967.
Source : Assistant Director General of Meteorology, Pune.

Statement 108: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State: BIHAR **Station**: PATNA (Observatory) **District**: PATNA

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	67	2.8	9.4	340.3	67	0.1	0.4	291.7
2	67	2.8	13.2	463.5	67	0.1	0.4	286.7
3	67	3.5	9.8	279.0	67	0.3	0.8	229.9
4	67	4.7	8.8	187.2	67	0.5	0.8	159.5
5	66	5.6	10.3	184.4	66	0.5	0.8	151.5
6	67	6.0	12.7	213.4	67	0.4	0.7	166.2
7	67	3.4	6.8	199.2	67	0.3	0.6	179.7
8	66	6.1	13.5	222.7	66	0.5	0.9	183.1
9	67	1.2	2.8	228.0	67	0.1	0.4	240.5
10	67	3.7	10.5	283.7	67	0.3	0.7	221.1
11	67	1.8	4.6	256.3	67	0.2	0.5	272.7
12	67	1.7	4.9	287.5	67	0.3	0.8	279.3
13	66	1.8	6.7	370.3	66	0.2	0.5	311.6
14	66	0.7	2.8	413.0	66	0.1	0.2	396.7
15	67	2.4	7.0	289.6	67	0.2	0.4	272.3
16	67	1.7	6.1	362.9	67	0.2	0.5	290.4
17	67	3.2	8.6	368.1	67	0.3	0.6	229.8
18	66	4.7	11.7	249.5	66	0.2	0.5	205.4
19	67	10.5	20.7	196.6	67	0.6	1.0	159.9
20	67	4.4	9.2	207.5	67	0.3	0.6	178.9
21	67	4.0	9.5	239.8	67	0.3	0.7	218.3
22	66	10.9	18.9	173.1	66	0.7	0.8	124.8
23	67	24.0	42.1	175.2	67	1.2	1.4	119.5
24	67	30.4	39.9	131.4	67	1.8	1.5	82.5

Statement 108 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	67	48.9	59.2	121.1	67	2.1	1.6	78.0
26	66	47.7	60.3	126.5	66	2.2	1.7	78.3
27	67	55.9	55.3	98.9	67	2.7	1.7	63.7
28	67	60.3	58.4	84.2	67	3.1	1.7	53.8
29	67	68.0	60.5	89.0	67	3.1	1.8	56.3
30	67	53.3	55.1	103.4	67	2.8	1.6	56.9
31	65	67.0	63.5	94.8	65	3.1	1.7	53.6
32	67	81.1	84.9	104.8	67	3.5	1.7	47.4
33	67	7.4	69.5	67.3	67	3.1	1.6	50.9
34	67	66.3	71.9	108.4	67	2.6	1.6	61.7
35	65	67.4	66.8	99.2	65	2.9	1.6	54.4
36	67	64.4	75.9	117.8	67	2.8	1.5	53.5
37	67	65.2	68.9	105.6	67	**2.7**	**1.8**	66.3
38	67	51.7	86.1	166.5	67	1.9	1.7	90.1
39	65	35.4	50.0	141.4	65	1.3	1.3	99.2
40	67	29.2	48.0	164.2	67	1.4	1.5	110.0
41	67	13.7	34.6	253.0	67	0.7	1.2	178.4
42	66	9.9	21.8	219.9	66	0.5	0.8	157.9
43	67	3.5	10.4	300.8	67	0.2	0.6	287.1
44	65	3.6	13.3	373.5	65	0.2	0.6	265.1
45	67	1.9	8.7	449.4	67	0.1	0.5	364.1
46	67	1.6	8.3	553.2	67	0.1	0.6	472.9
47	67	2.7	10.7	599.1	67	0.1	0.4	342.6
48	65	0.2	1.1	632.0	65	0.0	0.2	806.2
49	66	0.3	1.8	584.4	66	0.0	0.1	812.4
50	61	0.4	2.3	524.3	61	0.0	0.3	578.2
51	64	3.0	17.9	590.4	64.	0.2	0.6	341.0
52	61	1.4	4.0	290.7	61	0.2	0.4	227.7

Note : Data Cover the Period 1901 to 1967.
Source : Assistant Director General of Meteorology, Pune.

Statement 109: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State: BIHAR **Station:** PATNA AERODROME (Observatory) **District:** PATNA

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	32	2.2	5.9	265.8	32	0.2	0.5	224.4
2	32	4.1	18.1	441.8	32	0.2	0.4	286.6
3	32	2.1	4.3	208.3	32	0.2	0.4	192.0
4	30	4.9	8.5	171.6	30	0.4	0.6	155.4
5	32	5.8	12.7	217.7	32	0.4	0.7	176.0
6	32	4.5	10.8	242.9	32	0.4	0.6	162.4
7	32	3.0	7.2	242.2	32	0.3	0.7	268.8
8	32	3.0	5.1	171.1	32	0.3	0.6	175.0
9	32	1.4	3.8	283.5	32	0.1	0.4	337.0
10	32	2.5	6.6	268.3	32	0.2	0.5	224.4
11	31	2.4	8.0	328.4	31	0.2	0.5	280.4
12	31	2.7	5.5	201.2	31	0.3	0.7	202.3
13	31	2.2	9.7	450.9	31	0.1	0.4	331.3
14	32	0.4	1.6	373.1	32	0.1	0.2	393.5
15	32	1.2	4.1	330.0	32	0.1	0.4	337.0
16	32	2.2	4.5	210.0	32	0.3	0.6	206.2
17	32	2.1	6.3	303.9	32	0.3	0.6	248.9
18	31	5.9	10.1	172.8	31	0.4	0.7	172.4
19	32	11.3	19.4	171.9	32	0.5	0.8	158.5
20	32	7.2	10.9	151.2	32	0.6	0.9	147.3
21	32	5.6	19.9	352.0	32	0.2	0.5	251.2
22	31	8.9	19.8	223.8	31	0.4	0.8	182.4
23	32	19.1	25.2	131.9	32	1.1	1.1	101.2
24	32	27.8	33.9	121.7	32	1.4	1.4	104.1

Statement 109 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	32	37.3	40.6	108.9	32	1.8	1.5	85.2
26	32	60.0	62.9	104.8	32	2.3	1.6	67.3
27	32	43.7	45.9	105.0	32	2.6	1.6	61.1
28	32	79.0	70.9	89.8	32	3.0	1.6	54.0
29	32	88.0	68.4	77.8	32	3.7	1.7	45.4
30	32	60.2	54.9	91.2	32	2.9	1.7	58.9
31	32	72.5	65.5	90.3	32	3.4	1.9	55.7
32	33	65.5	61.6	94.2	33	2.7	1.4	52.1
33	33	68.9	62.0	90.0	33	3.1	1.7	57.1
34	33	59.7	61.4	102.8	33	2.7	1.7	63.2
35	32	35.9	39.2	109.2	32	2.3	1.4	60.6
36	32	44.5	37.8	84.8	32	2.5	1.2	49.8
37	32	74.5	83.1	111.5	32	3.0	1.9	63.5
38	32	49.9	84.8	169.9	32	2.0	1.4	73.5
39	32	58.5	82.7	141.3	32	1.9	1.4	73.4
40	32	59.5	76.4	128.5	32	1.8	1.7	92.4
41	32	28.2	50.2	177.8	32	1.0	1.1	112.7
42	32	6.8	18.0	265.1	32	0.4	0.9	216.7
43	32	2.5	7.0	277.6	32	0.2	0.5	251.2
44	32	5.7	19.0	333.3	32	0.3	0.7	268.8
45	32	2.2	12.4	555.2	32	0.1	0.4	565.7
46	32	2.0	9.1	444.3	32	0.2	0.6	367.4
47	32	0.4	1.5	357.0	32	0.0	0.2	565.7
48	31	1.3	4.8	382.4	31	0.1	0.4	331.3
49	31	0.5	2.9	539.6	31	0.0	0.2	556.8
50	31	0.6	3.5	556.8	31	0.0	0.2	556.8
51	31	0.7	2.7	388.8	31	0.1	0.4	409.4
52	31	1.3	3.2	346.1	31	0.2	0.5	246.7

Note : Data Cover the Period 1946 to 1979.
Source : Assistant Director General of Meteorology, Pune.

Statement 110: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State: BIHAR **Station: ISLAMPUR** **District: PATNA**

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	60	2.3	8.2	348.3	60	0.1	0.4	269.6
2	61	1.8	6.1	334.1	61	0.1	0.4	294.5
3	61	2.8	8.7	312.8	61	0.2	0.6	230.7
4	62	5.7	14.3	250.4	62	0.5	0.8	168.6
5	61	5.0	11.5	227.8	61	0.4	0.6	168.9
6	61	8.2	23.6	289.1	61	0.4	0.8	215.0
7	62	2.1	6.0	290.3	62	0.2	0.4	226.1
8	62	5.7	13.1	228.8	62	0.5	0.9	207.1
9	61	0.7	2.7	374.4	61	0.1	0.4	322.1
10	61	3.9	9.9	252.6	61	0.3	0.7	254.8
11	62	2.9	10.3	351.3	62	0.1	0.4	301.6
12	62	2.3	9.5	409.6	62	0.2	0.5	340.4
13	60	0.7	2.7	404.4	60	0.1	0.3	377.3
14	60	0.6	1.8	320.9	60	0.1	0.3	302.5
15	61	2.1	8.7	410.1	61	0.1	0.3	305.3
16	61	1.1	5.3	462.3	61	0.1	0.4	357.3
17	61	1.7	4.2	254.5	61	0.1	0.4	242.4
18	58	2.6	8.5	330.6	58	0.1	0.4	317.0
19	59	7.5	22.6	301.1	59	0.3	0.7	226.6
20	59	3.8	13.9	363.4	59	0.2	0.5	224.1
21	59	2.2	1.4	339.5	59	0.1	0.4	319.9
22	59	7.4	17.5	237.1	59	0.4	0.7	185.7
23	63	24.9	59.0	236.7	63	0.7	1.3	168.5
24	62	22.3	28.4	127.3	62	1.3	1.3	101.7

Statement 110 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	63	38.5	49.0	127.3	63	1.7	1.4	87.8
26	61	43.1	53.1	123.1	61	1.9	1.9	98.1
27	62	61.5	54.5	88.5	62	2.5	1.5	61.7
28	62	69.6	64.1	92.2	62	2.9	1.9	65.1
29	63	64.3	65.2	101.4	63	2.5	1.8	73.2
30	63	60.8	47.4	78.0	63	2.8	1.7	60.6
31	62	63.9	57.6	90.1	62	2.7	1.6	58.3
32	63	90.9	88.9	97.8	63	3.4	2.0	58.3
33	63	69.6	62.1	89.2	63	2.7	1.7	61.5
34	63	58.0	73.6	127.0	63	2.5	1.7	70.7
35	62	59.2	65.7	111.0	62	2.3	1.6	70.3
36	63	57.1	54.0	94.6	63	2.1	1.5	71.9
37	63	48.3	53.4	110.7	63	2.0	1.8	92.0
38	63	44.1	60.1	136.2	63	1.6	1.5	92.4
39	63	37.4	54.4	145.5	63	1.2	1.1	96.4
40	62	26.3	50.1	190.3	62	1.0	1.4	137.0
41	63	5.6	14.4	255.9	63	0.4	0.8	202.4
42	63	5.4	13.4	245.9	63	0.3	0.8	238.9
43	63	1.8	7.5	417.8	63	0.1	0.4	399.6
44	62	3.0	10.3	343.3	62	0.2	0.5	278.1
45	63	3.1	11.6	379.0	63	0.1	0.5	329.2
46	63	1.5	6.4	420.6	63	0.1	0.4	450.8
47	63	2.6	11.7	447.2	63	0.1	0.4	327.7
48	62	0.0	0.0	0.0	62	0.0	0.0	0.0
49	63	0.0	0.2	793.7	63	0.0	0.0	0.0
50	63	1.2	6.9	579.3	63	0.0	0.3	587.8
51	63	1.3	6.2	406.3	63	0.1	0.5	460.4
52	63	0.8	3.2	406.3	63	0.1	0.3	411.2

Note : Data Cover the Period 1903 to 1970.
Source : Assistant Director General of Meteorology, Pune.

Statement 111: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State: BIHAR **Station:** NAWADAH **District:** GAYA

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	67	2.3	9.9	426.6	67	0.2	0.5	292.2
2	67	2.5	8.3	337.0	67	0.2	0.5	228.7
3	67	2.5	6.6	238.3	67	0.3	0.5	200.6
4	66	6.3	14.2	225.2	66	0.4	0.8	198.6
5	66	6.3	12.2	193.1	66	0.6	0.8	143.1
6	68	6.4	14.0	217.6	68	0.4	0.8	182.6
7	68	4.3	12.6	289.8	68	0.3	0.7	225.6
8	68	6.9	13.5	195.3	68	0.5	0.9	172.3
9	66	1.6	4.9	309.7	66	0.2	0.5	270.0
10	67	3.2	8.0	246.7	67	0.3	0.7	298.0
11	67	2.3	6.3	270.9	67	0.3	0.6	250.6
12	67	2.6	7.7	295.2	67	0.2	0.5	257.3
13	66	1.1	3.3	298.9	66	0.2	0.5	308.3
14	67	1.6	8.1	502.9	67	0.1	0.5	364.1
15	67	1.6	6.9	424.8	67	0.2	0.5	310.9
16	67	2.1	4.6	218.5	67	0.2	0.6	231.5
17	66	2.6	7.1	278.9	66	0.3	0.6	229.0
18	67	3.8	13.5	354.5	67	0.2	0.5	273.6
19	69	6.7	14.6	216.9	69	0.5	0.7	146.1
20	69	4.2	9.9	236.5	69	0.4	0.7	189.2
21	69	4.8	11.3	234.2	69	0.3	0.5	165.7
22	68	8.0	16.2	202.7	68	0.5	0.8	157.2
23	70	19.9	37.1	186.5	70	1.0	1.3	124.8
24	70	25.7	34.8	135.2	70	1.5	1.6	103.9

Statement 111 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	70	35.8	41.7	116.4	70	2.0	1.7	82.3
26	68	46.9	52.5	111.8	68	2.4	1.9	80.4
27	70	56.6	53.6	94.8	70	2.8	1.8	65.5
28	70	66.1	53.8	81.5	70	3.1	1.5	49.9
29	70	62.3	60.3	96.9	70	3.1	1.8	58.7
30	69	53.8	45.2	84.0	69	3.2	1.6	49.7
31	69	64.6	57.5	89.0	69	3.3	1.9	58.1
32	69	83.3	65.8	79.0	69	3.7	1.8	47.8
33	69	61.0	51.1	83.7	69	3.2	1.5	45.8
34	69	52.9	43.9	83.0	69	2.8	1.7	60.5
35	67	58.6	51.6	88.0	67	3.1	1.9	61.3
36	69	53.7	53.8	100.1	69	2.9	1.5	54.2
37	69	48.1	54.1	112.5	69	2.4	1.7	70.0
38	69	37.1	39.3	105.7	69	1.9	1.5	79.2
39	68	36.3	53.5	147.4	68	1.5	1.2	80.2
40	70	38.6	84.7	219.2	70	1.2	1.6	129.5
41	70	11.1	22.6	202.8	70	0.6	1.0	152.2
42	70	7.6	16.2	214.3	70	0.4	0.8	178.8
43	69	4.8	23.1	486.8	69	0.2	0.6	257.7
44	68	3.9	11.5	299.2	68	0.2	0.6	235.6
45	69	3.2	13.5	415.7	69	0.1	0.5	319.2
46	69	2.3	7.6	332.4	69	0.1	0.4	396.4
47	69	2.2	8.3	375.0	69	0.1	0.4	296.4
48	68	0.9	5.7	654.5	68	0.0	0.3	611.0
49	69	0.1	0.7	830.7	69	0.0	0.1	830.7
50	69	0.4	2.0	480.4	69	0.1	0.4	491.8
51	69	1.6	7.1	437.4	69	0.2	0.6	350.6
52	68	1.0	3.3	327.3	68	0.1	0.5	343.0

Note : Data Cover the Period 1901 to 1970.
Source : Assistant Director General of Meteorology, Pune.

Statement 112: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : BIHAR **Station :** GAYA AERODROME (Observatory) **District :** BIHAR

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	78	3.0	10.6	348.3	78	0.2	0.5	296.7
2	78	3.4	9.4	275.0	78	0.3	0.7	234.9
3	78	2.6	5.0	194.9	78	0.3	0.6	185.2
4	78	6.7	14.7	219.1	78	0.5	0.8	178.9
5	76	6.1	11.0	182.2	76	0.5	0.8	162.6
6	78	6.8	13.6	201.3	78	0.6	0.8	150.9
7	78	4.5	10.2	223.9	78	0.4	0.8	192.4
8	78	5.8	12.1	208.6	78	0.6	0.9	159.2
9	78	1.6	4.4	270.1	78	0.2	0.6	320.5
10	78	4.4	9.9	223.4	78	0.3	0.7	214.4
11	78	2.7	6.5	240.6	78	0.3	0.6	227.8
12	78	1.8	4.1	233.3	78	0.2	0.5	217.4
13	76	1.3	3.5	266.6	76	0.2	0.4	221.6
14	78	1.1	2.7	238.7	78	0.2	0.4	244.9
15	78	2.3	7.5	321.5	78	0.2	0.5	264.8
16	78	2.2	8.7	395.9	78	0.2	0.5	312.1
17	76	1.4	4.5	308.7	76	0.1	0.3	374.7
18	77	1.6	5.2	329.8	77	0.1	0.4	288.9
19	78	6.1	13.0	214.4	78	0.5	0.8	157.8
20	78	5.5	11.1	201.6	78	0.4	0.6	168.5
21	78	2.9	6.9	236.5	78	0.3	0.7	224.1
22	76	5.9	13.6	230.1	76	0.4	0.6	158.8
23	77	23.4	53.3	228.0	77	0.9	1.2	133.8
24	78	29.2	41.3	141.4	78	1.5	1.6	110.8

Statement 112 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	78	38.9	48.1	123.6	78	1.9	1.4	75.5
26	76	52.2	63.1	120.8	76	2.4	1.9	77.1
27	77	63.7	50.4	79.1	77	3.1	1.9	59.9
28	77	75.1	66.1	88.0	77	3.5	1.8	50.2
29	78	72.7	61.2	84.2	78	3.3	1.8	54.0
30	76	70.9	48.6	68.6	76	3.5	1.7	48.2
31	77	77.6	65.4	84.3	77	3.7	1.8	48.6
32	78	107.2	101.7	94.9	78	4.1	1.7	42.7
33	78	69.5	54.6	78.6	78	3.5	1.7	48.7
34	78	61.2	54.7	89.5	78	3.0	1.6	52.9
35	74	65.1	67.6	103.9	74	3.1	1.7	54.3
36	77	53.7	48.8	61.0	77	2.8	1.4	48.1
37	77	53.4	62.6	117.3	77	2.5	1.7	68.4
38	77	46.9	69.1	147.4	77	2.0	1.5	72.7
39	75	34.0	40.3	118.8	75	1.7	1.4	79.3
40	77	27.2	35.7	131.5	77	1.4	1.5	107.4
41	77	11.7	21.7	186.0	77	0.7	1.2	155.6
42	77	8.5	18.4	215.5	77	0.5	1.0	198.9
43	77	3.0	10.8	256.9	77	0.2	0.5	238.6
44	75	3.8	10.5	278.4	75	0.3	0.6	225.1
45	77	3.6	15.4	431.3	77	0.2	0.6	330.6
46	77	1.7	8.5	491.8	77	0.1	0.4	339.2
47	76	2.9	10.3	253.6	76	0.2	0.5	311.2
48	75	1.2	6.4	546.0	75	0.1	0.3	513.3
49	74	0.2	1.0	549.8	74	0.0	0.2	604.1
50	76	0.4	2.3	547.8	76	0.1	0.2	427.1
51	77	1.2	6.4	509.0	77	0.1	0.5	382.6
52	73	1.4	4.3	265.4	73	0.2	0.5	270.1

Note : Data Cover the Period 1901 to 1979.
Source : Assistant Director General of Meteorology, Pune.

