CHAPTER 2

AGRICULTURAL PRODUCTION

Foodgrains production reached the record level of 151.5 million tonnes in 1983-84. Production in 1984-85 is expected to be around the same level. New records were achieved in 1983-84 in the production of wheat and rice. Oilseeds as a group as well as the major oilseeds, groundnut, and rape and mustard, also exceeded their previous peak levels. It is expected that 1984-85 will witness further increases in these crops. Cotton production had slumped in 1983-84 but is expected to recover in 1984-85. However, production of sugarcane declined in 1983-84 after a record crop of 189.5 million tonnes in 1982-83 and the situation is unlikely to improve in 1984-85. There was a big drop in jute and mesta in 1982-83 with their combined production falling to 7.17 million bales from the record level of 8.37 million bales in the preceding year. Production of these two crops recovered somewhat in 1983-84 and a further recovery is expected in 1984-85, but the total production is unlikely to reach the level of 1981-82.

Performance in 1983-84

2.2 Production of foodgrains during 1983-84 touched a level of 151.54 million tonnes marking a quantum jump of 18.24 million tonnes over the earlier peak of 133.3 million tonnes achieved in 1981-82. Both kharif and rabi crops contributed to this increase, though the bulk of the increase came from kharif harvests. In 1983-84 the production of kharif foodgrains increased over the preceding year by 19.20 million tonnes and that of rabi by 2.82 million tonnes. A notable feature of this quantum jump is the contribution of the eastern and central regions. The contribution of these regions

TABLE 2.1

Agricultural Production

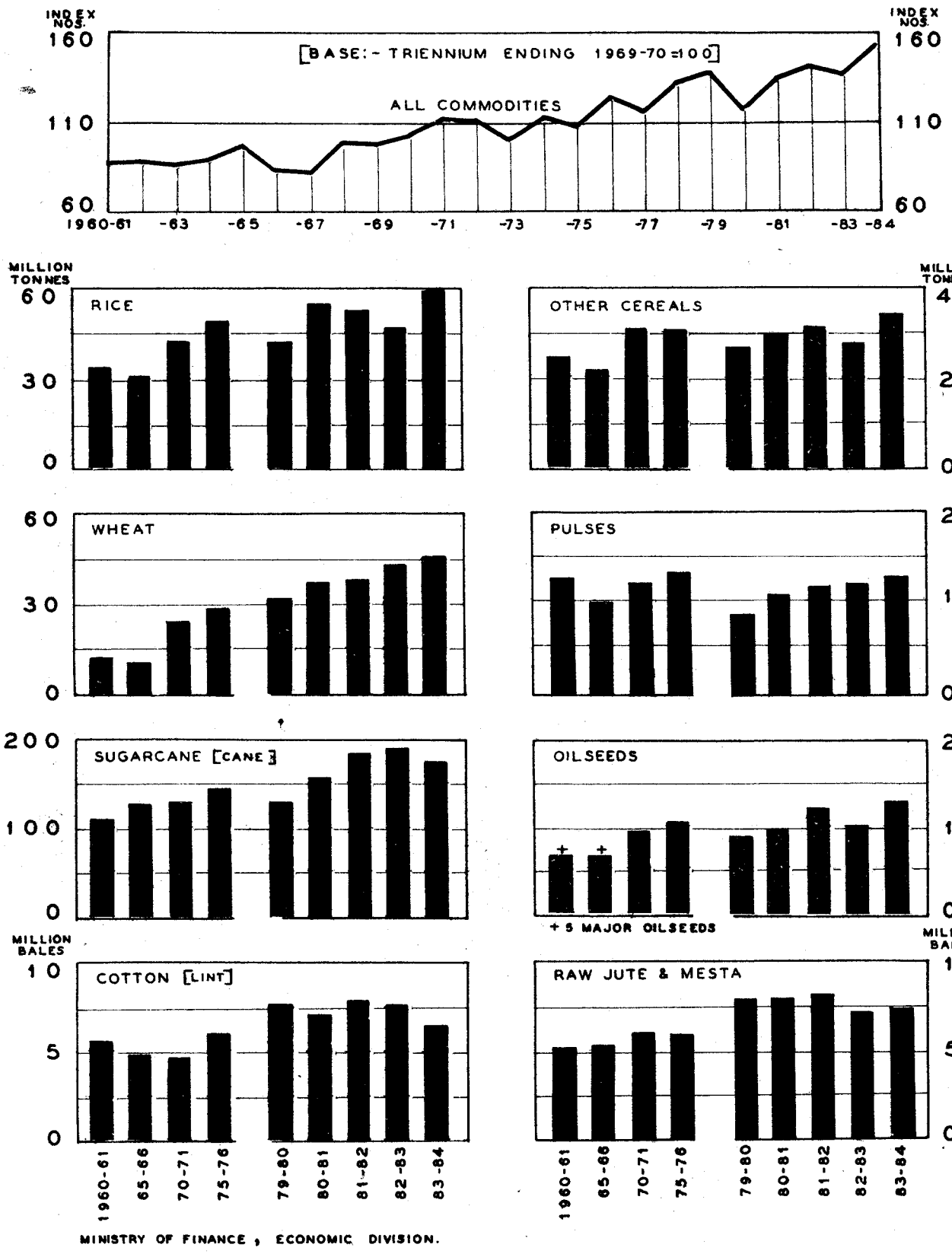
(Million Tonnes/bales*)

Crop	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84
1	2	3	4	5	6	7	8	9	10	11	12.79
Rice	44.05	39.58	48.74	41.92	52.67	53.77	42.33	53.63	53.25	47.12	59.77
Wheat	21.78	24.10	28.85	29.01	31.75	35.51	31.83	36.31	37.45	42.79	45.15
Pulses	10.01	10.01	13.04	11.36	11.97	12.18	8.57	10.63	11.51	11.86	12.65
Kharif foodgrains	67.84	59.10	73.89	66.53	77.72	78.08	63.25	77.65	79.38	69.90	89.10
Rabi foodgrains	36.83	40.73	47.15	44.64	48.69	53.82	46.45	51.94	53.92	59.62	62.44
All Foodgrains	104.67	99.83	121.03	111.17	126.41	131.90	109.70	129.59	133.30	129.52	151.54
Groundnut	5.93	5.11	6.75	5.26	6.09	6.21	5.77	5.01	7.22	5.28	7.28
Rapeseed and Mustard	1.70	2.25	1.94	1.55	1.65	1.86	1.43	2.30	2.38	2.21	2.57
Oilseeds@	9.39	9.15	10.61	8.43	9.66	10.10	8.74	9.37	12.08	10.00	12.81
Sugarcane (Cane)	140.81	144.29	140.60	153.01	175.97	151.66	128.83	154.25	186.36	189.50	177.02
Cotton (Lint)*	6.31	7.16	5.95	5.84	7.24	7.96	7.65	7.01	7.88	7.53	6.58
Jute and Mesta*	7.68	5.83	5.91	7.10	7.15	8.33	7.96	8.16	8.37	7.17	7.41

*170 Kgs. each for cotton and 180 Kgs. each for jute and mesta.

