

AGRICULTURE

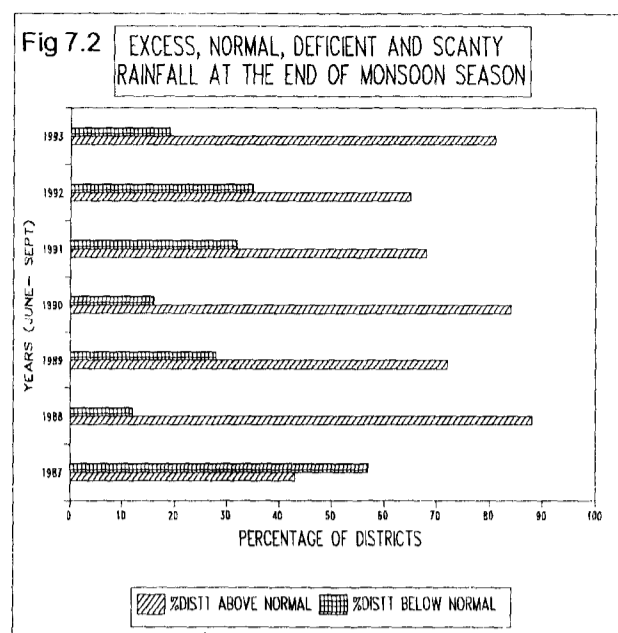
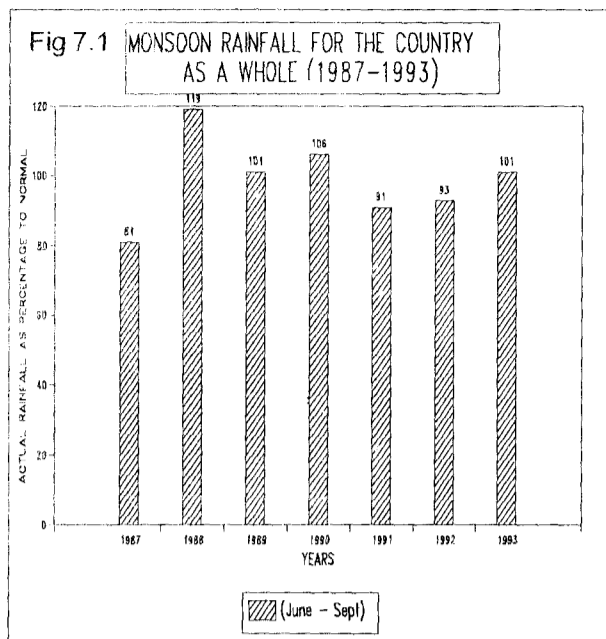
In spite of the dry spell in August, the 1993 Monsoon turned out to be reasonably satisfactory ensuring a fairly good Kharif output. And, as if to make up for the dry spell in August, higher average rainfall in late August and September, brightened the prospects for increased area coverage under rabi crops. With mid January rainfall all over the northern States, rabi crop output is likely to be above normal. Hence the prospects of this year's foodgrains output equalling or even surpassing record level of 180 million tonnes achieved in 1992-93 is a distinct possibility. The oilseeds situation turned out to be equally good despite the setback of crop loss in groundnut in Saurashtra. The total oilseeds output may even exceed the record level of last year's 20 million tonnes. Conditions for sugarcane were ideal in the North but not so good in Maharashtra and hence this year's output at 231 million tonnes would be around last year's level. Fibre crop output is estimated

to be lower this year because of fall in area sown; the decline in output being more pronounced in jute/mesta than in cotton. Plantation crops are expected to have fared better this year. Overall, it was a satisfactory agricultural year with some gain in output seen in rice and wheat, the two principal cereals, and stability maintained in most of the other farm products.

Monsoon During 1993

This year was the sixth successive normal Monsoon year. Country-wide, seasonal rainfall was 101 per cent of the long term average and was 8 percentage points higher than that of 1992 and 10 percentage points over 1991 level. The monsoon arrival was slightly before the normal date in most parts of the country. Punjab and Haryana experienced excess rainfall during the first fortnight of July caus-

Year	Number of Meteorological Sub-divisions			Percentage of districts with normal/excess rainfall	Actual Rainfall as per cent to normal rainfall (country as a whole)
	Excess/Normal	Deficient/Scanty	Total		
1	2	3	4	5	6
		(per cent)			
1987	14	21	35	43	81
1988	32	3	35	88	119
1989	29	6	35	72	101
1990	32	3	35	84	106
1991	27	8	35	68	91
1992	32	3	35	65	93
1993	33	2	35	81	101



ine unusual floods and some loss to cotton crop besides necessitating replanting of rice in some affected areas. Only two sub-divisions received deficient rainfall but there was no meteorological sub-division in the scanty rainfall category this year. There was, however, a dry spell in August, which caused moisture stress in some areas specially in Gujarat and Andhra Pradesh.

2 By the end of the Monsoon season, 33 out of 35 meteorological sub-divisions, accounting for 81 per cent of the districts, received normal to excess rainfall. The comparative performance of monsoon for the years 1987 to 1993 is shown in Table 7.1 and Figure 7.1.

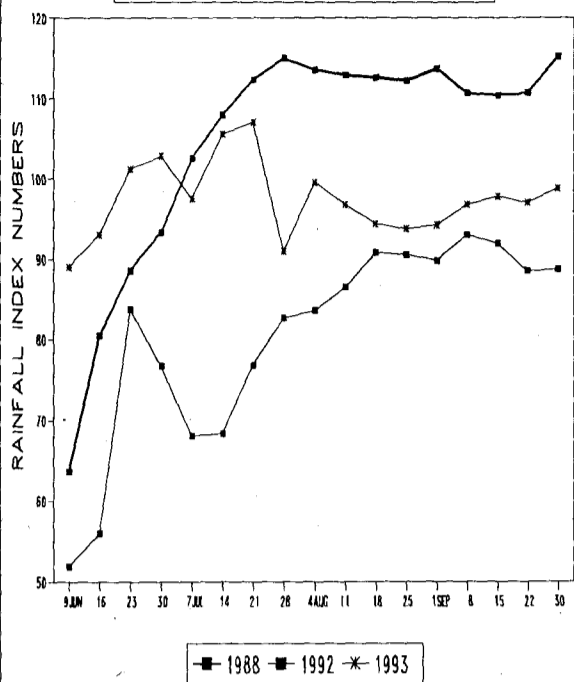
3 The two deficient meteorological sub-divisions this year were Coastal Andhra Pradesh and Saurashtra/Kutch.

TABLE 7.2
Rainfall Indices Weighted by Kharif Cereals Production-State-Wise

States	Production Weights	Rice Area under irrigation*	(Per cent)					
			As on July 14			As on Sept., 30		
			1988	1992	1993	1988	1992	1993
1	2	3	4	5	6	7	8	9
Andhra Pradesh	8.70	94.9	106.29	84.10	82.04	151.16	88.16	80.40
Assam	3.34	33.8	79.27	77.18	106.50	103.05	77.25	113.15
Bihar	7.94	35.4	137.30	54.44	69.10	107.68	64.37	97.14
Gujarat	3.30	48.5	62.62	55.93	161.50	133.69	111.84	102.25
Haryana	2.49	99.1	241.23	42.63	192.64	206.93	87.93	97.32
Himachal Pradesh	0.85	57.6	151.51	51.44	137.93	136.32	91.34	81.41
Jammu & Kashmir	1.23	91.2	165.97	NA	200.16	152.60	NA	38.74
Karnataka	5.80	61.0	75.78	103.07	96.88	119.08	108.78	93.34
Kerala	1.31	40.1	70.92	99.46	104.84	99.05	115.57	82.40
Madhya Pradesh	9.42	20.1	100.93	46.58	101.37	90.79	87.54	101.76
Maharashtra	7.51	30.4	82.54	64.03	100.64	125.82	95.72	100.80
Orissa	6.13	35.6	108.85	69.51	109.50	91.88	92.98	88.35
Punjab	6.91	99.2	179.37	57.28	250.86	183.13	79.22	115.95
Rajasthan	4.02	22.5	93.49	24.49	199.45	79.24	106.53	110.44
Tamil Nadu	8.06	90.8	117.38	105.55	100.66	122.60	94.74	102.91
Uttar Pradesh	12.87	43.4	116.49	52.57	99.13	102.96	81.91	95.75
West Bengal	8.40	24.6	136.81	81.03	95.69	112.99	91.99	113.39
All India	100.00	45.1	107.95	68.39	105.65	115.28	88.76	94.81

NA Not available
* Indicates percentage of irrigated area under rice in 1990-91.