Statement 113: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State: BIHAR **Station:** AURANGABAD (Observatory) **District:** GAYA

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	63	4.1	12.6	306.6	63	0.2	0.6	235.1
2	63	3.8	9.8	255.6	63	0.3	0.6	202.6
3	63	3.0	6.9	232.5	63	0.3	0.6	194.2
4	63	6.7	15.6	233.1	63	0.5	1.0	190.7
5	61	7.2	12.5	172.8	61	0.6	0.8	136.2
6	63	6.2	14.6	236.3	63	0.4	0.8	182.8
7	63	3.3	7.5	227.2	63	0.3	0.6	186.7
8	63	7.2	13.5	186.3	63	0.5	0.9	172.4
9	63	1.7	4.0	230.7	63	0.2	0.5	222.7
10	64	5.9	13.6	230.2	64	0.4	0.8	212.1
11	64	2.8	7.2	257.6	64	0.3	0.8	241.1
12	64	3.0	8.0	264.6	64	0.3	0.6	205.0
13	64	1.9	5.9	287.8	64	0.2	0.5	237.0
14	64	1.9	4.8	247.2	64	0.2	0.5	249.2
15	64	2.1	9.3	432.8	64	0.2	0.6	260.5
16	64	1.2	3.2	272.8	64	0.2	0.5	265.4
17	64	1.2	3.4	287.6	64	0.1	0.4	302.4
18	64	1.7	6.4	376.5	64	0.2	0.5	284.9
19	65	4.2	8.3	197.5	65	0.4	0.6	161.3
20	65	1.4	3.3	240.5	65	0.1	0.3	269.0
21	65	2.4	6.9	288.1	65	0.2	0.5	267.7
22	64	5.8	13.6	235.6	64	0.4	0.7	180.3
23	64	17.8	45.2	255.1	64	0.9	1.4	153.1
24	64	24.5	32.9	134.2	64	1.5	1.5	101.1

Statement 113 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	64	35.7	52.6	147.1	64	1.8	1.4	80.9
26	63	56.9	70.4	123.7	63	2.4	1.8	74.9
27	64	64.4	52.3	81.3	64	2.7	1.6	59.5
28	64	80.7	72.3	89.9	64	3.2	1.8	53.0
29	63	75.2	63.4	84.2	63	3.3	1.8	53.4
30	64	71.2	63.4	89.0	64	3.3	1.8	53.6
31	64	97.1	85.6	88.2	64	3.4	1.6	48.1
32	65	112.3	100.1	89.1	65	4.1	1.7	41.0
33	65	75.3	68.1	90.5	65	3.4	1.6	48.4
34	65	71.3	59.2	85.0	65	3.3	1.5	45.0
35	63	77.6	85.6	110.4	65	2.9	1.6	55.5
36	63	65.2	50.1	76.8	63	2.9	1.6	54.3
37	63	63.1	84.0	133.1	63	2.4	1.9	79.6
38	63	40.7	51.0	125.5	63	1.9	1.8	93.7
39	63	33.7	49.3	148.9	63	1.2	1.1	92.3
40	63	24.5	44.4	181.0	63	1.3	1.4	114.6
41	63	12.3	26.8	218.1	63	0.8	1.3	165.0
42	63	8.2	18.4	224.5	63	0.5	0.8	173.7
43	63	1.7	5.9	352.7	63	0.2	0.4	281.9
44	63	3.4	10.3	308.3	63	0.2	0.6	235.1
45	63	4.8	17.9	372.1	63	0.2	0.5	303.8
46	63	1.7	7.5	444.3	63	0.2	0.6	395.3
47	63	3.9	17.8	454.6	63	0.2	0.5	303.8
48	62	0.3	2.4	733.6	62	0.0	0.3	787.4
49	62	0.3	1.3	499.5	62	0.0	0.2	447.1
50	62	0.2	1.3	602.9	62	0.0	0.3	583.0
51	62	1.7	6.2	360.2	62	0.1	0.5	349.4
52	61	1.3	6.0	460.4	61	0.1	0.5	380.6

Note : Data Cover the Period 1901 to 1970.
Source : Assistant Director General of Meteorology, Pune.

Statement 114: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State: BIHAR **Station:** DEHRI (Observatory) **District:** SHAHABAD

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	67	3.3	10.9	330.7	67	0.2	0.6	255.8
2	67	2.5	7.3	298.2	67	0.2	0.5	228.7
3	67	2.2	5.3	234.2	67	0.3	0.8	233.4
4	67	5.8	9.9	171.1	67	0.6	0.8	142.0
5	67	5.8	11.1	190.7	67	0.5	0.8	172.3
6	68	6.2	14.0	224.4	68	0.5	0.8	177.9
7	68	3.7	7.3	198.3	68	0.4	0.8	195.3
8	68	6.1	16.3	265.2	68	0.5	0.9	179.2
9	68	2.2	5.3	242.4	68	0.3	0.5	187.7
10	68	3.5	8.1	233.7	68	0.3	0.6	231.8
11	68	3.5	9.4	267.7	68	0.3	0.6	243.1
12	68	2.1	5.1	238.1	68	0.3	0.6	204.0
13	66	2.1	5.8	278.9	66	0.3	0.6	248.5
14	65	2.6	7.7	207.4	65	0.2	0.5	253.1
15	65	1.6	4.0	255.8	65	0.2	0.4	262.8
16	65	1.5	5.3	351.5	65	0.2	0.5	349.1
17	65	1.0	3.0	315.6	65	0.2	0.6	367.5
18	65	1.6	5.5	342.3	65	0.2	0.6	301.2
19	67	4.9	11.1	227.9	67	0.4	0.7	156.9
20	67	1.7	4.9	297.1	67	0.2	0.4	250.8
21	67	1.7	6.3	269.5	67	0.1	0.4	286.7
22	66	6.2	17.1	274.4	66	0.4	0.7	171.8
23	66	21.2	48.8	229.5	66	0.9	1.4	153.4
24	66	30.0	60.6	202.3	66	1.6	1.3	85.7

Statement 114 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	66	44.0	44.0	137.3	66	1.7	1.4	86.0
26	66	52.8	61.8	117.2	66	2.5	1.8	70.5
27	67	56.8	42.0	73.9	67	3.0	1.8	58.5
28	67	71.0	68.0	95.8	67	2.9	1.7	58.4
29	67	72.7	59.8	82.3	67	3.4	1.9	57.0
30	67	62.6	48.6	77.8	67	3.3	1.6	49.8
31	66	70.5	73.1	103.7	66	3.4	1.8	53.5
32	66	95.0	99.1	104.4	66	3.8	1.6	42.3
33	66	75.8	61.1	80.6	66	3.5	1.6	46.3
34	66	59.0	48.8	82.7	66	2.9	1.6	53.4
35	65	67.7	61.4	90.8	65	3.1	1.6	51.3
36	66	57.4	46.3	80.6	66	2.8	1.6	57.3
37	66	67.5	88.8	131.7	66	2.6	2.0	75.4
38	66	42.9	58.1	135.4	66	1.9	1.7	88.3
39	66	32.7	39.9	122.0	66	1.5	1.1	76.8
40	65	26.8	38.8	144.7	65	1.4	1.6	108.0
41	66	9.3	21.8	235.0	66	0.6	1.0	152.6
42	66	7.4	16.5	222.2	66	0.5	0.8	177.6
43	66	2.5	7.0	282.9	66	0.2	0.6	276.1
44	65	3.4	12.1	255.6	65	0.2	0.5	285.5
45	65	2.4	10.0	425.8	65	0.1	0.4	333.3
46	65	2.4	12.1	513.2	65	0.2	0.5	267.7
47	65	3.2	14.1	437.4	65	0.1	0.3	334.8
48	64	0.9	5.3	567.6	64	0.1	0.5	483.4
49	66	0.7	3.8	580.1	66	0.1	0.3	491.1
50	65	0.5	2.5	478.6	65	0.1	0.3	418.0
51	66	1.0	5.7	580.4	66	0.1	0.5	500.5
52	66	1.9	5.8	311.4	66	0.2	0.6	280.6

Note : Data Cover the Period 1901 to 1980.
Source : Assistant Director General of Meteorology, Pune.

Statement 115: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State: BIHAR **Station:** ARRAH (Observatory) **District:** SHAHABAD

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	55	2.6	12.4	470.7	55	0.2	0.5	305.9
2	56	3.6	14.9	410.2	56	0.2	0.5	284.7
3	56	2.8	10.2	359.9	56	0.3	0.6	241.3
4	56	4.3	8.3	191.5	56	0.4	0.7	179.5
5	53	8.6	19.7	229.7	53	0.4	0.7	173.9
6	55	4.7	12.2	260.7	55	0.4	0.8	204.7
7	55	2.8	7.2	253.7	55	0.3	0.6	205.2
8	55	5.9	14.6	249.3	55	0.3	0.8	217.3
9	54	1.6	5.1	309.7	54	0.2	0.4	254.0
10	56	3.5	11.9	343.5	56	0.3	0.6	241.3
11	56	1.6	3.8	241.7	56	0.2	0.5	217.2
12	56	1.2	3.0	250.5	56	0.2	0.5	212.7
13	54	3.4	11.3	329.5	54	0.2	0.7	278.8
14	53	1.1	3.9	343.1	53	0.1	0.4	375.6
15	54	1.0	4.1	414.5	54	0.1	0.3	442.9
16	54	2.0	6.7	340.9	54	0.1	0.4	336.6
17	53	1.8	4.4	247.0	53	0.2	0.4	251.3
18	52	2.8	10.5	377.6	52	0.2	0.5	273.2
19	54	3.5	7.8	219.0	54	0.3	0.6	183.3
20	54	1.9	4.9	250.8	54	0.2	0.7	278.8
21	54	5.0	10.4	248.5	54	0.3	0.5	200.8
22	52	8.3	20.2	142.6	52	0.5	0.9	186.5
23	53	19.7	32.8	166.6	53	1.0	1.2	119.3
24	54	22.5	36.5	162.1	54	1.3	1.5	116.7

Statement 115 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	54	35.7	55.9	156.6	54	1.7	1.6	98.2
26	51	52.9	62.8	118.8	51	2.3	1.9	82.1
27	52	48.3	48.3	99.9	52	2.3	1.7	75.0
28	52	71.3	75.6	106.0	52	3.0	1.8	60.4
29	52	58.5	54.5	63.3	52	3.3	2.0	61.4
30	50	62.6	58.8	93.9	50	2.9	1.8	61.5
31	50	67.4	66.4	98.6	50	3.1	1.8	58.4
32	51	76.8	70.1	91.3	51	3.7	1.8	48.7
33	52	67.0	73.6	109.8	52	2.9	1.8	61.3
34	52	58.7	69.8	118.9	52	2.7	1.6	59.6
35	50	64.1	80.8	125.9	50	2.8	2.1	73.7
36	52	47.8	55.8	116.7	52	2.6	1.9	72.4
37	53	77.8	99.4	127.8	53	2.6	2.1	80.1
38	52	36.0	47.6	132.1	52	1.6	1.4	85.3
39	52	30.5	32.8	107.5	52	1.6	1.2	75.7
40	50	24.9	45.9	184.2	50	1.2	1.5	121.4
41	51	11.9	26.3	222.1	51	0.7	1.2	160.9
42	51	9.4	24.9	265.3	51	0.5	0.9	177.1
43	51	1.7	6.0	352.2	51	0.2	0.6	322.9
44	48	3.5	13.1	374.5	48	0.2	0.5	285.8
45	51	1.7	7.3	434.2	51	0.1	0.4	366.5
46	51	0.6	2.5	416.2	51	0.1	0.4	420.8
47	51	1.2	6.0	498.7	51	0.1	0.3	346.2
48	49	0.0	0.1	700.0	49	0.0	0.0	0.0
49	50	0.1	1.0	707.1	50	0.0	0.1	707.1
50	51	0.0	0.2	514.4	51	0.0	0.0	0.0
51	50	0.9	3.9	448.3	50	0.1	0.5	399.8
52	50	0.3	1.2	383.4	50	0.0	0.2	494.9

Note : Data Cover the Period 1901 to 1974.
Source : Assistant Director General of Meteorology, Pune.

Statement 116: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State: BIHAR **Station:** DALTONGANJ (Observatory) **District:** PALAMAU

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	77	4.6	14.9	321.9	77	0.2	0.6	285.1
2	77	4.9	10.6	217.1	77	0.4	0.7	158.0
3	77	3.2	6.5	205.2	77	0.3	0.7	201.6
4	77	8.5	16.1	188.3	77	0.7	1.1	165.4
5	76	8.2	15.1	183.7	76	0.7	0.9	131.2
6	76	8.7	15.7	180.1	76	0.6	0.9	141.2
7	77	7.2	16.2	225.4	77	0.5	1.0	183.7
8	77	8.2	15.4	189.4	77	0.7	1.0	151.4
9	77	3.2	7.2	226.1	77	0.4	0.7	205.7
10	77	5.7	11.8	206.1	77	0.5	0.8	174.1
11	77	3.4	7.2	210.5	77	0.4	0.8	222.6
12	77	3.6	8.8	246.2	77	0.4	0.8	222.6
13	76	3.1	8.9	284.1	76	0.3	0.8	253.2
14	77	2.9	7.9	269.9	77	0.3	0.7	249.8
15	77	2.9	7.3	245.9	77	0.3	0.6	218.8
16	76	2.8	8.6	309.9	76	0.2	0.6	298.5
17	77	1.4	6.2	439.4	77	0.1	0.5	335.2
18	76	2.9	7.5	255.0	76	0.3	0.6	226.9
19	76	4.8	10.2	211.1	76	0.4	0.7	181.9
20	73	2.3	4.6	197.5	73	0.3	0.6	213.0
21	76	2.7	5.7	212.3	76	0.3	0.6	227.4
22	76	6.9	17.2	249.6	76	0.5	0.8	155.5
23	78	20.1	40.7	202.9	78	1.0	1.4	134.5
24	77	30.7	40.1	130.5	77	1.7	1.6	93.7

Statement 116 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	79	42.9	62.6	145.7	79	2.2	1.5	71.1
26	79	63.9	62.9	98.5	79	2.7	1.6	57.0
27	79	60.3	44.6	74.0	79	3.5	1.9	53.4
28	79	68.4	49.1	71.7	79	3.7	1.7	49.3
29	79	84.5	63.6	75.2	79	3.8	1.6	42.7
30	79	84.1	89.5	106.4	79	3.7	1.6	43.8
31	79	89.7	81.8	91.2	79	3.6	1.7	47.5
32	79	89.7	57.4	64.0	79	4.2	1.5	36.1
33	79	76.2	53.6	70.3	79	3.7	1.5	41.8
34	79	81.6	107.3	131.5	79	3.5	1.6	46.5
35	77	61.3	47.3	77.3	77	3.3	1.7	51.5
36	74	60.2	50.7	84.1	74	2.9	1.7	58.1
37	75	52.4	52.6	100.4	75	2.7	2.0	72.6
38	71	65.6	217.3	331.4	71	1.9	1.4	72.5
39	73	34.7	41.3	119.0	73	1.9	1.5	76.4
40	75	23.1	28.8	124.0	75	1.4	1.5	106.3
41	76	13.4	23.5	175.4	76	0.7	1.1	155.7
42	74	7.6	13.9	181.8	74	0.6	1.0	172.0
43	74	10.8	59.3	546.6	74	0.3	0.6	184.8
44	72	4.6	13.7	299.9	72	0.3	0.7	253.7
45	76	3.7	15.5	417.6	76	0.2	0.5	311.2
46	75	2.0	7.5	378.7	75	0.1	0.4	305.1
47	76	4.2	12.8	302.7	76	0.2	0.6	248.6
48	76	1.9	6.3	338.4	76	0.1	0.5	389.2
49	68	0.2	0.8	435.9	68	0.0	0.1	824.6
50	72	0.6	2.0	336.6	72	0.1	0.3	334.0
51	70	1.5	7.0	468.8	70	0.1	0.5	395.5
52	70	1.8	5.9	338.4	70	0.2	0.5	263.8

Note : Data Cover the Period 1901 to 1980.
Source : Assistant Director General of Meteorology, Pune.