@Nine major oilseeds including groundnut, castorseed, sesamum, rapeseed and mustard, linseed, sunflower, nigerseed, safflower and soyabean.

AGRICULTURAL PRODUCTION



MINISTRY OF FINANCE , ECONOMIC DIVISION.

GMGIPMRND-PLW-419/1/Fin/84-85...Chart 3

works out to 61 per cent of the increase in the total production of foodgrains and 67 per cent of the increase in rice production. Production of oilseeds also reached the record level of 12.81 million tonnes. However production of sugarcane and cotton during 1983-84 was lower than in the preceding year.

2.3 An important factor contributing to the large increase in output was the weather. There was a delay of nearly two weeks in the onset of the monsoon in Kerala, and the monsoon was weak during the initial four weeks. However, the South-West monsoon was vigorous in most parts of the country in August and there was widespread rainfall in August-September, 1983. Cumulative rainfall during the four months (June—September, 1983) was normal or in excess of normal in as many as 32 out of the 35 meteorological sub-divisions. Floods were reported in some regions, but the damage to the crops was largely localised. Good *hathia* rains towards the end of September and early October proved very beneficial to the standing kharif crops. Total kharif foodgrains production increased from 69.9 million tonnes in 1982-83 to 89.1 million tonnes in 1983-84. As much as 62 per cent of this increase was contributed by rice alone. The production of kharif rice increased by 11.87 million tonnes to reach a record level of 55 million tonnes.

2.4 Output of kharif oilseeds increased to 7.31 million tonnes from 5.39 million tonnes in 1982-83, an increase of 35.6 per cent. Jute and mesta increased from 7.17 million bales in 1982-83 to 7.41 million bales in 1983-84. However, the output of cotton slumped from 7.53 million bales in 1982-83 to 6.58 million bales. Sugarcane production in 1983-84 was lower by 12.48 million tonnes as compared to 1982-83, mainly due to area shrinkage.

2.5 Good rainfall in early October 1983, contributed significantly to the sub-soil moisture as well as to the replenishment of water tanks and reservoirs to the benefit of the subsequent rabi operations. The winter rains (January-February, 1984) were in excess of the normal or normal in 10 sub-divisions out of a total of 35. Output of the main rabi crop, wheat, touched a new record level of 45.15 million tonnes. With this, wheat production has increased successively each year since the beginning of the Sixth Plan. Rabi jowar production increased by 1.8 per cent and rabi pulses (other than gram) by 10.1 per cent in 1983-84 over 1982-83. Rabi foodgrains, as a whole, increased from 59.62 million tonnes in 1982-83 to 62.44 million tonnes in 1983-84, showing an increase of 4.7 per cent.

2.6 A welcome development in crop production during 1983-84 was a step-up in the output of pulses and oilseeds. Production of nine major oilseeds increased in 1983-84 by 28 per cent to a record level of 12.81 million tonnes and all the nine oilseeds contributed to this increase. Pulses increased by a comparatively modest margin of 6.7 per cent to 12.65 million tonnes and is still to attain the level of 13.04 million tonnes, the highest so far reached in 1975-76.

2.7 Gross cropped area under foodgrains increased to a record level of 130.35 million hectares in 1983-84, from 125.1 million hectares in the preceding year. Area under pulses was 23.41 million hectares which was larger than 22.83 million hectares in 1982-83, though less than the peak achieved in 1975-76 by one million hectares. Similarly, gross cropped area under nine major oilseeds increased from 17.75 million hectares in 1982-83 to 18.69 million hectares in 1983-84, but this was less than the 19.06 million hectares achieved in 1981-82. However, area under cotton and sugarcane, in 1983-84, declined, as also their production.

Prospects in 1984-85

2.8 During 1984, the onset of South-West monsoon was generally in time in most parts of the country. However, the precipitation was uneven and erratic in many areas, and parts of West Bengal, Bihar and Orissa were affected by excessive rain during the last week of June 1984. In Punjab, Haryana and Uttar Pradesh, the monsoon was erratic and insufficient since mid-July. The situation was aggravated by power shortages and a breach in the Bhakra main-line canal. Moisture stress, which had delayed paddy transplantation in some States, also affected the groundnut crop in Saurashtra. However, widespread rain in the second half of August made up the deficiency to a considerable extent and brought relief to cotton and standing paddy crops. The total precipitation during the entire monsoon period of four months (June—September) was excess to normal in 25 meteorological sub-divisions (compared to 32 in 1983) out of

a total of 35 meteorological sub-divisions and was deficient in 10. On the whole, the weather conditions in 1984 were unfavourable, though not so adverse as in 1982.

2.9 The most encouraging feature of the 1984 monsoon was the good rainfall in the traditional rice-growing eastern region i.e., West Bengal, Bihar, Orissa, and Eastern Uttar Pradesh, thereby improving the prospects of rice production. Areas where rainfall was deficient are West Uttar Pradesh, Himachal Pradesh, Rajasthan, South-Interior Karnataka, Vidarbha, Marathwada, Coastal Andhra Pradesh, Telengana, Rayalseema and the Bay Islands. Madhya Pradesh and Coastal and North-Interior Karnataka also experienced long dry spells, though they ended up with 'normal' rainfall for the season.