Fig 7.3 RAINFALL INDEX WEIGHTED BY KHARIF CEREAL PRODUCTION JUNE TO SEPTEMBER



Percentage of districts with excess, normal, deficient and scanty rainfall at the end of monsoon season (June-September) for the period 1987-93 is shown in Figure 7.2.

4 The impact of the total rainfall received during the south-west monsoon and its spatial and temporal distribution on the production of kharif cereals, can be analysed by constructing area and production weighted rainfall index. The All-India and State-wise cereals production weighted cumulative rainfall indices for the entire season have been computed by assigning weights based on share in the production of kharif cereals for the triennium ending 1985-86. A comparative picture of temporal distribution of rainfall during the south-west monsoon season of 1993 as compared to 1988 and 1992 is shown in Figure 7.3. Overall rainfall index weighted by kharif cereal production as on 30 September, 1993 was 94.8 per cent compared to 88.8 per cent recorded for the corresponding period of last year.

5 The temporal distribution of rainfall during 1993-94 was somewhat less favourable to kharif crops compared to 1992-93 season, although the total rainfall received in 1993 was quantitatively more compared to 1992. The

TABLE 7.3 Agricultural Production-Principal Crops

Crop	1989-90	1990-91	1991-92 (Revised)	1992-93		1993-94	
				Target	Final	Target	Likely
1	2	3	4	5	6	7	8
(Million Tonnes)							
Rice	73.6	74.3	74.7	77.3	72.6	78.0	74.0
Wheat	49.8	55.1	55.7	57.0	56.8	58.5	56.9
Coarse Cereals	34.8	32.7	26.0	34.3	37.0	36.0	33.7
Pulses	12.8	14.3	12.0	14.4	13.6	15.5	14.5
Total Foodgrains	171.0	176.4	168.4	183.0	180.0	188.0	179.1
Kharif	101.0	99.4	91.6	103.3	100.5	105.5	98.9
Rabi	70.0	77.0	76.8	79.8	79.5	82.5	80.2
Oilseeds	16.9	18.6	18.6	19.0	20.3	21.0	20.5
Sugarcane	225.6	241.0	254.0	243.0	230.8	250.0	231.0
Cotton@	11.4	9.8	9.7	12.0	11.6	12.5	10.6
Jute & mesta	8.3	9.2	10.3	9.3	9.0	9.3	8.3
(Percentage variation in production over the previous year)							
Rice	4.4	1.0	0.5		-2.8		1.9
Wheat	-7.9	10.6	1.1		2.0		0.2
Coarse Cereals	10.5	-6.0	-20.5		42.3		-8.9
Pulses	-7.2	11.7	-16.1		13.3		6.6
Total Foodgrains	0.6	3.2	-4.5		6.9		-0.5
Kharif	5.6	-1.6	-7.8		9.7		-1.6
Rabi	-5.8	10.0	-0.3		3.5		0.9
Oilseeds	-6.1	10.1	-		9.1		1.0
Sugarcane	11.1	6.8	5.4		-9.1		0.1
Cotton@	31.0	-14.0	-1.0		19.6		-8.6
Jute & mesta\$	5.1	10.8	12.0		-12.6		-7.8

@ Bales of 170 kg each
\$ Bales of 180 kg each

spatial distribution of rainfall during 1988, 1992 and 1993 is given in Table 7.2

Reservoir Situation

6 According to Central Water Commission's report for the period ending September 1993 the total live storage position in 60 important reservoirs was 83.0 TMC as against 90.5 TMC during the corresponding period of 1992 and past 10 years average storage of 86.2 TMC. The water storage in September 1993 was nearly 70 per cent of the designed utilisable storage as against 77 per cent recorded during September 1992.

Production Performance During 1992-93 and Prospects During 1993-94

7 Performance of agricultural production during the last four years and the prospects during 1993-94 are given in Table 7.3. Trend in Foodgrain production for the period 1982-83 to 1992-93 is shown in Fig. 7.4. Production performance for the period 1985-86 to 1992-93 compared to 1970-71 and 1980-81 is shown in Fig. 7.5 and 7.6.

Foodgrains

8 The production of foodgrains during 1992-93 reached a record level of 180 million tonnes which was higher by about 7 per cent over the previous year. This was mainly due to a quantum jump in the production of coarse cereals which was higher by 11 million tonnes over 1991-92. The production of wheat also attained a new height at 56.76 million tonnes during 1992-93. The increase in production of foodgrains has been rather modest during the last three years.

Rice

9 Area under rice during 1992-93 was 41.64 million hectares, 2.4 per cent less than the previous year. With only 45.1 per cent of the total rice area under irrigation, the country still depends heavily on south-west monsoon rain. Total production of rice in 1992-93 at 72.61 million tonnes declined by 2.8 per cent from the previous year's record output of 74.68 million tonnes due to a decline in both area and yield.

10 Kharif 1993 rice area is expected to be at last year's level but production may be higher at 65.50 million tonnes. With summer(rabi) rice production expected at 8.50 million tonnes, the total output of rice (kharif and rabi) during 1993-94 is expected to be 74 million tonnes (about 2 per cent gain over 1992-93).

Wheat

11 In 1992-93, production of wheat reached a record level at 56.76 million tonnes which was 2 per cent higher than that of previous year. The area under wheat increased by 5 per cent from 23.26 million hectares in 1991-92 to

24.43 million hectares in 1992-93. The production target of wheat for 1993-94 has been fixed at 58.50 million tonnes. The cumulative rainfall has been satisfactory during the post monsoon season in all the major wheat growing areas of Punjab, Haryana, Rajasthan, Madhya Pradesh, Uttar Pradesh, besides Bihar plains. A good spell of widespread rain in January is likely to result in a higher wheat output even though current estimate of likely production is 56.9 million tonnes.

Coarse Cereals

12 Jowar, bajra, maize, ragi, small millets and barley constitute coarse cereals. Area under total coarse cereals at 34.8 million hectares in 1992-93 was 4 per cent higher than the preceding year. Production of coarse cereals in 1992-93 rose to a spectacular level at 37.04 million tonnes from the previous year's 25.99 million tonnes, registering an increase of 42.5 per cent, much of it due to extremely favourable weather effect. Production in the current year is likely to fall back to its normal growth trend and hence kharif 1993 output of coarse cereals may be 27.40 million tonnes. With the likelihood of normal production of rabi coarse cereals (i.e., jowar, maize, and barley) at 6.30 million tonnes for 1993-94, the total production of coarse cereals may be around 33.7 million tonnes against the target of 36.0 million tonnes.

