

Agriculture and Food Management

7

CHAPTER

The performance of the agricultural sector influences the growth of the Indian economy. Agriculture (including allied activities) accounted for 17.8 per cent of the Gross Domestic Product (GDP-at constant prices) in 2007-08 as compared to 21.7 per cent in 2003-04. Notwithstanding the fact that the share of this sector in GDP has been declining over the years, its role remains critical as it accounts for about 52 per cent of the employment in the country. Apart from being the provider of food and fodder, its importance also stems from the raw materials that it provides to industry. The prosperity of the rural economy is also closely linked to agriculture and allied activities. Agricultural sector contributed 12.2 per cent of national exports in 2007-08. The rural sector (including agriculture) is being increasingly seen as a potential source of domestic demand; a recognition, that is shaping the marketing strategies of entrepreneurs wishing to widen the demand for goods and services.

7.2 With an average growth of over 4.9 per cent over three years (2005-06 to 2007-08), the agriculture sector (including allied activities) lent credible support to the overall growth in GDP. However, in 2008-09,

the growth originating from agriculture and allied activities declined to 1.6 per cent (as per the revised estimates). While this is lower than the 4.9 and 4.0 per cent growth witnessed in 2007-08 and

Table 7.1 : Agriculture sector – Key indicators

Item	2007-08	2008-09
1. GDP – share and growth (per cent at 1999-00 prices)		
Growth in GDP in agriculture & allied sectors	4.9	1.6
Share in GDP - Agriculture and allied sectors	17.8	17.1
<i>Agriculture</i>	16.3	
<i>Forestry and logging</i>	0.7	
<i>Fishing</i>	0.8	
2. Share in total gross capital formation in the country (per cent at 1999-00 prices)		
Share of agriculture & allied sectors in total gross capital	6.7	
<i>Agriculture</i>	5.7	
<i>Forestry and logging</i>	0.1	
<i>Fishing</i>	0.9	
3. Agricultural imports & exports (per cent at current prices)		
Agricultural imports to national imports	3.1	
Agricultural exports to national exports	12.2	
4 Employment in the agriculture sector as share of total employment in 2004-05 as per Current Daily Status (per cent)		52.1

Source : Central Statistical Organisation & Dept of Agriculture and Cooperation

Table 7.2 : Gross capital formation in agriculture (Figures in Rs. crore at 1999-2000 prices)

Year	GDP	Agriculture & allied activities		GCF/GDP in agriculture & allied (%)	GCF in agriculture as % of total GDP
		GCF	GDP		
2004-05	2388768	57849	482446	12.0	2.4
2005-06	2616101	66065	511013	12.9	2.5
2006-07	2871120	73285	531315	13.8	2.6
2007-08	3129717	79328	557122	14.2	2.5

2006-07 respectively, the performance in 2008-09 needs to be viewed in the light of the high base of the previous years. Agricultural growth is characterized by sharp fluctuations and remains vulnerable to the vagaries of nature.

7.3 In terms of composition, out of the total share of 17.8 per cent in GDP in 2007-08 for the agriculture and allied activities sector, agriculture alone accounted for 16.3 per cent of GDP followed by fishing at 0.8 per cent and forestry and logging at 0.7 per cent of GDP.

Gross capital formation in agriculture and allied sector

7.4 The Gross Capital Formation (GCF) in agriculture as a proportion to the total GDP has shown a decline from 2.9 per cent in 2001-02 to 2.5 per cent in 2007-08. However, the GCF in agriculture relative to GDP in this sector has shown an improvement from 11.23 per cent in 1999-2000 to 14.24 per cent in 2007-2008 (Table 7.2).

7.5 The share of agriculture & allied sector in total GCF after showing a marginal increase during 1999-2000 to 2001-02 has been continuously declining. It stood at 10.2 per cent in 1999-2000, increased to 11.7 per cent in 2001-02 and thereafter

Table 7.3 : Share of agriculture & allied sector in total GCF (%) (at 1999-2000 prices)

Year	Public sector	Private sector	Total
1999-2000	6.0	11.9	10.2
2000-01	5.8	11.3	9.7
2001-02	6.7	13.7	11.7
2002-03	6.5	11.5	10.3
2003-04	7.4	9.2	8.8
2004-05	7.8	7.7	7.7
2005-06	7.9	7.1	7.2
2006-07	8.2	6.6	7.0

Source : Agricultural Statistics at a Glance 2008, Directorate of Economics & Statistics

declined to 7 per cent in 2006-07. The decline was mainly attributed to decline in the private sector despite increase in the share of public sector (Table 7.3).

7.6 Apart from production, the demand and distributional aspects of the agricultural sector, especially of food availability and food management, are of importance to the economy. This chapter reviews the production performance of different segments of agriculture and allied activities covering, inter alia, horticulture, animal husbandry and fisheries as also the developments in the area of food management during the year 2008-09.

Crop production, 2008-09

7.7 For three consecutive years (2005-06 to 2007-08), foodgrains production recorded an average annual increase of over 10 million tonnes. The total foodgrains production in 2007-08 was estimated at 230.78 million tonnes as against 217.3 million tonnes in 2006-07 and 208.60 million tonnes in 2005-06.

7.8 As per the third advance estimates, production of foodgrains in 2008-09 is estimated to be 229.85 million tonnes, which is a marginal improvement of 1.97 million tonnes over the second advance estimates for 2008-09. This is, however, lower than the target of 233 million tonnes set out for the year as also the final estimates of 230.78 million tonnes for 2007-08 (Table 7.4).