2.10 The *hathia* rains in the first half of October were plentiful in Bihar and West Bengal. This was beneficial to the standing paddy crops and also helped rabi sowings. Besides, plentiful rains in Tamil Nadu provided sufficient moisture for the sowings of summer rice and groundnut. The earlier drought conditions in parts of Karnataka, Maharashtra, Madhya Pradesh and Andhra Pradesh improved, when most of these areas experienced rainfall in early October.

2.11 The overall post-monsoon rainfall deficiency (October-December) in 1984 has been the worst since 1980. Twenty-three sub-divisions recorded deficient/scanty rainfall during the post-monsoon period. This resulted in considerable precipitation stress in the major rabi States of Punjab, Haryana, Uttar Pradesh, Rajasthan, Madhya Pradesh, Gujarat and Bihar plains. Rains towards end-December, 1984 and early January, 1985 in all these areas, except Haryana. Rajasthan and Gujarat, however, prevented any serious damage to the standing crops. About 70 per cent of the wheat crop is sown in the areas with irrigation facilities and was, therefore, largely protected. In the country as a whole the prospects for rabi harvest are quite encouraging.

Inputs

Seeds

2.12 Expansion of area under HYV has been an important component of the strategy for increasing agricultural production. The area under HYV increased from 38.4 million hectares in 1979-80 to 52.5 million hectares in 1983-84. The target for coverage of area under this programme has been fixed at 56 million hectares for 1984-85 and this is likely to be exceeded. Crop-wise details of area under HYV during the Sixth Five Year Plan are given below :

TABLE 2.2

Area under HYV

(Million hectares)

Crop	1980-81	1981-82	1982-83	1983-84	1984-85 (Target)
Paddy	18.2	19.7	18.8	22.2	25.0
Wheat	16.1	16.7	17.9	18.6	19.0
Jowar	3.5	3.9	4.4	4.8	5.0
Bajra	3.6	4.6	4.7	5.1	5.0
Maize	1.6	1.6	1.7	1.8	2.0
TOTAL	**43.0**	**46.5**	**47.5**	**52.5**	**56.0**

2.13 The increase in area under HYV in 1983-84 was particularly marked in paddy. Most of the HYV coverage continues to be under wheat and rice. As of 1983-84, about 76 per cent of the 24.4 million hectares of cropped area under wheat was covered by HYV, in the case of rice it was 54 per cent of the cropped area of 41 million hectares, while for coarse cereals, HYV coverage was only 28 per cent. Even in the case of rice and wheat, use of HYV seeds is getting concentrated in Punjab, Haryana, Uttar Pradesh and Andhra Pradesh. Evidently the pace of seed replacement has been slow in many areas.

2.14 The production and distribution of certified seeds increased from 14 lakh quintals in 1979-80 to 58 lakh quintals in 1983-84. The year wise distribution of certified/quality seed is as follows :

TABLE 2.3

Distribution of certified/quality seeds

(Lakh quintals)

1980-81	25.0
1981-82	29.8
1982-83	42.1
1983-84	57.7
1984-85 (Anticipated)	70.4

2.15 In 1983-84, 2.89 lakh quintals of certified/quality seeds of pulses were distributed as against 2.35 lakh quintals in 1982-83 and 0.98 lakh quintals in 1981-82. In the case of oilseeds, the distribution of certified/quality seeds registered an increase of 76 per cent from 3.76 lakh quintals in 1982-83 to 6.62 lakh

quintals in 1983-84. Nevertheless, inadequate multiplication and distribution of improved seeds is a major bottleneck in raising the production of oilseeds and pulses.

2.16 High prices of seeds relative to that of grains could be one of the reasons for the slower expansion of area under certified seeds of high yielding varieties in the States where productivity levels are low and so the proportion of seed cost to the total cost of grain production works out to be high. For example, in 1982-83 in Madhya Pradesh where yields levels of wheat hovered around 10 quintals per hectare, the cost of seeds constituted as much as 20.7 per cent of the total operational cost. On the other hand, in Punjab with a yield level of 30 quintals per hectare, the cost of seeds was no more than 8.1 per cent. In the 1983-84 season, the prices of certified seeds were fixed in the range of Rs. 380 to Rs. 390 per quintal for wheat and at Rs. 380 and Rs. 275 for gram, and rapeseed and mustard respectively.

2.17 The scheme of free distribution of improved varieties of seeds of cereals, oilseeds and pulses to the small and marginal farmers in the form of minikits instituted in 1982 has proved a very useful device for promoting the use of better seeds. The number of minikits distributed in the country increased from less than one lakh in 1980-81 to over 57 lakhs in 1983-84, those for oilseeds increased more than four fold in 1983-84 as compared to the preceding year and for pulses nearly five-fold. Each kit contains separately packed seeds, specific rhizobium culture and also the recommended package of practices and other instructions. The crop-wise details of minikits distributed are given below :

TABLE 2.4

Distribution of Minikits

(In lakhs)

Item	1980-81	1981-82	1982-83	1983-84
Rice	0.50	4.40	11.25	11.62
Wheat	0.05	0.14	1.42	1.43
Millets	..	0.23	2.59	4.74
Pulses	..	0.63	4.01	19.59
Oilseeds	0.32	0.72	4.42	19.68
TOTAL	0.87	6.12	23.69	57.06

Fertilisers

2.18 The total offtake of chemical fertiiizers doubled in four years from 25.7 lakh tonnes in 1974-75 to 51.2 lakh tonnes in 1978-79. In the next four years ending 1982-83, the offtake increased by 25 per cent to 63.9 lakh tonnes. The two bad drought years, 1979-80 and 1982-83 acted as a break on the growth of fertiliser use.

TABLE 2.5

Off-take of Fertilisers

(Lakh tonnes of nutrients)

Year	N	P	K	Total NPK
1979-80 . .	35.0	11.5	6.1	52.6
1980-81 . .	36.8	12.1	6.2	55.2
1981-82 . .	40.7	13.2	6.7	60.6
1982-83 . .	42.2	14.4	7.3	63.9
1983-84 . .	52.2	17.3	7.7	77.2
1984-85 (Target) .	56.6	18.8	8.6	84.0

N = Nitrogenous

P = Phosphatic

K = Potassic

2.19 There was a record increase in fertilizer consumption by 13.3 lakh tonnes (taking the total to 77.2 lakh tonnes) in 1983-84, marking a break from the past trend. The increase is attributable chiefly to a combination of two factors : favourable rainfall situation and reduction of 7.5 per cent in fertiliser prices in June 1983, followed by a further discount of 10 per cent on about 12 lakh tonnes of more than two years old stocks lying with the Food Corporation of India. The other factors which contributed towards increased consumption were the step-up in short-term loans to States for purchase and distribution of agricultural inputs and intensive fertiliser promotion campaign in 104 selected districts. The uptrend noticed in 1983-84 has continued in the current year

even though the weather conditions during the year were not favourable. Available data show an increase in fertilizer off-take during April—September, 1984 to the extent of about 8 lakh tonnes over the corresponding six months of 1983.