Statement 117: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State: BIHAR **Station:** HAZARIBAGH (Observatory) **District:** HAZARIBAGH

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	77	3.4	11.3	335.1	77	0.2	0.6	258.7
2	77	4.8	11.7	246.4	77	0.4	0.7	182.9
3	77	4.9	12.0	247.6	77	0.4	0.6	166.4
4	77	8.6	17.2	199.4	77	0.7	1.1	165.4
5	75	7.1	11.7	166.1	75	0.6	0.8	130.1
6	76	8.6	17.3	201.8	76	0.6	0.9	139.6
7	75	7.3	15.4	211.2	75	0.5	0.9	177.5
8	75	8.0	17.2	214.6	75	0.6	1.0	149.0
9	73	4.4	10.1	229.6	73	0.4	0.7	181.6
10	75	7.4	16.0	218.3	75	0.5	0.8	175.8
11	76	3.6	9.7	268.4	76	0.3	0.8	221.6
12	77	5.2	11.0	209.3	77	0.4	0.7	171.7
13	77	3.8	7.6	198.2	77	0.4	0.6	160.3
14	78	3.0	6.4	209.8	78	0.3	0.6	212.4
15	77	3.8	8.9	232.9	77	0.4	0.9	207.8
16	77	5.3	12.1	228.8	77	0.4	0.8	192.6
17	75	3.4	8.9	264.8	75	0.4	0.9	221.3
18	77	5.1	10.3	202.8	77	0.4	0.8	185.5
19	78	12.8	17.6	137.5	78	1.0	1.2	120.2
20	77	9.1	16.3	179.7	77	0.6	0.8	142.5
21	78	10.3	15.3	148.6	78	0.7	0.9	125.3
22	77	17.0	22.7	133.7	77	1.1	1.1	106.2
23	78	27.7	43.0	155.2	78	1.6	1.7	106.9
24	78	40.8	42.4	104.0	78	2.0	1.6	80.3

Statement 117 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	77	58.8	78.0	132.7	77	2.7	1.7	65.5
26	78	65.5	44.6	68.1	78	3.5	1.8	50.2
27	73	64.5	51.7	80.1	73	3.7	1.8	48.8
28	78	73.4	56.4	76.8	78	3.8	1.6	42.3
29	78	80.3	57.0	71.1	78	4.0	1.8	45.6
30	76	74.8	49.5	66.2	76	4.2	1.7	41.0
31	77	83.9	78.6	93.6	77	4.1	1.5	37.2
32	76	96.5	64.5	66.8	76	4.5	1.5	34.0
33	76	78.0	53.6	68.7	76	3.9	1.7	42.4
34	76	60.3	45.6	75.6	76	3.3	1.6	48.3
35	74	66.1	52.7	79.7	74	3.6	1.5	43.3
36	71	63.9	49.6	77.6	71	3.5	1.8	49.7
37	72	60.7	53.4	88.1	72	3.0	1.9	63.4
38	73	46.3	57.8	124.8	73	2.1	1.6	77.9
39	75	46.0	51.5	112.0	75	2.1	1.7	79.4
40	73	38.3	51.9	135.6	73	1.9	1.8	95.0
41	77	18.2	31.9	175.6	77	1.1	1.3	118.0
42	72	11.6	19.3	166.2	72	0.8	1.1	136.6
43	73	10.8	29.9	275.8	73	0.6	0.9	167.8
44	75	5.8	14.1	244.4	75	0.4	0.9	221.9
45	75	3.4	16.6	484.7	75	0.2	0.7	328.8
46	76	1.6	4.4	278.9	76	0.2	0.4	241.3
47	76	4.6	14.8	318.8	76	0.2	0.6	259.1
48	75	2.0	7.9	402.6	75	0.1	0.4	361.4
49	66	0.3	1.3	503.2	66	0.0	0.1	812.4
50	66	0.8	3.4	403.8	66	0.0	0.2	461.8
51	67	2.0	7.5	381.1	67	0.1	0.5	364.1
52	71	2.0	7.1	352.6	71	0.2	0.5	265.9

Note : Data Cover the Period 1901 to 1980.
Source : Assistant Director General of Meteorology, Pune.

Statement 118: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State: BIHAR **Station:** BAGODAR **District:** HAZARIBAGH

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	56	1.5	6.6	435.2	56	0.1	0.3	363.8
2	56	1.5	4.5	291.2	56	0.2	0.5	263.9
3	55	2.6	8.1	318.1	55	0.2	0.4	256.7
4	56	10.8	22.1	205.0	56	0.5	0.9	170.6
5	52	5.5	11.9	216.7	52	0.5	0.9	174.3
6	56	5.5	9.5	173.6	56	0.5	0.7	147.7
7	56	5.3	12.3	233.7	56	0.3	0.7	212.4
8	56	8.6	22.2	256.9	56	0.4	0.9	200.0
9	56	2.1	6.3	302.9	56	0.2	0.6	298.0
10	59	5.1	15.5	302.2	59	0.3	0.7	241.6
11	59	3.8	12.7	336.3	59	0.3	0.7	250.0
12	59	5.7	14.8	259.5	59	0.3	0.7	203.4
13	55	2.2	5.9	266.4	55	0.3	0.6	217.0
14	58	1.3	5.1	407.7	58	0.1	0.4	313.4
15	58	2.4	6.8	280.3	58	0.3	0.6	235.4
16	58	4.5	11.6	255.9	58	0.3	0.6	184.6
17	57	2.5	8.8	355.2	57	0.2	0.5	267.1
18	54	6.2	14.4	232.5	54	0.5	0.9	189.3
19	59	13.3	22.2	167.9	59	0.8	0.9	120.1
20	58	8.5	17.5	206.2	58	0.5	0.8	157.6
21	58	6.6	13.6	205.5	58	0.4	0.7	145.8
22	54	9.2	15.0	162.5	54	0.8	0.9	119.8
23	60	24.8	58.4	235.9	60	1.3	1.7	133.1
24	59	45.9	57.9	126.2	59	2.0	1.9	95.3

Statement 118 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	58	47.3	61.2	129.2	58	2.2	1.8	81.4
26	57	56.4	45.3	80.2	57	2.9	1.9	66.4
27	63	63.5	45.3	71.3	63	3.3	1.7	52.7
28	62	64.3	47.9	74.5	62	3.4	1.6	46.9
29	63	79.0	77.6	98.2	63	3.5	1.6	46.6
30	63	73.8	63.7	86.2	63	3.6	1.7	46.1
31	54	77.6	58.1	74.8	54	3.8	1.6	41.4
32	58	79.0	58.0	73.5	58	4.0	1.8	44.4
33	58	60.4	48.3	80.0	58	3.7	1.6	42.8
34	60	61.9	50.1	80.9	60	3.1	1.6	51.9
35	57	74.7	114.3	153.0	57	3.5	1.7	48.3
36	62	58.7	48.7	83.0	62	3.0	2.0	65.5
37	62	50.6	46.1	91.2	62	2.7	1.8	67.2
38	62	46.4	46.8	100.7	62	2.1	1.7	77.7
39	62	40.6	44.7	110.2	62	1.9	1.5	80.6
40	59	39.7	56.3	141.6	59	1.7	1.7	101.7
41	60	21.0	40.9	195.4	60	0.8	1.2	141.7
42	59	11.7	24.4	208.5	59	0.7	1.1	158.8
43	59	6.0	13.9	231.4	59	0.5	1.0	208.4
44	54	6.6	18.5	279.9	54	0.4	0.9	216.8
45	57	2.4	11.4	473.6	57	0.1	0.5	367.2
46	57	0.8	3.4	417.3	57	0.1	0.3	325.4
47	57	1.9	8.6	449.5	57	0.2	0.9	495.1
48	55	1.2	8.9	741.6	55	0.0	0.3	741.6
49	57	0.0	0.0	0.0	57	0.0	0.0	0.0
50	57	0.7	3.3	502.8	57	0.0	0.2	529.1
51	57	1.0	4.5	432.7	57	0.1	0.5	409.2
52	56	0.7	4.0	575.9	56	0.1	0.3	553.7

Note : Data Cover the Period 1905 to 1977.
Source : Assistant Director General of Meteorology, Pune.

Statement 119: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : BIHAR **Station :** DOMKA (Observatory) **District :** SANTHAL PARGANS

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	78	1.9	6.9	365.4	78	0.1	0.4	291.0
2	78	4.1	16.5	403.2	78	0.2	0.6	283.0
3	78	3.4	9.7	284.2	78	0.3	0.6	219.4
4	77	4.1	9.9	242.9	77	0.4	0.8	215.5
5	76	5.8	10.7	184.4	76	0.5	0.9	169.9
6	77	5.7	13.3	234.6	77	0.4	0.7	153.7
7	77	6.0	14.5	241.9	77	0.4	0.8	174.2
8	77	5.4	13.4	246.7	77	0.5	0.9	173.0
9	75	2.1	6.3	300.7	75	0.2	0.7	289.3
10	78	4.9	12.3	252.8	78	0.3	0.7	204.2
11	78	3.2	8.6	265.2	78	0.3	0.7	236.0
12	77	5.0	14.0	278.7	77	0.4	0.9	211.5
13	77	3.5	8.4	242.0	77	0.3	0.6	188.6
14	78	3.0	7.5	250.2	78	0.3	0.6	212.4
15	78	5.5	12.4	227.6	78	0.5	1.0	185.8
16	78	7.3	12.8	175.8	78	0.6	0.8	143.1
17	78	8.0	14.1	175.5	78	0.6	0.9	159.3
18	77	13.6	21.7	159.4	77	0.8	1.0	120.0
19	78	18.4	24.2	132.0	78	1.2	1.2	98.8
20	78	20.0	26.4	132.0	78	1.2	1.1	94.0
21	78	17.6	24.4	138.6	78	1.2	1.1	89.3
22	77	23.4	28.6	122.2	77	1.3	1.2	87.1
23	78	39.3	44.9	114.5	78	2.1	1.7	82.4
24	78	52.1	66.9	128.2	78	2.6	2.0	77.0

Statement 119 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	78	60.6	49.2	81.2	78	3.0	1.9	61.4
26	77	75.7	57.4	75.7	77	3.5	1.8	50.5
27	78	74.8	52.1	69.7	78	3.8	1.4	37.7
28	78	79.2	59.5	75.2	78	4.0	1.4	36.3
29	78	79.5	61.7	77.6	78	4.1	1.7	41.9
30	78	82.8	58.1	70.1	78	4.2	1.5	35.9
31	77	75.9	56.4	74.3	77	4.1	1.6	38.7
32	78	81.6	60.0	73.5	78	4.2	1.5	36.4
33	78	80.9	52.2	64.5	78	4.1	1.4	34.2
34	78	65.4	51.7	79.1	78	3.4	1.6	48.5
35	75	66.2	53.0	80.1	75	3.5	1.6	45.3
36	76	62.0	63.4	102.3	76	3.2	1.6	51.2
37	76	60.9	50.6	83.1	76	3.2	1.7	51.8
38	76	54.1	57.8	106.8	76	2.4	1.6	66.5
39	75	53.0	62.9	118.7	75	2.3	1.4	60.0
40	75	52.8	77.5	146.8	75	2.2	1.7	77.3
41	76	26.8	38.3	142.8	76	1.3	1.4	106.0
42	76	19.1	28.3	147.7	76	1.0	1.2	119.0
43	76	11.3	31.8	280.5	76	0.5	0.9	179.0
44	75	10.3	21.9	212.1	75	0.5	0.8	170.2
45	76	4.8	13.5	278.6	76	0.2	0.6	256.8
46	76	1.0	2.8	273.6	76	0.1	0.3	258.6
47	76	3.9	15.4	397.6	76	0.2	0.6	272.2
48	74	1.4	7.1	490.8	74	0.1	0.4	392.4
49	73	0.1	0.5	373.3	73	0.0	0.2	599.9
50	77	1.0	4.5	455.0	77	0.1	0.3	364.9
51	76	1.0	5.0	482.2	76	0.1	0.4	440.7
52	71	1.1	4.1	380.9	71	0.1	0.4	383.9

Note : Data Cover the Period 1901 to 1979.
Source : Assistant Director General of Meteorology, Pune.

Statement 120: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State: BIHAR **Station:** DHANBAD (Observatory) **District:** DHANBAD

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	40	2.3	6.9	293.5	40	0.2	0.4	219.9
2	40	1.9	5.2	267.2	40	0.2	0.4	255.1
3	40	4.9	13.8	281.6	40	0.3	0.6	202.5
4	40	4.0	8.0	202.4	40	0.4	0.9	231.4
5	40	7.4	12.1	164.5	40	0.6	0.8	129.6
6	40	6.3	13.8	217.1	40	0.5	0.8	156.9
7	40	3.2	8.8	272.2	40	0.3	0.6	176.1
8	40	5.1	9.3	183.0	40	0.5	0.8	158.0
9	40	2.7	6.0	224.7	40	0.3	0.6	216.2
10	40	3.0	6.2	208.6	40	0.3	0.6	201.5
11	40	3.1	6.6	214.4	40	0.4	0.7	197.4
12	40	6.5	10.6	162.2	40	0.6	0.8	141.4
13	40	5.0	11.1	222.8	40	0.5	0.8	156.9
14	41	2.7	6.7	247.2	41	0.3	0.6	205.6
15	41	3.8	10.2	251.0	41	0.4	0.8	226.7
16	41	5.8	10.0	172.4	41	0.6	1.0	163.5
17	41	7.4	14.2	190.7	41	0.5	0.9	175.3
18	41	9.6	17.3	180.4	41	0.7	1.0	136.7
19	41	13.1	16.7	126.9	41	1.0	1.1	108.6
20	41	9.5	15.5	162.1	41	0.6	0.8	131.6
21	41	9.2	14.3	155.4	41	0.6	0.7	115.3
22	41	15.0	20.1	134.5	41	1.0	1.2	116.5
23	41	29.8	39.1	131.4	41	1.7	1.5	86.6
24	41	43.5	60.0	138.0	41	2.1	1.4	66.0

Statement 120 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	41	48.0	40.9	85.2	41	2.6	1.3	51.2
26	41	61.6	46.9	76.1	41	3.5	1.8	52.5
27	41	74.7	55.9	74.7	41	3.9	1.6	40.4
28	41	75.1	49.1	65.3	41	4.1	1.4	33.1
29	41	92.3	68.2	73.8	41	4.2	1.4	33.3
30	41	78.2	51.2	65.4	41	4.0	1.5	37.5
31	40	89.0	61.2	68.9	40	4.3	1.8	42.8
32	40	89.1	61.1	68.5	40	4.0	1.6	39.7
33	41	75.5	39.7	52.6	41	3.9	1.3	32.9
34	41	51.6	34.9	67.6	41	3.2	1.7	51.9
35	39	70.1	72.1	102.7	39	3.3	1.8	54.0
36	40	59.1	48.1	81.2	40	3.1	1.9	61.3
37	40	64.2	54.4	84.8	40	3.0	1.8	59.0
38	40	54.3	52.8	97.1	40	2.3	1.5	65.8
39	40	58.9	69.4	117.9	40	2.4	1.4	58.4
40	40	39.7	58.4	146.9	40	1.9	1.8	94.5
41	40	71.9	40.3	184.0	40	1.1	1.0	97.4
42	40	15.0	20.5	136.4	40	1.1	1.2	116.1
43	40	13.0	30.1	231.9	40	0.5	0.9	175.4
44	40	7.4	15.7	211.7	40	0.5	0.9	169.5
45	40	3.4	8.7	252.8	40	0.3	0.7	229.0
46	40	0.5	1.8	377.0	40	0.0	0.2	441.4
47	40	4.4	19.6	444.7	40	0.3	0.7	297.0
48	40	1.1	4.1	368.9	40	0.1	0.4	378.9
49	41	1.0	4.4	444.8	41	0.1	0.3	360.3
50	41	1.3	6.4	507.6	41	0.0	0.2	447.1
51	41	0.7	3.7	517.5	41	0.0	0.2	447.1
52	41	1.7	6.7	407.1	41	0.1	0.4	288.3

Note : Data Cover the Period 1934 to 1979.
Source : Assistant Director General of Meteorology, Pune.

Statement 121: Weekly Mean Rainfall and Rany Days on Calendar Year Basis

State: BIHAR **Station:** GOBINDPUR **District:** DHANBAD

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	64	1.2	4.9	409.3	64	0.1	0.3	287.6
2	64	2.7	6.1	228.0	64	0.3	0.5	213.8
3	64	1.6	5.3	341.5	64	0.1	0.4	302.4
4	64	4.1	9.3	229.2	64	0.3	0.7	212.4
5	63	4.2	8.3	200.3	63	0.4	0.8	170.4
6	65	4.5	7.4	163.1	65	0.5	0.8	150.7
7	65	8.9	20.2	226.4	65	0.6	1.0	180.6
8	65	7.2	17.8	245.0	65	0.6	0.9	149.7
9	64	2.9	8.3	284.0	64	0.3	0.7	229.9
10	65	5.3	13.4	250.8	65	0.3	0.7	224.0
11	65	5.8	17.4	301.2	65	0.5	0.8	171.6
12	65	4.0	9.7	246.0	65	0.3	0.7	205.5
13	65	2.7	7.6	286.2	65	0.3	0.6	246.3
14	64	2.2	5.4	241.7	64	0.5	0.6	336.4
15	64	5.1	10.7	207.7	64	0.5	0.8	178.2
16	64	4.8	11.9	245.9	64	0.3	0.7	195.4
17	64	5.9	9.7	163.0	64	0.5	0.9	167.6
18	62	8.1	16.8	205.9	62	0.6	0.9	140.6
19	62	13.8	17.5	126.9	62	0.9	1.1	115.9
20	62	12.3	24.1	196.6	62	0.7	0.7	97.4
21	62	13.1	18.8	143.5	62	0.8	0.8	99.4
22	62	15.2	19.3	126.5	62	1.1	1.2	107.9
23	66	31.8	37.7	118.6	66	1.9	1.7	90.8
24	68	50.1	53.7	107.3	68	2.4	1.7	73.0

Statement 121 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	69	55.8	52.7	94.3	69	2.8	1.7	61.7
26	67	57.7	49.7	86.2	67	3.2	1.8	54.9
27	71	65.6	43.7	67.3	71	3.4	1.4	41.4
28	72	71.2	48.2	67.7	72	3.6	1.5	40.7
29	70	77.6	58.1	74.9	70	3.7	1.7	45.2
30	70	78.6	53.4	67.9	70	4.2	1.6	38.5
31	68	88.3	61.9	70.1	68	4.3	1.6	36.4
32	68	83.6	68.0	81.3	68	3.8	1.6	43.6
33	68	64.1	44.8	69.8	68	3.6	1.7	47.7
34	67	55.8	43.8	77.4	67	3.1	1.7	55.0
35	68	62.3	57.2	91.5	68	3.3	1.7	50.6
36	70	56.7	99.0	86.3	70	3.2	1.8	56.0
37	69	55.1	50.3	91.3	69	2.8	1.8	62.9
38	69	47.2	45.2	95.6	69	2.2	1.7	76.1
39	68	42.9	52.9	183.2	68	2.0	1.6	76.3
40	67	42.8	62.2	145.1	67	1.7	1.7	98.8
41	68	21.4	44.3	206.9	68	0.9	1.2	128.2
42	65	14.9	22.9	153.5	65	0.8	1.1	138.3
43	66	9.3	25.2	271.5	66	0.4	0.8	216.0
44	64	10.7	27.2	254.7	64	0.4	0.9	203.1
45	64	3.3	11.1	341.4	64	0.2	0.6	320.4
46	64	0.3	1.1	328.0	64	0.1	0.2	390.4
47	64	3.6	13.6	377.1	64	0.2	0.5	250.9
48	63	1.1	4.4	409.2	63	0.1	0.4	399.6
49	65	0.1	0.6	702.1	65	0.0	0.1	806.2
50	65	1.1	4.4	388.3	65	0.1	0.3	349.1
51	65	1.1	4.4	417.6	65	0.1	0.5	438.1
52	65	0.7	2.1	315.8	65	0.1	0.4	304.9

Note : Data Cover the Period 1901 to 1979.
Source : Assistant Director General of Meteorology, Pune.