Pulses

13 Production of pulses during 1992-93 increased significantly to 13.60 million tonnes from 12.02 million tonnes in 1991-92 recording an increase of 13.1 per cent. The increase in production of pulses during 1992-93 was

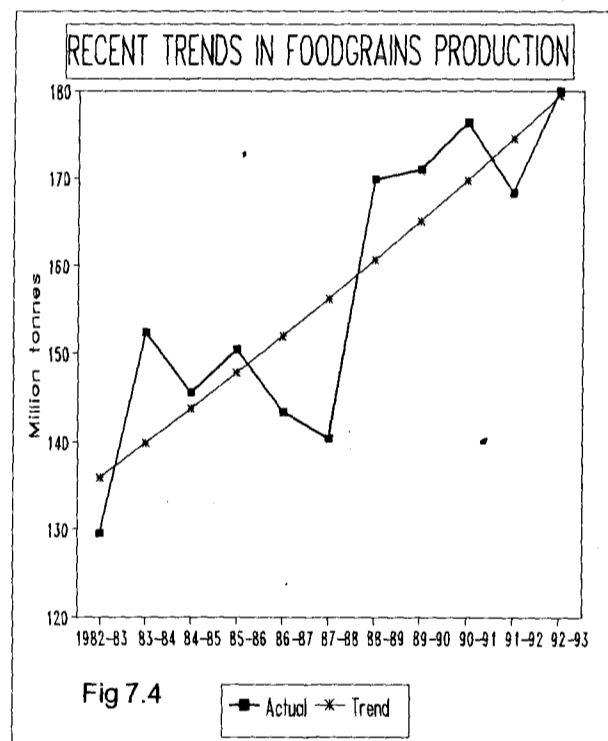


Fig 7.4

Actual * Trend

Figure 7.5

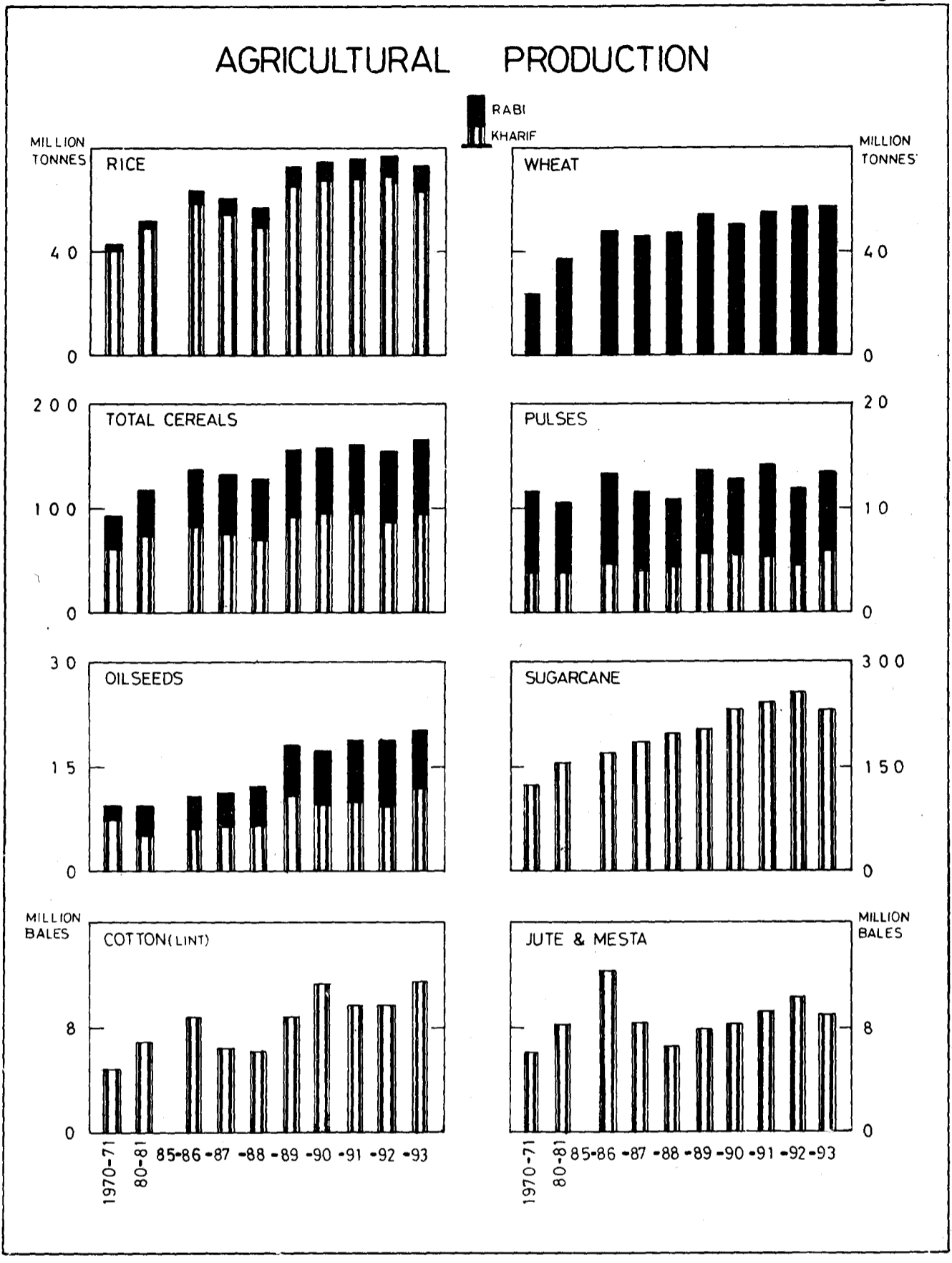
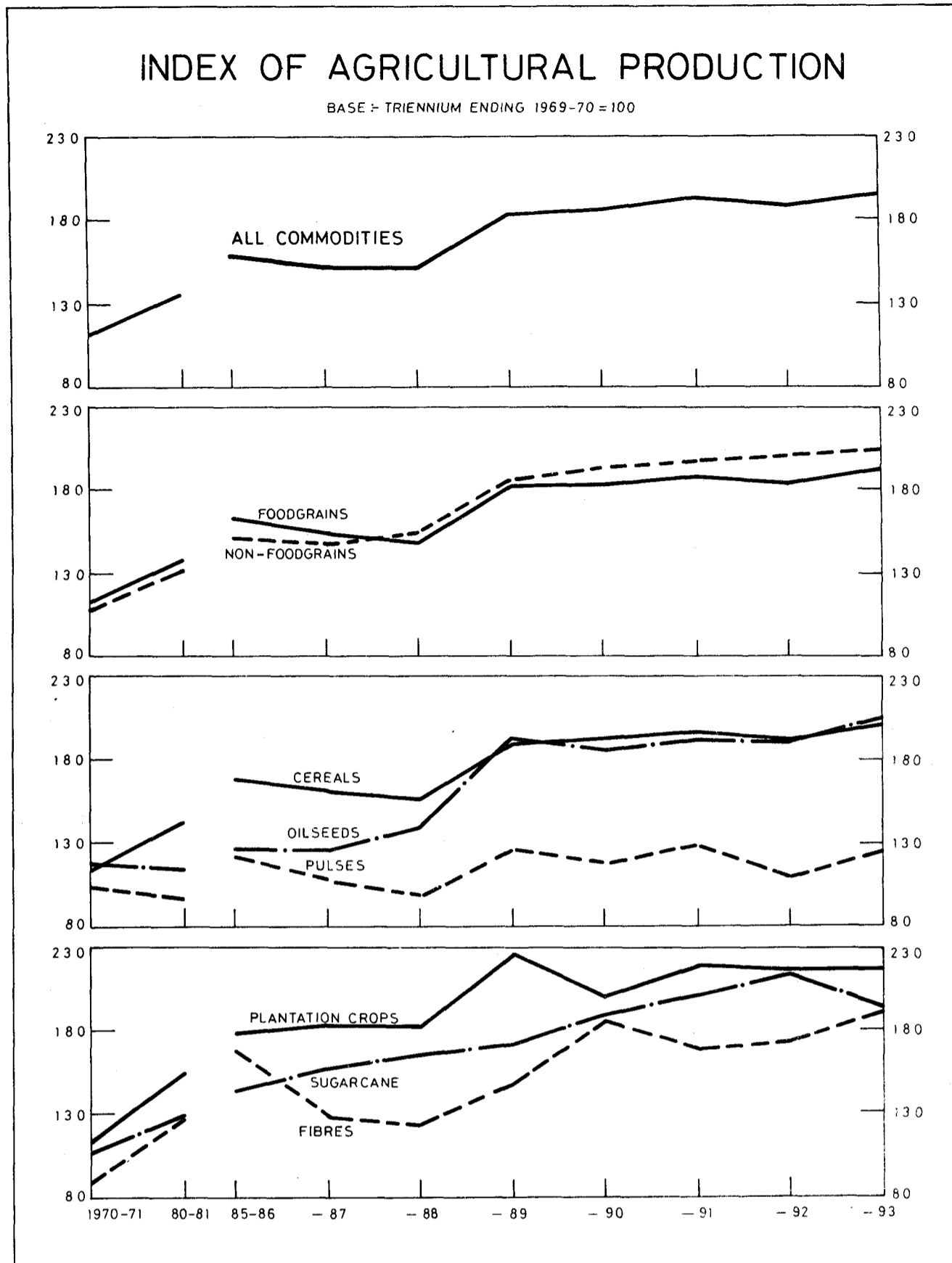


