

## AGRICULTURE

1995 was again a good year for agriculture, facilitated by a favourable Monsoon whose coverage across the country was fairly good. It was the eighth successive normal Monsoon year. The country's granaries are full and the initial estimates indicate that the current year may record 190 million tonnes output of foodgrains; a little lower than the record output of 191 million tonnes in 1994-95. Production of oilseeds is likely to be marginally better this year. Sugar production reached all time high of 146 lakh tonnes during 1994-95 (October-September) because of substantial increase in sugarcane availability. Cotton production at 12.3 million bales should be marginally higher in 1995-96 than the preceding year. Among plantation crops tea output is expected to be higher than last year. The overall growth in agriculture production in 1994-95 was about 5 per cent as against 3.4 per cent in 1993-94.

### South West Monsoon during 1995

2. The Southwest Monsoon in 1995 was normal in terms of seasonal rainfall. The cumulative seasonal rainfall for the country as a whole during the four month period (June to September) was 100 per cent of its long period average. This was the eighth successive normal monsoon since 1988.

3. 1995 monsoon made a sluggish and a delayed start over most parts of the country, but gained momentum during the second week of July. It set in over Kerala on June 8, 1995, a week later than its normal date. However, contrary to normal monsoon behaviour, it arrived over eastern parts of the country earlier than in Kerala. During the period July to September, the rainfall was well distributed in space though a little late over most parts of the country. By the end of the monsoon season, 33 out of 35 meteorological sub-divisions (which constitutes 415 districts) and 79 per cent of the districts covering 94 per cent of country's area had received normal to excess rains. The comparative

performance of the monsoon for the period 1988 to 1995 and district-wise distribution of rainfall is shown in Table 8.1 and Figure 8.1 and 8.2.

**TABLE 8.1**  
**Monsoon Performance, 1988 to 1995**  
(June-September)

Year	Number of Meteorological Sub-divisions		Total	Percentage of districts normal/ excess rainfall	Actual rainfall as per cent to normal rainfall
	Excess/ Normal	Deficient/ Scanty			
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	31	4	35	78	100
1994	25	10	35	76	110
1995	33	2	35	79	100

4. By and large distribution of rainfall over the country as a whole in 1995 was quite satisfactory and the total quantum of rainfall was very good. The rainfall was deficient only in Saurashtra / Kutch region of Gujarat but the overall deficiency in Gujarat state was marginal. The northeastern states experienced floods in June. Jammu & Kashmir experienced floods in the second fortnight of July and parts of northwest India notably Haryana and Punjab experienced floods in the last week of August. Floods also occurred in West Bengal during the last week of September.

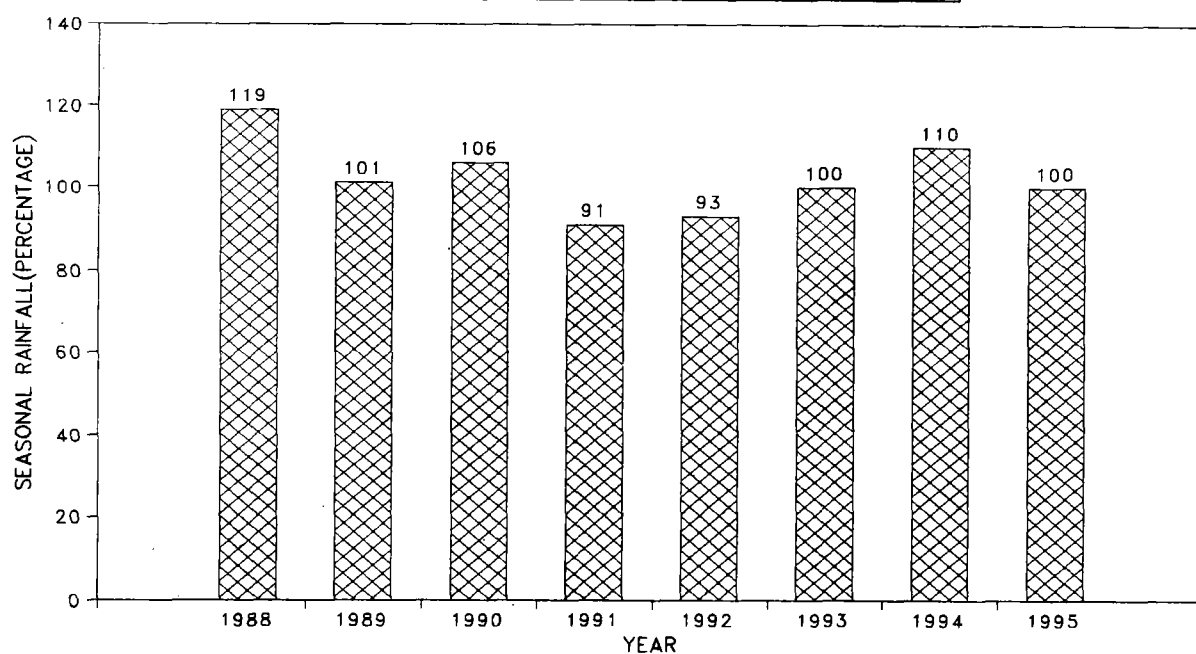
5. The spatial distribution of rainfall index in 1995 and in the preceding year, as also the previous best in 1988, is shown in Table 8.2.

### Reservoir Situation

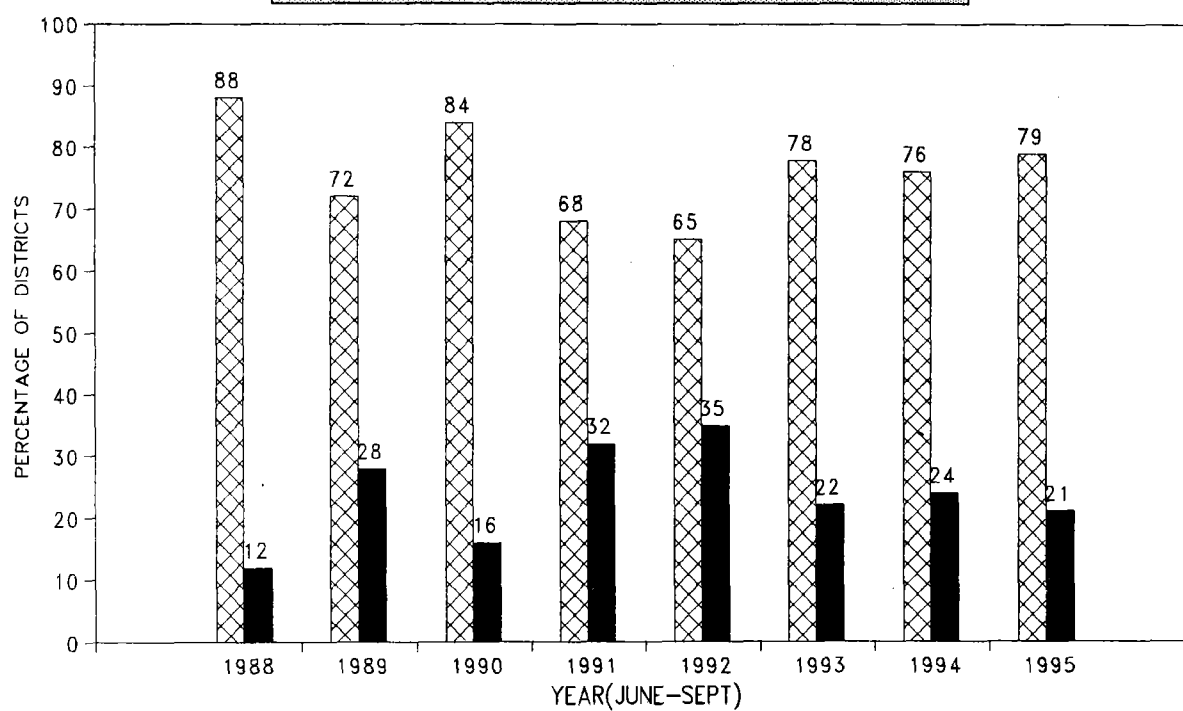
6. The Central Water Commission monitors water level in 63 important reservoirs whose total live storage capacity is 124.6 thousand million cubic