2.20 Despite notable growth, the pattern of fertiliser consumption remains markedly skewed, season-wise, crop-wise, as well as region-wise. This tends to constrain the incremental output from additional doses of fertilisers. For obtaining maximum benefit from the use of fertilisers it is necessary to ensure adoption of better application practices at the farm level, and the development, by the fertiliser factories, of products which are more efficient in terms of nutrient delivery to plants. Also, there seems to be inadequate recognition of the need for balanced use of different plant nutrients. Fertiliser consumption has not been increasing at the desired pace in the dry-farming areas. Apart from low levels, application of fertilisers in these areas is confined primarily to commercial crops rather than foodgrains which account for more than 70 per cent of the gross cropped area under dry-farming conditions. High yielding varieties in bajra and jowar are known to be responsive to higher doses of fertilisers and, if their maximum potential is to be realised, cultivators in dry-farming areas must be encouraged to increase fertiliser application to the HYV of these crops.

2.21 There has been considerable increase in the domestic production of fertilisers over the years, but not enough to keep pace with the growth in consumption. Large quantities of fertilisers have to be imported. Imports totalled 2.76 million tonnes in 1980-81, when domestic production was 3.0 million tonnes. Domestic production increased to 4.09 million tonnes in 1981-82 and further to 4.4 million tonnes in 1982-83. The increase in production together with the slow pace of expansion in fertiliser off-take resulted in a reduction in imports to 2.04 million tonnes in 1981-82, and further to 1.13 million tonnes in 1982-83. In 1983-84 the off-take soared, but domestic production increased only marginally. Imports, too, were programmed to increase only moderately. Against the combined production and imports of 5.89 million tonnes, the off-take in 1983-84 was 7.72 million tonnes. This meant a heavy draw down of stocks. In order to improve the stock position and to provide for a further step-up in off-take larger imports had to be arranged in 1984-85, even though domestic production has significantly increased.

TABLE 2.6

Fertilizers : Production, Imports & Subsidies

(Total NPK)

Year	Production ('000 tonnes)	Imports ('000 tonnes)	Subsidies (Rs. crores)		
			On imported fertilizer	On domestic production	Total
1979-80 .	2983	2005	282	321	603
1980-81 .	3005	2759	335	170	505
1981-82 .	4093	2041	100	275	375
1982-83 .	4404	1132	55	550	605
1983-84 .	4533	1,355	148*	900*	1048*
1984-85 .	4272@	N.A.	150**	930**	1080**

*Revised Estimates.

**Budget Estimates.

@April—Jan. This is 16.2 per cent higher than in the corresponding period last year.

2.22 Prices of imported as well as indigenously produced fertilisers are highly subsidised. With the growth in imports and domestic production, the quantum of fertiliser subsidy has grown. It increased from Rs. 375 crores in 1981-82 to Rs. 605 crores in 1982-83, Rs. 1,048 crores (RE) in 1983-84, and further to Rs. 1,080 crores (BE) in 1984-85. The step-up in domestic fertiliser off-take is a welcome development; but such a sharp increase in subsidy is a matter of concern. It is necessary now to undertake a review of the entire structure of fertiliser pricing and subsidisation to ensure that over the medium term the budgetary burdens do not become intolerable, while paying due regard to the need for providing sufficient incentive for increasing domestic production and off-take of fertilisers.

Irrigation

2.23 At the beginning of the Sixth Plan, the irrigation potential under major and medium irrigation works was 26.5 million hectares and under minor irrigation the potential was 30 million hectares. During the first four years of the Sixth Plan, additional irrigation potential of the order 9.1 million hectares was created. The addition has come both from

medium/major irrigation projects and minor irrigation wells, tubewells, pumpsets, tanks etc. Of the total addition to irrigation potential during the first four years, about 3.5 million hectares was covered by major and medium irrigation projects and 5.6 million hectares by minor irrigation schemes. A comulative potential of about 65.6 million hectares was created by the end of June, 1984 compared with 56.5 million hectares at the end of June 1980, that is, at a rate of around 2.3 million hectares per annum.

2.24 For a variety of reasons, there has been a lag between the creation of additional irrigation potential and its utilisation at the field level. While an additional potential of about 9.1 million hectares was created during the first four years of the Sixth Plan, the additional utilisation was only 8.3 million hectares. The cumulative gap between the potential created and its utilisation increased from 4.3 million hectares at the end of June, 1980 to 5.1 million hectares at the end of June, 1984. In reality, the gap may be higher as some of the potential under minor irrigation schemes may have remained unharnessed, contrary to the common assumption of full utilisation of the minor irrigation potential.

2.25 The following table shows the ultimate irrigation potential in the country, the potential already created, its utilisation upto 1983-84 and the targets set for 1984-85.

TABLE 2.7

Development of Irrigation Potential and its Utilisation

(Cumulative Coverage)

(Million hectares)

Year	Major and medium schemes		Minor schemes		All schemes	
	Potential	Utilisation	Potential	Utilisation	Potential	Utilisation
1979-80	26.5	22.2	30.0	30.0	56.5	52.2
1980-81	27.3	22.7	31.4	31.4	58.7	54.1
1981-82	28.2	23.2	32.8	32.8	61.0	56.0
1982-83	29.1	24.0	34.2	34.2	63.3	58.2
1983-84	30.0	24.9	35.6	35.6	65.6	60.5
1984-85 (Target)	30.9	25.8	37.1	37.1	68.0	62.9
Ultimate Potential	58.5		55.0		113.5	

2.26 'Utilisation' of irrigation potential, again, does not by itself imply the full realisation of intended benefits on the field, particularly in the case of major/medium projects. In addition to silt deposits, evaporation and seepage, losses of water due to inadequate distribution channels to the farmers' fields and overflooding are often substantial. Also, optimum benefits may not be derived due to poor management and suboptimal cropping pattern. The Command Area Development Programme has been devised to achieve optimum utilisation of the potential already created through major/medium projects. Provision is being made for construction of field channels in the command areas not covered by the CAD programme. Maintenance of existing irrigation systems should be a prior charge on resources. Besides, there are a large number of incomplete medium and major irrigation schemes on which substantial investments have already been made. Quick completion of these projects, obviously calls for top priority.