Figure 7.6



Oilseeds	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92*	1992-93**	1993-94	
								Target	Likely
1	2	3	4	5	6	7	8	9	10
Groundnut	5.88	5.85	9.66	8.10	7.51	7.09	8.85	8.20	7.15
Kharif	4.43	4.18	7.49	6.10	5.12	4.99	6.58	6.00	4.90
Rabi	1.45	1.67	2.17	2.00	2.39	2.10	2.27	2.20	2.25
Castorseed	0.23	0.20	0.41	0.52	0.72	0.58	0.62	0.70	0.50
Sesamum	0.45	0.58	0.68	0.74	0.84	0.71	0.85	0.90	0.80
Rapeseed&Mustard	2.60	2.46	4.38	4.12	5.23	5.87	4.87	5.70	5.25
Linseed	0.32	0.39	0.36	0.33	0.33	0.29	0.27	0.40	0.30
Nigerseed	0.13	0.18	0.18	0.19	0.19	0.18	0.18	0.20	0.20
Safflower	0.35	0.46	0.44	0.49	0.32	0.20	0.34	0.40	0.40
Sunflower	0.42	0.63	0.37	0.63	0.87	1.19	1.18	1.40	1.40
Kharif	0.25	0.38	0.22	0.27	0.33	0.36	0.42	0.60	0.60
Rabi	0.17	0.25	0.15	0.36	0.54	0.83	0.76	0.80	0.80
Soyabean	0.89	0.90	1.55	1.80	2.60	2.49	3.11	3.10	4.50
Total	11.27	12.65	18.03	16.92	18.61	18.60	20.27	21.00	20.50
Kharif	6.38	6.42	10.53	9.62	9.80	9.31	11.76	11.50	11.50
Rabi	4.89	6.23	7.50	7.30	8.81	9.29	8.52	9.50	9.00

* Revised estimates
** Final estimates

the result of an increase in both area and yield. Output of pulses during kharif season in 1993-94 may be 6 million tonnes compared to 5.85 million tonnes in 1992-93. If rabi season turns out to be reasonably satisfactory, the total production of pulses during 1993-94 may reach 14.5 million tonnes, which should reduce the pressure for imports of pulses.

Oilseeds

14 Production of nine oilseeds (groundnut, rapeseed and mustard, soyabean, sunflower, sesamum, castorseed, nigerseed, linseed and safflower) is estimated at 20.27 million tonnes during 1992-93 against the preceding year's production of 18.60 million tonnes, registering an increase of 9 per cent. The increase in production of oilseeds was mainly due to an increase in yield from 719 kg. per hectare in 1991-92 to 793 kg. per hectare in 1992-93. Production of safflower, groundnut, soyabean, sesamum and castorseed increased by 70.0 per cent, 24.8 per cent, 24.9 per cent, 19.7 per cent and 7 per cent, respectively, in 1992-93 over 1991-92. On the contrary, production of rapeseed and mustard, linseed and sunflower declined by 17.0 per cent, 6.8 per cent and 0.8 per cent respectively, during the same period. It is interesting to note that the production of groundnut and sesamum increased significantly during 1992-93 despite decline in area by 3.7 per cent and 10 per cent respectively. In spite of dry spell during August,

1993, causing heavy damage to groundnut production in Gujarat, this year's total production of oilseeds may exceed last year's level, since the decline in production of groundnut is likely to have been offset by increased production of soyabean. Trends of production of oilseeds from 1986-87 to 1992-93 and the likely production during 1993-94 along with the targets are shown in Table 7.4

Sugarcane

15 Since 1985-86 production of sugarcane had maintained uptrend until it touched 254.0 million tonnes in 1991-92. In 1992-93, it declined to 230.8 million tonnes mainly due to a decline in area from 3.84 million hectares in 1991-92 to 3.62 million hectares in 1992-93. During 1993-94, the acreage under sugarcane is expected to decline further by 3 per cent, though the production is expected to be around last year's level.

Cotton

16 In spite of a decline in area under cotton by 1.5 per cent during 1992-93 over 1991-92, the production of cotton increased significantly by 19.2 per cent from 9.71 million bales (of 170 kg each) to 11.58 million bales in 1992-93. The increase in production of cotton during 1992-93 was, therefore, exclusively due to an increase in yield. Because of floods in Punjab and Haryana in July and deficient rains in Gujarat during August/September, produc-

tion of cotton during 1993-94 may be just 10.6 million bales.

Jute & Mesta

17 Production of jute and mesta at 9 million bales (of 180 kg each) in 1992-93 registered a decline of 12.6 per cent over the previous year's production of 10.29 million bales mainly due to a decline in area, both under jute and mesta, by about 12.6 per cent and 11.5 per cent respectively. The area under jute in 1993-94 is expected to have declined further as dry weather prevailed at the time of the sowing of the crop in the jute growing eastern region. The crop coverage under mesta was, however, reported to be satisfactory. The total production of jute and mesta may be around 8.3 million bales in 1993-94.

Plantation Crops

Tea

18 Tea is an important traditional item of export. The domestic demand for tea in the last decade has risen at a faster pace compared to production thus resulting in a decline in exportable surplus. Due to unfavourable climatic factors, production of tea declined marginally from 727 million kgs. in 1991-92 to 721 million kgs in 1992-93. In consequence, export of tea was of the order of 177.89 million kgs valued at Rs.993.4 crore during 1993-94 as compared to 216.45 million kgs valued at Rs.1212.27 crore during 1991-92. To meet the increasing domestic and international demand for Indian tea, a perspective plan for achieving the production target of 1000 million kgs by the year 2000 AD has been prepared by the Tea Board. The production target for 1993-94 has been set at 730 million kgs and export target at 210 million kgs.

Coffee

19 The production of coffee varies considerably with the fluctuations in weather conditions. However, from a small quantity of 18893 tonnes in 1950-51, it had gone up to an all time high of 215000 tonnes in 1988-89. The production during 1992-93 was 161500 tonnes. Unlike tea, the bulk of coffee is exported. The domestic demand has been stagnating at around 55000 tonnes per annum. Exports of coffee amounted to 1.13 lakh tonnes valued at Rs.381 crore during 1992-93 compared with 1.11 lakh tonnes valued at Rs.349 crore in 1991-92.

Rubber

20 Production of natural rubber increased from 2.6 lakh tonnes in 1988-89 to 3.95 lakh tonnes in 1992-93. The total area under rubber is estimated to be 4.66 lakh hectares, out of which Kerala alone accounts for 85 per cent. The increase in production was due to an increase in both

area and yield. Rubber is now being grown in non-traditional areas of Karnataka, Maharashtra, Tripura, Meghalaya, Mizoram, Manipur, Assam, Nagaland, Andaman & Nicobar Islands, Goa and Orissa. Most of the rubber plantations are small, the average size being 0.5 hectare. Consumption of rubber is expected to increase from 4.14 lakh tonnes in 1992-93 to 4.5 lakh tonnes in 1993-94. To meet the gap between demand and supply, some quantity of natural rubber continues to be imported.

Irrigation

21 The country's irrigation potential has increased from 22.6 million hectares in the pre-Plan period to 83.4 million hectares at the end of 1992-93 comprising of 31.3 million hectares under major and medium irrigation projects and 52.1 million hectares in minor irrigation projects. The target for 1993-94 is 86.1 million hectares comprising 32.0 million hectares under major and medium projects and 54.1 hectares under minor irrigation projects. Irrigation sector continues to be a priority sector for development in the Eighth Five Year Plan.

22 The problem of underutilisation of created irrigation potential, particularly in major and medium irrigation projects continues to persist. At the end of 1992-93 utilisation was 75.1 million hectares against a created potential of 83.4 million hectares. This leaves a gap of 8.3 million hectares (4.5 million hectares in major and medium and 3.8 million hectares in minor irrigation). The main reasons for the gap are delays involved in the development of on-farm works like construction of field channels, land levelling and adoption of the 'warabandi system' (network of distributories and minors over the command area) and finally the time taken by the farmers in switching over to the new cropping pattern, i.e., from dry farming to irrigated farming.