**Fig. 8.1**

### Monsoon Performance (June-September) All India (1988-1995)

**Fig. 8.2**

### Percentage of Districts Above/Below Normal Monsoon (1988-1995)



 % DIST ABOVE NORMAL
  % DIST BELOW NORMAL

**TABLE 8.2**  
**Rainfall Indices Weighted by Cumulative Kharif Cereals Production - State-wise.**  
 (Per cent)

States	Production Weights	Rice Area under Irrigation*	Rainfall Indices-14 July			Rainfall Indices-30 September		
			1988	1994	1995	1988	1994	1995
Andhra Pradesh	8.70	94.5	106.29	100.30	85.33	151.16	84.88	138.05
Assam	3.34	33.8	79.27	87.96	126.01	103.05	74.75	112.76
Bihar	7.94	37.5	137.30	87.00	83.76	107.68	87.01	104.33
Gujarat	3.30	52.4	62.62	150.93	9.49	133.69	175.40	77.50
Haryana	2.49	99.6	241.23	122.33	118.28	206.93	122.27	179.30
Himachal Pradesh	0.85	62.2	151.51	134.10	96.56	136.32	105.12	-
Jammu & Kashmir	1.23	90.8	165.97	-	-	152.60	-	-
Karnataka	5.80	64.9	75.78	140.77	80.31	119.08	118.57	96.51
Kerala	1.31	39.4	70.92	107.65	88.69	99.05	115.75	92.69
Madhya Pradesh	9.42	23.3	100.93	172.01	61.28	90.79	139.94	89.93
Maharashtra	7.51	26.1	82.54	137.13	55.65	125.82	114.51	82.67
Orissa	6.13	34.7	108.85	140.19	56.42	91.88	131.41	83.68
Punjab	6.91	99.0	179.37	80.68	75.78	183.13	111.07	146.18
Rajasthan	4.02	35.9	93.49	178.75	34.10	79.24	133.70	121.71
Tamil Nadu	8.06	92.3	117.38	83.45	101.79	122.60	70.83	112.30
Uttar Pradesh	12.87	48.9	116.49	82.22	84.65	102.96	97.42	101.03
West Bengal	8.40	24.6	136.81	69.07	113.12	112.99	89.47	119.26
<b>All India</b>		<b>46.8</b>	<b>107.95</b>	<b>110.80</b>	<b>79.72</b>	<b>115.28</b>	<b>108.03</b>	<b>104.38</b>

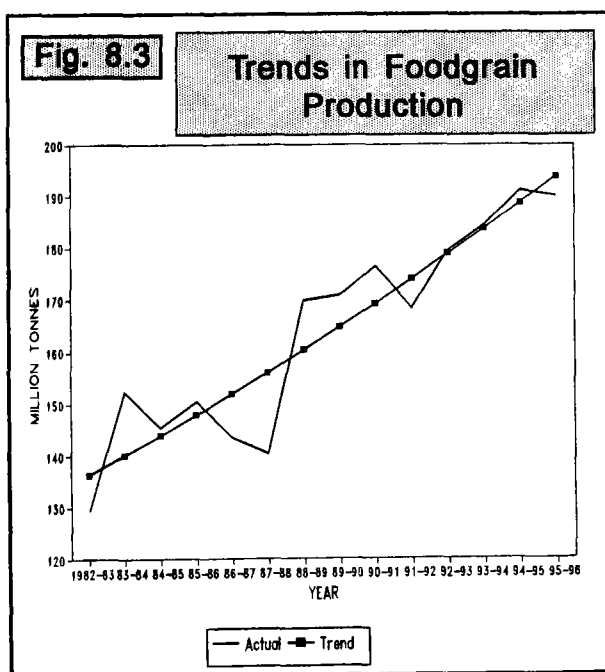
\* Indicates percentages of irrigated area under rice in 1992-93

meters (TMC). Against this, the total live capacity of these reservoirs at the end of September, 1995 was 90.1 TMC (72 per cent of capacity) as against 112.7 TMC (90 per cent of capacity) in the corresponding period of 1994. The annual average capacity of these reservoirs for the past ten years was 93.4 TMC (75 per cent of capacity).

### Agricultural Production Performance 1994-95 and Prospects for 1995-96.

7. Foodgrains production of 191.1 million tonnes in 1994-95 was a record in the country's history and was higher (by 3.7 per cent) than the previous year. However, 1995-96 production is likely to be a little lower because of drop in rice output in Punjab and Haryana due to excessive late season rainfall. Despite the marginal decline in the 1995 kharif output, the prospect of rabi crops is brighter and the year 1995-96 may still end up with an output level that is close to the last year's record level of over 191 million tonnes.

8. Performance of agricultural production during the last few years and the likely out turn in 1995-96 is shown in Table 8.3. Trends in foodgrains production for the period 1982-83 to 1995-96 are shown in Figure 8.3 (see also Figures 8.4 and 8.5).



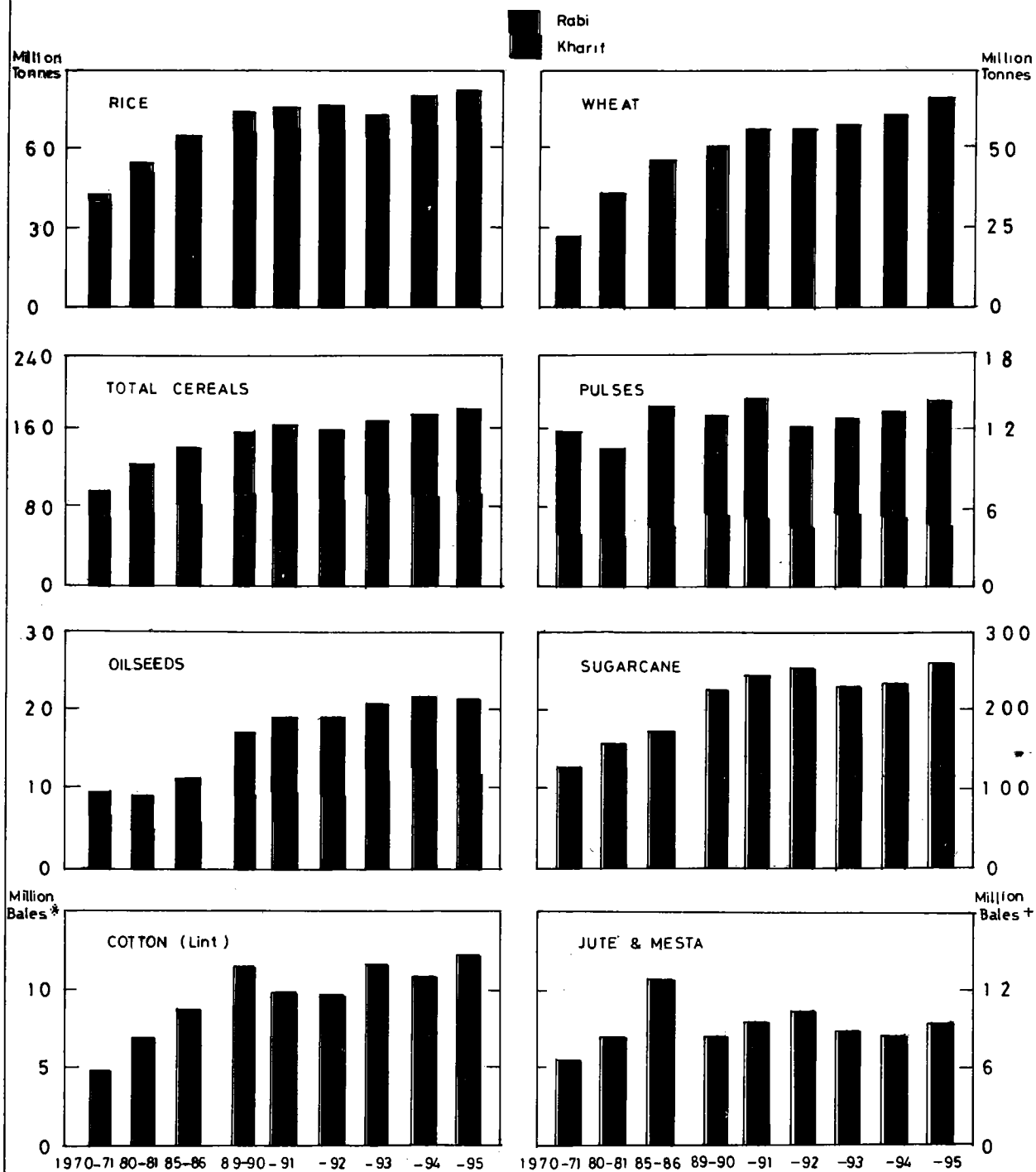
### Food Crops

#### Wheat

9. Uttar Pradesh, Punjab, Haryana, Madhya Pradesh, Bihar, Gujarat and Rajasthan are the major wheat growing states. In 1994-95, country's total wheat output was 65.5 million tonnes, which was 9.5 per cent higher than 1993-94. In 1995-96, the prospect of production is quite good and expected

Figure 8.4

# AGRICULTURAL PRODUCTION



\* BALE OF 170 Kgs. each.