Statement 122: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State: BIHAR **Station:** RANCHI (Observatory) **District:** RANCHI

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	66	4.7	12.7	268.0	66	0.3	0.6	217.7
2	66	3.8	8.8	233.5	66	0.3	0.7	219.1
3	66	5.4	12.5	231.4	66	0.4	0.7	170.0
4	66	7.4	15.5	208.1	66	0.7	1.2	189.4
5	66	9.6	17.0	177.3	66	0.6	0.9	143.3
6	67	9.4	14.4	153.0	67	0.9	1.1	129.8
7	67	11.5	25.4	221.8	67	0.8	1.3	172.0
8	67	11.1	19.8	178.6	67	0.9	1.3	146.9
9	66	5.6	10.8	194.1	66	0.5	0.9	176.3
10	66	6.6	17.9	271.8	66	0.5	1.1	214.1
11	66	8.7	19.3	222.8	66	0.6	1.0	162.5
12	66	6.5	13.4	205.6	66	0.6	1.0	180.1
13	66	5.6	12.2	217.6	66	0.5	0.9	186.5
14	65	5.0	10.0	199.5	65	0.5	0.9	176.4
15	65	6.7	12.2	181.3	65	0.6	1.0	166.1
16	65	6.2	11.7	188.6	65	0.5	0.8	150.7
17	66	4.6	10.5	226.6	66	0.4	0.7	190.7
18	66	3.4	6.6	193.0	66	0.4	0.8	191.6
19	66	16.9	22.3	131.9	66	1.2	1.3	107.6
20	66	9.9	20.1	202.7	66	0.8	1.1	133.7
21	67	10.0	13.9	139.0	67	0.7	0.9	118.0
22	66	16.2	22.9	141.3	66	1.2	1.3	101.9
23	66	34.7	56.2	162.0	66	1.7	1.7	98.8
24	66	48.3	46.8	96.9	66	2.5	1.8	75.4

Statement 122 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	66	55.0	45.0	81.8	66	2.8	1.6	57.4
26	66	70.4	56.4	80.1	66	3.6	1.7	47.2
27	67	80.7	55.6	68.9	67	4.1	1.6	38.6
28	67	78.1	44.2	56.6	67	3.9	1.5	38.5
29	67	90.0	52.1	57.9	67	4.2	1.5	34.8
30	67	104.0	73.5	70.6	67	4.5	1.4	31.5
31	67	84.5	57.7	68.4	67	4.3	1.5	35.5
32	67	86.2	53.3	61.8	67	4.2	1.5	36.5
33	67	80.2	53.7	66.9	67	4.0	1.7	42.2
34	66	70.3	45.0	64.1	66	3.9	1.4	37.2
35	67	81.3	60.7	74.6	67	3.8	1.6	41.5
36	67	74.1	50.4	70.6	67	3.6	1.6	44.0
37	66	60.7	53.4	88.1	66	3.1	1.8	58.5
38	67	48.5	51.4	106.0	67	2.2	1.8	78.6
39	67	45.3	47.5	104.8	67	2.1	1.4	64.9
40	67	38.9	51.9	133.5	67	1.8	1.8	100.8
41	65	21.4	38.5	179.8	65	1.4	1.4	100.3
42	67	14.8	22.0	148.8	67	1.0	1.2	122.8
43	66	9.6	26.0	270.6	66	0.6	1.1	175.7
44	67	10.5	22.7	216.2	67	0.6	1.0	189.9
45	67	6.4	20.5	320.7	67	0.3	0.9	284.3
46	67	2.0	6.5	321.0	67	0.2	0.5	257.3
47	67	4.3	15.1	349.9	67	0.2	0.6	255.8
48	66	1.5	7.4	495.7	66	0.1	0.4	369.4
49	66	0.7	3.0	442.9	66	0.1	0.2	396.7
50	65	2.1	7.3	349.0	65	0.1	0.5	334.8
51	66	2.1	7.8	376.0	66	0.2	0.6	303.7
52	63	1.8	6.5	369.3	63	0.1	0.4	331.5

Note : Data Cover the Period 1901 to 1967.
Source : Assistant Director General of Meteorology, Pune.

Statement 123: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State: BIHAR **Station:** RANCHI AERO (Observatory) **District:** RANCHI

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	25	4.4	16.8	379.7	25	0.2	0.4	204.1
2	25	3.4	9.0	263.6	25	0.3	0.6	196.0
3	25	3.1	7.1	232.0	25	0.3	0.6	196.0
4	25	8.0	17.2	215.2	25	0.5	0.8	171.4
5	25	8.6	16.0	186.0	25	0.7	1.2	173.6
6	25	11.2	15.6	139.4	25	0.7	0.7	110.0
7	25	7.4	14.1	191.3	25	0.5	0.8	158.2
8	25	4.4	7.0	161.3	25	0.4	0.6	144.3
9	25	6.6	10.7	160.3	25	0.8	1.2	144.3
10	24	5.2	9.7	188.7	24	0.5	0.9	163.1
11	24	6.9	22.8	328.7	24	0.5	1.1	220.7
12	25	4.9	8.5	172.5	25	0.5	0.8	160.5
13	24	8.3	16.4	197.6	24	0.6	0.8	131.9
14	24	3.1	7.4	236.7	24	0.3	0.7	236.7
15	24	3.8	8.7	232.7	24	0.3	0.8	257.3
16	24	10.8	22.5	209.4	24	0.8	1.1	144.2
17	24	8.5	13.7	160.2	24	0.6	0.7	123.0
18	24	7.2	15.2	211.9	24	0.8	1.2	163.3
19	24	11.6	13.7	117.9	24	1.0	1.3	124.9
20	24	14.0	17.9	127.8	24	1.0	1.6	102.2
21	24	11.1	13.8	124.4	24	0.8	1.0	128.9
22	23	20.2	28.2	139.6	23	1.3	1.4	107.0
23	25	33.7	51.3	152.4	25	1.5	1.3	83.0
24	25	35.8	32.9	92.0	25	2.3	1.4	62.7

Statement 123 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	25	60.7	51.6	85.0	25	3.2	1.8	54.4
26	25	63.9	37.8	59.2	25	3.3	1.8	55.3
27	25	77.7	52.5	67.5	25	4.1	1.6	39.2
28	25	68.2	29.8	43.7	25	4.3	1.2	28.2
29	25	92.4	54.8	59.3	25	4.6	1.5	32.6
30	25	72.7	64.5	88.7	25	3.6	1.6	43.7
31	25	76.2	53.3	69.9	25	4.0	1.9	46.9
32	25	81.8	46.9	57.4	25	3.8	1.6	41.0
33	25	87.3	58.5	67.1	25	3.9	1.6	41.6
34	25	63.5	46.5	73.3	25	3.4	1.6	46.5
35	24	73.5	60.7	82.5	24	3.5	2.0	55.9
36	24	81.5	53.7	65.9	24	3.6	1.9	51.3
37	24	68.4	49.0	71.6	24	3.5	1.7	49.1
38	24	54.4	65.5	120.3	24	2.5	1.7	65.6
39	24	51.3	50.8	99.0	24	2.5	1.7	68.8
40	24	34.4	49.4	143.9	24	1.8	1.5	84.7
41	24	20.1	36.6	182.7	24	1.2	1.0	84.5
42	24	9.3	15.5	167.2	24	0.7	0.9	137.5
43	24	16.0	27.0	169.2	24	0.8	1.2	144.5
44	24	14.9	26.8	180.2	24	0.7	1.1	163.5
45	24	0.8	2.3	276.0	24	0.1	0.3	338.8
46	24	1.0	3.8	380.1	24	0.1	0.4	358.7
47	24	2.2	6.9	306.9	24	0.3	0.7	294.9
48	24	2.3	5.6	245.7	24	0.3	0.6	243.2
49	24	1.7	4.7	284.9	24	0.2	0.4	228.4
50	24	1.1	5.6	489.9	24	0.1	0.4	489.9
51	24	0.0	0.1	489.9	24	0.0	0.0	0.0
52	24	1.7	5.1	294.6	24	0.2	0.5	288.9

Note : Data Cover the Period 1956 to 1980.
Source : Assistant Director General of Meteorology, Pune.

Statement 124: Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State: BIHAR **Station:** CHAIBASA (Observatory) **District:** SINGBHUM

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	75	2.7	8.0	303.3	75	0.2	0.5	234.9
2	76	3.4	8.5	247.7	76	0.3	0.6	226.9
3	76	2.8	7.0	253.6	76	0.3	0.5	217.9
4	76	5.5	12.3	223.9	76	0.5	0.9	190.3
5	74	6.8	12.2	178.1	74	0.6	0.8	133.6
6	76	7.5	14.4	191.9	76	0.6	0.8	142.9
7	77	11.0	26.8	243.2	77	0.6	1.1	182.2
8	77	6.2	12.0	193.4	77	0.6	0.9	155.1
9	74	4.6	11.0	239.4	74	0.4	0.8	210.4
10	77	4.4	11.9	273.1	77	0.5	1.0	215.7
11	78	6.3	16.9	267.3	78	0.5	1.0	211.5
12	77	3.3	7.6	230.1	77	0.4	0.8	217.0
13	75	5.5	13.1	235.8	75	0.5	1.0	200.8
14	77	4.5	12.4	275.1	77	0.4	0.7	187.9
15	76	7.9	18.6	236.9	76	0.6	1.0	167.5
16	78	8.0	17.6	219.1	78	0.6	0.9	163.1
17	76	5.6	9.7	174.3	76	0.5	0.8	164.9
18	75	8.1	13.6	167.0	75	0.8	1.0	124.2
19	75	18.5	21.8	117.4	75	1.4	1.2	89.4
20	78	11.6	16.8	144.1	78	0.9	1.0	108.0
21	77	14.9	18.9	127.5	77	1.1	1.2	109.3
22	74	17.8	24.7	139.0	74	1.2	1.2	100.3
23	75	25.7	30.8	119.5	75	1.7	1.5	87.6
24	74	40.9	41.2	100.7	74	2.3	1.6	72.7

Statement 124 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	77	51.8	44.6	86.0	77	2.9	1.7	56.1
26	72	55.1	41.9	75.9	72	3.0	1.5	50.4
27	77	68.8	49.9	72.6	77	3.6	1.5	41.0
28	77	73.1	62.8	85.9	77	3.4	1.6	45.6
29	77	65.4	60.1	92.0	77	3.5	1.6	46.6
30	78	79.1	67.7	85.6	78	3.7	1.6	43.6
31	75	73.3	56.8	77.5	75	3.8	1.6	41.7
32	77	63.3	44.9	70.9	77	3.7	1.5	40.6
33	77	76.1	83.7	63.7	77	3.5	1.6	45.5
34	75	73.5	68.9	50.6	75	3.5	1.5	42.6
35	71	61.3	78.1	68.9	71	3.4	1.6	45.9
36	73	60.2	74.5	78.1	73	3.3	1.7	51.4
37	75	52.0	76.8	74.5	75	3.1	1.6	51.3
38	75	40.9	98.1	106.3	75	2.2	1.6	71.1
39	73	40.0	106.3	143.6	73	2.1	1.4	65.4
40	71	32.2	143.6	139.6	71	1.8	1.6	92.9
41	72	19.4	162.1	148.0	72	1.1	1.3	118.8
42	69	20.1	163.5	162.1	69	0.9	1.1	127.4
43	75	11.1	24.2	217.9	75	0.6	1.1	181.8
44	70	10.8	23.0	212.5	70	0.7	1.1	169.7
45	75	3.2	9.4	290.7	75	0.2	0.6	254.8
46	75	2.9	10.9	372.4	75	0.2	0.4	272.6
47	75	4.6	13.1	285.5	75	0.3	0.7	249.2
48	69	1.8	6.6	372.5	69	0.1	0.4	419.1
49	68	0.4	1.6	430.0	68	0.0	0.2	468.9
50	67	0.5	2.6	502.5	67	0.1	0.3	494.9
51	66	1.3	6.1	462.7	66	0.1	0.3	372.5
52	66	0.6	2.3	397.2	66	0.1	0.3	421.3

Note : Data Cover the Period 1901 to 1979.
Source : Assistant Director General of Meteorology, Pune.

Statement 125 : Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : UTTAR PRADESH **Station :** BAHARAICH (Observatory) **District :** BAHARAICH

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	78	4.9	14.4	293.0	78	0.3	0.8	230.2
2	80	4.5	11.7	257.2	80	0.3	0.6	215.7
3	80	4.5	11.0	243.4	80	0.4	0.7	187.5
4	79	6.4	12.9	201.8	79	0.5	0.7	160.2
5	76	5.2	9.7	185.8	76	0.5	0.9	168.4
6	80	5.2	9.1	173.6	80	0.5	0.8	165.4
7	77	4.6	11.8	254.8	77	0.4	0.7	181.5
8	80	4.2	8.7	206.8	80	0.4	0.8	187.8
9	77	3.3	10.0	305.9	77	0.2	0.5	209.5
10	79	4.2	9.9	237.1	79	0.3	0.6	189.7
11	79	1.7	4.5	271.2	79	0.2	0.5	242.1
12	79	2.2	6.9	312.6	79	0.2	0.6	242.0
13	77	1.8	5.0	271.6	77	0.2	0.6	249.2
14	78	1.0	2.9	280.8	78	0.1	0.4	311.7
15	79	1.7	6.4	384.0	79	0.1	0.4	293.1
16	79	3.1	13.9	453.0	79	0.2	0.6	305.0
17	77	1.8	5.8	315.6	77	0.2	0.5	248.0
18	76	2.3	5.5	235.3	76	0.2	0.5	216.6
19	78	7.0	13.9	198.8	78	0.5	0.8	148.7
20	78	5.4	13.3	244.9	78	0.4	0.8	191.7
21	79	6.9	15.5	224.7	79	0.4	0.7	175.1
22	76	14.1	26.3	186.7	76	1.8	1.0	129.7
23	79	18.1	28.8	159.0	79	1.1	1.3	120.6
24	79	27.8	48.5	174.3	79	1.3	1.2	94.5

Statement 125 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	78	51.2	75.0	146.5	78	1.8	1.5	83.4
26	76	57.5	58.4	101.5	76	2.1	1.5	73.3
27	77	65.8	65.0	100.0	77	2.7	1.7	62.0
28	78	71.9	66.9	93.0	78	2.7	1.6	60.0
29	77	89.1	89.5	100.0	77	3.1	1.7	54.4
30	78	74.3	75.8	102.0	78	2.8	1.8	63.8
31	74	81.9	73.7	90.0	74	3.1	1.7	56.6
32	78	77.7	76.0	47.8	78	3.2	1.7	54.5
33	79	61.4	54.9	89.5	79	2.8	1.6	59.2
34	78	66.6	80.4	120.6	78	2.7	1.6	59.0
35	77	56.1	64.4	114.9	77	2.3	1.6	69.6
36	78	67.8	89.3	131.8	78	2.4	1.5	63.5
37	79	55.0	62.3	113.3	79	2.2	1.8	80.4
38	79	37.1	51.5	138.8	79	1.5	1.4	93.7
39	78	30.5	54.5	145.6	78	1.2	1.1	94.0
40	78	31.9	58.0	181.6	78	1.1	1.4	128.8
41	80	16.0	49.0	306.2	80	0.5	1.1	207.7
42	80	7.5	22.2	295.6	80	0.4	0.8	213.7
43	80	2.9	13.2	461.2	80	0.1	0.4	346.2
44	76	3.9	21.6	557.7	76	0.1	0.5	369.1
45	80	0.9	4.0	426.7	80	0.1	0.4	408.8
46	78	1.8	10.9	598.3	78	0.1	0.4	457.5
47	80	1.0	7.2	693.7	80	0.0	0.3	501.9
48	75	0.5	1.7	355.4	75	0.1	0.3	376.7
49	78	1.5	9.5	635.5	78	0.1	0.3	459.5
50	79	1.5	3.7	321.2	79	0.2	0.5	282.5
51	78	1.7	5.1	299.3	78	0.1	0.4	296.3
52	78	2.9	6.7	230.6	78	0.3	0.6	198.1

Note : Data Cover the Period 1901 to 1980.
Source : Assistant Director General of Meteorology, Pune.

Statement 126 : Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : UTTAR PRADESH **Station :** GONDA **District :** GONDA

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	70	3.6	10.5	295.9	70	0.3	0.8	251.4
2	71	3.3	9.4	280.4	71	0.2	0.5	228.4
3	71	4.0	10.4	256.8	71	0.4	0.8	220.5
4	71	5.8	12.2	212.1	71	0.4	0.8	172.0
5	69	6.3	13.3	212.4	69	0.5	0.9	171.1
6	70	3.9	8.1	207.7	70	0.3	0.6	191.9
7	70	4.3	11.1	259.8	70	0.3	0.7	218.1
8	70	4.4	9.3	210.5	70	0.4	0.7	172.6
9	68	2.0	7.6	388.9	68	0.1	0.5	316.7
10	70	3.9	11.3	289.9	70	0.2	0.6	237.1
11	70	1.2	4.0	321.9	70	0.2	0.5	279.5
12	70	2.0	7.4	372.9	70	0.2	0.5	264.0
13	68	2.5	9.1	366.9	68	0.2	0.5	294.6
14	68	0.7	3.2	434.1	68	0.1	0.2	403.0
15	69	2.2	10.2	465.8	69	0.1	0.3	278.2
16	69	0.9	3.8	417.8	69	0.1	0.3	381.4
17	69	1.8	6.3	343.8	69	0.1	0.3	299.8
18	67	3.2	10.4	327.8	67	0.2	0.5	249.4
19	69	6.7	14.5	217.2	69	0.5	0.8	162.8
20	70	3.6	11.7	323.5	70	0.2	0.5	236.9
21	70	6.6	17.6	268.7	70	0.3	0.5	182.6
22	70	13.6	22.8	167.6	70	0.7	1.0	143.3
23	70	14.3	25.1	176.3	70	0.9	1.3	147.4
24	71	22.1	40.0	180.7	71	1.0	1.1	114.4

Statement 126 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	71	44.8	56.6	126.2	71	1.5	1.3	83.8
26	71	60.5	60.6	100.1	71	2.3	1.7	73.4
27	70	71.9	76.2	106.0	70	2.5	1.8	70.0
28	71	73.3	70.8	96.6	71	3.0	1.7	56.1
29	71	88.5	97.8	110.6	71	3.1	1.7	55.3
30	71	71.7	68.9	96.1	71	3.0	1.8	58.6
31	70	89.2	78.2	87.6	70	3.5	1.8	52.1
32	71	89.4	76.6	85.7	71	3.5	1.8	51.2
33	71	69.0	68.6	99.4	71	2.9	1.7	58.0
34	71	74.4	76.4	102.8	71	2.8	1.5	53.1
35	71	64.1	65.6	102.3	71	2.7	2.0	73.6
36	70	70.2	78.3	111.4	70	2.7	1.7	63.2
37	71	67.0	86.6	129.2	71	2.2	1.9	84.5
38	71	40.6	57.7	142.0	71	1.5	1.5	100.6
39	71	33.2	48.1	144.9	71	1.2	1.2	100.6
40	69	29.2	52.2	178.7	69	1.1	1.4	121.3
41	70	12.5	35.9	288.2	70	0.5	1.1	207.3
42	70	9.1	29.6	324.5	70	0.3	0.7	215.8
43	70	1.4	4.4	327.8	70	0.1	0.4	317.5
44	69	3.2	13.7	427.0	69	0.2	0.4	266.9
45	71	1.3	6.8	536.7	71	0.1	0.4	553.8
46	71	0.8	4.2	560.3	71	0.1	0.4	499.1
47	71	1.2	8.0	650.0	71	0.1	0.3	591.5
48	71	0.7	4.8	662.1	71	0.0	0.2	479.5
49	70	1.0	3.7	357.0	70	0.1	0.4	317.5
50	71	0.9	4.2	465.8	71	0.1	0.3	387.2
51	71	2.0	5.8	284.3	71	0.2	0.4	259.3
52	71	2.0	6.5	323.4	71	0.2	0.6	279.4

Note : Data Cover the Period 1901 to 1972.
Source : Assistant Director General of Meteorology, Pune.