23 A Centrally sponsored Command Area Development Scheme (CAD) was initiated in 1974-75 with the basic objective of bridging the gap between potential created and potential utilised. The programme, inter-alia, envisaged execution of on-farm development works like construction of field channels, land levelling and shaping, implementation of 'warabandi' for rotational supply of water and construction of field drains. In addition, the programme also encompasses adaptive trials, demonstration and training of farmers and introduction of suitable cropping patterns. Up to March 1993 about Rs.3512 crore was spent on the programme, of which the Central assistance amounted to Rs.1185 crore and the balance of Rs.2327 crore was met under the State sector schemes.

24 Minor irrigation schemes include ground water and surface water projects. While ground water schemes in-

	At the end of Seventh Plan	During 1990-92	At the end of 1991-92	1992-93 (Likely)	1993-94 (Target)
1	2	3	4	5	6
1. Major & medium irrigation					
Potential	29.9	0.8	30.7	0.6	0.7
Utilisation	25.5	0.9	26.4	0.5	0.6
2. Minor Irrigation					
Potential	46.6	3.7	50.3	1.8	2.0
Utilisation	43.1	3.4	46.5	1.7	1.7
3. Total					
Potential	76.5	4.5	81.0	2.4	2.7
Utilisation	68.6	4.3	72.9	2.2	2.3

Note : Irrigation projects with a Cumulative Command Area (CCA) of more than 10000 hectares are classified as major projects and projects with CCA of more than 2000 hectares and up to 10000 hectares as medium projects.

clude dugwells, shallow tubewells and pumpsets, the surface water schemes include tanks and reservoirs diversion schemes, lift irrigation from rivers and streams etc. These schemes have been accorded special attention under the Special Foodgrains Production Programme. For 1993-94, the targets for irrigation potential created and utilisation are 2.0 m.ha. and 1.7 m.ha respectively. Because of shorter gestation lags and lower investment costs, emphasis is being laid on creation of minor irrigation schemes to cover both surface and ground water. Because of advantageous water table levels, the eastern sector is being given special attention for exploration of minor irrigation during the Eighth Plan.

25 The details of development of irrigation potential and their utilisation are listed in Table 7.5.

26 Strengthening the infrastructure for irrigation is one of the main objectives of the Eighth Plan. Major elements of the strategy include giving priority for completion of the on-going projects, ensuring speedy transition to irrigated agriculture and optimum use of water through Command Area Development (CAD) programme, installation of sprinkler and drip irrigation systems in water scarce and drought prone areas and encouragement to minor surface water and lift irrigation schemes.

27 Water for irrigation is a scarce resource and, therefore, water use optimisation is fundamental to water resource use. Maintaining irrigation system raises the important question of delivery cost of the system. The user cost is an issue that can no longer be brushed aside. Irrigation charges should be such as to reflect the scarcity value of the resource to the users and to foster economy in the use of water. The charges should at least cover the

annual maintenance and operational expenses and a part of the fixed costs. The water rates for surface and ground water need to be rationalised with due regard to the interests of small and marginal farmers.

Seeds

28 Availability of quality seeds is essential for achieving higher production. Accordingly, high yielding variety programme (HYV) started in 1966-67 has remained a major instrument of agricultural strategy to increase foodgrains production in the country. The HYV programme is supported by 'mini kit demonstration' programme for rice, wheat and coarse-cereals for popularising newly identified varieties suitable for different agro climatic zones.

29 During 1992-93, 5.85 million quintals of certified quality seeds were distributed to farmers as against 5.75 million quintals during 1991-92. The distribution of certified seeds is expected to reach the level of 7 million quintals by the end of Eighth Plan. The progress of area covered under HYV seeds under different crops and their share in the total area are listed in Table 7.6.

30 As an incentive to improve and diversify domestic seed industry, imports of seeds of oilseeds, pulses, vegetables, flowers or fruits for sowing or planting, etc. have been fully exempted from custom duties, besides allowing pre-shipment credit for 180 days at concessional rate of interest. Apart from this, the National Seeds Project Phase-III launched in March 1990 with the assistance of the World Bank for strengthening the public and private seed sector is continuing. The project is scheduled to receive an assistance of U.S.\$150 million up to June 1995.

Crop	1966-67	1988-89	1989-90	1990-91	1991-92*	1992-93 (Estimated)	1993-94 (Target)
1	2	3	4	5	6	7	8
	(Million hectares)						
Paddy	0.9	25.4	26.2	28.1	28.0	28.3	31.0
Wheat	0.5	20.2	20.3	20.4	20.5	22.2	22.8
Jowar	0.1	6.1	6.9	6.7	6.8	6.9	9.0
Bajra	0.1	5.9	5.6	5.1	5.4	5.6	6.9
Maize	0.2	2.5	2.3	2.6	2.8	3.0	3.5
Ragi	-	-	-	1.0	1.2	1.1	1.1
Total	1.8	60.1	61.2	63.9	64.7	67.1	74.3
	(Percentage of HYV area to Total Area under the crop)						
Paddy	2.6	60.9	62.1	65.8	65.7	68.0	
Wheat	3.9	83.8	86.4	84.3	88.1	90.8	
Jowar	0.6	41.8	46.6	46.5	55.0	52.6	
Bajra	0.8	49.2	51.4	48.6	53.8	52.9	
Maize	3.9	42.4	39.0	44.1	47.8	49.8	
Ragi	-	-	-	45.5	56.3	53.4	
* Revised							

Fertilisers

31 Use of fertilisers remains one of the principal determinants of crop yield. The consumption of fertiliser, which was only 0.13 million tonnes in 1955-56, increased to 12.2 million tonnes in 1992-93. At this level the consumption was lower by 4.52 per cent as compared to 1991-92. This was mainly due to a fall in the consumption of phosphatic and potassic fertilisers in the wake of price decontrol and consequent rise in prices in August 1992. Fertiliser consumption since 1985-86 is shown in Table 7.7.

Year	Nitrogenous	Phosphatic	Potassic	Total
1	2	3	4	5
1985-86	5.7	2.0	0.8	8.5
1986-87	5.7	2.1	0.9	8.7
1987-88	5.7	2.2	0.9	8.8
1988-89	7.3	2.7	1.1	11.1
1989-90	7.4	3.0	1.2	11.6
1990-91	8.0	3.2	1.3	12.5
1991-92	8.0	3.3	1.4	12.7
1992-93	8.4	2.9	0.9	12.2
1993-94*	9.6	3.2	1.0	13.8
* Target				

32 Consumption in appropriate mix of the three primary plant nutrients -Nitrogen(N), Phosphate (P) and Potash(K) is essential for increasing crop yields. The ideal average NPK ratio aggregated for the country as a whole is 4:2:1, which is substantially at variance with the observed all-India NPK consumption ratio as shown in Table 7.8.

Year	N	P	K
1	2	3	4
1955-56	10.8	1.3	1
1960-61	7.2	1.8	1
1965-66	7.5	1.7	1
1970-71	6.5	2.0	1
1975-76	7.7	1.7	1
1980-81	5.9	1.9	1
1985-86	7.0	2.5	1
1990-91	6.0	2.4	1
1991-92	5.9	2.4	1
1991-92*	6.4	2.6	1
1992-93	9.5	3.2	1
1992-93*	15.1	4.6	1
* Rabi			

33 There was some narrowing down of NP ratio of consumption from 5.9:1.9 in 1980-81 to 5.9:2.4 in 1991-92. However, this trend seems to have been reversed during 1992-93 as the Nitrogen to Phosphate ratio has increased to 9.5:3.2 in 1992-93. This is attributed to the distortion

	Production (N+P) (000' tonnes)	Imports (N+P) (000' tonnes)	Subsidy (Rs. crore)		Total
			On imported fertilisers	On domestic fertilisers	
1	2	3	4	5	6
1985-86	5756	3399	324	1600	1924
1986-87	7070	2310	197	1700	1897
1987-88	7131	984	114	2050	2164
1988-89	8964	1608	201	3000	3201
1989-90	8543	3114	771	3771	4542
1990-91	9045	2758	659	3730	4389
1991-92	9863	2769	1300	3500	4800
1992-93	9740	2986	996	4800	5796
1993-94 (Budgeted)	10000	2938	570	3430	4000

in fertiliser pricing policy. The impact of distortion is more visible in the rabi season as N to P ratio has significantly increased from 6.4:2.6 in 1991-92(Rabi) to 15.1:4.6 in 1992-93(Rabi). This is not a healthy trend as this imbalance in NPK consumption may aggravate soil fertility problems and affect productivity adversely in future crop seasons.