+ BALE OF 180 Kgs each

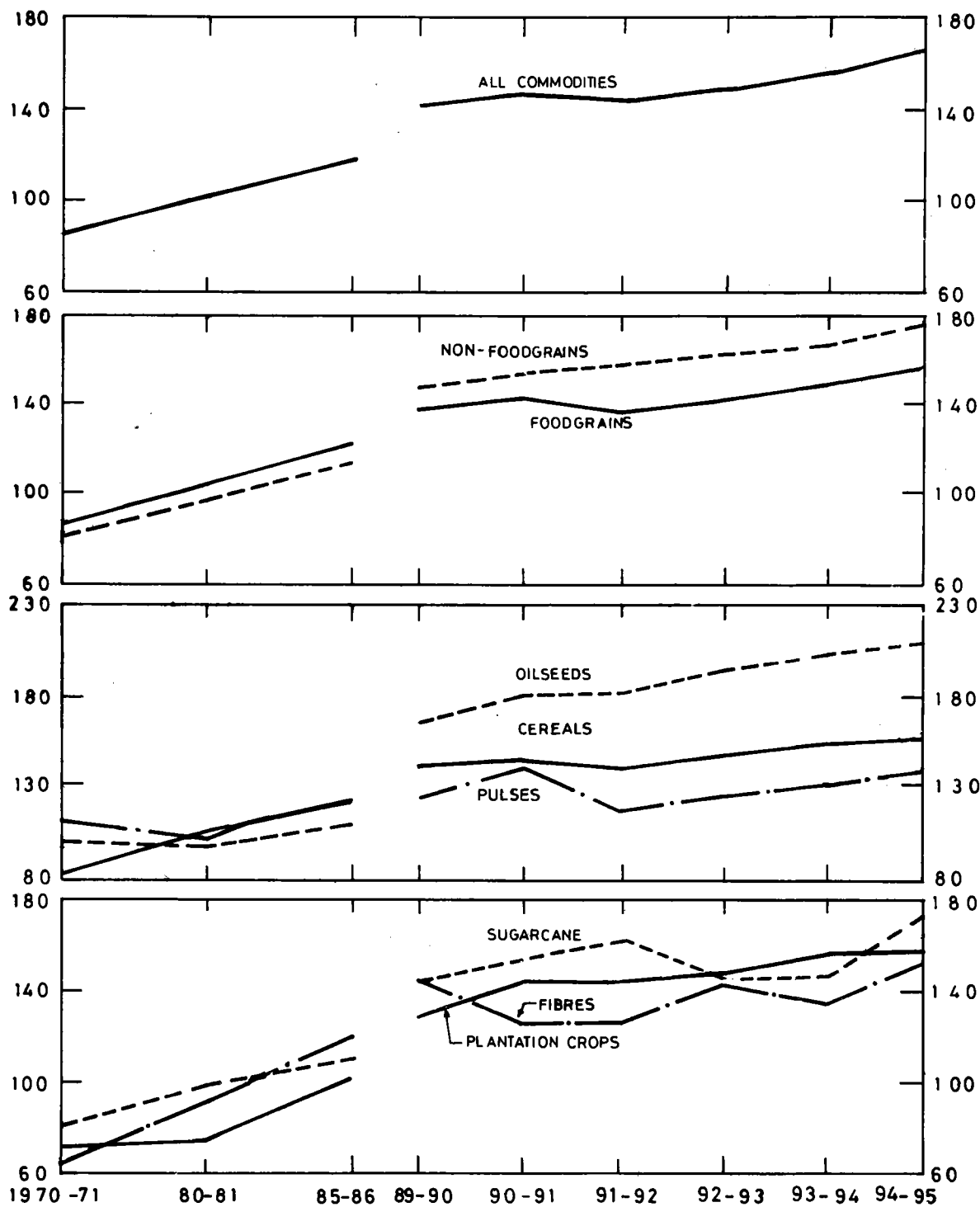
# INDEX OF AGRICULTURAL PRODUCTION

BASE= TRIENNIUM ENDING 1981-82=100

The figure consists of four vertically stacked line graphs, each showing the index of agricultural production for different categories over time. The x-axis for all graphs represents the triennium ending year, with labels: 1970-71, 80-81, 85-86, 89-90, 90-91, 91-92, 92-93, 93-94, and 94-95. The y-axis represents the index value, with labels 60, 100, 140, and 180. The base year is 1981-82=100.

- ALL COMMODITIES:** A solid line showing a steady increase from approximately 85 in 1970-71 to 125 in 1985-86, then a jump to 140 in 1989-90, and continuing to rise to about 170 by 1994-95.
- NON-FOODGRAINS:** A dashed line showing a steady increase from approximately 80 in 1970-71 to 115 in 1985-86, then a jump to 145 in 1989-90, and continuing to rise to about 175 by 1994-95.
- FOODGRAINS:** A solid line showing a steady increase from approximately 80 in 1970-71 to 115 in 1985-86, then a jump to 135 in 1989-90, and continuing to rise to about 160 by 1994-95.
- OILSEEDS:** A dashed line showing a steady increase from approximately 80 in 1970-71 to 115 in 1985-86, then a jump to 145 in 1989-90, and continuing to rise to about 175 by 1994-95.
- CEREALS:** A solid line showing a steady increase from approximately 80 in 1970-71 to 115 in 1985-86, then a jump to 135 in 1989-90, and continuing to rise to about 160 by 1994-95.
- PULSES:** A dash-dot line showing a steady increase from approximately 80 in 1970-71 to 115 in 1985-86, then a jump to 135 in 1989-90, and continuing to rise to about 160 by 1994-95.
- SUGARCANE:** A dashed line showing a steady increase from approximately 80 in 1970-71 to 115 in 1985-86, then a jump to 145 in 1989-90, and continuing to rise to about 175 by 1994-95.
- FIBRES:** A solid line showing a steady increase from approximately 80 in 1970-71 to 115 in 1985-86, then a jump to 135 in 1989-90, and continuing to rise to about 160 by 1994-95.
- PLANTATION CROPS:** A dash-dot line showing a steady increase from approximately 80 in 1970-71 to 115 in 1985-86, then a jump to 135 in 1989-90, and continuing to rise to about 160 by 1994-95.

BASE: TRIENNIUM ENDING 1981-82=100



**TABLE 8.3**  
**Production of Principal Crops**

(Million Tonnes)

Crop	1990-91	1991-92	1992-93	1993-94 (Revised)	1994-95 Target	Final	1995-96 Target	Likely
Rice	74.3	74.7	72.9	80.3	78.5	81.1	80.0	80.0
Wheat	55.1	55.7	57.2	59.8	58.5	65.5	60.0	65.2
Coarse Cereals	32.7	26.0	36.6	30.8	36.5	30.4	36.5	30.0
Pulses	14.3	12.0	12.8	13.3	15.5	14.1	15.5	14.8
Total Foodgrains	176.4	168.4	179.5	184.3	189.0	191.1	192.0	190.0
Kharif	99.4	91.6	101.5	100.4	106.3	100.6	107.5	100.0
Rabi	77.0	76.8	78.0	83.9	82.7	90.5	84.5	90.0
Oilseeds	18.6	18.6	20.1	21.5	22.0	21.4	22.5	22.0
Sugarcane	241.0	254.0	228.0	229.7	250.0	271.2	255.0	265.0
Cotton@	9.8	9.7	11.4	10.7	12.5	12.1	13.0	12.3
Jute & mesta\$	9.2	10.3	8.6	8.4	9.3	9.5	9.3	9.4
(Percentage variation in production over the previous year)								
Rice	1.0	0.5	-2.4	10.2		1.0		-1.4
Wheat	10.6	1.1	2.7	4.5		9.5		-0.5
Coarse Cereals	-6.0	-20.5	40.8	-15.8		-1.3		-1.3
Pulses	10.9	-16.1	6.7	3.9		6.0		5.0
Total Foodgrains	3.2	-4.5	6.6	2.7		3.7		-0.6
Kharif	-1.6	-7.8	10.8	-1.1		0.2		-0.6
Rabi	10.0	-0.3	1.6	7.5		8.0		-0.6
Oilseeds	10.1	0.0	8.1	7.0		-0.5		2.8
Sugarcane	6.8	5.4	-10.2	0.7		18.1		-2.3
Cotton@	-14.0	-1.0	17.5	-6.1		13.1		1.7
Jute & mesta\$	10.8	12.0	-16.5	-2.3		13.1		-1.1
@ Million Bales of 170 kg each								
\$ Million Bales of 180 kg each								

production is likely to be close to the level of last year. It is interesting to observe that since late sixties when the effect of the green revolution was first felt

conditions (such as floods). Therefore, in 1995-96 total rice production is expected to be about 80 million tonnes.

**TABLE 8.4**  
**Production of Rice and Wheat**  
(Million Tonnes)

Year	Rice	Wheat	Percentage of Wheat to Rice
1950-51	20.58	6.46	31.39
1960-61	34.58	11.00	31.81
1970-71	42.22	23.83	56.44
1980-81	53.63	36.31	67.70
1990-91	74.29	55.14	74.22
1994-95	81.10	65.50	80.76

most in wheat output, the ratio of wheat to rice has steadily increased from one third in 1950-51 to over four fifth in 1994-95, (see Table 8.4).