Cereal production

7.9 The overall production of cereals in 2008-09 has shown a decline of 0.2 per cent over 2007-08 and a shortfall of 0.8 per cent over target for the year. While rice production in 2008-09 exceeded both target for the year and the level in 2007-08, wheat production was marginally below the target for the year and production level achieved in 2007-08. In the case of coarse cereals, there has been a large

Table 7.4 : Foodgrain production (million tonnes)

Crop	2007-08	2008-09			
	Final	Targets	3 rd Advance Estimates	Percentage Increase (+) Decrease(-) Over final 2007-08	Percentage Increase (+) Decrease (-) vis-à-vis target for 2008-09
1 Rice	96.69	97.00	99.37	2.8	2.4
2 Wheat	78.57	78.50	77.63	-1.2	-1.1
3 Coarse cereals	40.76	42.00	38.67	-5.1	-7.9
4 Cereals	216.02	217.50	215.67	-0.2	-0.8
5 Total pulses	14.76	15.50	14.18	-3.9	-8.5
6 Total food grains	230.78	233.00	229.85	-0.4	-1.4

shortfall both with reference to the targeted production as also the level achieved in the previous year.

Rice

7.10 As per the third advance estimates, the production of rice was 99.37 million tonnes in 2008-09, an increase of about 2.8 per cent over 2007-08 levels and 2.4 per cent over the target for 2008-09. The increase in the production of rice during the year was mainly on account of the kharif season output which was 3.4 per cent higher than the level achieved in corresponding period of 2007-08 and 3.0 per cent over the target for the year. Rabi rice, on the other hand, is expected to be lower by, about 0.9 per cent over the 2007-08 production levels and by 0.6 per cent over targeted production for 2008-09.

Wheat

7.11 Wheat production is estimated at 77.63 million tonnes in 2008-09 against the target of 78.50 million tonnes. The production in 2008-09 is expected to be 1.2 per cent lower than the 2007-08 production level.

Coarse cereals

7.12 Total production of coarse cereals are expected to decline to 38.67 million tonnes against production of 40.76 million tonnes in 2007-08 and the 2008-09 target of 42 million tonnes. The kharif production is estimated at 28.31 million tonnes which is 11.2 per cent lower than the kharif production in 2007-08 and 13.2 per cent lower than the target for 2008-09. The decline in production in 2008-09 vis-à-vis last year's production, is spread across jowar, bajra, maize, ragi and small millets. However production of barley shows an increase of 29.2 per cent over that of 2007-08.

Pulses

7.13 Total production of pulses is estimated at 14.18 million tonnes in 2008-09, which is 3.9 per cent lower than the production in 2007-08 and 8.5 per cent lower than the targeted production for 2008-09. The decline over the previous year is significant for the kharif season, which was only partially neutralized by the increase in production in the rabi crop.

Oilseeds

7.14 Total production of the nine oilseeds is estimated at 281.3 lakh tonnes, which is about 5.5 per cent lower than the production in 2007-08 and about 11.4 per cent lower than the targeted production for 2008-09. As compared to the previous year, there is a decline of 12.3 per cent in kharif oilseed production while in the rabi oilseed production, there is an increase of about 10.1 per cent (Table 7.5).

Sugarcane

7.15 The production of sugarcane during 2008-09 is estimated at 2,892 lakh tonnes which is lower than the production of 3,482 lakh tonnes during 2007-08. This represents a decline of 16.9 per cent over previous year and of 14.9 per cent vis-a-vis the target for 2008-09.

Cotton

7.16 The production of cotton, estimated at 232.68 lakh bales, is short of the final estimates of 258.84 lakh bales in 2007-08 by 10.1 per cent and as compared to the target by 10.5 per cent.

Jute and mesta

7.17 The production of jute and mesta, estimated at 103.28 lakh bales in 2008-09, is lower than the targeted production of 110 lakh bales by 6.1 per cent

Table 7.5 : Production of commercial crops

Crop	Units	2007-08 Final	2008-09			
			Targets	3 rd Advance Estimates	Per cent increase over 2007-08	Per cent increase vis-a vis target
Total Nine Oilseeds	Lakh tonnes	297.55	317.50	281.27	-5.5	-11.4
Sugarcane	Lakh tonnes	3481.88	3400.00	2892.34	-16.9	-14.9
Cotton #	Lakh bales	258.84	260.00	232.68	-10.1	-10.5
Jute & Mesta # #	Lakh bales	112.11	110.00	103.28	-7.9	-6.1

Source : Department of Agriculture & Cooperation # bales of 170 kgs each ## bales of 180 kgs.

and also lower than the production in 2007-08 by 7.9 per cent.

7.18 It therefore emerges that as per the present reckoning from third advance estimates for 2008-09, the production of coarse cereals, pulses, and most commercial crops (in particular, sugarcane and cotton) are lower than the levels achieved in 2007-08.

Area, production and yield

7.19 Growth in the production of agricultural crops depends on acreage and yield. Limitations in the expansion of agricultural land suggest that increase in gross cropped area can come from multiple cropping. In view of this, the main source of long-term output growth is improvement in yield. [The trends in indices of area, production and yield of different crops till 2007-08 (Base T.E 1981-82=100) are given as under Table 7.6. Trends in area and production are given in Figure 7.1.

Rice

7.20 Compound growth rates of index of area under rice show a negative growth of (-) 0.1 per cent per annum during 2001-08 compared to the 1990s. The area under rice cultivation has remained more or less stagnant in the recent years while growth in yield has shown an increase.

Wheat

7.21 Area under wheat that was around 25 million hectares in 2002-03 increased to 26.4 million hectares in 2005-06 and further to 28 million hectares in 2007-08. The coverage under irrigation has been about 87 to 89 per cent of area for wheat. The compound growth rates of indices of area, production and yield of wheat during 1991-2000 and 2001-08 show a perceptible decline.