34 The production of nitrogenous and phosphatic fertilisers during 1992-93 stood at about 9.74 million tonnes exhibiting a marginal decline of about one per cent over the previous year. During the year 1993-94, however, the production of nitrogenous and phosphatic fertilisers is expected to increase. Details of production, imports and subsidies are given in Table 7.9.

35 Domestic fertiliser industry has begun to face greater competition following the decontrol and decanalisation of non-nitrogenous fertilisers and trade policy changes introduced in 1992-93. The custom duty on imports of phosphoric acid, the main intermediate used in manufacture of DAP, has been abolished. To offset the sharp increase in the price of Diammonium Phosphate (DAP), the Government has provided a subsidy of Rs.1000 per tonne on the sale of indigenous DAP and proportionate concession on indigenous complex fertilisers in 1992-93 and 1993-94. This subsidy of Rs. 1000 per tonne is also available on sale of imported Muriate of Potash(MOP). A concession of Rs.340 per tonne has also been allowed on single super phosphate during 1993-94. Thus apart from the budgeted provision of Rs.3500 crore as fertiliser subsidy, demand was approved for supplementary appropriation for Rs.430 crore arising on account of Rs.1000/tonne subsidy on indigenous DAP. Additional import of urea involving Rs.70 crore subsidy has also been provided for. The total subsidy therefore would amount to Rs.4000 crore in 1993-94.

36 As a long term measure to reduce the capital related cost of fertiliser plants, custom duty on imports of capital goods required for setting up of new fertiliser plants as well as for renovation and modernisation programmes was abolished on September 23, 1992. It is apprehended that the increasing gap between demand and indigenous production would have to be met through imports. Similarly, the entire requirement of potassic fertilisers would continue to be imported since there is no domestic capacity. In spite of decontrol of phosphatic and potassic fertilisers, the total fertiliser subsidy during 1992-93 was of the order of Rs. 5796.11 crore. It is, therefore, important that some price rationalisation is introduced to not only remove the imbalance in the use of plant nutrients but also to limit the total subsidy.

Plant Protection

37 Need-based and judicious application of pesticides has been promoted through Integrated Pest Management (IPM). The strategy is to adopt environmentally safe and cost-effective plant protection measures. This technology harmonises with other segments of crop husbandry for achieving higher productivity. The IPM includes pest monitoring, promotion of biological control of pests, organising demonstrations and training of extension workers and farmers especially on crops such as, rice, cotton, oilseeds and pulses by 26 Central Integrated Pest Management Centres in collaboration with the State Departments of Agriculture, State Agricultural Universities, Krishi Vikas Kendras and Indian Council of Agricultural Research Institutes.

38 After a lapse of three decades, about 200 mature/maturing swarms/swarmlet incursions occurred in the districts of Jaisalmer, Barmer and Bikaner of Rajasthan and

Banaskantha and Kutch districts of Gujarat from the Western border during July-October 1993. The unprecedented locust incursions were handled by the Locust Warning Organisation and most of the swarms were neutralised within the Scheduled Desert Area. This has also helped in preventing possible reverse migration towards the winter-spring breeding areas of Pakistan, Iran, etc.

39 The consumption of pesticides in 1992-93 is estimated to be 75000 tonnes as compared to 72100 tonnes in 1991-92. Bulk of the requirement of pesticides was met through indigenous production. In order to reduce the use of chemical pesticides and contamination to environment, bio-pesticides are being actively promoted.

Agricultural Credit

40 Availability of adequate credit/finance to the agricultural sector is one of the most important factors for achieving the objectives of increased foodgrains production/productivity. The institutional framework for present rural credit system consists of cooperative banks, regional rural banks (RRBs), rural branches of commercial banks and National Bank for Agriculture and Rural Development (NABARD). The institutional agencies advance loans for a variety of purposes such as agriculture, agro industry and rural artisans and target groups under Integrated Rural Development Programme (IRDP). The loans are of short, medium and long term duration depending upon the end-use of the funds.

41 The total quantum of agricultural loans provided by cooperatives, commercial banks and RRBs has increased

from Rs. 7005 crore in 1985-86 to Rs. 11308 crore in 1991-92 and to Rs. 13000 crore in 1992-93. The target for 1993-94 is Rs. 15100 crore. Agency-wise disbursement of agricultural credit from 1985-86 to 1992-93 and the target for 1993-94 are given in Table 7.10.

42 Despite the increase in overall agricultural credit, there is a serious problem of overdues which has been inhibiting credit expansion and economic viability of the lending institutions, especially the cooperatives and the RRBs. The waiver of agricultural loans in 1990 has further accentuated the problem of recovery. For strengthening the cooperative credit structure, NABARD is contemplating an institutional strengthening programme. The Government has also initiated certain measures to revitalise the cooperatives on the recommendations of the Agricultural Credit Review Committee. These measures include amendment to State Cooperative Laws, holding elections of cooperative bodies, revitalising Primary Agricultural Credit Societies (PACS) through business development planning and formulating Deposit Guarantee Schemes for PACS.

43 Considering the increase in prices of agricultural inputs and with a view to enabling the NABARD to extend adequate credit support for rabi crop operations, the Reserve Bank of India has announced in October 1993 additional loans and credit for short-term agricultural operations.

Crop Insurance

44 In order to provide financial support to farmers in the event of crop failure due to drought, flood, etc., and to

TABLE 7.10
Disbursement of Agricultural Credit

Source and type of credit	(Rs. crore)								
	1985-86	1986-87	1987-88§	1988-89§	1989-90§	1990-91*	1991-92*	1992-93*	1993-94 (Target)
1	2	3	4	5	6	7	8	9	10
COOPERATIVES									
Short-term	2787	3007	3824	4087	3995	2822	3950	4900	6000
Medium-term	505	585	688	809	577	366	391	182	461
Long-term	582	615	734	655	684	785	1005	1213	2039
Sub-total	3874	4207	5246	5551	5256	3973	5346	6295	8500
COMMERCIAL AND REGIONAL RURAL BANKS									
Short-term & term loans	3131	3809	4009	4234	4930	5010	5962	6705	6600
Grand Total :	7005	8016	9255	9785	10186	8983	11308	13000	15100
§ Revised									
* Provisional									

restore the credit eligibility for the next crop season, a Comprehensive Crop Insurance Scheme (CCIS) was introduced in April 1985 which at present covers wheat, paddy, millets, oilseeds and pulses. Half of the premium payable by small and marginal farmers is subsidised equally by the Central and State Governments and indemnity claims are shared between the Government of India and State Governments in the ratio of 2:1 under this Scheme.

45 From kharif 1985 to the end of rabi 1992-93 season, 365.55 lakh farmers have been covered over an area of 637.08 lakh hectares insuring a sum of Rs.8458.85 crore. Claims amounting to Rs.948.56 crore were paid to the farmers (of which Gujarat alone accounted for more than half the amount) against a premium income of Rs.141.91 crore. The season-wise progress of CCIS is shown in Table 7.11

Investment

46 Deceleration in agricultural investment during the eighties has been an area of concern. Gross investment in real terms (at 1980-81 prices) in agriculture has declined from Rs.4636 crore in 1980-81 to Rs.4580 crore in 1991-92 (estimates). From 18 per cent of the total gross domestic capital formation in agriculture in 1980-81, it has sharply declined to 11 per cent in 1991-92. During 1991-92, investment in agriculture as a proportion of gross domestic capital formation, however, increased from 9.5 per

cent in 1990-91 to 11 per cent. The decline in capital formation in agriculture by public sector is more perceptible as it has come down to Rs.1043 crore in 1991-92 compared to Rs.1796 crore in 1980-81. Even though the private sector investment in agriculture has increased in absolute terms from Rs.2840 crore in 1980-81 to Rs.3537 crore in 1991-92, yet its share in total gross domestic capital formation declined from 20.2 per cent to 15.4 per cent during the period.