### Rice

10. Rice production of 81.1 million tonnes in 1994-95 was a new record but in 1995-96, some decline in production in Haryana, Punjab and Andhra Pradesh was expected due to the adverse weather

### Coarse Cereals

11. Jowar, bajra, ragi, maize and small millets constitute coarse cereals. Coarse grains have a strong supplemental influence on the food economy of the country. These are grown mostly by small and marginal farmers in areas characterised by low and often erratic rainfall. The major producing states are Rajasthan, Gujarat, Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu, Madhya Pradesh, Uttar Pradesh and Bihar. The likely production of coarse cereals during 1995-96 is reported to be at the same level of 30 million tonnes as achieved in 1994-95. In fact, a good rainfall year causes shift of area to higher value crops from coarse grains, ensuring at the same time higher yields per unit area under coarse cereals.

### Pulses

12. Per capita daily availability of pulses has come down significantly from 69 grams in 1961 to about 37 grams in 1995. This is due to stagnation in the production of pulses over the last three decades. Lower per hectare yields characterise the pulse

13. With the ushering in of green revolution in the country since 1967-68, foodgrains production has been registering a steady rate of growth of 2.67 per cent. Maintaining higher threshold of wheat yields has largely sustained the overall trend rate of growth in foodgrains. However, the higher growth rate achieved in rice since 1980-81 (3.48 per cent per annum) has also contributed significantly to the comfortable food supply position witnessed during the past four years as a consequence of which public stocks for food security touched a record of 35.6 million tonnes in July, 1995. Table 8.5 lists compound and annual growth rate in production of foodgrains. Lower productivity in pulses remains the only area of concern in the overall foodgrains economy of the country.

(Per cent )

## Oilseeds

14. With about 21.4 million tonnes production estimated in 1994-95, the production of nine oilseeds (groundnut, rapeseed mustard, soyabean, sunflower, sesamum, castor seed, safflower, nigerseed and linseed) has increased substantially from 10.83 million tonnes in 1985-86. Groundnut is by far the dominant oilseeds crop accounting for 38.56 per cent of total output of nine oilseeds (in 1994-95) followed by rapeseed/mustard which accounts for 27.45 per cent. Therefore, the two oil-seeds together (accounting for 66.01 per cent of production of nine oilseeds) dominate the edible oil economy in the

(Million Tonnes)

\* Revised  
\*\* Final

country. The contribution of other oils, though, significantly supplemental, play a relatively lesser role except that soyabean oil and sunflower oil have of late emerged as the major potential growth areas. Production of soyabean may soon outrank rapeseed/mustard and thus occupy second position after groundnut. Trend of production of oilseeds from 1987-88 to 1994-95 and the likely production during 1995-96 alongwith the targets are listed in Table 8.6

### Sugarcane

15. Sugarcane production shows an uptrend since 1985-86 except, in 1992-93 and 1993-94, when it suffered some marginal decline. In 1994-95, the cane production was 271.2 million tonnes. The likely production during 1995-96 would be around 265 million tonnes.

### Cotton

16. In 1995-96, cotton production may be around 123 lakh bales against 121 lakh bales produced last year (an increase of 1.7 per cent). Apparently there have been significant gains in cotton productivity trends thus offsetting the decline in area under cotton from 80.6 lakh hectares in 1981-82 to 73.2 lakh hectares in 1993-94. Consumption of cotton has also continuously increased from 75.9 lakh bales in 1981-82 to 128 lakh bales in 1993-94, outpacing the increase in domestic cotton output, thus necessitating imports in some years. Future increase in raw cotton demand is likely to put further pressure on cotton prices.

### Jute and Mesta

17. The combined production of Jute and Mesta in 1985-86 reached a peak level of 12.6 million bales (of 180 kgs. each), thereafter it fell in successive years to a level ranging between 8.4 to 10.3 million bales. Production in 1994-95 was 9.5 million bales. In 1995-96 the production of jute & mesta is likely to be around 9.4 million bales as against the target of 9.3 million bales.

## Plantation crops

### Tea

18. Tea industry provides gainful direct employment to more than one million workers mainly drawn from the backward and socially weaker sections of the society. It is also a substantial foreign exchange earner (with negligible import content) and provides significant contribution to the State and Central exchequer. Tea plantations in India are mainly located in rural hill and backward areas of North Eastern and Southern States.

19. The production of tea in the country has grown steadily from 561 million kgs in 1982-83 to estimated

737.39 million kgs in 1994-95. However, the domestic demand for tea has risen at a faster pace, thereby, creating pressure on the exportable surplus which is close to about 200 million kgs. The Government have taken a number of steps to stimulate its production so as to meet the growing domestic and international demand for tea. In this context a perspective plan for achieving production target of 1000 million kgs by 2000 AD has been drawn up by the Tea Board. Quantity exported during 1993-94 was 154.55 million kgs. valued at Rs.1062.03 crore and, during 1994-95, 149.76 million kgs. valued at Rs.924.08 crore. The decline in exports in recent years was mainly due to lower off-take of Indian tea by Russia.

20. A production target of 780 million kgs and an export target of 170 million kgs has been fixed for 1995-96. Upto October 1995, production of tea was estimated to be 625.38 million kgs as against 649.72 million kgs during the corresponding period of last year. During April-October 1995, 93.42 million kgs valued at Rs.659.95 crore was exported as compared to 80.43 million kgs valued at Rs.478.24 crore during the corresponding period of last year.

### Coffee

21. Robusta and Arabica are the two main varieties grown in the country. India accounts for nearly 3.2 per cent of the total world production of coffee. The domestic demand for coffee hovers around 60,000 tonnes annually which constitutes nearly one-third of total production. Remaining two-third of output is available for exports.

22. In 1994-95 production of coffee was 1.8 lakh tonnes which is likely to have increased to an estimated 2.24 lakh tonnes in 1995-96. Large variation in coffee production (Table 8.7) in some years is due to seasonal factors as coffee is extremely sensitive to changes in weather conditions.

**TABLE 8.7**  
**Coffee Production**  
(Lakh Tonnes)

Year/Season	Production
1987-88	1.22
1988-89	2.15
1989-90	1.18
1990-91	1.70
1991-92	1.80
1992-93	1.69
1993-94	2.08
1994-95	1.80
1995-96*	2.24
*(Estimated)	



23. In 1994-95 India's share in world exports is estimated to be around 3 per cent. Export during 1992-93 was 1,13,602 tonnes valued at Rs.381.3 crore. However, in 1993-94, the exports rose to 1,36,690 tonnes and export realisation rose to Rs.586.99 crore. In 1994-95, the exports reached 1,36,404 tonnes for a value of Rs.1086.89 crore, the higher unit realisation being mainly due to high global prices.

24. Pre-liberalisation period (upto 1991-92) was marked by the compulsory pooling of the coffee output with Coffee Board except for 30 per cent allowed as Internal Sale Quota (ISQ). In January, 1994, for the first time, growers were permitted to sell 50 per cent of output as Free Sale Quota (FSQ). This policy was further liberalised in April, 1995 permitting 100 per cent FSQ to small growers (holding less than 10 hectares). Rest of the growers were permitted 70 per cent of output as FSQ with the balance 30 per cent required to be pooled for auction through Coffee Board. The new policy gives more flexibility to growers in the export market.

**Natural Rubber**

25. Natural rubber is a vital raw material for the rubber manufacturing industry which in turn produces a variety of products indispensable in modern life. Currently about 96 per cent of the natural rubber demand in the country is met by indigenous production and the deficit is met by imports. Rubber production has shown a significant uptrend in recent years. From 3.3 lakh tonnes in 1990-91, it has increased to 4.72 lakh tonnes in 1994-95. Area under rubber has also gone up from 4.75 lakh hectares in 1990-91 to an estimated 5.15 lakh hectares in 1994-95. Kerala continues to be the major rubber producing state accounting for 86 per cent of the total area and contributing more than three-fourth of the total production. Most rubber plantations are small and the average size of holding is 0.5 hectares. As against production of 4.72 lakh tonnes and consumption of 4.86 lakh tonnes in 1994-95, the estimated production and consumption during 1995-96 is 5.11 lakh tonnes and 5.30 lakh

tonnes respectively. Import of natural rubber from time to time continues to bridge the gap between demand and supply. Annual production and consumption of natural rubber during the past 5 years is listed in Table 8.8.

**Horticultural Crops**

26. India produces a large variety of horticultural crops like fruits, coconuts, vegetables, cashewnuts, spices and plantation crops and diverse range of medicinal and aromatic plants, mushroom, floriculture, betelvine, root and tuber crops etc.