Statement 127 : Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : UTTAR PRADESH **Station :** GONDA (Observatory) **District :** GONDA

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	47	4.3	10.7	248.7	47	0.4	0.8	214.7
2	46	3.1	8.7	279.6	46	0.2	0.6	236.3
3	46	5.9	13.5	229.4	46	0.5	1.0	180.7
4	47	6.1	12.5	204.0	47	0.4	0.7	167.9
5	46	6.0	8.1	134.0	46	0.6	0.9	139.3
6	46	3.3	6.0	179.7	46	0.3	0.6	194.5
7	47	18.9	112.1	592.3	47	0.3	0.6	186.6
8	47	4.4	8.3	187.0	47	0.4	0.7	183.5
9	45	1.3	5.5	421.2	45	0.2	0.4	272.6
10	43	2.2	5.2	233.4	43	0.2	0.5	206.4
11	45	1.7	5.6	323.6	45	0.2	0.6	269.5
12	46	2.9	7.0	232.5	46	0.3	0.7	228.4
13	46	3.3	11.6	345.7	46	0.2	0.5	277.2
14	48	0.6	2.6	474.3	48	0.1	0.3	335.2
15	47	2.3	10.7	470.9	47	0.1	0.3	293.0
16	47	4.8	24.3	510.9	47	0.2	0.5	307.9
17	47	1.6	4.6	277.6	47	0.2	0.5	280.6
18	47	2.5	7.6	304.8	47	0.2	0.5	280.6
19	48	3.9	8.5	218.3	48	0.3	0.7	198.9
20	49	6.4	14.9	233.9	49	0.4	0.7	181.7
21	49	6.7	19.0	282.3	49	0.3	0.5	184.9
22	49	13.8	23.7	172.4	49	0.7	1.1	153.4
23	48	17.7	30.4	171.8	48	1.0	1.2	122.0
24	49	22.7	38.9	171.5	49	1.2	1.3	108.6

Statement 127 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	49	45.9	59.1	128.7	49	1.7	1.4	85.4
26	49	67.9	67.3	99.2	49	2.7	1.6	58.3
27	48	61.0	57.5	94.2	48	2.6	1.7	64.2
28	48	71.4	65.3	91.5	48	3.0	1.9	64.1
29	48	100.2	99.0	98.8	48	3.6	1.7	45.7
30	49	83.9	85.5	101.9	49	3.2	1.9	59.6
31	48	96.1	78.4	181.6	48	3.5	1.7	46.9
32	48	86.6	79.1	91.3	48	3.4	1.7	50.4
33	49	60.8	45.5	74.8	49	3.0	1.5	51.4
34	49	82.0	78.7	96.0	49	3.0	1.6	54.0
35	49	58.5	61.0	104.3	49	2.4	1.3	65.5
36	48	78.5	90.5	115.3	48	2.5	1.5	60.7
37	49	67.4	72.4	107.4	49	2.6	1.9	73.4
38	49	35.8	44.1	123.2	49	1.8	1.7	90.5
39	49	32.2	54.1	160.5	49	1.4	1.3	93.9
40	49	36.1	69.3	191.9	49	1.2	1.5	125.2
41	48	12.5	34.3	274.8	48	0.6	1.0	179.7
42	49	16.2	44.1	272.4	49	0.5	1.0	188.9
43	49	2.7	9.6	354.3	49	0.2	0.4	240.2
44	49	2.7	17.0	624.7	49	0.1	0.5	278.0
45	48	0.9	5.6	633.2	48	0.1	0.4	692.8
46	49	0.2	1.2	106.0	49	0.0	0.2	489.8
47	49	0.1	0.6	700.0	49	0.0	0.1	700.0
48	48	2.5	1.9	409.6	48	0.1	0.3	416.7
49	47	0.7	2.3	305.4	47	0.1	0.3	293.0
50	47	1.1	4.1	358.0	47	0.1	0.5	312.4
51	47	1.5	3.9	250.3	47	0.2	0.5	258.1
52	47	2.0	4.8	236.9	47	0.2	0.5	217.7

Note : Data Cover the Period 1931 to 1980.
Source : Assistant Director General of Meteorology, Pune.

Statement 128 : Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : UTTAR PRADESH **Station :** BASTI **District :** BASTI

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	71	3.0	7.7	258.0	71	0.3	0.7	252.3
2	71	2.1	5.2	250.5	71	0.3	0.6	217.9
3	71	4.9	13.3	270.2	71	0.4	0.9	202.7
4	71	3.7	7.1	192.1	71	0.4	0.7	158.4
5	70	4.8	8.2	168.9	70	0.5	0.7	156.3
6	70	4.2	8.0	190.2	70	0.4	0.7	172.6
7	70	4.4	9.8	224.1	70	0.5	0.9	188.7
8	70	5.0	9.9	195.9	70	0.5	0.9	168.0
9	70	2.0	5.8	283.8	70	0.2	0.4	279.1
10	71	3.3	10.2	310.2	71	0.2	0.5	217.2
11	71	3.0	14.0	475.1	71	0.2	0.5	316.0
12	71	2.6	8.7	332.9	71	0.2	0.6	268.5
13	70	3.2	11.6	364.9	70	0.2	0.6	289.9
14	71	1.2	3.7	295.4	71	0.1	0.4	296.1
15	71	2.5	11.3	460.1	71	0.1	0.4	353.4
16	71	1.5	6.9	466.7	71	0.1	0.5	385.1
17	71	2.9	7.6	268.2	71	0.2	0.5	238.9
18	71	2.5	8.3	326.7	71	0.2	0.4	231.9
19	71	5.6	10.4	184.5	71	0.6	0.9	158.0
20	71	4.6	11.8	256.8	71	0.3	0.6	201.1
21	71	5.4	12.3	229.5	71	0.4	0.6	174.2
22	71	15.4	23.7	154.0	71	0.8	1.0	123.8
23	71	19.8	27.9	166.4	71	0.9	1.3	144.5
24	71	28.1	39.9	141.8	71	1.2	1.4	114.6

Statement 128 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	71	32.6	37.1	113.8	71	1.7	1.4	82.4
26	70	54.8	45.7	83.2	70	2.3	1.6	66.6
27	71	67.8	62.1	91.7	71	2.5	1.5	60.3
28	71	74.2	72.5	97.7	71	3.2	2.0	63.1
29	71	99.4	85.7	86.2	71	3.5	1.7	49.8
30	71	72.8	74.0	101.7	71	3.2	1.9	60.3
31	71	82.2	74.2	90.4	71	3.4	1.7	48.7
32	71	75.8	55.1	72.7	71	3.5	1.5	42.9
33	71	71.8	68.8	95.8	71	3.2	1.7	54.3
34	71	66.0	56.1	85.0	71	3.1	1.7	53.4
35	71	70.1	78.3	111.8	71	2.8	1.9	65.4
36	71	68.5	75.0	109.5	71	2.6	1.7	63.3
37	71	61.3	87.8	143.2	71	2.3	1.8	78.8
38	71	38.6	57.4	148.6	71	1.7	1.5	90.9
39	71	36.9	66.4	179.9	71	1.5	1.4	89.6
40	71	29.1	47.2	162.1	71	1.2	1.5	122.8
41	71	16.2	57.3	353.3	71	0.5	1.1	217.2
42	71	8.6	27.5	319.6	71	0.3	0.7	224.2
43	70	2.3	11.1	487.6	70	0.2	0.5	313.6
44	71	2.1	12.3	579.4	71	0.1	0.5	345.7
45	71	1.7	10.9	633.6	71	0.1	0.4	519.5
46	71	1.5	9.0	603.3	71	0.1	0.4	553.8
47	71	0.9	4.2	546.2	71	0.1	0.4	499.1
48	71	0.2	1.0	549.2	71	0.0	0.2	591.5
49	71	0.6	2.1	352.1	71	0.1	0.3	331.5
50	70	0.4	1.7	396.9	70	0.1	0.4	495.5
51	69	2.2	6.8	302.8	69	0.2	0.4	255.1
52	70	2.8	5.9	209.4	70	0.3	0.6	207.3

Note : Data Cover the Period 1901 to 1972.
Source : Assistant Director General of Meteorology, Pune.

Statement 129 : Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : UTTAR PRADESH **Station :** GORAKHPUR (Observatory) **District :** GORAKHPUR

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	74	3.1	9.5	309.8	74	0.3	0.7	262.0
2	73	2.7	7.2	259.5	73	0.3	0.8	232.6
3	73	3.3	9.8	294.3	73	0.4	0.8	231.0
4	75	3.5	6.3	179.5	75	0.4	0.7	159.6
5	73	4.9	9.0	183.2	73	0.5	0.8	164.8
6	75	4.8	11.6	239.6	75	0.4	0.7	183.8
7	73	4.3	8.0	187.8	73	0.5	0.9	186.4
8	75	4.5	8.7	192.8	75	0.5	0.8	166.5
9	73	2.2	6.4	291.6	73	0.2	0.5	286.1
10	74	2.1	6.2	289.2	74	0.3	0.6	233.0
11	74	2.2	6.6	272.7	74	0.2	0.5	222.6
12	76	2.4	7.2	295.9	76	0.2	0.5	237.7
13	74	2.2	5.4	253.1	74	0.2	0.5	222.6
14	75	0.6	2.4	270.8	75	0.1	0.4	242.8
15	73	2.8	10.0	362.7	73	0.2	0.6	265.8
16	76	3.2	13.2	419.3	76	0.3	0.7	258.6
17	76	3.9	12.4	317.5	76	0.2	0.6	265.9
18	73	5.3	11.8	220.9	73	0.3	0.6	182.3
19	75	8.3	14.8	178.3	75	0.5	0.8	149.5
20	75	6.9	18.6	269.4	75	0.4	0.7	169.2
21	75	7.4	12.4	166.8	75	0.6	0.8	150.4
22	73	15.5	24.3	156.8	73	0.8	1.1	125.1
23	75	22.0	32.7	148.9	75	1.2	1.3	111.5
24	74	31.3	39.8	127.0	74	1.5	1.4	93.5

Statement 129 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	76	44.9	50.6	112.8	76	2.1	1.6	77.7
26	76	64.2	62.7	97.6	76	2.4	1.5	61.5
27	74	75.6	71.9	95.1	74	2.7	1.6	58.9
28	72	79.7	73.6	92.2	72	3.1	2.1	66.2
29	75	91.5	71.7	78.3	75	3.5	1.7	98.7
30	75	70.3	64.5	91.8	75	2.9	1.7	58.2
31	72	80.3	63.1	78.5	72	3.4	1.7	48.3
32	76	87.0	62.1	71.4	76	3.7	1.5	39.9
33	73	81.2	79.7	98.2	73	3.4	1.6	47.8
34	75	66.2	61.8	93.4	75	3.2	1.7	51.6
35	73	74.2	74.9	100.9	73	3.1	1.9	61.2
36	75	64.8	58.5	90.4	75	2.8	1.7	60.4
37	72	67.0	84.3	125.8	72	2.7	1.8	67.7
38	75	42.4	57.7	136.0	75	1.9	1.6	82.0
39	73	34.7	52.3	150.5	73	1.6	1.4	89.7
40	73	31.4	50.4	159.8	73	1.1	1.3	115.7
41	73	19.4	53.8	277.6	73	0.7	1.2	182.6
42	73	13.1	31.7	242.4	73	0.5	1.0	194.5
43	74	1.7	7.1	421.0	74	0.1	0.4	331.5
44	72	3.7	16.4	448.1	72	0.2	0.6	351.8
45	75	0.9	5.0	548.1	75	0.1	0.3	450.2
46	73	1.4	8.9	618.1	73	0.1	0.4	465.2
47	75	0.8	4.1	542.8	75	0.1	0.3	513.3
48	73	0.4	2.6	600.1	73	0.0	0.2	599.9
49	74	0.4	1.9	503.6	74	0.1	0.2	421.2
50	72	0.3	1.5	512.0	72	0.0	0.0	482.9
51	72	1.9	6.7	350.3	72	0.1	0.4	353.7
52	74	2.3	5.9	259.4	74	0.2	0.5	244.7

Note : Data Cover the Period 1901 to 1972.
Source : Assistant Director General of Meteorology, Pune.

Statement 130 : Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : UTTAR PRADESH **Station :** DEORIA **District :** DEORIA

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	71	3.1	10.7	349.9	71	0.3	0.6	255.8
2	71	2.3	6.3	272.8	71	0.3	0.6	218.3
3	71	2.8	8.2	291.0	71	0.3	0.6	218.4
4	71	4.0	8.3	206.0	71	0.4	0.7	174.0
5	70	4.5	8.2	183.0	70	0.4	0.6	159.9
6	70	3.7	9.4	255.3	70	9.3	0.6	199.4
7	70	4.2	8.8	208.4	70	0.4	0.8	174.6
8	70	4.6	9.0	196.1	70	0.4	0.8	181.4
9	70	1.9	5.5	293.9	70	0.2	0.4	279.1
10	71	2.0	5.1	257.3	71	0.2	0.5	236.6
11	70	1.8	4.3	241.3	70	0.2	0.4	221.4
12	70	2.2	6.1	278.7	70	0.2	0.5	234.7
13	70	1.7	7.3	426.7	70	0.1	0.6	437.0
14	71	2.9	15.3	530.4	71	0.1	0.4	276.2
15	71	2.0	6.8	346.1	71	0.2	0.5	299.8
16	71	3.6	11.3	315.7	71	0.3	0.7	244.3
17	71	4.1	11.4	277.1	71	0.3	0.8	223.3
18	71	5.1	12.1	238.6	71	0.4	0.6	168.0
19	71	6.5	11.4	175.1	71	0.5	0.7	140.0
20	71	5.3	10.9	207.2	71	0.4	0.7	184.2
21	71	3.7	7.8	210.0	71	0.3	0.6	193.6
22	71	9.5	15.2	161.0	71	0.6	0.9	135.8
23	71	17.6	23.0	130.4	71	1.1	1.3	121.3
24	71	27.3	35.6	130.4	71	1.3	1.3	97.8

Statement 130 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	71	37.9	41.7	110.1	71	1.9	1.7	90.1
26	71	61.6	64.7	105.1	71	2.2	1.6	74.1
27	71	51.1	45.9	80.5	71	2.6	1.5	57.8
28	71	69.9	65.6	93.8	71	3.1	1.8	56.7
29	71	83.4	70.5	84.5	71	3.4	1.6	46.8
30	71	56.8	55.8	98.2	71	2.8	1.6	54.7
31	71	70.8	58.6	82.8	71	3.3	1.7	51.6
32	71	70.3	59.5	84.6	71	3.5	1.7	47.7
33	71	86.9	83.8	96.4	71	3.6	1.8	51.0
34	71	56.4	53.8	95.4	71	2.7	1.8	66.4
35	71	62.9	60.5	96.2	71	2.9	1.9	64.2
36	71	60.3	58.2	96.5	71	2.7	1.6	59.1
37	71	68.8	97.3	141.5	71	2.4	1.9	78.4
38	71	43.0	53.2	123.7	71	1.9	1.6	81.6
39	70	23.5	28.9	122.8	70	1.3	1.2	94.5
40	71	37.7	68.0	180.5	71	1.2	1.4	118.7
41	71	11.1	24.1	216.5	71	0.6	1.1	179.6
42	71	8.9	26.3	283.8	71	0.4	0.8	222.5
43	71	1.7	9.9	359.7	71	0.2	0.5	299.8
44	71	2.9	13.5	468.7	71	0.1	0.4	353.4
45	72	1.4	7.4	511.2	72	0.1	0.4	438.9
46	72	1.7	8.6	510.3	72	0.1	0.4	482.9
47	72	0.8	4.3	552.7	72	0.1	0.3	502.7
48	71	0.3	2.7	813.7	71	0.0	0.2	842.6
49	71	0.3	1.6	555.4	71	0.0	0.2	591.5
50	71	0.2	1.4	809.6	71	0.0	0.2	842.6
51	71	1.6	6.2	308.7	71	0.1	0.3	349.5
52	71	1.4	3.5	250.3	71	0.2	0.4	212.7

Note : Data Cover the Period 1901 to 1976.
Source : Assistant Director General of Meteorology, Pune.