47 The problem of investment in agriculture is not a problem of total availability of resources but one of distribution between current expenditure and capital formation. Since 1980-81 a larger portion of public expenditure went into current expenditure in the form of increased level of subsidies for fertiliser, irrigation, electricity, credit and other agricultural inputs rather than investment. Government is still grappling with the task of reducing subsidies and rationalising farm input support policies so as to release resources for investment in agriculture specially in irrigation which has high potential to enhance productivity. It is also felt that there is scope for increasing the investment by the private sector if policy incentives are seen to be effective especially in export oriented agricultural enterprises.

Agricultural Research and Extension

48 The remarkable stability and resilience attained in Indian agriculture despite the occasional hiccups caused

TABLE 7.11
Progress of Comprehensive Crop Insurance Scheme (CCIS)
(Kharif 1985 to Rabi 1992-93)

Season	No. of States/UTs	No. of farmers covered (Lakh)	Area covered (Lakh hectares)	Sum Insured (Rs. crore)	Premium collected (Rs. crore)	Claims paid/payable (Rs. crore)
1	2	3	4	5	6	7
Kharif 1985	13	26.4	53.7	542.7	9.4	84.1
Rabi 1985-86	16	12.1	23.2	238.4	4.5	3.1
Kharif 1986	18	39.6	77.4	856.2	15.0	169.4
Rabi 1986-87	17	11.3	21.0	242.4	4.5	4.6
Kharif 1987	21	46.3	84.1	1140.7	19.1	277.4
Rabi 1987-88	19	21.3	32.4	475.4	8.8	12.1
Kharif 1988	13	29.6	52.4	547.9	8.8	29.2
Rabi 1988-89	9	8.7	10.1	164.1	3.1	3.9
Kharif 1989	17	42.3	66.5	873.9	14.5	34.4
Rabi 1989-90	17	6.6	9.6	151.6	2.8	2.9
Kharif 1990	17	19.4	34.1	515.1	7.7	81.6
Rabi 1990-91	16	7.9	10.7	196.3	3.5	4.0
Kharif 1991	17	37.6	68.6	931.4	14.4	195.0
Rabi 1991-92	15	7.8	11.0	199.9	3.6	8.8
Kharif 1992	17	41.2	72.3	1154.7	18.1	43.7
Rabi 1992-93	16	7.4	10.1	228.1	4.1	7.0

by erratic monsoon is testimony to the progress made through research in this sector. The Indian Council of Agricultural Research (ICAR) has been in the forefront in evolving, testing and propagating new farm technologies. It has initiated research on almost all the economically important crops, besides soil sciences, horticulture and agricultural extension. Today India is one of the eight gene centres in the world having three Bureaux dealing with plants, animals and fishes.

49 Department of Agriculture has reorganised extension services in major States including North-Eastern States and other Union Territories. Training infrastructure in the Central and State sector has been developed substantially. National Institute of Agricultural Extension Management, 4 Extension Education Institutes and 15 Advanced Training Institutes have been established for training of extension personnel at various levels. To improve farmer-scientist interaction two new schemes, namely, 'Agricultural Extension through Voluntary Organisations' and 'Women in Agriculture,' are in the pipeline.

Animal Husbandry and Dairy Development

50 Owing to its vast employment potential, animal husbandry/livestock rearing plays a prominent role in the rural economy in supplementing the family income particularly for the low income landless families and small and marginal farmers. By providing valuable animal protein for human diets and also other products of mass consumption, this sector's contribution is crucial in raising the per capita nutritional level.

51 India is endowed with livestock resources of considerable genetic diversity to withstand environmental stress and inadequate levels of nutrition and management. The gross value of output from this sector is estimated at Rs.51600 crores in 1991-92 compared to Rs.43659 crore in 1990-91 accounting for 25.5 per cent of the value of total agricultural output (excluding the contribution of animal draught output).

52 India ranks second in the world in milk production, with an estimated production of 58.6 million tonnes in 1992-93, about 3.5 per cent higher over 1991-92. Success in raising the level of milk production is ascribed to the Operation Flood Project, world's largest integrated dairy development programme started in 1970 by the National Dairy Development Board (NDDB). This programme is basically designed to link rural milk producers with urban consumers and is currently in its third phase of implementation with financial assistance from the World Bank and commodity assistance in the form of skimmed milk powder and butter oil from European Economic Community (EEC). Over 65300 Dairy Cooperative Societies

have been organised in 10 milk sheds involving about 8.4 million farmer members. A Technology Mission for Dairy Development has been launched in order to systematise and coordinate dairy development programmes.

Poultry

53 Poultry farming is fast becoming one of the most important components of rural economy as it provides additional income and employment opportunities to a large segment of the population especially the weaker sections of the society, educated unemployed youth and women. Main strategy is to increase production of eggs and poultry meat through increased availability of quality chicks and supply of other inputs like balanced feed, health care, marketing and storage and other infrastructural facilities.

54 A large number of poultry estates are planned to be set up in collaboration with agencies like National Cooperative Development Corporation (NCDC), National Bank for Agricultural and Rural Development (NABARD), State Governments and non-Government organisations. Production of eggs in 1992-93 is estimated at 25.1 billion.

Fisheries

55 Fisheries sector is an important source of augmenting country's food supply, raising nutritional levels, generating employment and earning foreign exchange. Production of fish reached 4.36 million tonnes in 1992-93, registering 5 per cent growth over 1991-92. This comprised 2.58 million tonnes of marine fish and 1.78 million tonnes of inland fish. Production of fish is expected to be 4.57 million tonnes in 1993-94. Special efforts have been made to promote extensive and intensive fish farming activity in the inland sector through modernisation of coastal fisheries, and by giving encouragement to deep-sea fishing through joint ventures, etc. Share of inland fish production in total fish production increased from 36 per cent in 1980-81 to 41 per cent in 1992-93. In the case of marine fisheries, a quantum jump in production in recent years was possible through speedy motorisation of traditional fishing craft with added incentive provided for reimbursement of central excise duty on high speed diesel oil used by the mechanized boats, besides banning of bulk trawling of chartered foreign fishing vessels.

56 Fisheries sector, especially its marine component, has tremendous export potential. Export of marine products was valued at Rs.1767 crore in 1992-93 up from Rs.1395 crore in 1991-92. Export earnings are expected to be Rs.2105 crore in 1993-94. According to quick estimates made by the Central Statistical Organisation, contribution of fisheries sector to the Net Domestic Product at current prices showed a seven fold increase from Rs.806 crore in 1980-81 to Rs.5860 crore in 1992-93.

57 The Eighth Plan aims at increasing the average productivity of fish from the present 2075 kg. to 2500 kg. per hectare per annum and the area under fish culture from the existing three lakh hectares to four lakh hectares. Plans to increase fisheries output include Centrally Sponsored Scheme, Fish Farmers' Development Agencies and selective introduction of motorised fishing crafts for offshore pelagic fishing for exploitation of underexploited fish resources in the coastal waters. To promote export-oriented shrimp production, a World Bank assisted shrimp culture project has been taken up on the east coast that includes West Bengal, Orissa and Andhra Pradesh. Prawn farmers are also assisted through a subsidy of Rs. 30000 per hectare for construction of ponds all along the coastal States.

Agricultural Marketing

58 Much of the agricultural produce in the country is freely marketed through private trade operating in organised markets/mandies. The role of the Government is limited to protecting the interests of producers and consumers, particularly in respect of wage goods, mass consumption goods and essential goods. Government endeavours to promote organised marketing of agricultural commodities in the country.

59 To achieve this objective most of the State/U.T. Governments have enacted necessary legislation for regulation of agricultural produce markets. The number of regulated markets in the country as on March 30, 1993 was 6772. A number of organisations have been established with specific objective of helping the Government in implementation of various policies and developmental programmes relating to agricultural marketing.