27. India ranked first in production of fruits during 1993, overtaking Brazil which held this distinction hitherto. India also occupies the first position in global production of mangoes and bananas and is amongst the top ten in apple and pineapple production. Production of higher quality fruits for exports purposes is now receiving greater attention. India holds the first position in global production of cauliflower, and is amongst the first ten countries leading in the production of green peas, onion, potato and tomato.

28. India, with a production level of 11375 million nuts in 1992-93, has moved to second position in the global production of coconuts (in terms of number of nuts) after staying at the third position for the last two decades. However, Kerala which is the largest producer of coconut (accounting for two third of total output), faced problems due to fall in prices of copra due to excessive supply. Major programmes have been undertaken for product diversification like coconut milk, coconut drink, coconut cream etc. to broaden the demand for coconut besides finding new avenues for export.

29. Cashewnut is a prime cash crop and a key export commodity. India has the distinction of being world's largest producer of cashewnut with annual output of 3.5 lakh tonnes. Various programmes for increasing the overall productivity are being implemented so as to achieve a production target of 4.7 lakh tonnes of raw cashewnuts by the end of 1997.

30. Production of spices during 1994-95 is expected to be maintained at 2.2 million tonnes. Fifteen major spice crops out of a large number of spice crops, have been singled out for intensive development. Of these, black pepper occupies the most prominent place for domestic consumption and for exports. Better processing and quality control would help increase India's share in the expanding global export market.

**Use of Plastics in Horticulture**

31. In order to improve productivity of horticulture crops, the Government is encouraging the use of plastics in the form of drip irrigation, green houses

TABLE 8.8 Production and Consumption of Rubber (Tonnes)		
Year	Production	Consumption
1991-92	366745	380150
1992-93	393490	414105
1993-94	435160	450180
1994-95	472000	486000
1995-96*	511000	530000
*(Estimated)		

and plastic mulches. An investment of Rs.250 crore has been allocated in the Eighth Plan period (1992-97). Of this, Rs.200 crore is earmarked for drip irrigation alone which is becoming quite popular in several States. The earlier restriction of permitting assistance for only 1 hectare per beneficiary for drip irrigation has been removed during 1995-96 and assistance is now provided for the entire holding of the beneficiary for growing horticultural crops, as permitted under the State Land ceiling laws. Green-houses are being encouraged for export oriented floriculture projects. Low cost green houses have already become immensely popular in cold arid regions such as Ladakh for growing vegetables in the off-season.

### Post Harvest Technology

32. Country is losing over Rs.3000 crore annually due to post harvest losses of fruits and vegetables because of poor infrastructure and lack of organised marketing. For the Eighth Plan (1992-97) an amount of Rs.200 crore has been earmarked for providing soft loans for facilities like precooling units, cold storages, packing houses, etc. for reducing the post harvest losses and preventing deterioration in the quality of the end product. There is a vast scope for private investment in processing and preservation technology since the country produces a large variety of tropical and temperate fruits and vegetables.

## AGRICULTURAL INPUTS

### Factors influencing Agricultural Output

33. Performance of agricultural sector depends on numerous factors ranging from weather conditions to the use and optimal applications of various inputs (like irrigation, fertilisers, seeds, diseases control etc.) besides institutional support through Governments price policies and organised marketing and credit supply. Since most of the cropped area even now does not have assured irrigation, monsoon plays a crucial role in influencing agricultural production.

### Irrigation

34. A highly efficient and irrigated cropping system alone can sustain India's ever expanding population. The creation of irrigation potential and its optimum utilisation, therefore, continues to receive a high priority.

35. The country's Irrigation Potential Created (IPC) area has increased from 22.6 million hectares in the pre-plan period (1950-51) to about 87.06 million hectares at the end of 1994-95 comprising 32.27 million hectares under major and medium irrigation projects and 54.79 million hectares in minor irrigation

schemes. The anticipated irrigated potential created by the end of 1995-96 is 89.42 million hectares comprising 33.04 million hectares under major and medium projects and 56.38 million hectares under minor irrigation schemes.

36. Under-utilisation of irrigation potential, particularly under major and medium irrigation projects continues to persist. At the end of 1994-95, the likely utilisation was 77.86 million hectares against the created potential of 87.06 million hectares. This leaves a gap of 9.20 million hectares of under-utilized potential (4.63 million hectares in major and medium and 4.57 million hectares in minor irrigation). The gap is basically attributable to delays involved in the development of on-farm works, namely, construction of field channels, land levelling and adoption of the 'warabandi' system and also the time taken by the farmers in switching over to the new cropping pattern - from dry farming to irrigated farming.

37. Command Area Development Programme (CAD) has been under implementation since 1974-75 with the basic objective of reducing the gap between potential created and potential utilised. Up to March 1995 about Rs.4322 crore were spent on the programme, of which the Central assistance amounted to Rs.1426 crore and the balance of Rs. 2896 crore was met under the State sector schemes. The programme envisages execution of on-farm development works like construction of field channels, land levelling, contouring and shaping, implementation of 'warabandi' for rotational supply of water and construction of field drains.

38. Minor irrigation schemes include ground water and surface water schemes. While ground water schemes include dugwells, shallow tubewells and pumpsets, the surface water schemes include tanks and reservoir diversion schemes, lift irrigation from rivers and streams. These schemes have been accorded special attention under the Special Foodgrains Production Programme. At the end of 1994-95, irrigation potential created and its utilisation through Minor irrigation schemes was estimated at 54.79 million hectares and 50.22 million hectares respectively. For 1995-96 the targets for creation and utilisation of additional irrigation potential are 1.59 million hectares and 1.29 million hectares respectively. Because of shorter gestation period and relatively lower investment levels, added emphasis is being laid on undertaking and completion of minor irrigation schemes covering both surface and ground water. Because of comparatively advantageous water table levels, the eastern sector is being accorded special attention for development of minor irrigation during the Eighth Five Year Plan (1992-97). The progress of development of irrigation potential and its utilisation is listed in Table 8.9.

**TABLE 8.9**  
**Development of Irrigation Potential and its Utilisation**

(Million Hectares)

Irrigation Schemes	At the end of Seventh Plan	During 1990-92	At the end of 1991-92	1993-94 actuals	1994-95 (Likely)	1995-96 (Targets)
<b>1. Major &amp; medium irrigation</b>						
Potential	29.9	0.8	30.7	0.5	0.7	0.8
Utilisation	25.5	0.8	26.3	0.5	0.6	0.8
<b>2. Minor Irrigation</b>						
Potential	46.6	3.8	50.4	1.4	1.5	1.6
Utilisation	43.1	3.4	46.5	1.2	1.1	1.3
<b>3. Total</b>						
Potential	76.5	4.6	81.1	1.9	2.2	2.4
Utilisation	68.6	4.2	72.8	1.7	1.7	2.1
<b>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.</b>						

39. Strengthening of irrigation infrastructure is one of the main objectives in irrigation supply management. At the commencement of the Eighth Plan in 1992, there were 158 major, 226 medium and 95 Extension, Renovation and Modernisation (ERM) projects carried forward from the previous plans. The total spill over cost of these projects has been estimated at about Rs.40,563 crore. Therefore, the Eighth Plan accorded high priority to completion of the on going projects. The other major elements of the strategy include ensuring of 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 surface water and lift irrigation.

40. Demand for increased rural as well as urban use of fresh water is causing acute pressure on developed water resources. This brings in focus user-cost of water. There is an urgent need to reach a consensus on resolving the problem posed by mounting arrears and the consequent subsidies incurred in water delivery for various end-users. There is a broad consensus that the irrigation rates should, at least, cover the annual maintenance and operational expenses besides some percentage of the fixed costs. Whereas the water rates for surface and ground water need to be rationalised with due regard to the interests of small and marginal farmers, the issue of sound financial restructuring of irrigation projects must receive greater attention at the policy making levels in the States.

41. Water resources development and management is inter-disciplinary in nature. The national water policy envisages involvement of farmers in various aspects of management of irrigation system particularly in water distribution and collection of water rates.

42. Although fresh water is a renewable resource, increased use of commercial fertilisers and pesticides and generation of new and toxic wastes by industries are adding more and more to the possibilities and dimensions of water pollution. Pollution is becoming a serious problem in almost all the rivers, lakes and estuaries. Concern for water quality is, thus going to be very critical element in the future water resources development programmes. Central Water Commission is monitoring water quality through a network of about 318 stations in which 24 parameters are observed with an objective to judge suitability of water for various end uses.

43. Increased awareness about the environmental aspects of water resources development is a new phenomenon. The concern against environmental degradation occupies a central place in the water resources development programmes. To ensure that the environmental concerns are dealt with within the planning phase of the project itself, 'environmental impact assessment' studies are now carried out in all the major projects. Environmental management plans in respect of all likely adverse impacts are also prepared in advance at the planning stage itself. Catchment area treatment plan, which

is also an integral part of the environmental plan, is aimed at reducing the sediment inflows into the reservoirs.