Statement 131 : Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : UTTAR PRADESH **Station :** FAIZABAD **District :** FAIZABAD

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	65	3.8	9.7	256.5	65	0.3	0.8	239.2
2	68	2.3	6.2	270.1	68	0.2	0.5	245.8
3	68	4.7	12.9	275.0	68	0.4	0.8	217.6
4	68	4.2	8.7	207.0	68	0.4	0.7	167.9
5	64	5.3	10.3	193.6	64	0.5	0.8	161.1
6	66	4.3	8.7	204.0	66	0.4	0.7	171.4
7	67	4.6	11.7	255.6	67	0.4	0.8	187.0
8	67	4.6	8.5	186.1	67	0.4	0.7	171.7
9	65	1.6	4.5	328.6	65	0.2	0.4	286.8
10	67	3.1	7.2	228.9	67	0.3	0.6	201.8
11	68	1.5	4.6	313.4	68	0.1	0.5	316.7
12	68	1.8	6.7	379.6	68	0.1	0.4	294.1
13	65	1.6	6.3	393.9	65	0.2	0.5	329.7
14	68	0.6	2.2	393.8	68	0.1	0.2	403.0
15	68	2.4	9.8	412.0	68	0.1	0.4	417.2
16	68	1.6	7.3	452.1	68	0.1	0.4	380.5
17	66	1.7	7.4	438.9	66	0.1	0.3	282.5
18	66	2.5	6.7	266.3	66	0.2	0.5	220.5
19	68	9.3	34.1	367.2	68	0.4	0.7	158.5
20	68	1.3	3.4	253.4	68	0.2	0.5	230.7
21	68	2.5	8.6	343.3	68	0.2	0.5	232.9
22	65	9.3	21.7	233.2	65	0.5	0.7	134.9
23	68	16.7	39.9	238.2	68	0.9	1.3	152.8
24	68..	19.8	25.7	129.8	68	1.0	1.3	122.1

Statement 131 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	67	40.7	57.8	142.0	67	1.6	1.4	85.7
26	65	60.7	67.0	110.4	65	2.0	1.6	82.4
27	66	53.6	91.1	109.0	66	2.8	1.8	63.6
28	68	65.2	67.0	102.8	68	3.0	1.8	59.2
29	68	88.5	103.0	116.3	68	3.2	1.7	53.4
30	67	81.1	85.8	105.8	67	3.1	1.7	55.1
31	66	78.7	73.7	93.6	66	3.2	1.6	50.8
32	68	80.2	75.4	94.0	68	3.3	1.6	46.9
33	68	64.8	60.6	93.6	68	3.1	1.8	58.4
34	68	56.4	53.4	94.7	68	2.7	1.6	58.6
35	65	57.1	59.9	105.0	65	2.6	1.9	71.6
36	68	62.7	75.6	120.5	68	2.5	1.5	60.9
37	67	57.9	79.9	138.1	67	2.2	1.8	84.1
38	68	32.6	50.4	154.4	68	1.5	1.6	108.8
39	67	33.7	71.4	212.0	67	1.3	1.3	101.1
40	66	30.5	56.1	184.0	66	1.1	1.5	136.8
41	68	13.6	44.1	323.6	68	0.4	1.1	260.4
42	68	6.4	21.4	335.8	68	0.3	0.7	218.5
43	68	0.9	4.0	430.7	68	0.1	0.4	380.5
44	65	2.8	22.2	716.3	65	0.1	0.5	438.1
45	68	0.4	2.9	716.3	68	0.1	0.4	541.8
46	68	1.0	4.8	461.4	68	0.1	0.5	403.0
47	68	0.7	4.3	581.1	68	0.1	0.3	578.7
48	65	0.1	0.7	485.0	65	0.1	0.2	565.6
49	68	0.6	2.7	467.0	68	0.1	0.3	498.7
50	67	0.6	3.4	565.4	47	0.1	0.3	494.9
51	68	2.3	6.6	279.4	68	0.2	0.5	259.7
52	67	1.9	6.0	322.0	67	0.2	0.4	250.8

Note : Data Cover the Period 1901 to 1972.
Source : Assistant Director General of Meteorology, Pune.

Statement 132 : Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : UTTAR PRADESH **Station :** FAIZABAD (Observatory) **District :** FAIZABAD

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	21	1.4	3.1	216.9	21	0.1	0.4	251.0
2	22	2.7	7.9	295.3	22	0.3	0.8	281.3
3	22	2.9	6.6	227.4	22	0.3	0.7	257.6
4	22	6.3	11.6	183.9	22	0.5	0.8	176.1
5	21	6.5	6.6	190.7	21	0.4	0.6	154.8
6	22	3.5	6.3	178.7	22	0.4	0.7	162.8
7	22	1.4	3.4	242.3	22	0.1	0.3	323.7
8	22	4.2	9.7	330.9	22	0.4	0.7	199.9
9	21	1.2	3.9	258.9	21	0.1	0.5	334.7
10	22	2.1	3.6	177.1	22	0.3	0.6	201.8
11	22	1.4	5.1	372.6	22	0.1	0.5	342.9
12	22	2.0	4.6	227.1	22	0.2	0.4	217.4
13	20	2.1	4.3	203.7	20	0.3	0.7	191.7
14	21	0.5	1.3	263.2	21	0.1	0.3	315.8
15	21	0.2	0.7	346.4	21	0.0	0.2	458.3
16	21	3.6	13.6	381.8	21	0.1	0.5	334.7
17	21	1.8	4.4	248.6	21	0.2	0.5	226.4
18	20	1.8	4.7	256.1	20	0.2	0.5	261.6
19	21	2.2	4.1	189.6	21	0.2	0.5	226.4
20	21	5.6	11.6	208.5	21	0.3	0.5	144.9
21	21	5.7	14.1	247.1	21	0.4	0.6	154.8
22	20	7.1	14.2	200.2	20	0.5	0.7	137.6
23	21	10.3	15.3	148.3	21	0.6	1.0	157.3
24	21	22.2	26.3	118.7	21	1.3	1.3	104.8

Statement 132 (Contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	21	35.1	57.6	164.1	21	1.4	1.7	120.0
26	20	38.9	31.5	80.9	20	1.8	1.2	66.3
27	21	44.1	46.4	105.1	21	2.2	1.4	63.9
28	21	96.4	84.7	87.9	21	3.4	2.2	62.9
29	21	114.4	79.6	69.6	21	3.8	1.5	40.2
30	21	50.4	57.1	113.3	21	2.5	1.9	75.8
31	20	117.1	125.8	107.4	20	3.5	1.7	47.9
32	21	73.9	60.6	82.0	21	3.4	1.6	46.6
33	21	74.6	62.9	34.2	21	3.3	1.2	34.6
34	21	67.6	59.4	87.8	21	2.7	1.5	53.6
35	20	47.4	64.7	136.4	20	2.3	1.9	83.9
36	21	40.3	45.3	112.5	21	2.0	1.4	69.0
37	21	71.8	86.6	120.6	21	2.6	1.9	74.4
38	21	40.8	79.9	195.4	21	1.5	1.7	111.0
39	21	27.9	31.1	111.8	21	1.4	1.3	90.1
40	20	37.5	54.7	145.8	20	1.6	1.8	109.9
41	21	10.6	35.3	332.3	21	0.4	0.9	241.7
42	21	12.3	34.5	281.8	21	0.4	1.0	228.3
43	21	0.6	2.0	315.9	21	0.1	0.3	215.8
44	20	0.8	2.4	291.5	20	0.1	0.4	244.2
45	21	0.1	0.5	458.3	21	0.0	0.0	0.0
46	21	1.2	5.2	428.8	21	0.1	0.7	458.3
47	21	0.4	1.5	347.8	21	0.0	0.2	458.3
48	20	1.3	3.3	245.3	20	0.1	0.4	242.2
49	21	0.5	1.7	323.7	21	0.0	0.2	458.3
50	21	2.0	6.8	343.6	21	0.1	0.5	334.7
51	21	1.4	4.5	315.8	21	0.1	0.5	334.7
52	21	3.1	6.6	212.4	21	0.3	0.8	238.7

Note : Data Cover the Period 1959 to 1980.
Source : Assistant Director General of Meteorology, Pune.

Statement 133 : Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : UTTAR PRADESH **Station :** SULTANPUR **District :** SULTANPUR

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	68	3.1	7.9	257.4	68	0.3	0.7	235.4
2	70	2.2	4.9	226.5	70	0.3	0.6	191.4
3	70	4.2	8.9	210.5	70	0.4	0.9	200.9
4	70	3.4	6.6	192.5	70	0.4	0.8	120.4
5	69	5.7	10.8	190.9	69	0.5	0.8	154.2
6	67	3.5	7.1	202.7	67	0.4	0.7	183.6
7	69	3.3	7.2	221.5	69	0.4	0.7	189.2
8	69	5.5	13.0	238.9	69	0.4	0.9	192.9
9	69	3.7	5.0	294.7	69	0.2	0.6	271.8
10	68	1.4	4.6	314.5	68	0.2	0.4	274.6
11	70	1.2	3.6	287.1	70	0.2	0.6	274.0
12	70	1.4	4.2	299.5	70	0.1	0.4	293.8
13	70	2.1	13.1	632.2	70	0.2	0.8	492.2
14	68	0.8	2.5	424.1	68	0.1	0.4	341.5
15	70	2.2	11.1	295.9	70	0.2	0.6	353.3
16	70	1.7	5.6	331.7	70	0.2	0.5	299.4
17	70	1.6	6.5	415.2	70	0.1	0.3	346.8
18	70	1.1	4.7	405.8	70	0.1	0.4	350.7
19	68	2.5	5.2	212.2	68	0.3	0.5	186.3
20	70	2.3	6.8	295.3	70	0.2	0.6	262.2
21	70	4.8	13.4	280.0	70	0.3	0.6	191.9
22	70	7.1	14.6	207.1	70	0.5	0.7	156.6
23	68	9.4	18.1	192.4	68	0.6	1.1	170.2
24	70	15.8	27.3	173.2	70	0.9	1.2	128.8

Statement 133 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	70	24.2	27.3	112.6	70	1.5	1.2	80.8
26	70	47.2	59.1	125.1	70	2.1	1.7	78.3
27	68	64.0	70.0	109.4	68	2.7	1.6	60.0
28	70	79.1	73.3	92.6	70	3.1	1.8	58.3
29	70	77.0	77.3	100.5	70	3.4	1.7	50.1
30	70	63.3	54.6	86.3	70	3.0	1.7	57.0
31	70	69.8	49.5	70.9	70	3.5	1.6	66.3
32	68	81.0	57.3	70.7	68	3.7	1.6	42.7
33	70	54.5	57.1	104.8	70	3.2	1.5	48.5
34	70	61.3	53.1	86.5	70	3.1	1.7	56.5
35	70	57.6	61.7	107.2	70	2.8	1.7	61.0
36	68	69.6	77.6	111.6	68	3.0	1.7	55.9
37	70	54.5	65.6	120.4	70	2.4	2.0	80.3
38	70	41.6	60.1	144.4	70	1.7	1.6	98.5
39	70	27.9	47.0	168.3	70	1.3	1.2	90.3
40	69	27.1	54.8	202.1	69	1.4	1.4	135.0
41	69	14.6	44.2	302.0	69	0.6	1.3	229.9
42	70	5.0	16.1	320.6	70	0.2	0.6	296.1
43	70	1.0	3.9	385.5	70	0.1	0.4	350.7
44	70	2.0	10.6	518.3	70	0.1	0.5	372.7
45	68	0.7	2.6	369.7	68	0.1	0.5	403.0
46	70	1.5	6.1	418.1	70	0.1	0.5	363.7
47	70	0.6	3.2	572.7	70	0.1	0.3	587.3
48	70	0.4	2.1	482.9	70	0.1	0.2	409.1
49	68	0.7	3.4	462.0	68	0.1	0.3	427.9
50	70	0.8	3.1	393.1	70	0.1	0.4	350.7
51	70	1.9	5.2	268.3	70	0.2	0.5	280.4
52	70	2.2	6.7	310.3	70	0.2	0.6	280.4

Note : Data Cover the Period 1901 to 1972.
Source : Assistant Director General of Meteorology, Pune.

Statement 134 : Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : UTTAR PRADESH **Station :** SULTANPUR (Observatory) **District :** SULTANPUR

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	18	1.8	3.8	211.1	18	0.2	0.4	192.5
2	17	1.6	5.6	357.4	17	0.2	0.5	299.5
3	17	2.6	5.7	220.2	17	0.4	0.7	198.9
4	17	3.4	9.5	278.3	17	0.4	0.9	211.3
5	18	3.8	9.4	243.3	18	0.2	0.4	192.5
6	17	2.9	6.0	206.2	17	0.4	0.7	173.0
7	17	1.6	3.7	237.7	17	0.2	0.6	239.0
8	17	2.1	7.9	369.8	17	0.1	0.5	412.3
9	16	1.0	2.4	228.4	16	0.2	0.5	290.1
10	16	0.6	1.3	220.1	16	0.2	0.4	250.0
11	16	0.3	1.1	400.0	16	0.1	0.3	400.0
12	16	1.9	3.3	175.2	16	0.3	0.5	153.2
13	16	1.4	4.7	338.4	16	0.2	0.5	290.1
14	17	0.0	0.0	0.0	17	0.0	0.0	0.0
15	17	0.5	1.8	362.9	17	0.1	0.2	412.3
16	16	1.4	5.4	388.7	16	0.1	0.5	400.5
17	16	1.1	4.1	365.8	16	0.1	0.3	400.0
18	16	2.1	7.9	372.0	16	0.1	0.5	400.0
19	16	1.6	3.6	226.9	16	0.2	0.4	215.6
20	17	6.8	16.5	243.8	17	0.2	0.4	185.8
21	17	8.9	31.2	350.7	17	0.2	0.7	282.3
22	15	7.4	15.6	212.2	15	0.5	0.9	171.7
23	15	4.1	11.1	270.9	15	0.3	0.9	269.8
24	15	16.2	25.5	157.3	15	1.1	1.3	120.0

Statement 134 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	16	19.4	19.1	98.6	16	1.2	1.2	98.3
26	16	34.6	35.0	101.1	16	1.8	1.4	78.6
27	16	47.7	36.2	75.8	16	2.3	1.3	57.4
28	16	99.0	89.2	90.1	16	3.0	2.3	75.0
29	16	50.5	32.0	63.4	16	2.8	1.4	50.6
30	16	68.6	56.3	82.1	16	2.6	1.7	56.9
31	16	76.1	60.9	80.0	16	2.9	1.7	56.2
32	17	80.5	74.6	92.7	17	3.3	2.1	62.4
33	17	58.4	53.5	74.5	17	3.2	1.8	56.3
34	17	70.5	58.4	82.8	17	3.1	1.4	46.9
35	17	55.2	59.8	108.3	17	2.2	1.7	76.7
36	17	56.3	44.1	121.7	17	1.9	1.2	61.7
37	18	68.4	99.9	145.9	18	2.1	1.7	79.4
38	17	36.8	56.1	152.6	17	1.4	1.6	114.9
39	17	33.1	34.0	102.7	17	1.5	1.4	92.8
40	16	24.6	25.9	105.1	16	1.6	1.7	102.7
41	16	25.8	81.3	315.1	16	0.7	1.7	156.8
42	18	10.3	30.9	300.0	18	0.3	1.0	291.0
43	17	0.1	0.4	412.3	17	0.0	0.0	0.0
44	18	1.0	3.9	399.5	18	0.1	0.2	424.3
45	17	0.1	0.5	412.3	17	0.0	0.0	0.0
46	17	0.5	1.5	282.3	17	0.1	0.3	282.3
47	18	0.0	0.0	0.0	18	0.0	0.0	0.0
48	16	0.8	2.2	273.3	16	0.1	0.3	273.3
49	17	0.0	0.0	0.0	17	0.0	0.0	0.0
50	17	0.0	0.0	0.0	17	0.0	0.0	0.0
51	17	2.3	6.6	284.2	17	0.2	0.5	299.5
52	16	2.5	8.9	354.6	16	0.2	0.8	400.0

Note : Data Cover the Period 1959 to 1980.
Source : Assistant Director General of Meteorology, Pune.

Statement 135 : Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : UTTAR PRADESH **Station :** PARTAPGARH **District :** PARTAPGARH

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	71	3.0	8.9	296.0	71	0.3	0.8	239.5
2	71	2.3	4.6	109.2	71	0.3	0.6	201.2
3	71	4.1	12.1	294.2	71	0.4	0.8	188.6
4	71	4.6	8.3	182.1	71	0.4	0.7	179.2
5	70	6.1	10.5	172.7	70	0.5	0.8	161.3
6	70	3.7	8.9	242.2	70	0.4	0.7	193.9
7	70	3.3	6.8	207.8	70	0.4	0.8	218.6
8	70	6.6	15.0	227.6	70	0.5	0.9	127.8
9	70	2.0	5.8	286.4	70	0.2	0.6	249.0
10	70	2.3	6.9	206.7	70	0.2	0.5	237.6
11	70	1.5	3.7	263.0	70	0.2	0.4	242.7
12	70	1.7	5.4	310.4	70	0.2	0.4	218.7
13	70	1.5	8.7	560.0	70	0.1	0.5	542.4
14	71	0.6	2.1	363.3	71	0.1	0.3	365.9
15	71	1.2	4.0	327.6	71	0.1	0.5	324.2
16	71	1.1	4.8	417.0	71	0.1	0.4	353.4
17	71	1.7	7.9	476.8	71	0.1	0.4	320.0
18	71	1.3	4.0	311.0	71	0.1	0.4	296.1
19	71	1.7	5.4	320.6	71	0.1	0.4	276.2
20	71	1.3	3.9	305.8	71	0.2	0.4	281.3
21	70	3.6	8.2	226.2	70	0.3	0.5	195.1
22	70	5.1	11.5	227.0	70	0.3	0.6	191.9
23	71	9.9	21.7	218.3	71	0.6	1.0	171.7
24	71	13.9	21.2	152.3	71	0.8	1.1	124.3

Statement 135 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	71	22.7	37.8	166.8	71	1.3	1.4	103.7
26	71	47.0	68.5	145.7	71	2.0	1.6	82.4
27	71	67.1	77.4	115.4	71	2.6	1.7	64.8
28	71	66.3	69.1	104.2	71	2.8	2.0	70.2
29	70	77.2	88.1	114.6	70	3.2	1.8	55.9
30	71	72.2	60.5	83.9	71	3.2	1.7	53.5
31	71	72.9	54.2	74.3	71	3.4	1.6	46.1
32	71	75.5	62.9	83.3	71	3.8	1.7	45.7
33	71	57.7	42.4	73.6	71	3.1	1.6	52.9
34	71	65.9	64.3	97.2	71	3.0	1.8	58.8
35	71	64.1	82.8	129.2	71	2.8	1.9	65.7
36	71	60.8	68.5	112.8	71	2.6	1.9	72.5
37	71	53.5	61.9	115.6	71	2.3	1.8	76.1
38	71	32.1	52.2	162.6	71	1.7	1.5	88.1
39	71	23.4	29.1	124.4	71	1.3	1.2	9.9
40	71	23.4	40.2	171.6	71	1.3	1.6	121.5
41	71	10.3	26.2	254.2	71	6.6	1.3	207.0
42	71	4.7	13.8	290.5	71	0.3	0.7	228.8
43	71	1.4	5.8	406.4	71	0.1	0.4	353.4
44	70	3.1	16.9	550.8	70	0.1	0.5	409.1
45	70	1.1	4.3	387.0	70	0.1	0.4	386.4
46	70	1.8	7.2	403.9	70	0.1	0.5	343.0
47	70	0.8	4.1	501.4	70	0.1	0.4	476.0
48	70	0.4	1.5	403.3	70	0.1	0.2	409.1
49	71	0.9	3.4	365.5	71	0.1	0.3	349.5
50	69	0.5	2.1	393.9	69	0.1	0.3	381.4
51	70	1.6	4.9	315.8	70	0.2	0.5	280.4
52	69	2.3	6.7	290.1	69	0.3	0.7	260.1

Note : Data Cover the Period 1956 to 1980.
Source : Assistant Director General of Meteorology, Pune.