Table 7.6 : Compound growth rates of area, production and yield

(as % per annum with Base T.E 1981-82=100)

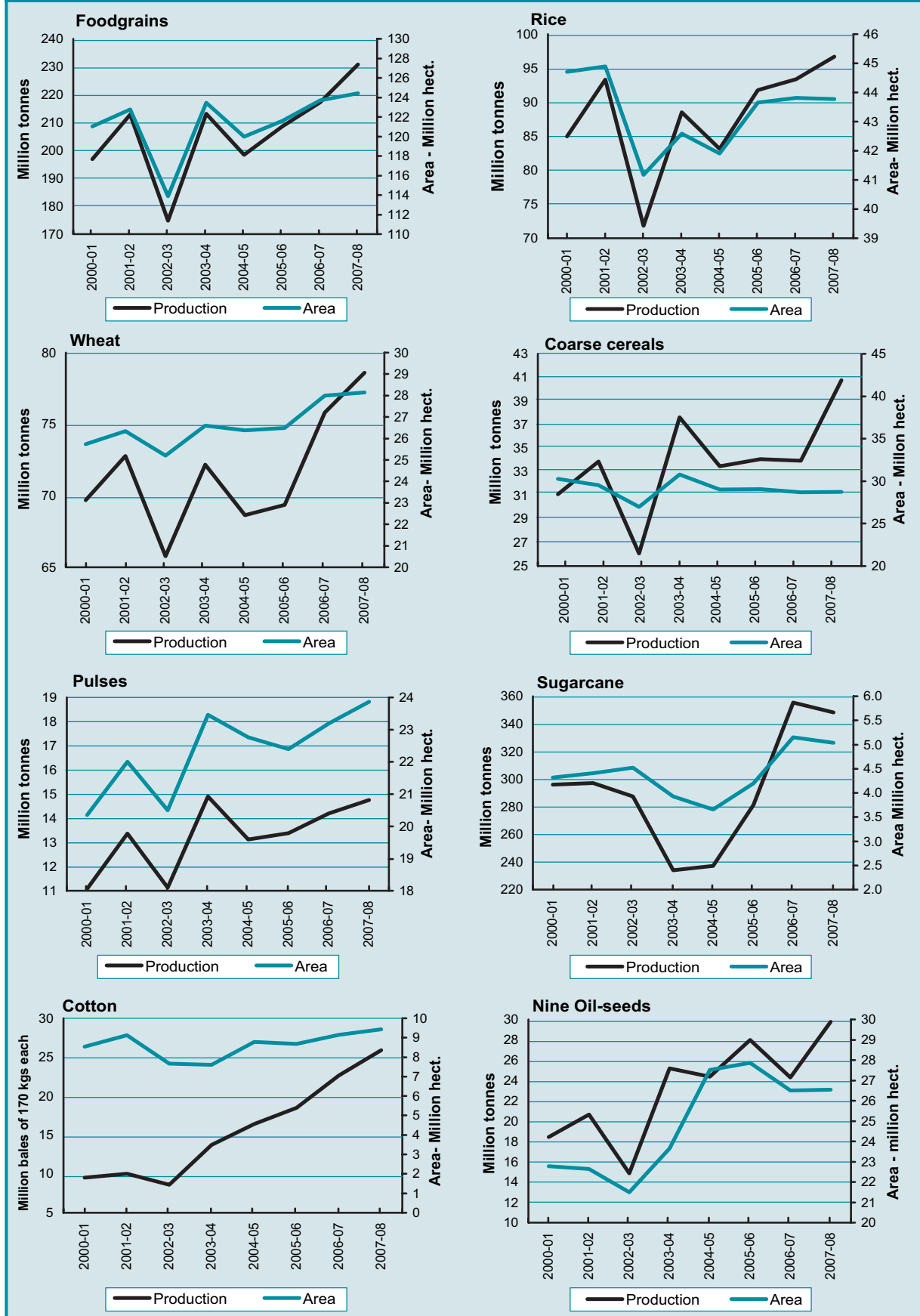
Rice			
Growth rates	1980-81 to 1989-90	1990-91 to 1999-2000	2000-01 to 2007-08
Area	0.4	0.7	-0.1
Production	3.6	2.0	1.9
Yield	3.2	1.3	2.0
Wheat			
Area	0.5	1.7	1.3
Production	3.6	3.6	1.4
Yield	3.1	1.8	0.1
Coarse cereals			
Area	-1.3	-2.1	-0.4
Production	0.4	0.0	3.3
Yield	1.6	1.8	4.3
Pulses			
Area	-0.1	-0.6	1.9
Production	1.5	0.6	3.4
Yield	1.6	0.9	1.7
Sugarcane			
Area	1.4	-0.1	1.9
Production	2.7	2.7	2.2
Yield	1.2	1.1	0.3
Cotton			
Area	-1.3	2.7	1.5
Production	2.8	2.3	17.5
Yield	4.1	-0.4	15.8
Nine oilseeds			
Area	2.5	0.2	3.4
Production	5.4	1.4	7.2
Yield	2.5	1.4	3.7

Source : Department of Agriculture & Cooperation

Coarse cereals

7.22 Growth in index of area during 2001-08 improved, compared to the 1990s. The growth in

Figure 7.1 : Area & production of principal crops (production in million tonnes, area in million hectares)



index of yield increased significantly, leading to an increase in the growth in production.

Pulses

7.23 Gram and tur are the major contributors to the total pulses production in the country. During the period 2000-01 to 2007-08 there has been an improvement in the growth in the indices of yield and in area resulting in considerable increase in the growth in production.