2.27 Minor irrigation schemes deserve priority as they are relatively less capital-intensive and do not take long to be constructed. However, expansion of minor irrigation particularly from ground water schemes, to a large extent, depends on private initiative. Investment decisions in this sector are naturally governed by the farmers' perception of profitability, availability, at economic cost, of infrastructure facilities like assured power/diesel supply, construction material, equipment and credit. Rural electrification works need to be expedited in order to optimise returns from the existing investment in groundwater irrigation. Besides, special efforts by State Minor Irrigation Departments and credit agencies could also accelerate the energisation of pumpsets and construction of dugwells. As

the water requirements of pulses and oilseed crops are relatively low, it is desirable to encourage the tempo of expansion of irrigated area under these crops in regions with limited irrigation facilities.

Medium Term Trends

2.28 An analysis of the trends in agricultural production in recent years shows that the "Green Revolution" which provided the big push to Indian agriculture in the mid-Sixties has gathered further strength in subsequent years, extending beyond the narrow base of regions with developed infrastructure and particular crops like wheat. There has been a distinct acceleration in the production of most crops, brought about mainly by improvement in yields, during the period 1976-77 to 1983-84, compared with the period 1967-68 to 1975-76. Overall growth rate of agricultural production increased from 2.26 per cent per annum to 2.96 per cent. This came about as a result of a step-up in productivity growth from 1.3 to 2.29 per cent per annum as the area under various crops increased at a slower pace of 0.3 per cent, compared with the growth rate of 0.51 per cent in the earlier period.

2.29 Compound rates of growth in production, productivity (per hectare yields), and area in respect of some major crops and groups of crops over these two periods are given in the Table 2.8.

TABLE 2.8

Compound Growth Rates

(1967-68 to 1975-76 and 1976-77 to 1983-84)

(Per cent per annum)

Item	Area		Productivity		Production	
	I	II	I	II	I	II
All Groups	0.51	0.30	1.30	2.29	2.26	2.96
All Foodgrains	0.40	0.30	1.50	2.71	1.91	3.01
All Cereals	0.31	0.36	1.90	2.86	2.22	3.23
Rice	0.69	0.27	1.00	2.30	1.96	2.58
Wheat	3.18	1.78	2.52	4.10	5.80	5.96
All Pulses	0.77	0.02	—1.27	0.87	—0.51	0.90
Gram	—0.17	—1.17	—1.36	—0.51	—1.45	—1.66
Tur	—0.31	2.99	0.92	0.87	0.60	3.89
All Oilseeds	0.58	1.55	2.30	2.91	2.90	4.51
Groundnut	—0.45	0.77	1.86	1.47	1.43	2.26
Rape & Mustard	1.74	2.70	2.40	4.76	4.20	7.58
Sugarcane	2.84	1.34	0.52	1.15	3.37	2.50
Cotton	—0.64	0.92	2.96	0.18	2.30	1.10
Jute	—1.86	—0.54	1.37	2.47	0.12	1.91

I 1967-68 to 1975-76.
II 1976-77 to 1983-84.

2.30 It is worth quoting that during 1976-77 to 1983-84 (as compared with the period 1967-68 to 1975-76) there was an alround increase in the growth rates of productivity and production of wheat, rice, 'all cereals', and 'all foodgrains'. In the case of pulses, the declining trend in productivity was reversed, the compound growth rate of productivity improving from —1.27 to +0.87. In gram, however, the negative trend in productivity is still observed, though the growth rate has improved from —1.36 to —0.51. But even this improvement is nullified by acceleration in the negative rate of growth of area under gram. Thus, the rate of decline in gram production has increased from 1.45 to 1.66 per cent per annum.

2.31 Among non-foodgrain crops, compound annual growth rate of oilseeds production increased from 2.9 to 4.51 per cent, aided by improvement in the growth rates of area as well as productivity. Performance of rape and mustard seeds has been particularly impressive. In the case of cotton and sugarcane the growth of production decelerated, due to a sharp decline in the productivity growth rate in the case of cotton and a decline in the rate of growth of area in the case of sugarcane. Near-stagnancy in the production of jute during 1967-68 to 1975-76 has given way to a production growth rate of 1.91 per cent during 1976-77 to 1983-84. This has been the combined

effect of an acceleration in the rate of growth in productivity and a moderation in the rate of decline in acreage.

2.32 Widespread productivity gains in recent years in comparison with the earlier period reflect the dissemination and absorption of new technology in agriculture over a wider area than had taken place earlier. The newly emerging trends need to be strengthened. In particular, special efforts are required to induce and enable small and marginal farmers to adopt the new technology. Large shortfalls relative to requirements continue in the production of oilseeds, necessitating bulk imports of edible oils. In pulses also there is a large gap between demand and supply. The new technology in rice and wheat has to be expanded to cover wider area. Jute and cotton textile industries are facing acute raw material shortage, under-scoring the urgency of measures to increase the domestic production of jute and cotton.

Cereals

Rice

2.33 Production of rice has increased at a slower pace than that of wheat largely because of slow growth of production in the eastern and also in the southern region. An analysis of the regional variation in growth rates in area, production and yields of rice shows that the northern region displayed the highest growth rates in area, production, as well as per hectare yield during 1970-71 to 1981-82.

TABLE 2.9

Rice : Compound Annual Growth Rates

(1970-71 to 1981-82)

Region	Production	Yield	Area
Northern Region[1] .	10.93	5.66	4.86
Southern Region[2] .	2.02	1.72	0.29
Eastern Region[3] .	0.78	0.43	0.35
All India . . .	**2.39**	**1.55**	**0.83**

1. Punjab, Haryana and West Uttar Pradesh.
2. Andhra Pradesh, Karnataka, Tamil Nadu and Kerala.
3. East Uttar Pradesh, Bihar, West Bengal, Orissa and Assam.