Statement 136 : Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : UTTAR PRADESH **Station :** JAUNPUR **District :** JAUNPUR

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	70	2.6	7.9	301.8	70	0.3	0.6	235.8
2	71	2.6	6.0	233.7	71	0.3	0.6	200.7
3	70	3.9	12.3	314.1	70	0.4	0.8	199.2
4	71	3.9	7.7	167.4	71	0.4	0.6	174.2
5	69	5.4	9.6	175.9	69	0.5	0.8	141.5
6	70	5.3	12.0	228.3	70	0.5	0.9	177.8
7	69	3.9	8.2	210.1	69	0.4	0.8	197.4
8	70	5.9	13.2	222.2	70	0.5	0.9	170.9
9	69	2.2	6.6	304.5	69	0.2	0.6	217.7
10	71	2.5	5.9	241.1	71	0.3	0.6	217.9
11	70	1.7	4.6	267.4	70	0.2	0.6	259.9
12	71	1.4	3.3	225.9	71	0.2	0.4	212.7
13	71	1.0	5.7	600.7	71	0.1	0.5	518.7
14	70	0.6	2.9	488.3	70	0.0	0.2	476.0
15	71	1.3	4.5	342.5	71	0.2	0.5	316.0
16	70	1.1	4.9	434.2	70	0.1	0.4	386.4
17	71	0.7	2.3	335.4	71	0.1	0.3	331.5
18	70	2.0	5.9	293.5	70	0.2	0.4	262.2
19	71	4.6	10.7	230.0	71	0.3	0.7	207.2
20	70	0.9	3.2	353.1	70	0.1	0.3	262.2
21	71	2.1	5.8	279.8	71	0.2	0.5	236.6
22	71	5.2	9.8	190.3	71	0.5	0.8	162.9
23	70	11.1	23.1	208.1	70	0.7	1.1	156.4
24	71	15.6	25.0	160.7	71	1.0	1.2	121.7

Statement 136 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	70	25.2	32.3	128.2	70	1.5	1.3	88.7
26	71	46.7	54.0	115.7	71	2.2	1.8	80.9
27	70	56.4	62.6	111.0	70	2.6	1.7	85.6
28	71	75.1	77.6	103.3	71	2.9	1.9	66.0
29	70	75.1	81.3	108.3	70	3.3	1.8	55.8
30	71	61.0	57.8	94.7	70	3.2	1.8	55.8
31	70	72.8	67.5	92.8	70	3.1	1.8	58.9
32	71	67.8	55.4	78.8	71	3.6	1.7	46.8
33	70	66.2	56.1	84.8	70	3.3	1.9	50.4
34	71	56.3	48.8	86.7	71	3.0	1.5	40.6
35	71	60.3	69.5	115.2	71	2.7	1.8	85.0
36	70	67.6	82.0	121.4	70	2.6	1.7	65.6
37	71	59.0	78.0	132.3	71	2.3	2.0	75.4
38	70	36.6	47.9	130.8	70	1.9	1.6	76.5
39	71	35.4	64.0	181.1	71	1.5	1.5	99.2
40	70	27.9	56.1	200.9	70	1.2	1.4	115.0
41	71	6.4	17.9	278.3	71	0.4	1.1	247.1
42	70	0.1	19.9	323.7	70	0.2	0.6	266.4
43	71	2.0	9.0	451.1	71	0.2	0.5	332.9
44	70	2.8	13.4	484.8	70	0.1	0.4	348.4
45	71	1.6	5.3	333.3	71	0.2	0.5	399.8
46	70	2.5	11.2	446.6	70	0.2	0.7	396.9
47	71	1.5	6.9	472.1	71	0.1	0.4	389.3
48	71	1.8	10.2	570.3	71	0.1	0.3	407.6
49	70	0.4	2.0	459.8	70	0.1	0.2	409.1
50	71	0.3	1.6	494.9	71	0.0	0.2	591.5
51	70	2.3	7.7	339.1	70	0.2	0.5	597.5
52	70	2.0	5.9	294.0	70	0.2	0.6	259.9

Note : Data Cover the Period 1901 to 1972.
Source : Assistant Director General of Meteorology, Pune.

Statement 137 : Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : UTTAR PRADESH **Station :** AZAMGARH **District :** AZAMGARH

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	69	2.5	8.2	930.5	69	0.2	0.6	274.9
2	69	3.4	8.9	261.0	69	0.3	0.6	205.5
3	69	3.8	9.1	237.0	69	0.4	0.8	192.1
4	68	3.7	8.1	221.7	78	0.4	0.6	168.8
5	67	5.0	8.6	172.0	67	0.4	0.7	152.0
6	67	5.2	13.4	256.5	67	0.5	0.9	178.0
7	67	4.3	8.4	194.6	67	0.5	0.8	177.8
8	67	6.1	12.2	201.0	67	0.5	0.8	157.6
9	66	2.1	6.5	300.8	66	0.2	0.5	271.3
10	69	2.5	6.6	259.7	69	0.2	0.6	246.9
11	69	1.7	4.1	246.8	69	0.2	0.6	246.9
12	69	1.2	3.4	283.1	69	0.2	0.4	255.1
13	67	1.3	3.9	311.8	67	0.2	0.4	272.3
14	68	0.6	2.0	361.0	68	0.1	0.3	257.6
15	68	2.7	9.2	346.3	68	0.2	0.7	321.5
16	68	2.3	10.6	466.6	68	0.1	0.4	375.3
17	67	1.1	5.1	465.7	67	0.1	0.3	354.8
18	68	3.1	9.2	299.8	68	0.2	0.6	272.7
19	68	3.9	8.4	214.0	68	0.3	0.6	195.8
20	68	1.6	4.4	277.8	68	0.2	0.6	257.9
21	67	2.6	6.9	270.3	67	0.2	0.5	257.3
22	68	5.7	11.4	198.6	68	0.4	0.8	181.1
23	70	14.9	34.5	231.2	70	0.7	1.1	145.8
24	70	20.1	33.6	166.6	70	1.1	1.1	100.1

Statement 137 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	70	35.0	47.3	135.3	70	1.6	1.4	84.2
26	69	50.2	53.8	107.2	69	2.1	1.5	73.8
27	70	63.0	65.8	104.4	70	2.7	1.8	66.5
28	70	70.8	76.3	107.7	70	2.8	1.9	67.4
29	70	76.0	66.8	87.8	70	3.2	1.7	52.9
30	69	61.3	61.7	100.6	69	3.1	1.8	56.3
31	70	65.4	49.8	76.3	70	3.3	1.6	47.2
32	71	80.9	76.2	94.2	71	3.6	1.5	42.4
33	71	74.9	72.7	97.0	71	3.4	1.7	50.7
34	70	54.2	51.3	94.7	70	2.7	1.5	56.1
35	69	58.9	50.5	85.7	69	2.9	1.8	63.4
36	69	65.5	66.8	102.1	69	2.8	1.8	63.3
37	69	61.4	94.5	153.8	69	2.2	1.9	87.9
38	69	37.5	44.9	122.3	69	2.0	1.5	74.8
39	67	35.1	50.6	144.2	67	1.4	1.3	91.8
40	67	23.6	40.1	169.9	67	1.2	1.3	109.2
41	68	12.1	37.1	306.6	68	0.5	1.5	206.8
42	68	9.4	23.7	253.0	68	0.4	0.8	197.1
43	67	1.8	6.8	375.6	67	0.1	0.4	314.7
44	68	2.9	13.5	461.1	68	0.2	0.5	308.7
45	68	2.8	15.9	574.0	68	0.1	0.5	357.6
46	68	1.9	8.5	437.5	68	0.1	0.5	403.0
47	68	1.4	6.9	475.3	68	0.1	0.4	426.1
48	66	1.0	5.3	544.1	66	0.0	0.2	461.8
49	67	0.2	1.2	488.6	67	0.0	0.2	465.4
50	67	0.3	1.9	566.5	67	0.0	0.3	606.4
51	67	1.9	6.5	336.2	67	0.2	0.6	283.0
52	66	2.3	8.2	349.9	66	0.2	0.5	255.3

Note : Data Cover the Period 1901 to 1972.
Source : Assistant Director General of Meteorology, Pune.

Statement 138 : Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : UTTAR PRADESH **Station :** AZAMGARH (Observatory) **District :** AZAMGARH

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	27	1.3	2.9	321.6	27	0.2	0.5	261.0
2	27	3.9	9.8	254.4	27	0.4	0.9	218.1
3	27	3.9	7.3	189.9	27	0.4	0.6	156.1
4	28	3.5	6.3	182.0	28	0.4	0.7	161.0
5	26	5.9	9.3	156.3	26	0.5	0.6	140.2
6	27	4.6	10.8	237.5	27	0.4	0.7	157.0
7	27	2.2	5.7	266.2	27	0.3	0.7	223.0
8	28	4.7	12.4	265.3	28	0.3	0.7	249.4
9	28	2.6	7.8	297.6	28	0.2	0.5	232.7
10	29	2.0	5.0	254.7	29	0.2	0.4	223.0
11	30	1.6	3.9	249.4	30	0.2	0.5	216.0
12	30	2.5	4.7	187.5	30	0.3	0.5	264.0
13	28	1.8	4.9	280.4	28	0.2	0.5	306.9
14	29	0.1	0.6	462.0	29	0.0	0.2	538.5
15	28	1.0	4.5	464.6	28	0.0	0.2	529.1
16	29	2.2	9.9	449.5	29	0.1	0.5	373.9
17	29	1.6	6.3	390.7	29	0.1	0.3	299.6
18	26	4.7	12.1	256.6	26	0.3	0.7	215.3
19	26	1.7	4.1	370.5	26	0.1	0.3	353.3
20	27	1.8	5.5	300.2	27	0.2	0.6	300.9
21	27	2.3	7.4	316.5	27	0.2	0.6	288.2
22	27	3.3	8.9	273.6	27	0.3	0.6	205.4
23	26	13.5	21.4	158.1	26	0.6	0.7	121.8
24	28	13.7	23.6	172.6	28	0.8	1.1	128.6

Statement 138 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	28	31.3	35.3	112.8	28	1.5	1.3	88.0
26	28	39.9	46.7	117.1	28	2.0	1.8	88.2
27	29	53.3	51.5	96.5	29	2.7	1.6	61.3
28	28	53.6	49.4	92.1	28	2.7	2.0	73.6
29	29	93.6	72.2	77.2	29	3.7	1.7	45.2
30	29	72.6	56.8	78.3	29	3.4	1.8	51.2
31	29	56.3	34.4	61.6	29	3.1	1.2	37.8
32	27	83.0	61.3	73.8	27	3.7	1.8	49.6
33	29	73.3	47.2	64.3	29	3.8	1.5	40.6
34	30	50.4	55.0	109.2	30	2.5	1.5	60.9
35	29	41.7	55.0	131.9	29	2.3	1.8	79.4
36	29	50.9	46.6	91.7	29	2.4	1.5	63.1
37	28	90.1	139.3	154.6	28	2.5	1.7	68.3
38	29	33.1	34.7	104.7	29	1.6	1.4	77.5
39	29	37.6	49.5	131.6	29	1.6	1.3	81.7
40	27	28.7	44.4	154.8	27	1.6	1.6	101.4
41	27	8.1	21.5	265.0	27	0.4	0.8	195.6
42	28	6.4	16.3	255.2	28	0.4	0.8	218.4
43	28	1.3	4.9	380.7	28	0.1	0.4	388.5
44	28	5.7	20.6	363.4	28	0.2	0.7	320.2
45	28	2.0	1.3	529.1	28	0.0	0.2	529.1
46	29	1.0	5.2	538.5	29	0.1	0.6	538.5
47	29	0.1	0.8	538.5	29	0.0	0.2	538.5
48	27	3.4	11.9	353.6	27	0.1	0.5	360.3
49	27	0.6	3.1	519.6	27	0.0	0.2	519.6
50	25	0.5	2.1	408.2	25	0.1	0.3	346.1
51	27	1.4	5.8	410.8	27	0.1	0.3	288.2
52	27	1.8	3.5	195.6	27	0.3	0.5	202.8

Note : Data Cover the Period 1949 to 1980.
Source : Assistant Director General of Meteorology, Pune.

Statement 139 : Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : UTTAR PRADESH **Station :** BALLIA **District :** BALLIA

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	69	3.1	11.2	359.2	69	0.2	0.6	287.6
2	69	2.7	8.6	322.9	69	0.2	0.5	223.7
3	69	2.9	8.3	283.6	69	0.3	0.6	242.9
4	69	4.9	9.0	185.2	69	0.4	0.7	164.3
5	68	4.2	8.9	211.0	68	0.4	0.7	174.8
6	69	5.3	14.9	279.1	69	0.4	0.8	201.6
7	70	3.1	6.4	204.4	70	0.4	0.7	183.6
8	70	5.0	10.4	210.0	70	0.5	0.8	174.4
9	69	1.5	4.2	288.5	69	0.1	0.4	271.8
10	70	2.8	6.8	241.5	70	0.3	0.7	231.9
11	70	2.6	6.8	260.3	70	0.3	0.7	239.4
12	70	2.0	5.8	288.9	70	0.2	0.5	264.0
13	70	1.5	5.5	368.9	70	0.1	0.5	363.2
14	70	0.2	0.9	375.1	70	0.0	0.2	587.3
15	70	2.0	5.7	280.0	70	0.2	0.5	249.6
16	70	2.0	6.3	310.1	70	0.2	0.5	280.4
17	70	1.9	6.6	339.9	70	0.2	0.5	280.4
18	70	3.2	10.3	124.4	70	0.2	0.5	264.0
19	70	5.4	9.9	184.0	70	0.5	0.7	152.0
20	70	3.3	12.6	377.7	70	0.2	0.5	237.6
21	70	3.8	9.2	238.9	70	0.3	0.5	182.6
22	69	6.7	12.9	192.6	69	0.5	0.7	150.5
23	70	16.7	29.4	175.7	70	0.9	1.1	123.9
24	70	26.3	34.1	129.7	70	1.4	1.5	101.5

Statement 139 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	70	33.4	38.7	116.1	70	1.9	1.4	77.4
26	70	59.8	55.9	143.7	70	2.5	1.9	76.6
27	70	66.0	56.3	85.3	70	2.9	1.6	55.8
28	70	78.1	74.2	95.0	70	3.0	1.8	60.5
29	70	69.6	60.4	86.8	70	3.0	1.4	45.8
30	70	63.7	56.3	88.3	70	3.1	1.7	56.5
31	70	78.4	56.5	72.1	70	3.3	1.7	51.1
32	71	80.8	73.6	61.1	71	3.5	1.8	52.1
33	71	67.6	60.4	89.4	71	3.0	1.7	55.7
34	71	57.7	53.6	92.8	71	2.8	1.6	57.0
35	70	64.8	58.9	90.9	70	3.0	1.7	55.2
36	70	55.3	49.6	89.8	70	2.6	1.6	60.9
37	70	67.8	87.3	128.8	70	2.6	2.0	75.3
38	70	38.5	42.2	109.7	70	2.1	1.6	77.5
39	70	29.4	32.9	112.1	70	1.6	1.3	80.7
40	70	23.5	39.3	167.2	70	1.2	1.5	126.6
41	70	12.0	32.2	267.5	70	0.7	1.2	175.2
42	70	9.0	21.3	237.2	70	0.4	0.8	178.8
43	70	1.8	6.3	349.7	70	0.1	0.4	293.8
44	70	3.2	11.4	358.9	70	0.2	0.6	274.0
45	71	2.2	9.4	424.9	71	0.2	0.5	299.8
46	71	1.8	9.7	536.8	71	0.1	0.5	489.6
47	71	1.4	5.7	412.8	71	0.1	0.4	389.3
48	71	0.4	2.5	621.2	71	0.0	0.2	476.0
49	70	0.5	2.1	463.8	70	0.1	0.3	506.1
50	70	0.3	1.9	606.1	70	0.0	0.3	620.0
51	70	1.9	7.6	308.6	70	0.2	0.5	297.5
52	70	1.5	4.4	283.5	70	0.2	0.4	202.2

Note : Data Cover the Period 1901 to 1972.
Source : Assistant Director General of Meteorology, Pune.