### Seeds

44. Seed quality is the basic and crucial input for attaining sustained growth in agricultural production. Seed is the carrier of new technology for crop production, propagation and multiplication. Distribution of assured quality seeds is fundamental to attain higher crop yields. Policy initiatives taken by Government of India during 1960's and 1970's for generating quality seed production and distribution of new improved plant varieties, identified by the scientists, is the main reason for country's current self-sufficiency in foodgrains. Indian seed industry has shown impressive growth and should continue to provide further potential for growth in agricultural production. The role of seed industry is not only to produce adequate quantity of seeds of good quality but also to achieve diversity in varietal distribution. Towards achieving this objective the principal players are the two national level organisations National Seed Corporation (NSC) and State Farms Corporation of India (SFCI), 13 State Seeds Corporations, and about 100 private seed organisations. Apart from this, there are 19 State Seed Certification Agencies and 86 State Seed Testing Laboratories to ensure/check the quality of seeds.

45. Major achievement in the seeds development sector has been the systematic release/notification of new varieties of agricultural and horticultural crops

through Central Seed Committee. Since 1969, till date, 1898 varieties of agricultural and 340 of horticultural crops respectively have been notified. Out of this, 137 varieties of agricultural crops and 21 varieties of horticultural crops have been notified during last two years. Another major achievement has been the implementation of Seed Control Order, 1983 issued under the provisions of the Essential Commodities Act, 1955 with effect from July, 1994. It seeks to regulate supply, distribution and trade in seeds. Seeds Act 1966 and Seed Rules, 1968 promulgated in 1968 have been instrumental in bringing about overall improvement in seed quality as per prescribed minimum seed certification standards.

46. National Seeds Project - a World Bank assisted project-provides assistance to NSC, SFCI, State Seed Corporation and State Seed Certification Agencies for their restructuring. As a result of these efforts 65 lakh quintals of certified/quality seed distribution during 1994-95 was achieved, which in 1995-96 is estimated to further improve to 68.8 lakh quintals. It is likely that the annual target of 70 lakh quintals by the end of Eighth Plan (1992-97) would be achieved. The progress of area covered under HYV seeds under different crops and their share in the total area is shown in Table 8.10.

### Fertilizers

47. Use of chemical fertilisers continues to be one of the principal inputs for enhancing crop yields. The consumption of chemical fertilizers, which was

**TABLE 8.10**  
**Area under High-Yielding Varieties of seeds**

Crop	(Million Hectares)							
	1966-67	1989-90	1990-91	1991-92	1992-93	1993-94	1994-95*	1995-96 (Targets)
Paddy	0.9	26.2	27.4	28.0	27.5	28.9	31.0	31.2
Wheat	0.5	20.3	21.0	20.5	21.7	22.0	23.3	23.3
Jowar	0.2	6.9	7.1	6.8	6.9	6.8	7.1	9.0
Bajra	0.1	5.6	5.7	5.4	5.6	5.1	5.4	6.9
Maize	0.2	2.3	2.6	2.8	2.6	2.7	3.4	3.5
Ragi	-	-	1.2	1.2	1.1	1.2	1.1	1.1
Total	1.9	61.2	65.0	64.7	65.4	66.7	71.3	75.0
(Percentage of HYV area to Total Area under the crop)								
Paddy	2.6	62.1	64.2	65.7	65.9	68.8	74.6	
Wheat	3.9	86.4	86.9	88.1	88.2	88.4	90.7	
Jowar	1.1	46.6	49.4	55.0	53.1	52.7	60.2	
Bajra	0.8	51.4	54.4	53.8	52.8	53.7	53.4	
Maize	3.9	39.0	44.1	47.8	43.6	45.1	54.9	
Ragi	-	-	55.3	56.3	57.6	62.8	58.4	

\* Revised

only 0.13 million tonnes in nutrient terms in 1955-56, increased to 13.56 million tonnes in 1994-95. The overall increase in fertiliser consumption during 1994-95 over 1993-94 was 9.7 per cent. While the increase in potash consumption was 23.9 per cent during 1994-95 over the previous year, the consumption of nitrogenous and phosphatic fertilisers increased by 8.2 and 9.9 per cent respectively during 1994-95. The progress of fertiliser consumption since 1987-88 is shown in Table 8.11.

48. The consumption in an appropriate mix (ratio) of the three primary plant nutrients - Nitrogen (N), Phosphate (P) and Potash (K) is essential for increasing crop yields. The ideal NPK ratio

TABLE 8.11 Chemical Fertilizers-Consumption (Million Tonnes of Nutrients)				
Year	Nitrogen (N)	Phosphate (P)	Potash (K)	Total NPK
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	8.8	2.7	0.9	12.4
1994-95	9.5	2.9	1.1	13.5
1995-96*	10.8	3.6	1.3	15.7
* Estimated.				

aggregated for the country as a whole is 4:2:1, but the current all India NPK consumption ratios do not conform to the ideal norms (Table 8.12).

49. The NPK ratio which was almost at an ideal level prior to decontrol of phosphatic and potassic fertilizers in August, 1992, witnessed steep deviation

TABLE 8.12 N P K - Consumption ratio			
Year	Nitrogen	Phosphate	Potash
1955-56	10.8	1.3	1
1960-61	7.2	1.8	1
1965-66	7.5	1.7	1
1980-81	5.9	1.9	1
1985-86	7.0	2.5	1
1991-92	5.9	2.4	1
1992-93	9.5	3.2	1
1993-94	9.7	2.9	1
1994-95	8.5	2.6	1

after decontrol. But this ratio has since started improving and may improve further, once price distortions arising from relatively low price of

nitrogenous fertilizers get corrected. A small step in this direction was taken when the price of urea was raised by 20 per cent in June, 1994. Simultaneously, prices of low analysis nitrogenous fertilizers, viz. Calcium Ammonium Nitrate, Ammonium Sulphate and Ammonium Chloride were also decontrolled. However, the scheme of special concessions on decontrolled phosphatic and potassic fertilizers has been continued for the fourth year in succession in order to encourage their consumption.

50. The production of nitrogenous and phosphatic fertilizers during 1994-95 stood at about 9.05 million tonnes, recording an increase of about 15.4 per cent over 1993-94. In 1995-96, the production of nitrogenous and phosphatic fertilizers is expected to further increase to over 11.3 million tonnes (86.33 lakh tonnes of nitrogen and 26.67 lakh tonnes of phosphate). Production, imports and subsidy since 1987-88 are listed in Table 8.13.

51. The fertilizer subsidy budget of 1995-96 is likely to come under pressure mainly on account of fluctuations in exchange rate and increase in the international price of urea.

TABLE 8.13 Fertilizer Production, Imports and Subsidies					
Year	Production (N+P) (000 Tons)	Imports (N+P+K) (000 Tons)	Subsidy (Rs.crore)		
			Imported Fertilizers	Domestic Fertilizers	Total
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	9736	2988	996	4800	5796
1993-94	9047	3166	600	3800	4400
1994-95	10438	2965	1166	4075	5241
1995-96 (Budgeted)	11300	-	1650	3750	5400*
*Incorporates import of Urea, in nutrient terms, the only controlled fertilizer imported on government account.					

## Plant Protection

52. Plant protection is an essential input for sustaining agricultural production by minimising crop damage due to insect pests, diseases and weeds. Integrated Pest Management (IPM) technology being an eco-friendly approach has been given major thrust during the Eighth Plan period (1992-97). A massive human resource development programme is being implemented by imparting training to subject matter specialists through season long residential training programme. During 1995-96, about 11,000 extension functionaries and 66,000 farmers would be trained in IPM on rice, cotton, vegetable, pulses and oilseeds. Eco-friendly 'neem' based pesticides and bio-pesticides are being encouraged under the overall ambit of IPM.

53. Plant Quarantine Regulations have been

streamlined to facilitate import of seeds/planting materials of high-yielding varieties for boosting export of agricultural commodities.

### Agricultural Credit

54. Timely and adequate credit to farmers is vital for increasing agricultural production and productivity. Providing access to institutional credit for small and marginal farmers and other weaker sections to enable them to adopt modern technology and improved agricultural practices has been the major objective of the credit policy.

55. Loans are disbursed through a multi-agency network consisting of Commercial Banks, Regional Rural Banks (RRBs) and Cooperatives. The total agricultural credit from various institutional sources has increased from Rs.9785 crore in 1988-89 to Rs.21113 crore in 1994-95. The target for credit disbursement for 1995-96 is Rs.26450 crore. Agency-wise disbursement of agricultural credit from 1991-92 to 1995-96 are indicated in the Table 8.14.