2.34 Farmers in the traditionally non-rice States of Punjab and Haryana and in the western Uttar Pradesh have adopted the new technology, and with the spread of irrigation facilities they have achieved remarkable increases in yield rates. As the financial attractiveness of raising paddy crops increased, new areas were brought under the crop. These two factors, together, brought about an impressive 10.93 per cent annual growth in production over a fairly long period. The total rice production in the northern region increased from 2.5 million tonnes in 1970-71 to 7.2 million tonnes in 1981-82 and the region's share in the all-India production went up from 5.9 per cent to 13.5 per cent. In all the eastern States and Union Territories put together, area under rice was 17.8 million hectares in 1983-84. The yield per hectare in this region averaged 12.1 quintals, compared to 30.6 quintals in Punjab.

2.35 The important factors responsible for low rice yields in the eastern region are low coverage of area under high yielding varieties, poor consumption of fertilisers, late sowing/transplanting and prevalence of the practice of direct seeding over large areas. The number of seedlings per square metre is found to be much less than the optimum, particularly in the directly sown areas. Line-sowing in the directly sown areas will facilitate weeding operations and thus help improve the yields. Assam gets low yields from the *Ahu* crop, and can do better by diverting the *Ahu* area to *Aman*. Alternatively, some of the *Ahu* paddy are may be diverted to kharif pulses and oilseeds. In Bihar many paddy areas get submerged due to floods ; the damage can be minimised by staggering sowings in nurseries and taking up replanting in the affected areas later. Rice yields are low in the uplands, and farmers need to be induced to switch from paddy to maize, groundnut, soyabean or pulses. Growers in the region also face frequent occurrence of insects, pests and diseases. Work on the evolution of varieties for the region and resistant to common insects and diseases has to be stepped up. To some extent, early sowings may help avoid the infestation of pests and diseases. Appropriate chemicals and pesticides should be made available to farmers in time, in adequate quantities, and at reasonable prices, with the necessary credit back up.

Wheat

2.36 The growth of wheat production in India has been a success story : the Green Revolution is largely the Wheat Revolution. Production of wheat has been

increasing from year to year and new records have been set every year since the beginning of the Sixth Plan. Wheat can be grown successfully in varying agro-climatic conditions, and is now being widely cultivated outside the traditional regions.

2.37 However, the lead in the production of wheat remains with the traditional region. The yield rates of wheat outside Punjab, Haryana and Uttar Pradesh are low. While the average yield per hectare in 1983-84 in Punjab was 30.2 quintals per hectare, it was only 13.8 quintals outside Punjab, Haryana and Uttar Pradesh. The difference in yield rates between the northern States and the other wheat growing areas represents the immediately realisable potential. Many progressive farmers in these areas have obtained yields as high as in Punjab or even higher. Effective extension effort and adequate input supplies can ensure that such yield rates are the rule rather than the exception. The main constraints in wheat production in these areas are inadequate replacement of the old HYV seeds, low coverage of area under irrigation and low level of fertiliser application. Newly emerging wheat areas in the eastern region are characterised by relatively abundant groundwater resources. As in the Punjab-Haryana-West Uttar Pradesh belt, it should be possible to exploit groundwater resources in the eastern region through an extensive network of tubewells and pump sets. Wheat sowings in the eastern region are generally late and the sowing time-table in the region needs to be advanced. Rajasthan has to introduce split doses of fertilisers on account of its sandy soil.

2.38 Seed is the key ingredient in any production plan. In the absence of high quality seed it is not possible to achieve optimum results from investments in fertilisers, micro-nutrients, water, weed control, etc. Large areas, particularly in the eastern Uttar Pradesh and Bihar, are yet to be brought under HYV seeds. The HYV seeds should be replaced every five years, at the rate of 20 per cent annual replacement. Seed productng agencies generally have a conservative approach. Being commercially oriented they do not want to take the risk of non-utilisation. Appropriate policy has to be developed to tackle this problem. Proper storage of seed is important, more so in the eastern region where humid conditions prevail. Seed breeders and distribution agencies should ensure varietal diversification in each region as an insurance against total loss in the event of eruption of disease or pest of any particular variety.

2.39 Some weeds, particularly phalaris minor and wild oats, constitute a menace to wheat production and often cause quite substantial losses. The weed problem is particularly acute in Punjab, Haryana, Uttar Pradesh and Bihar. Manual control of these weeds is difficult. Effective weedicides are however available. Special efforts ought to be made for their timely supply to small and marginal farmers at low prices.

2.40 Use of optimum doses of fertilisers (NPK) also needs to be promoted. Attention has to be devoted to the maintenance of the proper balance of micro-nutrients in the soil. Because of the growing intensity of cropping, deficiency symptoms in regard to manganese, zinc and sulphur have already appeared in north western India and in northern Bengal. These deficiencies need to be rectified in order to get optimum benefits from the package of improved practices.

Oilseeds

2.41 Only 14.3 per cent of the total area under oilseeds was irrigated in 1980-81. Irrigation coverage was only 7-8 per cent upto 1976-77. As oilseeds continue to be grown predominantly in rainfed areas, their yields fluctuate widely from year to year and region to region. The problem is further accentuated by the fact that a substantial part of the rainfed area under oilseeds comprises marginal, low quality lands. The incidence of pest attacks is very high in these crops and a measure of stability in yield can be secured only through comprehensive pest control operations on a large scale.

2.42 Application of phosphatic fertilizers to groundnut crop is an important drought-combating measure as it promotes root development and thereby stabilises production. Seed production and distribution is another aspect that needs strengthening. A recent welcome trend is the increasing popularity of summer groundnut, soyabean (particularly in Madhya Pradesh), sunflower seeds, and of rape-mustard in the non-traditional areas (in particular Gujarat). Yield rates in all such cases are high in comparison with those obtaining in the traditionally cropped areas. Groundnut requires very light irrigation. Residual moisture after kharif harvests in the irrigated as well as high rainfall areas is sufficient for the sprouting and early growth of summer groundnut. Winter rains and/or some supplemental light irrigation at a later stage is enough to meet the water

requirements of the crop. Yield rates of summer groundnut are, on an average, twice as high as those of the kharif crop. Till a decade ago summer groundnut was almost unknown outside Andhra Pradesh and Tamil Nadu. It has been spreading since then, particularly in Gujarat, Maharashtra and Karnataka. Total area under summer groundnuts increased from 3.8 lakh hectares in 1976-77 to 12.5 lakh hectares in 1983-84. Production of summer groundnut over the period increased from 4.4 lakh tonnes to 19.2 lakh tonnes, and now (in 1983-84) accounts for 26.4 per cent of the total groundnut production. Summer groundnut holds out good promise in future.