Sugarcane

7.24 The area under sugarcane showed an increase from 3.93 million hectares in 2003-04 to around 5.04 million hectares in 2007-08. Production increased from 233.86 million tonnes in 2003-04 to 348.2 million tonnes in 2007-08. Accordingly, yield increased from 59.4 tonnes per hectare to 69.1 tonnes per hectare in 2007-08. Despite a decline in growth in index of yield during 2001-08 as compared to the 1990s, the index of production growth was more or less sustained by the growth in index of area during the period.

Cotton

7.25 Cotton occupies an important place among the cash crops in India. Cotton is grown in nine major states namely, Punjab, Haryana, North Rajasthan, Gujarat, Maharashtra, Madhya Pradesh, Andhra Pradesh, Karnataka and Tamil Nadu.

7.26 The area under cotton increased from 7.60 million hectares in 2003-04 to 9.43 million hectares in 2007-08. The yield of cotton went up from 307 kgs per hectare in 2003-04 to 466 kgs per hectare in 2007-08. The compound growth in index of yield has shown an increase from (-) 0.4 per cent during the 1990s to 15.8 per cent during 2001-08. However, the growth in index of area moderated, but remained positive. The combined effect on index of production was an increase in growth from 2.3 per cent during the 1990s to 17.5 per cent during 2001-08.

Oilseeds

7.27 Area covered under nine oilseeds, which stood at 23.66 million hectares in 2003-04 increased to 26.54 million hectares in 2007-08. Production of oilseeds, which stood at 25.19 million tonnes in 2003-04, increased to 29.76 million tonnes in 2007-08. The growth in indices of yield and area under oilseeds has shown a perceptible improvement during 2001-08 as compared to the 1990s.

Area coverage 2008-09

7.28 During 2008-09 the area sown at all-India level under kharif was 2.3 per cent less than the

area sown in 2007-08 of 1,039.23 lakh hectares. As on 27.03.09, area sown under all rabi crops taken together has been reported to be higher at 638.33 lakh hectares as compared to 619.68 lakh hectares in the corresponding period of 2007-08.

Agricultural inputs

7.29 Improvement in yield which is key to long-term growth depends on a host of factors that includes technology, use of quality seeds, fertilizers and pesticides and micronutrients, not the least irrigation. Each of these plays a role in determining the yield level and in turn the augmentation in the level of production.

Seeds

7.30 The story of the agricultural season begins with soil preparation. However, the first decisive step that a farmer takes relates to sowing. The availability of quality seeds (among other factors) make a critical difference to output growth. In India, more than four-fifths of the farmers rely on farm-saved seed leading to a low seed replacement rate.

7.31 The Indian Seed Programme includes the participation of Central and State Governments, the Indian Council of Agricultural Research (ICAR), state agricultural universities and the cooperatives and private players. There are 15 state seed corporations besides two national level corporations, viz. the National Seeds Corporation and the State Farms Corporation of India. Indian seeds programme recognizes three kinds of seed generation, viz. breeder, foundation and certified seeds. Production of breeder and foundation seeds during 2008-09 is anticipated at 1.00 lakh quintals and 9.69 lakh quintals respectively and the distribution of certified/quality seeds at about 190.0 lakh quintals (Table 7.7).

Table 7.7 : Production of breeder and foundation seeds and distribution of certified seed

Year	Breeder seeds (quintals)	Foundation seeds (lakh quintals)	Distribution of certified/quality seeds (lakh quintals)
2004-05	66,460	6.9	113.10
2005-06	68,654	7.4	126.74
2006-07	73,829	7.96	155.01
2007-08	91,960	8.22	179.05
2008-09	1,00,000 (Anticipated)	9.69 (Anticipated)	190.00 (Anticipated)

Source : Department of Agriculture & Cooperation

7.32 The Ministry of Agriculture is implementing a Central sector scheme "Development and Strengthening of Infrastructure Facilities for Production and Distribution of Quality Seeds" on all-India basis since 2005-06. The scheme is aimed at making available quality seeds of various crops to the farmers at affordable price and in time so as to enhance seed replacement rate, boost seed production in private sector and help the public sector seed companies to contribute in enhancing seed production.

7.33 A major thrust under the scheme is on improving quality of farm-saved seeds through "Seed Village Programme," under which more than 25,000 seed villages have been organized during 2008-09 across the country. Certified/quality seed production has increased from 194.31 lakh quintals during 2006-07 to 250.35 lakh quintals during 2008-09.

7.34 The seed component of the Prime Minister's Relief Package for distressed farmers is being implemented in 31 suicide-affected districts in four states of Maharashtra, Andhra Pradesh, Karnataka and Kerala under the above scheme, Certified seeds are supplied at 50 per cent of the seed cost to the farmers in such affected districts. During the year 2008-09, an amount of Rs. 445.81 crore has been released under the PM's Relief Package.

7.35 Fifty-two proposals for seed infrastructure development were sanctioned for boosting seed production in private sector and nine notified seed testing laboratories and two state seed certification agencies are being strengthened. Financial sanctions have been given for establishing tissue culture facilities in Orissa and Maharashtra for banana and pomegranate respectively. The Biotech Consortium of India Limited (BCIL) has been engaged as an expert agency to execute public awareness programmes in nine BT cotton-growing states. The consortium has been provided financial assistance of Rs. 26.65 lakh during the year 2008-09.

7.36 The Protection of Plant Varieties and Farmers' Rights (PPV&FR) Authority has been established in November 2005. The Authority has the mandate to implement provisions of the PPV&FR Act, 2001. Fourteen crops, namely, rice, bread wheat, maize, sorghum, pearl millet, chickpea, pigeon pea, green gram, black gram, lentil, field pea, kidney bean, cotton and jute were notified for the purpose of registration under the Act. The Authority has plans to extend its coverage to forestry, aromatic

and medicinal plants. The Government of India on January 1, 2008 approved the restructuring of State Farms Corporation of India.