56. Short-term (production) advances by credit cooperatives accounted for 67 per cent of the total

TABLE 8.14 Disbursement of Agricultural Credit (Rs. Crore)					
Item	1991-92	1992-93	1993-94	1994-95	1995-96 (Target)
<b>COOPERATIVE</b>					
Short-term	4403	7170	7839	9462	9966
Medium-term	570	2208	2278	2454	2800
Long-term	827				
Sub-total	5800	9378	10117	11916	12766
<b>COMMERCIAL AND REGIONAL RURAL BANKS</b>					
Short-term & term loans	5402	5791	6377	9197	13684
<b>GRAND TOTAL</b>	<b>11202</b>	<b>15169</b>	<b>16494</b>	<b>21113</b>	<b>26450</b>

disbursements, commercial banks ranked next with 28 per cent and Regional Rural Banks provided the balance 5 per cent during 1994-95. In medium/long term (investment) credit, cooperatives account for 36 per cent of the total disbursements while commercial banks account for 57 per cent and Regional Rural Banks 7 per cent. Though the share of cooperatives in agricultural credit had shown a declining trend till 1991-92, it has shown strong signs of recovery thereafter. The network of cooperative credit institutions with 88000 'primary agricultural societies' for short-term advances and 2258 primary units for long term credit have been instrumental in reaching credit to farmers in the remotest parts of the country.

57. Though there is an overall increase in agricultural credit, yet there is a grave problem of overdues which has been inhibiting credit expansion and economic viability of the lending institutions, especially cooperatives and the RRBs. Agricultural loans waived in 1990 had severely aggravated the problem of recovery. The position regarding recovery of direct agricultural advances of all scheduled commercial banks for the last three years is shown in Table 8.15.

58. In October 1994, the Reserve Bank of India deregulated the interest rate structure for

TABLE 8.15 Recovery of Agricultural Advances by Commercial Banks (Rs. crore)				
Year (ended June)	Demand	Recovery	Overdues	Recovery per cent
1992	9338.31	5056.56	4281.75	54.15
1993	10460.92	5847.33	4613.59	55.90
1994	11231.48	6477.27	4754.21	57.67

cooperatives for lending (subject to a minimum of 12 per cent) and for raising deposits. This is expected to improve the viability of the cooperative banks. Also, as envisaged in the Budget of 1995-96 Reserve Bank has taken steps for setting up the Rural Infrastructural Development Fund (RIDF) at National Bank for Agriculture and Rural Development (NABARD) with the corpus of Rs.2000 crore. With the establishment of RIDF 2247 projects with a loan amount of about Rs.1827 crore could be sanctioned by NABARD to eighteen states. These projects are expected to create an additional irrigation potential of 15.5 lakh hectares.

### Crop Insurance

59. From Kharif 1985 to the end of Rabi 1994-95 season, 467 lakh farmers have been covered under Comprehensive Crop Insurance Scheme (CCIS) covering an area of 802 lakh hectares insuring a sum of Rs.11846 crore. Claims amounting to Rs. 1178.76 crore were paid to the farmers (of which, Gujarat alone accounted for more than half of the amount) till end of September, 1995 against a premium income of Rs.195.55 crore.

### Animal Husbandry and Dairy Development

60. Animal Husbandry and Dairying is estimated to account for 26 per cent of the total value of agricultural output. According to the National Sample Survey estimates, the animal husbandry sub-sector has registered a higher average long term growth rate of employment relative to

agriculture (crop husbandry). Landless, marginal and small farmers engage themselves in this activity either on full-time basis for gainful employment or for supplementing their income. Livestock development programmes are suitable for weaker sections of the rural population. Apart from offering substantial direct employment the livestock segment has also a large inbuilt potential for generating indirect employment in several ancillary activities like manufacture of livestock feed, fabrication of dairy and poultry equipments and a large number of animal based industries using hides, skins, bones, wool, bristles etc.

61. Milk production was estimated at 63.1 million tonnes in 1994-95, about 4.3 per cent higher over 1993-94. India ranks perhaps second in the world milk production. Success in raising the level of milk production is ascribed to the Operation Flood Project, an 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. About 70000 Dairy Cooperative Societies have been organised in 170 'milk sheds' involving about 9 million farmer members so far. The export earnings from the livestock sector and related products rose from Rs.792 crore in 1988-89 to Rs.1672 crore in 1994-95.

### Poultry

62. Poultry production in the country has made significant progress over the years due to the research and development thrust of the Government and organised private sector. The main thrust is on increasing the production of eggs and poultry meat through increased availability of quality chicks and support facilities such as storage, marketing, balanced feed, health care and other infrastructural amenities. The egg production is expected to have increased to the level of 24.7 billion and broiler production to 300 million during 1994-95 compared to 8 billion eggs and 4 million broilers two decades ago.

### Fisheries and Aquaculture

63. Fisheries and aquaculture play an important role in augmenting the country's food supply, raising nutritional levels, generating employment and earnings through exports. According to quick estimates of the Central Statistical Organisation, the contribution of fisheries sector to the net domestic product has increased from Rs. 1478 crore in 1984-85 to Rs.6753 crore in 1993-94 at current prices.

64. Fish production in the country has increased from 7.5 lakh tonnes in 1950-51 to 47.89 lakh tonnes

during 1994-95. The average annual growth rate in fish production during the period 1984-85 to 1994-95 is 5.6 per cent. The growth rates in the marine and inland fisheries have been 5 per cent and 6.7 per cent per annum during this period. The export of marine products has recorded a significant increase and, for the first time, crossed 1 billion US dollars during 1994-95. The trend of fish production and export is listed in Table 8.16. The target for fish production in 1995-96 is 49.50 lakh tonnes comprising 28.25 lakh tonnes from marine sources and 21.25 lakh tonnes from inland waters. The Department of Agriculture and Cooperation operates a number of schemes for increasing fish production. These schemes inter-alia, include development of freshwater aquaculture through Fish Farmers' Development Agencies (FFDAs), development of brackishwater aquaculture through Brackishwater Fish Farmers' Development Agencies (BFDAs); introduction of modernised fishing craft to enable fishermen to extend their area of operation and catch pelagic species under the scheme of development of Coastal Marine Fisheries; and excise duty relief on diesel utilised by mechanised craft upto 20 metres overall length for marine fisheries. A Shrimp and Fish Culture Project is also being implemented with World Bank assistance for development of shrimp culture in the States of Andhra Pradesh, Orissa and West Bengal and for increasing inland fish production in States of Bihar and Uttar Pradesh. To develop sustainable and environment friendly brackishwater aquaculture, guidelines have since been issued to all the coastal States and Union Territories.

TABLE 8.16					
Marine and Inland Fish Production and Export of Marine Products					
year	Fish production (Lakh tonnes)			Export of Marine products	
	Marine	Inland	Total	Quantity (Lakh Tonnes)	Value (Rs. Crore)
1989-90	22.75	14.02	36.77	1.11	634.99
1990-91	23.00	15.36	38.36	1.39	893.37
1991-92	24.47	17.10	41.56	1.72	1375.89
1992-93	25.76	17.89	43.65	2.09	1767.43
1993-94	26.49	19.95	46.44	2.44	2503.62
1994-95(P)	26.92	20.97	47.89	3.07	3575.27
1995-96(T)	28.25	21.25	49.50	-	-
P : Provisional T : Target					



## Agricultural Marketing

65. Marketing of farm products in the country by and large operates under the normal forces of supply and demand. Private trade is the centrepiece of the country's market mechanism. The Government intervention is limited mainly to protect the interests of both producers and consumers through farm support policies and promotion of organised marketing of agricultural commodities. To achieve this, most of the State Governments have enacted the necessary legislation for regulation of agricultural produce markets.

66. The number of regulated markets in the country in March, 1995 was 6836. The Central Government has provided assistance for the creation of infrastructural facilities in the markets and also for setting up of rural godowns. To facilitate grading, standards have been laid down for 151 agricultural and allied commodities under the Agricultural Produce (Grading and Marking) Act, 1937. There were 3167 licensed cold storages with an installed capacity of 8.577 million tonnes as on March 31, 1995. To promote setting up of cold storage under the cooperative sector, the National Cooperative Development Corporation (NCDC) has provided Rs.77.16 crore for setting up of 247 cold storages with an installed capacity of 7.33 lakh tonnes till the end of March, 1995.

67. A number of organisations and institutions function currently to deal with product and area specific problems that have a bearing on production, pricing, and marketing of agricultural products. The most important of these institutions are the Commission for Agricultural Costs and Prices, the Food Corporation of India, the Cotton Corporation of India, the Jute Corporation of India and the Commodity Boards.

68. Agricultural Marketing is also closely linked to a network of cooperatives at primary level, state level and at the national level. Marketing cooperatives are operating almost in all 'mandis'. Cooperative societies are functioning in the area of processing of fruits and vegetables, sugarcane crushing, cotton ginning and pressing etc. The marketing of agriculture produce through cooperatives has registered a remarkable growth from Rs.1950 crore in 1980-81 to about Rs.6800 crore in 1992-93.