2.43 Commercial cultivation of soyabean is of recent origin, having been started in the early seventies. Area under the crop increased from less than one lakh hectares in 1975-76 to over 8 lakh hectares in 1983-84. Production during the period increased from 0.9 to 5.8 lakh tonnes. In 1984-85, according to early reports, soyabean production may exceed 8 lakh tonnes. It has already become the country's third most important oilseed crop after groundnut and rape-mustard. There is good scope for further expansion of soyabean cultivation without displacing other crops. Good potential exists in the large area that remains fallow in Madhya Pradesh and the Bundelkhand region of Uttar Pradesh during the South-West monsoon preceding the cultivation of wheat.

2.44 Potential also exists for the development of high-oil-content sunflower crop as a replacement of low-yielding traditional oilseeds in dryland agriculture. In areas with only light irrigation facilities, sunflower can be profitably accommodated in the rotational pattern, following potato, toria or wheat. Sunflower is also suitable for inter-cropping with long duration crops like sugarcane, or with groundnut in areas with uncertain rainfall. In spite of this potential, however, the production of sunflower has not increased as fast as that of soyabean. After a decade of development effort under especially formulated schemes, area under sunflower increased from 2.4 lakh hectares in 1973-74 to 6.7 lakh hectares in 1983-84. But the yield per hectare over the period has declined from 7.1 quintals to 4.1 quintals. The yield constraints need to be identified. Particular attention needs to be paid to the supply of quality seeds as the high incidence of hollow and poorly-filled seeds was reported to be one of the reasons for the decline in the productivity of the crop.

Pulses

2.45 Production of pulses in India has been stagnating around 10-12 million tonnes for the last 20 years, with the exception of 1975-76 when it reached 13.04 million tonnes. Like oilseeds, pulses are grown mainly on rainfed land, as only 9 per cent of the cultivated area under pulses has irrigation facilities. Pulses are selected for their adaptation to moisture stress conditions, rather than for high yields. Generally, comparatively poor quality lands are devoted to pulses cultivation. Traditional pulse growing areas switch to other crops as irrigation becomes available. There has, however, been no overall reduction in the area under pulses as newly reclaimed and traditionally fallow areas with low quality soil and/or inadequate irrigation facilities are brought under pulses. With the shortfall in the production of pulses, their prices rose much faster than those of coarse cereals which are also grown largely under rainfed conditions. This led to some diversion of area from coarse grains to pulses. Area under pulses increased at a compound rate of 0.77 per cent per annum in the early years of Green Revolution, but the expansion stopped in the later years.

2.46 Another factor underlying sluggish growth in pulses production is that no real high yielding varieties are available in pulses. Only recently some successful work has been done in arhar (tur), moong and gram.

2.47 The story of stagnation in pulses is brought out vividly by the trends in gram, which is the most important pulse crop, accounting for nearly 40 per cent of the total output of pulses. With the spread of HYV of wheat and expansion of irrigated area in the major gram producing States of Punjab, Haryana and Uttar Pradesh, cultivation of gram declined sharply in these States, even though gram prices rose much faster than of wheat. Acreage under gram declined at the rate of 0.17 per cent per annum during 1967-68 to 1975-76. The rate of decline accentuated to 1.7 per cent during 1976-77 to 1983-84. With the sharp increase in gram prices its cultivation became more profitably than coarse grains in the unirrigated areas in Madhya Pradesh, Maharashtra, Gujarat and Rajasthan. Consequently, the share of these states in the total acerage under gram increased from 38.4 per cent in the triennium ending 1963-64 to 47.4 per cent in the triennium ending 1973-74, and further to 61.7 per cent in the triennium ending 1983-84. This, coupled with the continued decline in yields, has acted as a drag on

pulses production in the country. Unless there is a breakthrough in finding a superior high yielding variety of gram, significant increase in production is unlikely to come about.

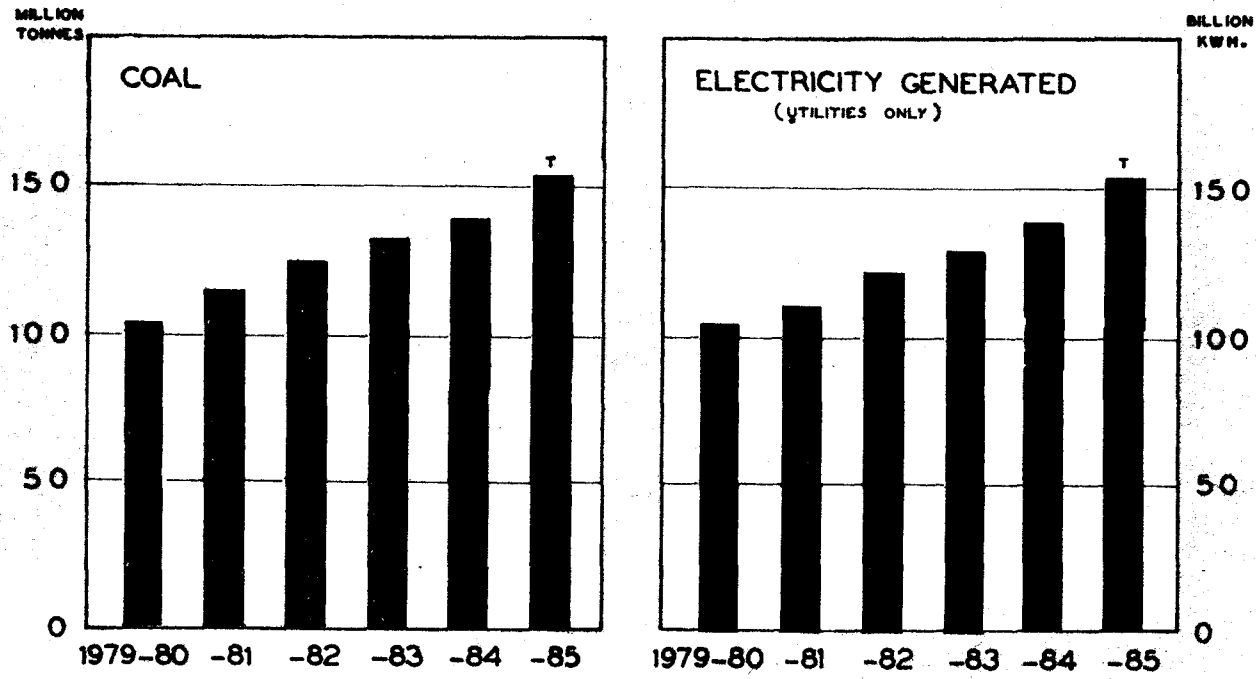
2.48 Tur is the next important pulse crop. It has traditionally been a long duration crop and farmers have been disinclined to grow this crop if alternative short duration crops can be taken from the same land. A hopeful recent development is the evolution of short duration varieties of tur (arhar). These varieties enable arhar to be taken as an additional crop under irrigated as well as assured rainfall conditions. Early maturing varieties of arhar can be accommodated in the northern wheat belt under arhar-wheat rotation. Similarly, potential exists for extending cultivation of rabi moong and urad in the rice fallows, utilising residual moisture, in the eastern and southern States. Moong as a catch crop after harvesting wheat in the irrigated areas may be popularised in some States, specially in the northern region. Timely supply of plant protection chemicals and equipment at reasonable costs is necessary to tur as well as gram crops.