7.37 In response to the changes that have taken place in the seed sector, the existing Seeds Act, 1966 is proposed to be replaced by a suitable legislation to, inter alia, (i) create a facilitative climate for growth of the seed industry so as to enhance seed replacement rates, boost the export of seeds and encourage import of useful germplasm, create a conducive atmosphere for application of frontier sciences in varietal development and for enhanced investment in related R&D. The Government introduced the Seeds Bill in the Rajya Sabha in December 2004 which was referred to the Parliamentary Standing Committee on Agriculture. The Parliamentary Standing Committee has recommended modifications in the Bill. The Government moved the official amendments to the Seeds Bill in June 2008, which will be taken up for consideration by the Parliament.

Irrigation

7.38 The Government of India has taken up irrigation potential creation through public funding and assisting farmers to create potential on their own farms. Substantial irrigation potential has been created through major and medium irrigation schemes. The total irrigation potential in the country has increased from 81.1 million hectares in 1991-92 to 102.08 million hectares up to the end of the Tenth Five Year Plan (2006-07). Of the total potential created however only 87.2 million hectares is actually utilized. The Working Group on Water Resources for the Eleventh Five Year Plan (2007-12) has proposed creation of irrigation potential of 16 million hectares (9 million hectares from MMI sector and 7 million hectares from MI sector) during the Eleventh Five Year Plan period.

7.39 The Central Government initiated the Accelerated Irrigation Benefit Programme (AIBP) from 1996-97 for extending assistance for the completion of irrigation schemes remaining incomplete. Under the programme the project approved by the Planning Commission are eligible for assistance. Further, the assistance, which was entirely a loan from the Centre in the beginning, was modified with inclusion of grant component w.e.f. 2004-05. The AIBP guidelines were further modified in December 2006 to provide enhanced assistance at 90 per cent of the project cost as grant to special category states; Drought Prone Area Programme

(DPAP)/tribal areas/flood-prone area and KBK districts of Orissa. Under AIBP, State Governments were provided Rs. 27,996 crore as Central Loan Assistance (CLA)/grant for major and medium projects up to December 31, 2008. So far 91 major and medium irrigation schemes have been completed. In 2008-09, Rs. 2,791 crore has been released for AIBP for major and medium irrigation schemes up to December 2008.

Fertilizers

7.40 Chemical fertilizers have played a significant role in the development of the agricultural sector. The per hectare consumption of fertilizers in nutrient terms stands at 117.07 kg in 2007-08. However, recent trends in agricultural productivity show a decline in marginal productivity of soil in relation to the application of fertilizers and in some cases has also become negative. Some of the evident factors contributing to the decline in marginal productivity are skewed NPK application ratio in the country, comparatively higher application of straight fertilizers like urea, DAP and MOP as against the complex fertilizers (NPKs) which are considered to be ergonomically better and more balanced fertilizer products. Lack of application of proper nutrients based on soil analysis has also contributed to slowdown in growth of productivity.

7.41 The domestic production of urea in the year 2008-09 was 199.22 lakh tonnes as compared to 187.27 lakh tonnes in 2002-03 whereas that of DAP declined in 2008-09 to 29.33 lakh tonnes after reaching a peak of 52.36 lakh tonnes in 2002-03, mainly because of shift from DAP production to complex fertilizer production (Table 7.8).

7.42 Availability of raw material/ intermediates has also been a major bottleneck towards increase in production. There is no domestic production of MOP and its requirement is met fully by import. The imports of urea, DAP and MOP are given in Table 7.9.

Table 7.8 : Production of urea, DAP and complex fertilizers

(in lakh tonnes)				
Year	2005-06	2006-07	2007-08	2008-09
Urea	200.98	203.08	198.58	199.22
DAP	46.28	48.51	42.12	29.33
Complex fertilizers	67.64	74.64	58.50	68.48

Source : Department of Fertilizer

Table 7.9 : Imports of urea, DAP and MOP

(Lakh MT)			
	Urea	DAP	MOP
2005-06	20.57	28.27	45.28
2006-07	47.18	28.75	34.48
2007-08	69.28	29.90	44.20
2008-09	56.67	61.91	56.72

Source : Department of Fertilizer

Fertilizer prices and subsidy

7.43 The international prices of fertilizers increased manifold and the domestic cost of production of fertilizers has also increased during last couple of years. In spite of this, the prices of fertilizers have not been increased and have been kept at the same level of 2002 for major fertilizers. In addition, due to implementation of nutrient-based subsidy pricing, prices of various complex fertilizers were reduced by 18 per cent on an average. Increased burden of cost is borne by the Government in the form of increased subsidy/concessions paid to the manufacturers of various fertilizers. Total subsidy bill, which was Rs. 11,835 crore during 2003-04, increased to Rs. 99,456 crore during 2008-09.

7.44 The Government has taken various policy initiatives for the fertilizer sector. These cover pricing policy for indigenous urea, new investments in urea sector, nutrient-based pricing, production and availability of fortified and coated fertilizers, uniform freight subsidy on all fertilizers under the fertilizer subsidy regime, concession scheme for decontrolled phosphatic and potassic fertilizers, inclusion of Mono Ammonium Phosphate (MAP), Tri Super Phosphate (TSP) and Ammonium Sulphate (AS) in the

Table 7.10 : The consumption of fertilizers in nutrient terms

(lakh tonnes)				
Product	2005-06	2006-07	2007-08	2008-09* (Kharif 08)
Nitrogenous (N)	127.23	137.73	144.19	73.75
Phosphatic (P)	62.04	55.43	55.15	33.21
Potassic (K)	24.13	23.35	26.36	17.74
Total (N+P+K)	203.4	216.51	225.7	124.70
Per hectare Consumption (kg.)	105.5	112.3	117.07	—

Source : Department of Fertilizer

* Estimated

concession scheme, revised scheme for concession for Single Super Phosphate (SSP) based on inputs cost and a uniform all-India maximum retail price of Rs. 3,400 per tonne for SSP, policy for conversion of FO/LSHS urea units to natural gas.