69. At the National level, the NCDC plans and promotes programmes for the production, processing, marketing, storage, export and import of agricultural produce through cooperatives. The National Agricultural Cooperative Marketing Federation of India Ltd. (NAFED) is an apex cooperative organisation dealing in procurement, distribution, export and import of selected agricultural

commodities. NAFED is a central nodal agency for undertaking price support operations for pulses and oilseeds and market intervention operation for horticultural items like kinoo/malta, onion, potato, grapes, black pepper and red chillies etc. During 1994-95 NAFED's turnover was Rs.718.77 crore and the turnover target for 1995-96 is Rs.874.92 crore. A few other organisations in the cooperative sector are the National Cooperative Tobacco Growers' Federation Ltd., the National Consumers' Cooperative Federation and the Tribal Cooperative Marketing Development Federation of India Ltd. (TRIFED) which attends specifically to the marketing problems of the tribal areas. However, the share of cooperatives in the total marketing of agricultural commodities is rather small.

70. Specialised Commodity Boards continue to operate for rubber, coffee, tea, tobacco, spices, coconut, oil-seeds and vegetable oils, horticulture etc. The National Dairy Development Board is also engaged in the marketing of agricultural commodities. Separate Directorates have been functioning for development of agro raw materials like sugarcane, jute, tobacco, oil-seeds, rice, millets, cotton, pulses, cashewnuts, cocoa, arecanut, spices etc. Active in the field of agricultural commodity exports are various organisation such as the State Trading Corporation, the Cashewnuts Export Promotion Council, the Shellac Export Promotion Council, and the Agricultural and Processed Food Export Development Authority also accomplish the task of promoting/boosting agriculture exports. The role of cooperatives in the marketing of agricultural produce has been progressively expanding.

## Agricultural Research and Extension

71. As an apex scientific organisation at national level, the Indian Council of Agricultural Research (ICAR) plays a crucial role in promoting and augmenting science and technology programmes relating to agricultural research, education and demonstration of new technologies.

72. Fundamental and applied agricultural research in traditional and frontier areas are undertaken by the Council to offer solutions to problems relating to conservation and management of resources, productivity improvement of crops, animals and fisheries. For formulating research policies and programmes, the ICAR has developed a national grid comprising a chain of Central Institutes, Bureaux, Project Directorates, National Research Centres, All India Coordinated Research Projects and Operational Research Projects with their centres located in different parts of the country. The strong agricultural research and educational base of ICAR has attained the ability and resilience to transform the agrarian economy through increased productivity,



self sufficiency in food, fodder and other essential commodities. The coordinated research activities are not only multi-institutional but are also multi-disciplinary and multi-locational to cover whole spectrum of various situations and conditions.

73. Agricultural Education Programmes are, by and large, carried out by 27 State Agricultural Universities (SAUs) of the country covering 16 major states. One Central Agricultural University (CAU) for North East Hill (NEH) Region has been established at Imphal to help and support the human resource development needs of the region. In addition to these, 4 National Institutes of the Council viz. Indian Agricultural Research Institute (IARI), Indian Veterinary Research Institute (IVRI), National Dairy Research Institute (NDRI) and Central Institute of Fisheries Education (CIFE) have been granted the status of deemed universities. These institutes offer post graduate degree programmes in addition to undertaking researches in their respective areas.

74. The ICAR discharges the responsibility of transfer of technology through demonstration of latest agricultural technologies to farmers, extension functionaries of States, Agricultural Departments and other non-governmental agencies involved in agricultural development. All the technology transfer programme of ICAR have been brought under the canopy of integrated Krishi Vigyan Kendras (KVKs) for better coordination and support. A network of 183 on-going KVKs and 78 new KVKs established in the country, are imparting on-farm training in different aspects of agriculture, animal sciences, fisheries and allied vocations to youth, farm men and women and rural workers. These programmes get a back-up support through Trainers' Training Centres. The technology generated by institutions under ICAR and coordinated research projects / programmes are by and large, oriented to improve the socio-economic status of the farmers through vocational training, so that the target group acquire special skills for raising and improving production of traditional and non-traditional crops, agro-forestry, sericulture, animal husbandry, poultry, fisheries and post harvest technology.

### **Small Farmers Agri-Business Consortium**

75. The Small Farmers' Agri-Business Consortium (SFAC), a Society registered under the Societies Registration Act, 1860 came into existence in January, 1994. This was done in pursuance of the Finance Minister's Budget Speech announcing setting up of a Small Farmers' Agri-Business Consortium, an autonomous independent entity funded by the RBI, NABARD and IDBI to initiate projects on the principles of economic efficiency, environmental soundness and social equity. This

organisation has been set up to generate agri-business activities with the theme objective of securing expanding employment opportunities and raising income levels in the rural areas through effective support to various types of agri-business. Detailed project studies were arranged to be commissioned (with UNDP assistance, under the auspices of M.S. Swaminathan Research Foundation) for 12 identified districts viz Barapetta (Assam), Mehbubnagar (Andhra Pradesh), Valsad (Gujarat), Dharwar (Karnataka), Ernakulam (Kerala), Jabalpur (Madhya Pradesh), Ganjam (Orissa), Pondicherry, Bikaner (Rajasthan), Dharmapuri (Tamil Nadu), Pithoragarh (Uttar Pradesh) and Midnapore (West Bengal). Pune was also taken up as the 13th district under the project. Studies have been completed and Project Reports are ready. Horticulture, Wasteland Development, Sericulture and Aquaculture are some of the areas identified for development of Agri-business activities. SFAC will be a catalytic/promotional/financial agency. Emphasis will be laid on establishing linkages between production, processing and marketing so that the farmers can derive the benefits of value addition. The project reports of the 13 identified districts are ready, but the funding of the projects is yet to be arranged. The approach of the SFAC is that the projects should not be subsidy driven but self-sustainable.

### **Export of Agricultural Products**

76. In almost all the non-oil producing developing countries, agricultural commodities or value added products from agriculture account for a major portion of their export earnings. In India, share of agricultural exports to total exports was only 8.56 per cent in 1994-95. The total exports of agricultural products (excluding tea, coffee, marine products and raw cotton) during 1992-93, 1993-94 and 1994-95 were Rs.5686.81 crore, Rs.7532.99 crore and Rs.7049.05 crore respectively. Important items of agricultural exports are rice, cashewnuts, horticulture and floriculture products, coffee, tea etc.

77. India's share in the world trade in agricultural commodities is less than 1 per cent. For over four decades industry remained highly protected and agriculture served as a source of cheap raw materials for the domestic industry, a very large segment of which was inefficient and globally non-competitive. This had a dampening effect on agricultural exports and investment in agriculture. The new economic policy since 1991-92 has attempted to correct this imbalance and agriculture has now begun to see some gains through competitive exports - the latest example of which is the large volume of exports of rice in 1995-96. Even wheat is beginning to find export market.

78. A number of policy changes have been introduced to make agricultural exports more viable. Lowering of import duties on capital goods particularly for greenhouse equipment and plant and machinery necessary for food processing industries as well as easier availability of credit for export has helped agricultural exports. Most of the restrictions on agricultural exports have been removed. Only two items in the category of agricultural and food exports are in the negative list i.e. beef and tallow. The items on the restricted list have been drastically pruned and only a few items now remain subject to either licensing or quantitative ceiling.

79. Rice and wheat are emerging as major export products. Quantitative ceiling and Minimum Export Price in respect of rice has been abolished. To further enhance exports, Food Corporation of India has been permitted to export/sell for exports 3 million tonnes of fine/superfine varieties of rice. Export of wheat, upto 2.5 million tonnes in case of non-durum wheat and 0.5 million tonnes in case of durum wheat has also been permitted. Free sale quota for coffee has been raised to 70 per cent for large producers whereas small coffee growers are now permitted 100 per cent free sale quota. Fruits, vegetables and flowers have emerged as products with immense export potential. A number of Export

Oriented Units in the floriculture sector are under various stages of completion. To facilitate export of perishable products, subsidy on air freight is being provided for specified items.

### Outlook

80. Indian agriculture is beginning to appear globally competitive. Two important policy changes have made this possible. The first is the deliberate reduction in the excessive protection earlier accorded to the manufacturing sector; this has improved the relative profitability of agriculture. The second is letting farming community receive market oriented prices so as to bring about a more equitable terms of trade for the agricultural sector. There is also encouraging indication of reduced level of subsidies for agriculture by advanced industrial countries which is likely to result in the global prices of primary products becoming more favourable for the developing countries. Global prices of grains have now attained a level which has enabled India to export large volumes of non-basmati rice and may even cause export demand for wheat to arise for the first time. The global environment together with pragmatic domestic pricing policies for agriculture exports augurs well for overall agriculture development.