Statement 141 : Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : UTTAR PRADESH **Station :** GAZIPUR **District :** GAZIPUR

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	69	3.5	9.7	278.5	69	0.3	0.8	228.2
2	71	2.7	7.7	232.7	71	0.2	0.5	228.4
3	71	3.9	9.0	251.0	71	0.3	0.7	193.3
4	71	5.5	9.9	181.4	71	0.4	0.7	173.5
5	69	7.6	13.0	179.7	69	0.6	0.9	161.9
6	69	4.9	13.0	278.3	69	0.4	0.7	175.9
7	70	4.0	10.9	248.1	70	0.3	0.7	213.6
8	70	5.9	12.2	206.8	70	0.5	0.8	153.5
9	69	2.2	5.3	243.6	69	0.2	0.5	261.6
10	70	2.9	7.4	251.7	70	0.3	0.6	225.5
11	71	2.5	7.5	205.9	71	0.2	0.6	251.0
12	71	1.4	4.4	311.9	71	0.2	0.4	264.3
13	69	1.0	3.9	332.9	69	0.1	0.5	345.7
14	68	0.3	1.1	401.1	68	0.0	0.2	578.7
15	70	2.2	5.7	261.2	70	0.2	0.5	236.9
16	69	0.9	4.1	481.7	69	0.1	0.4	491.8
17	70	2.1	9.9	473.0	70	0.2	0.5	299.4
18	68	2.0	6.0	301.1	68	0.2	0.4	274.6
19	70	4.3	10.8	253.6	70	0.3	0.6	177.4
20	70	1.5	5.2	339.0	70	0.2	0.5	280.4
21	70	2.4	9.1	385.3	70	0.2	0.4	233.3
22	69	6.0	18.1	300.3	69	0.4	0.6	154.2
23	69	15.1	31.8	209.7	69	0.8	1.3	171.0
24	70	23.5	39.8	169.8	70	1.2	1.3	111.4

Statement 141 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	70	31.7	38.2	120.6	70	1.7	1.4	83.4
26	69	56.1	87.1	155.1	69	2.1	1.8	84.1
27	70	55.7	55.1	98.9	70	2.6	1.6	60.5
28	71	74.6	72.5	97.2	71	3.0	1.9	64.3
29	71	74.4	64.8	87.1	71	3.2	1.5	47.3
30	71	59.8	52.5	87.8	71	3.0	1.7	57.2
31	70	93.9	85.3	90.9	70	3.2	1.5	46.6
32	70	93.7	127.4	135.9	70	3.6	1.7	48.3
33	71	74.4	83.6	119.1	71	3.1	1.7	55.5
34	71	67.0	68.7	102.5	71	2.9	1.6	53.9
35	70	60.7	68.4	112.7	70	2.7	1.5	57.3
36	70	62.7	64.3	102.6	70	2.7	1.5	56.2
37	71	64.7	96.1	148.4	71	2.4	1.9	30.2
38	71	37.9	54.1	142.8	71	1.9	1.6	34.8
39	71	31.6	38.0	120.5	71	1.4	1.2	87.6
40	69	30.8	57.3	186.4	69	1.2	1.5	120.6
41	71	19.8	28.0	157.2	71	1.0	1.2	197.1
42	71	14.7	72.9	404.6	71	0.3	0.6	200.6
43	71	2.4	8.6	363.1	71	0.2	0.4	264.3
44	70	3.8	15.3	399.8	70	0.2	0.5	318.4
45	70	2.3	8.1	351.6	70	0.2	0.5	318.4
46	71	2.3	10.8	467.4	71	0.1	0.5	438.6
47	71	1.6	6.8	427.1	71	0.1	0.4	383.9
48	70	0.9	6.1	670.6	70	0.0	0.3	320.0
49	70	0.7	2.8	387.0	70	0.1	1.3	363.2
50	71	0.3	1.7	628.7	70	0.0	0.3	624.4
51	71	2.1	8.8	417.2	71	0.1	0.5	345.7
52	71	2.0	6.7	341.2	71	0.2	0.5	282.6

Note : Data Cover the Period 1901 to 1972.
Source : Assistant Director General of Meteorology, Pune.

Statement 142 : Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : UTTAR PRADESH **Station :** ALLAHABAD (Observatory) **District :** ALLAHABAD

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	76	2.3	6.4	275.8	76	0.2	0.5	260.0
2	79	1.8	3.2	208.8	79	0.2	0.5	232.6
3	77	4.8	11.1	231.1	77	0.4	0.8	194.6
4	78	6.0	12.5	209.4	78	0.5	0.9	171.4
5	77	6.1	11.6	160.2	77	0.5	0.9	169.9
6	79	4.8	10.0	209.5	79	0.4	0.8	179.8
7	77	3.2	8.7	275.2	77	0.4	0.8	225.5
8	75	5.9	14.4	244.7	75	0.5	0.8	175.8
9	77	3.3	8.8	268.3	77	0.2	0.5	219.6
10	79	2.2	6.0	267.8	79	0.3	0.6	256.7
11	79	2.2	5.9	264.5	79	0.3	0.6	240.6
12	76	2.0	6.2	304.0	76	0.2	0.5	260.9
13	77	2.2	8.2	373.9	77	0.2	0.6	285.1
14	78	0.9	2.4	264.3	78	0.1	0.3	320.5
15	79	1.1	3.6	316.5	79	0.1	0.4	319.2
16	76	1.3	4.7	351.8	76	0.2	0.5	276.5
17	77	1.4	4.0	352.1	77	0.1	0.4	288 9
18	76	1.1	3.7	339.5	76	0.1	0.4	366 4
19	79	2.4	7.0	289.3	79	0.2	0.6	252.9
20	77	1.9	9.4	390.7	77	0.2	0.5	278.5
21	77	1.4	8.3	459.6	77	0.1	0.3	456.4
22	77	3.1	7.7	246.2	77	0.3	0.6	237.0
23	79	8.4	20.2	239.9	79	0.5	0.9	176.9
24	79	11.6	26.2	227.4	79	0.8	1.0	131.1

Statement 142 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	76	28.5	49.0	174.2	76	1.5	1.3	89.8
26	78	41.7	56.7	136.1	78	2.0	1.7	82.6
27	77	56.4	59.5	105.5	77	2.6	1.8	70.3
28	77	68.0	78.0	114.6	77	2.9	1.9	66.2
29	77	68.0	57.3	84.3	77	3.4	1.9	57.4
30	78	71.1	61.8	87.0	78	3.3	1.8	56.7
31	76	77.0	65.6	84.0	76	3.4	1.8	52.2
32	79	88.2	64.9	73.6	79	3.9	1.7	43.2
33	77	61.7	54.5	88.3	77	3.2	1.8	55.3
34	76	59.8	82.8	138.6	76	2.8	1.6	58.0
35	77	58.8	55.4	94.1	77	2.8	1.7	60.2
36	78	63.8	77.3	121.2	78	2.7	1.7	62.4
37	79	56.8	90.9	160.1	79	2.3	1.9	62.2
38	76	27.0	37.0	137.1	76	1.4	1.5	103.6
39	78	20.7	29.1	140.6	78	1.2	1.2	96.6
40	76	21.2	42.2	198.6	76	1.2	1.6	137.6
41	79	11.8	29.6	251.1	79	6.5	1.1	212.6
42	76	5.2	19.1	268.6	76	0.2	0.6	278.9
43	77	1.5	5.4	369.7	77	0.1	0.5	401.9
44	75	2.7	15.3	558.3	75	0.1	0.4	471.8
45	79	2.3	9.4	400.5	79	0.2	0.5	296.4
46	79	2.2	10.2	466.3	79	0.1	0.6	410.4
47	76	1.8	7.7	415.7	76	0.1	0.6	386.0
48	78	2.0	10.6	531.3	78	0.1	0.4	403.4
49	77	0.9	3.7	436.2	77	0.1	0.4	369.0
50	78	0.8	2.9	370.7	78	0.1	0.3	459.5
51	75	1.8	6.5	366.9	75	0.2	0.5	341.4
52	78	2.1	5.5	258.5	78	0.2	0.5	230.8

Note : Data Cover the Period 1901 to 1979.
Source : Assistant Director General of Meteorology, Pune.

Statement 143 : Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : UTTAR PRADESH **Station :** VARANASI (Observatory) **District :** VARANASI

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	76	2.9	7.3	249.7	76	0.3	0.7	201.0
2	77	2.1	5.1	244.8	77	0.2	0.5	238.6
3	75	5.5	13.8	252.0	75	0.4	0.8	184.0
4	77	7.4	13.5	182.4	77	0.6	0.8	145.2
5	75	5.0	11.4	227.0	75	0.4	0.7	168.7
6	78	6.2	18.2	292.8	78	0.5	0.8	177.0
7	77	3.9	8.6	220.3	77	0.4	0.7	167.4
8	78	6.0	14.4	239.8	78	0.5	0.9	171.4
9	77	2.4	6.4	270.6	77	0.2	0.5	294.6
10	78	3.1	7.4	236.5	78	0.3	0.7	226.1
11	77	2.8	8.1	289.7	77	0.3	0.6	237.0
12	77	1.5	3.9	258.7	77	0.2	0.4	234.3
13	76	2.6	9.5	357.0	76	0.2	0.6	336.0
14	78	1.2	3.5	289.6	78	0.1	0.4	291.0
15	78	1.8	6.6	360.1	78	0.2	0.5	315.6
16	78	1.0	3.7	384.8	78	0.1	0.4	403.4
17	78	0.9	3.7	427.2	78	0.1	0.3	320.5
18	76	2.4	9.5	406.0	76	0.1	0.4	364.0
19	76	3.8	8.6	228.4	76	0.4	0.6	170.8
20	76	2.2	6.0	272.2	76	0.2	0.5	276.5
21	76	2.4	7.2	208.0	76	0.2	0.5	246.2
22	74	4.1	10.1	246.8	74	0.3	0.6	191.7
23	77	10.9	23.4	214.4	77	0.6	1.1	163.4
24	77	16.4	27.1	165.0	77	1.0	1.2	121.4

Statement 143 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	77	22.9	31.7	138.7	77	1.5	1.5	99.4
26	77	41.8	46.2	110.5	77	2.1	1.6	79.5
27	77	58.6	67.1	114.5	77	2.8	1.7	59.4
28	77	74.4	80.9	108.7	77	3.0	1.8	60.5
29	77	79.9	66.1	82.7	77	3.4	1.7	49.5
30	77	66.4	58.3	87.8	77	3.1	1.7	55.1
31	75	68.8	64.3	93.5	75	3.3	1.8	54.2
32	77	90.1	70.2	77.9	77	3.9	1.6	42.2
33	77	66.9	57.6	86.1	77	3.3	1.7	52.5
34	77	59.1	52.0	88.1	77	3.1	1.6	52.3
35	76	61.4	67.6	110.0	76	2.8	1.6	57.0
36	76	60.6	58.3	96.3	76	2.7	1.7	64.6
37	76	65.1	95.1	146.0	76	2.4	1.8	74.4
38	77	41.2	52.0	126.2	77	1.9	1.4	78.0
39	76	33.0	54.5	165.2	76	1.6	1.3	80.8
40	77	29.8	54.1	181.7	77	1.3	1.4	110.6
41	77	7.2	19.8	275.3	77	0.5	1.0	217.8
42	77	7.8	21.0	270.3	77	0.4	0.7	204.0
43	77	1.3	5.3	418.0	77	0.1	0.4	443.7
44	76	2.9	13.7	478.1	76	0.1	0.5	389.2
45	77	3.1	12.0	405.3	77	0.1	0.4	294.2
46	77	3.0	13.9	464.8	77	0.1	0.5	415.8
47	75	1.8	6.7	382.1	75	0.1	0.5	376.7
48	76	2.8	19.5	684.0	76	0.1	0.4	451.4
49	76	1.0	4.5	432.5	76	0.1	0.3	401.3
50	73	0.3	1.1	376.4	73	0.0	0.0	589.9
51	75	2.2	9.0	409.4	75	0.2	0.5	308.9
52	74	1.6	4.8	304.7	74	0.2	0.5	258.0

Note : Data Cover the Period 1901 to 1978.
Source : Assistant Director General of Meteorology, Pune.

Statement 144 : Weekly Mean Rainfall and Rainy Days on Calendar Year Basis

State : UTTAR PRADESH **Station :** MIRZAPUR **District :** MIRZAPUR

Week	Rainfall				Rainy Days			
	Years	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation	Years	Mean no. of rainy days	Standard Deviation	Coefficient of Variation
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	70	2.9	9.5	325.7	70	0.3	0.6	224.1
2	69	1.9	4.4	228.3	69	0.3	0.6	205.8
3	70	4.2	12.6	302.6	70	0.4	0.8	210.2
4	70	7.7	18.3	236.3	70	0.5	0.9	108.0
5	69	7.3	15.9	217.1	69	0.6	1.0	157.4
6	69	5.3	12.9	241.4	69	0.5	0.8	164.3
7	68	3.3	6.4	192.1	68	0.4	0.7	180.9
8	69	6.0	12.9	214.9	69	0.5	0.8	174.2
9	67	3.7	9.2	250.7	67	0.2	0.6	242.7
10	69	2.7	7.5	273.7	69	0.2	0.5	247.8
11	68	2.2	5.3	241.5	68	0.3	0.6	233.5
12	69	1.8	4.7	259.1	69	0.2	0.5	247.6
13	69	1.4	4.5	317.5	69	0.1	0.4	271.8
14	70	1.0	2.9	200.4	70	0.1	0.4	298.8
15	69	1.5	3.7	255.1	69	0.2	0.5	295.1
16	70	0.7	3.0	421.2	70	0.1	0.3	434.4
17	70	0.8	3.4	422.6	70	0.1	0.3	384.3
18	70	0.6	2.1	369.2	70	0.1	0.3	329.0
19	69	2.9	7.7	264.8	69	0.2	0.5	234.9
20	70	2.2	7.1	326.4	70	0.1	0.4	298.8
21	70	0.8	1.9	248.2	70	0.2	0.4	233.3
22	70	3.9	11.3	289.1	70	0.2	0.4	208.6
23	70	10.2	24.8	243.5	70	0.7	1.1	165.7
24	69	12.0	20.4	170.2	69	0.8	1.2	146.6

Statement 144 (contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
25	70	26.8	38.6	143.8	70	1.4	1.4	98.7
26	70	45.0	51.3	114.0	70	2.0	1.7	83.0
27	70	61.9	74.4	120.3	70	2.8	1.7	59.4
28	69	67.5	72.1	106.9	69	3.0	1.7	57.7
29	70	69.6	72.0	90.4	70	3.4	1.9	56.9
30	70	58.6	47.4	80.9	70	3.0	1.7	56.4
31	69	87.7	81.2	92.6	69	3.4	1.8	52.2
32	69	98.6	79.4	80.5	69	4.0	1.5	38.3
33	68	63.4	59.4	63.7	68	3.1	1.9	61.8
34	70	60.5	51.4	85.0	70	3.0	1.6	51.7
35	70	66.3	70.9	106.9	70	3.0	1.6	53.8
36	70	57.7	68.9	119.4	70	2.6	1.7	65.9
37	69	52.2	76.9	147.4	69	2.3	2.0	85.3
38	70	34.0	45.6	134.1	70	1.7	1.5	88.9
39	70	23.7	47.8	201.4	70	1.2	1.1	91.1
40	70	21.4	37.9	176.6	70	1.1	1.5	138.0
41	69	8.4	23.0	273.5	69	0.6	1.2	209.1
42	69	5.1	12.7	246.3	69	0.3	0.6	197.6
43	70	0.3	1.3	414.9	70	0.0	0.2	476.0
44	70	4.6	19.2	418.9	70	0.1	0.5	343.0
45	70	2.3	8.5	365.2	70	0.1	0.4	298.8
46	69	2.9	12.2	428.4	69	0.2	0.6	366.8
47	70	1.2	4.5	370.1	70	0.1	0.4	350.7
48	70	1.4	8.6	607.8	70	0.1	0.3	434.3
49	70	0.8	3.1	385.1	70	0.1	0.3	384.3
50	68	0.4	1.8	418.4	68	0.0	0.2	468.9
51	69	2.9	16.1	560.4	69	0.2	0.5	333.7
52	69	1.8	7.5	417.6	69	0.2	0.6	274.9

Note : Data Cover the Period 1901 to 1972.
Source : Assistant Director General of Meteorology, Pune.

Errata

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1	2	3	4	5
2	1.1.5	1	Constaints	Constraints
3	1.5.3	2	alluviam	alluvium
10	2.1.1	6	ond	and
12	Table 2.2.	3	Treinnium	Triennium
17	2.10.8	3	maintence	maintenance
35	3.2.13	5	Annexure 3.4	Annexure 3.3
36	3.3.5	3	Annexure 3.2	Annexure 3.1
40	3.4.5	3	Annexure 3.2	Annexure 3.1
43	3.4.14	6	Annexure 3.4	Annexure 3.3
44	3.5.5	3	Annexure 3.2	Annexure 3.1
48	3.6.5	1	Annexure 3.2	Annexure 3.1
49	3.6.8	3	urd	urad
52	3.7.5	3	Annexure 3.2	Annexure 3.1
53	3.7.7	1	Calturable	culturable
54	3.7.8	3	Annexure 3.3	Annexure 3.2
55	3.7.13	5	Annexure 3.4	Annexure 3.3
63	Annexure 3.3	II	Tarai	Terai
63	Annexure 3.3	II/4	Rapseed	Rapeseed
67	Annexure 3.3	3/yield	1980-81@	1980-81
85	5.1.1	9	cutom	custom
93	5.8.7	1	5.8.7	5.8.1
115	Annexure 5.4(i)	6	fallowed	followed
122	Chapter heading	—	Requirement	Requirements
147	9.11.14	2	1979-80	1978-81
155	9.14.14	4	Cuttak	cuttack
157	9.14.19	1	9.14.19	9.14.23
157	9.14.19	1	Specail	Special
160	Annexure 9.2	3	cercals	cereals
162	Annexure 9.4 (Heading)	1	1979-81	1978-81
173	Footnote	1	those those	those
184	Annexure 10.3	1	District	Districts
198	11.7.4(iv)	1	indentified	identified
200	12.1.1	11	chapter	chapters
203	(xiv)	3	Gevernment	Government
203	(xiv)	6	my	may
210	12.10.3	1	Reseacrh	Research
211	12.10.6	9	agritural	agricultural
221	Annexure 12.3(q)	1	molysdenum	molybdenum
221	Annexure 12.3(s)	1	costal	coastal
226	13.1.6	4	construetion	construction
238	15.9	1	Facllities	Facilities
241	16.3.3	2	70 lakh tonnes in 1982-83	71 lakh tonnes in 1979-80
244	16.9.4	4	there	these
246	16.12.2	2	BISCOMAUN	BISCOMAUN,
250	16.12.13	2	is	it
251	16.12.18	3	Annexure 2	Annexure 16.5
252	16.13.1	3	has	had

Page	Item/Para/ Table/ Statement	Line/ Column	For	Read
1	2	3	4	5
252	16.13.3	8	overlues	overdues
254	Table 16.12	Heading	Commerial	Commercial
254	16.14.3	3	implemented)	implemented
254	16.14.4	2	16.23	16.13
255	16.15.2	2	8, 91.153	8, 91, 153
302	18.6.1	5	contraints	constraints
309	19.4.6	6	particularily	particularly
331	Chapter Heading	—	Investment Credit	Investment and Credit
333	20.1.10	5	duing	during
334	20.2.1	11	have also	have
340	22.3.1	1	Agricultural census	census
350	Table 23.1	1981-82	6.08	80.9
355	23.10.1	4	Long,	Long-
368	24.3.4	2	1980-81.	1980-81
392	25.5.2(i)	1	pratapgarn	pratapgarh
397	26.3.2(xi)	4	acquifers	aquifers
415	West Bengal	3 Col. (2)	1981	1981*
415	Orissa	4 Col. (2)	1961*	1961
441	Footnote	2	Co-operations	co-operation
445	Heading	Col. No. 12	—	State
452	Footnote†	2	1979-80	1978-79
453	Orissa	1	1771	1971
457	Item 1	1	Socieies	Societies
458	Item 3	2	dorment	dormant
459	Heading	Column 7	Seceretary	Secretary
470	Bihar	1st line (last column)	1983	1953