Rainfall and reservoir storage

7.45 Rainfall greatly influences the crop productivity. More than 75 per cent of annual rainfall is received during the South-west (SW) monsoon season (June-September). During winter season (January-February) of 2008, the country as a whole received 14 per cent less rainfall of long period average (LPA). In the pre-monsoon period of 2008 (March-May), the departure of rainfall was 14 per cent below of LPA. During SW monsoon of 2008, the country as a whole received 2 per cent less rainfall compared to the LPA. Southern peninsula, central India and the North-east experienced deficient rainfall of 4 per cent, 4 per cent and 6 per cent respectively of their LPA. The North-west India however received 7 per cent more rainfall.

7.46 At district level, 28 per cent of districts of the country received excess rainfall, 48 per cent normal rainfall, 23 per cent deficient rainfall and 1 per cent scanty rainfall. During post-monsoon season (October to December) of 2008, country as a whole received 31 per cent less rainfall of LPA. During winter season (January-February) of 2009 the country as a whole received 45 per cent less of LPA.

7.47 The spatial distribution of seasonal monsoon rainfall during 2008 was largely uniform with 30 meteorological subdivisions recording normal rainfall. Only two subdivisions (Punjab and Orissa) recorded excess rainfall. The subdivisions Nagaland, Manipur, Mizoram & Tripura, West Madhya Pradesh, Vidarbha

and Kerala recorded deficient rainfall. Out of 36 meteorological subdivisions, 92 per cent of the country's area comprising of 32 subdivisions received excess / normal rainfall and the remaining 8 per cent received deficient rainfall during the season. Monsoon rainfall was marked by large temporal variations for the country as a whole, as the rainfall was 24 per cent above LPA in June. In July, the monsoon rainfall was 17 per cent below LPA. The rainfall was near normal during August and September as it was 3 per cent and 1 per cent below LPA respectively.

Reservoir storage

7.48 The Central Water Commission (CWC) monitors the total live storages of 81 important reservoirs with live storage capacity at Full Reservoir Level (FRL) of 151.77 billion cubic meters (BCM) (Table 7.11).

7.49 At the end of monsoon 2008 the total water availability in these reservoirs was 114.262 BCM which was higher than the average of the last 10 years by 12.2 per cent (12.433 BCM). The storages were comfortable from the view point of hydro electricity generation as well as irrigation for rabi crops.

Price policy for agricultural produce

7.50 Price policy for agricultural commodities seeks to ensure remunerative prices to growers for their produce with a view to encourage higher investment and production and at the same time to safeguard the interest of consumers by making available supplies at reasonable prices. The minimum support prices (MSP) for major agricultural products announced each year are fixed taking into account the recommendations of the Commission for Agricultural Costs and Prices (CACP). The CACP

Table 7.11 : Reservoir storage status

Item	2008		2007		Average of last 10 years	
	Storage BCM	% of FRL	Storage BCM	% of FRL	Storage BCM	% of FRL
Beginning of monsoon season as on 1.6.2008	29.495	19	31.120	21	21.259	14
End of monsoon season as on 30.9.2008	114.262	75	124.150	82	101.829	67
Increase in storage during monsoon season, June 1 to September 30	84.767	56	93.030	61	80.570	53

Source : Central Water Commission

Table 7.12 : Minimum support prices

(Rs. per quintal)			
Commodity	MSP 2008-09 (crop year)	Commodity	MSP 2008-09 (crop year)
Kharif crops		Rabi crops	
Paddy (common)	850 + Rs. 50 per quintal bonus	Wheat	1080
Paddy (Gr.A)	880 + Rs. 50 per quintal bonus	Gram	1730
Jowar (Malindi)	860	Masur (lentil)	1870
Maize	840	Rapeseed/mustard	1830
Arhar (Tur)	2000	Barley	680
Moong	2520	Other crops	
Cotton (F-414/H-777/J34)	2500*	Sugarcane	81.18
Groundnut in shell	2100		

* staple length (mm) of 24.5 – 25.5 and Micronaire value of 4.3 -5.1

recommends MSPs for 24 important crops. Apart from taking into account the cost of production, the CACP considers other factors such as demand–supply gap, price situation, global availability inter-crop price parity and terms of trade between agriculture and non-agriculture sector (Table 7.12).

7.51 The MSPs of kharif crops of 2008-09 season was raised substantially over the respective MSPs for 2007-08 season. The MSP for paddy was raised by Rs. 205 per quintal. A bonus of Rs. 50 per quintal was also payable over and above the MSP, thus raising the purchase price to Rs. 900 per quintal. An increase of Rs. 240 per quintal was given for jowar and bajra, while the MSPs of maize and ragi were raised by Rs. 220 and Rs. 315 per quintal respectively. The MSPs of moong and urad were raised by Rs. 820 per quintal and of arhar by Rs. 450 per quintal. The MSPs of sesamum and nigerseed were also substantially raised by Rs. 1,170 and Rs. 1,165 per quintal respectively. The MSP of sunflower seed was raised by Rs. 705 per quintal while that of groundnut-in-shell was raised by Rs. 550 per quintal. The MSP of soyabean (black) was raised by Rs. 440 per quintal while the MSP of soyabean (yellow) by Rs. 340 per quintal. The MSP of cotton (staple length 24.5 mm-25.5 mm and micronaire value of 4.3-5.1) was fixed at Rs. 2,500 per quintal against Rs. 1,800 per quintal for medium staple cotton in the previous year, while the MSP of cotton (staple length 29.5 -30.5 mm and micronaire value of 3.5-4.3) was fixed at Rs. 3,000 per quintal against Rs. 2,030 per quintal for long staple cotton in the previous year.