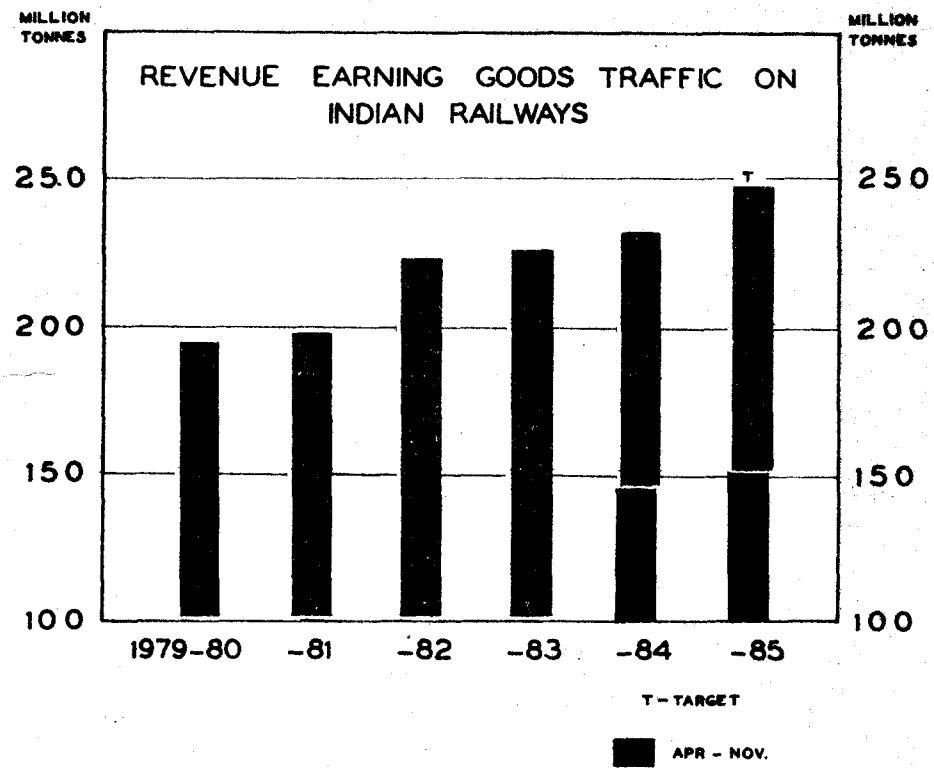
2.49 A substantial step-up in the production of pulses should be achievable as the current yields are low. It is necessary that the farmers adopt improved farm practices like proper spacing, timely sowing, use of proper seed rate, early weed control and, if possible, one or two irigations at critical periods. Productivity of pulse crops can be increased through the use of improved varieties suitable for rainfed cultivation, application of fertilisers—particularly phosphatic, adoption of need-based plant protection measures and seed inoculation with suitable strains of rhizobial cultures.

2.50 To sum up, the performance of Indian agriculture during 1983-84 has been impressive. New production records have been established in wheat, rice and oilseeds. Over the year, foodgrains production increased by 17.0 per cent to 151.5 million tonnes. Considerable progress has been achieved in increasing area under HYV.. The quantity of certified seeds produced has increased manifold during the Plan and an especially encouraging factor has been that these increases were very significant in oilseeds and pulses. The number of minikits of improved varieties of seeds also increased from less than one lakh in 1980-81 to over 57 lakhs in 1983-84. Consumption of fertilisers reached a record level of 7.7 million tonnes in 1983-84 showing an increase of over 1.3 million tonnes in a single year. This impressive increase is attributable to favourable weather conditions, expansion of irrigation, increased coverage of fertiliser-responsive HYV seeds, increase in the number of sale points, improved fertiliser availability at lower prices, and extension efforts.

2.51 The strategy followed so far has been amply rewarded. However, imbalances persist, region-wise and crop-wise. It is therefore necessary to have a region-specific strategy. Some areas show very substantial increases in yield rates while others have lagged behind. Efforts for raising yields in the latter regions command priority. Apart from increasing overall production, this would also help to reduce regional imbalances. Similarly, yield rates of small and marginal farmers continue to lag behind. Since bulk of the total cultivated area is operated by the small/marginal farmers, improvement in the productivity of the small holdings is crucial for further increases in overall production.

PERFORMANCE OF INFRASTRUCTURE SECTORS





MINISTRY OF FINANCE, ECONOMIC DIVISION.

GMGI P/RND-PLN-419/1/Fin/84-85...Chart 4