60 Marketing of farm produce is also encouraged through a network of cooperative societies operating as primary, state and national level marketing societies, general marketing societies as well as commodity marketing societies. The marketing of agricultural produce through cooperatives has registered a substantial growth from Rs.1950 crore in 1980-81 to Rs.6503 crore in 1991-92. Cooperatives play an important role in the procurement operations of both essential consumer commodities like rice and wheat and commercial crops like cotton and jute. The National Agricultural Cooperative Marketing Federation of India (NAFED) is an apex cooperative organisation dealing in procurement/distribution/export and import of selected agricultural commodities. A few other organisations in the cooperative sector are the National Cooperative Tobacco Growers Federation Limited and the National Consumers Cooperative Federation. One of the important functions of the Tribal Cooperative Marketing Development Federation of India Limited is to attend to

the marketing problems of the tribals. In addition, specialised boards for commodities like rubber, coffee, tea, tobacco, spices, vegetable oils, etc. and separate Directorates to manage development of special commodities like sugarcane, jute, tobacco, oilseeds, rice, cotton, cocoa, arecanut, spices, etc. have been created. The NAFED has been appointed as a Central Nodal Agency for undertaking marketing operations for a number of agricultural commodities covered under the price support/market intervention operations.

Exports of Agricultural Products

61 One of the principal objectives of the current Export and Import policy is to enhance export capabilities of the agriculture sector by promoting productivity, modernisation and competitiveness. To achieve this objective, definition of capital goods has been enlarged to cover agricultural sector. This will facilitate import of capital goods at reduced duty rates. Negative list of exports has been substantially pruned by deleting 72 items and 72 sub-items. The benefits available under the scheme of 100 per cent Export Oriented Units (EOU) and Export Processing Zones (EPZ) have been extended to the exporters in agriculture, animal husbandry, floriculture, pisciculture and poultry sectors. Domestic Tariff Area sales have been permitted upto 50 per cent of their turnover. Aquaculture EOUs will not be subject to physical bonding.

62 Indian farm products are characterised by extremely low import content compared to non-farm exportables. The exchange rate convertibility on trade account has, therefore, enabled many of the farm-based products become internationally competitive. Rice, wheat, cotton, fruits and vegetables and flowers are some of the non-traditional exportables. Some of the important measures initiated recently to accelerate the growth of agricultural exports are: (i) minimum export price (MEP) on basmati rice, pepper, guar gum, orchids and meat of sheep, goat and buffalo has been removed; (ii) exports of milk products have been decanalised; (iii) permission has been granted to freely export superfine non-basmati rice subject to an MEP which has been lowered to \$200 per tonne; (iv) exports of mustard seeds and rapeseeds have been allowed against quota; (v) exports of wheat products have been decontrolled and exports of high value durum wheat and of non-FAQ Jowar permitted subject to ceiling; (vi) cess on sugar exports has been waived and cess on pepper exports suspended.

63 Buoyancy in exports of agricultural products is already visible. Exports have increased from Rs.6090 crore in 1991-92 to Rs. 7391 crore in 1992-93. During April-September 1993 the agricultural exports are estimated at

Rs. 3230 crore registering a growth of about 31 per cent over the corresponding period last year. These are expected to touch Rs. 10000 crore during 1993-94.

GATT and Agriculture

64 During the run up to the GATT agreement, which was finalised in December 1993, fears were expressed that India's interests in agriculture will be adversely affected as a result of the proposed agreement on agricultural issues in the Uruguay Round. There were apprehensions that we may be forced to reduce the subsidies available to our farmers; phase out the public distribution system and compulsorily open up to agricultural imports. It was also feared that the traditional rights of the farmers to retain and exchange seeds may also be constrained. A thorough analysis of the agreement, as finalised in December, leads to the conclusion that on the whole the country's interests will not only be protected but India may expect to benefit as a result of agriculture being brought into the fold of the GATT. The agreement has stipulated that countries with an aggregate subsidy of more than 10% of the value of agricultural produce will have to lower them. The current level of subsidy for Indian agriculture is well below this level and this stipulation will therefore not affect us. It has also been clarified from the GATT that consumption subsidies for targetted groups of population, as under our public distribution system which is targetted primarily for the rural and urban poor, are permitted and can therefore continue. Farmers' interests will be completely protected once the proposed *sui generis* legislation to protect plant varieties comes into effect. Under the proposed legislation, farmer's right to retain and exchange seeds will not be affected. The central feature of the agreement on agriculture is the reduction in production subsidies paid by developed countries to their farmers and the rolling back of some of the non-tariff barriers which have restricted agricultural trade. These measures will benefit India as our agricultural exports enjoy a comparative and competitive advantage. India's agricultural exports will therefore, receive a welcome stimulus, at a time when the incentive structures in the domestic economy are beginning to work to their advantage.

Agricultural Policy Resolution

65 Recognising the crucial role of agriculture in supporting broad-based and equitable development, the Government placed a Draft Agricultural Policy Resolution (DAPR) in the Parliament in December 1992. The main objectives and thrust areas of Draft Agricultural Policy Resolution have been endorsed at the Chief Minister's Conference in March, 1993. The draft has been modified incorporating the major suggestions of the Chief Minis-

ters' Conference and the modified draft has been placed in Parliament on May 14, 1993.

66 The Resolution seeks to dovetail agricultural development and research programmes to meet the challenges in Indian agriculture and seeks to arrest the decelerating trends in capital formation in agriculture and step up public investments to accelerate development of supportive infrastructure for agriculture and rural development. The DAPR seeks to accord top priority to the alleviation of rural poverty, underemployment, unemployment and malnutrition by generating activities through diversification of agriculture and promotion of agro-based industries. Some of its major objectives are: augmenting facilities for processing, marketing and storage; developing rainfed and irrigated horticulture; augmenting biomass production and increased utilisation of irrigation potential and promoting water conservation. It also aims at reviving and strengthening the cooperatives and local communities and increasing the involvement of non-Governmental organisations in agricultural development.

Outlook

67 General living standards can be raised only by ensuring sustained and diversified agricultural development. The agricultural sector in India accounts for about 30 per cent of GDP and two thirds of population is still dependent on this sector. The long term trend growth rate in Indian agriculture at present is little over 2.2 per cent per annum which needs to be raised to at least 3.0 per cent if GDP growth has to be accelerated. In order to achieve this acceleration of growth, a number of key problems and issues have to be faced in the agricultural sector. The rate of investment in agriculture has declined in recent years; in many areas the existing stocks of public capital assets are deteriorating for want of adequate funds for operation and maintenance. Reversal of this trend will require a shift in the balance of public expenditure for the agricultural sector from large input subsidies to creation and maintenance of public infrastructure. Public investment in irrigation, rural communication, schemes for control of land and water degradation and other agriculture related infrastructure must be increased. But the resources for this are only likely to be available if the massive subsidies provided for water, electricity and fertilizers are scaled down. It has to be appreciated that if charges for water and electricity are not raised to appropriate levels then delivery of these critical inputs is likely to worsen over time and undermine agricultural development.

68 Policies must also be undertaken to upgrade the quality of extension and research support, develop and propagate technologies for dryland agriculture and implement measures for curbing water and land degradation. Particu-

lar attention has to be given to farming systems which affect small and marginal farmers who constitute the bulk of our farming population, and the majority of our poorest people.

69 Private investment in agriculture can increase if public investment grows, remunerative prices for agricultural produce are maintained, controls on domestic trade and marketing are scaled down, opportunities for earning incomes from agricultural exports are increased and the preferential protection to the industrial sector is brought down. Bouyancy in agricultural investment will also require a thorough revamping of the system of rural credit which has been seriously weakened by a culture of non-recovery, high costs of financial intermediation and subsidised interest rates which, in effect, reduce the overall availability of institutional credit. Policy must also address issues of land reform and tenure which, in some States, are important

factors inhibiting more rapid and equitable agricultural development.

70 Agriculture can also benefit from more rapid development of agro processing in which there is enormous potential. Agricultural exports have shown significant growth in recent years, but a great deal of potential remains unexploited due to inadequate infrastructure, food processing technology, lack of adequate marketing linkages and policy impediments. This potential must be realized.

71 Most of the impetus for effective policies in the agricultural sector will need to come from the States. The Central Government also has a significant role to play. Together we must ensure that agriculture is put on a path of sustained, broad-based development, without which progress in overall economic growth and poverty alleviation will be elusive.