7.52 In the case of rabi crops of 2007-08 season, the MSP of wheat was fixed at Rs. 1,000 per quintal against Rs. 750 per quintal in the previous year, an increase of Rs. 250 per quintal. The MSPs of gram and masur were raised by Rs. 155 per quintal and that of barley and rapeseed/mustard by Rs. 85 per quintal. The MSPs of rabi crops of 2008-09 season to be marketed in 2009-10 have been further raised over their previous years' MSPs. The MSP of wheat has been raised to Rs. 1,080 per quintal and of barley to Rs. 680 per quintal. MSP of gram has been raised by Rs. 130 per quintal and of masur by Rs. 170 per quintal. The MSP of rapeseed/mustard has been raised to Rs. 1,830 per quintal.

7.53 While the price support scheme for wheat and rice is implemented by the Department of Food & Public Distribution, for the coarse cereals, a system of decentralized procurement is followed. For purchase of cotton, the Cotton Corporation of India and NAFED are the designated agencies while for jute it is the Jute Corporation of India. Losses incurred if any, in these operations are fully reimbursed by the Central Government.

7.54 The Department of Agriculture & Cooperation is implementing the Price Support Scheme (PSS) for procurement of oilseeds and pulses. The Department of Agriculture & Cooperation is also implementing the Market Intervention Scheme (MIS) on request from the State Governments for procurement of horticultural and agricultural commodities generally perishable in nature and not covered under the Price Support Scheme.

**Table 7.13 : Procurement made by NAFED during 2008-09
(on the request of State Governments) Under Market Intervention Scheme.**

Sl. No.	State	Commodity	Quantity allowed (in MT)	Market intervention price (Rs. per MT)	Value in (Rs. crore)
1	Uttar Pradesh	Potato	1,00,000	2,500	25.0
2	Mizoram	Chilli	1,810	28,000	5.1
3	West Bengal	Potato	1,00,000	2,300	23.0
4	Mizoram	Passion Fruit	9,000	7,000	6.3
5	Uttarakhand	Apple	1,500	4,500	0.7
6	Himachal Pradesh	Apple	38,000	4,500	17.1
7	Uttarakhand	Apple	1,500	4,500	0.7
8	Mizoram	Chow chow	6,450	4,500	2.9
9	Nagaland	Ginger	15,000	5,000	7.5
10	Andhra Pradesh	Oil palm	30,000	5,000	15.0
11	Karnataka	Arecanut white	6,000	69,000	41.4
		Red	4,000	89,000	35.6
12	Uttar Pradesh	Potato	1,00,000	2,850	28.5
13	Nagaland	Orange	16,000	5,100	8.2
14	Karnataka	oil palm	800	5,000	0.4
Total					217.27

7.55 NAFED undertakes procurement of oilseeds, pulses and cotton under PSS as and when prices fall below the MSP. Procurement under PSS continues till prices stabilize at or above the MSP. Losses, if any, incurred by NAFED in undertaking MSP operations are fully reimbursed by the Central Government. Profit, if any, earned in undertaking MSP operations are credited to the Central Government. During 2008-09, NAFED has procured a quantity of 535 MT of copra valuing Rs. 2.17 crore in Kerala, Tamil Nadu and Karnataka, 17.99 lakh MT raw cotton valuing Rs. 5,139.33 crore in Maharashtra, Gujarat and Andhra Pradesh, 12,060 MT sunflower seed valuing Rs. 29.39 crore in Andhra Pradesh, Karnataka, Maharashtra and 40 MT groundnut valuing Rs. 0.09 crore in Uttar Pradesh under PSS (Table 7.13).

7.56 The MIS is implemented in order to protect the growers of these commodities from making a distress sale in the event of a bumper crop when there is glut in the market and prices fall below the economic levels / cost of production. Procurement under MIS is made by NAFED as the central agency and by the state designated agencies. Losses if any incurred by the procuring agencies are shared between the Central Government and the concerned State Government on 50:50 basis (75:25 in case of

North-eastern States). However, the amount of loss to be shared between the Central Government and the concerned State Government is restricted to 25 per cent of the procurement cost. Profit if any earned by the procuring agencies is retained by them.

Progress of special programmes for raising agricultural production

National food security mission

7.57 The national food security mission (NFSM) is being implemented in 312 identified districts of 17 states of the country. The NFSM-Rice is being implemented in 136 districts of 14 states i.e. Andhra Pradesh, Assam, Bihar, Chhattisgarh, Gujarat, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Tamil Nadu, Uttar Pradesh and West Bengal. The interventions covered under NFSM-Rice include demonstrations on improved practices; system of rice intensification; promotion of hybrid rice-production and distribution; distribution of HYV seeds; seed minikits; micro-nutrients; liming; conoweeders; zero till seed drills; multi-crop planters; seed drills; rotavators, diesel pump sets, power weeders, knap sack sprayers; plant protection chemicals and bio-pesticides; farmers' field schools; local initiatives; award for best performing districts;

mass media campaign; international exposures for technical knowledge enrichment and project management team. NFSM-Wheat is being implemented in 141 districts of 9 states i.e. Bihar, Gujarat, Haryana, Madhya Pradesh, Maharashtra, Punjab, Rajasthan, Uttar Pradesh and West Bengal. The interventions covered under NFSM-Wheat include demonstrations on improved practices; seed replacement; seed minikits; micro-nutrients; gypsum; zero till seed drills; rotavators, diesel pump sets, multi-crop planters; seed drills; sprinkler sets; knap sack sprayers; diesel pump sets; pilot project on community generators; farmers' field schools; award for best performing districts; local initiatives; international exposures for technical knowledge enrichment and project management team. NFSM-Pulses is being implemented in 171 identified districts in 14 states i.e. Andhra Pradesh, Bihar, Chhattisgarh, Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal. NFSM-Pulses interventions includes assistance in the form of production and purchase of breeder seeds and foundation and certified seeds; distribution of certified seeds; strengthening of seeds certification agencies; sprinkler sets; zero till seed drills; strengthening of infrastructure of IIPR, Kanpur; pilot project on blue bull; demonstration of ICRISAT technologies and project management team and other facilities provided under NFSM-Rice and NFSM-Wheat. During 2008-09, an amount of Rs. 883.26 crore was released under the Programme.

The rashtriya krishi vikas yojana

7.58 Under the Scheme of RKVY, the following indicative broad activities have been identified for focused attention – Integrated Development of Food Crops, including coarse cereals, minor millets and pulses; agriculture mechanization; soil health and productivity; development of rain-fed farming systems; integrated pest management; market infrastructure; horticulture; animal husbandry, dairying and fisheries; Concept to Completion Projects that have definite timelines; support to institutions that promote agriculture and horticulture, etc.; organic and bio-fertilizers; and innovative schemes. During the year 2007-08 an outlay of Rs. 1,500 crore was approved of which an amount of Rs. 1,246.89 crore including Rs. 48 crore at Rs. 10 lakh per district for preparation of District Agriculture Plan (DAP) was released to the states. For the year 2008-09, an outlay of Rs. 2,891.70 crore has been provided at revised

estimate (RE) stage and an amount of Rs. 2,886.80 crore has been released to the eligible States as on 31.03.2009.

Information availability

7.59 Timely availability of reliable information on agricultural output is of great significance for planning and policy making. The existing system of agricultural statistics, in spite of established procedures and wide coverage, has inherent limitations in the matter of providing an objective assessment of crops at the pre-harvesting stages with the desired spatial details, which are essential to identify problem areas and the nature of required interventions in terms of spatial, temporal and qualitative inferences. Capabilities of the existing system of crop forecasts and crop estimation can be enhanced with the introduction of technological advancements and the adoption of emerging methodologies. In turn, an efficient and sound information mechanism can assist considerably in the management of concerns in areas such as food security, price stability, international trade, etc. Remote Sensing (RS), Information and Communication Technology (ICT) and Geographic Information System (GIS) can be used towards this end. Schemes/projects like Forecasting Agricultural Output using Space, Agro-meteorology and Land-based Observations (FASAL) and Extended Range Forecasting System (ERFS) have been initiated to establish a more scientific and reliable basis for forecasting.

7.60 In order to enhance the capabilities of the existing system of crop forecasts and crop estimation, the Ministry of Agriculture considered introduction of technological advancements and adoption of emerging methodologies such as RS and GIS. Accordingly, in 1987, the Department of Agriculture & Cooperation (DAC) sponsored a project called "Crop Acreage and Production Estimates (CAPE)" with the objective of developing methodologies using the RS techniques for crop area and production forecasting. The project was implemented through the Space Applications Centre (SAC), Ahmedabad and provided a platform for development and standardization of basic procedures, models and software packages for crop area and production forecasting, using remote sensing and weather data. The concept of FASAL seeks to strengthen the current capabilities of early and in-season crop estimation capabilities from econometric and weather-based techniques with remote sensing applications. Mid-season assessments can be supplemented with multi-

temporal coarse resolution data based analysis. In the latter half of crop growth period, direct contribution of remote sensing in the form of acreage estimates and yield forecasts would be available

7.61 Keeping in view the expertise needed, some of the functions under the scheme have been outsourced, for example, forecasting of area and production of major crops using Remote Sensing technology is being handled by SAC. and forecast of production based on econometric modelling is being done by the Institute of Economic Growth (IEG), New Delhi. The activities relating to forecast of production based on crop growth and yield modelling by making use of the agro-met data has been assigned to the India Meteorological Department (IMD). All other functions, including coordination with various groups are being performed by the National Crop Forecasting Centre (NCFC) in the Ministry of Agriculture. Experimental forecasts based on econometric models and forecast based on RS technology for specific crops have commenced.

Forecasting systems

7.62 In view of immense importance of extended range forecasting in agriculture applications, the Department of Agriculture and Cooperation, as

custodian of the end-users i.e. the farming community, has sponsored a project entitled "Development and Application of Extended Range Forecasting System for Climate Risk Management in Agriculture (ERFS)". The principal participating agencies are India Meteorological Department; the National Centre for Medium Range Weather Forecasting (NCMRWF); Space Applications Centre; Indian Council of Agricultural Research, Centre for Atmospheric Sciences, IIT, Delhi and Department of Agriculture and Cooperation. These six partners have signed an agreement in December 2006 to work jointly on various implementation aspects of the project.

7.63 The objective of ERFS is to generate and disseminate information with a lead-time of 25-30 days. It is expected to give sufficient time to the farmers to plan their cropping activities and help the policymakers to take necessary corrective measures for any contingency, which may arise. Under ERFS, forecast for each month at regional/district level is the ultimate goal. The project is likely to be completed in 5-6 years time frame in two phases. In the first phase (two-three years), it is envisaged to develop a seasonal forecast system for met subdivisions/ agro-climatic zones. In the second phase, monthly forecast is targeted at these levels.