

Agriculture

As per information received from the India Meteorological Department (IMD), the South West Monsoon (June-September) arrived over Kerala on May 26, 2006, a week earlier than normal. The monsoon covered the entire country by July 24, 2006, with a delay of nine days. The area-weighted rainfall from June 1 to September 30, 2006 for the country was 99 per cent of long-period average (LPA) against a forecast of 93 per cent of LPA made by the IMD. The 2006 monsoon rainfall was not evenly distributed over time and space. The uneven distribution of the rainfall (June–September, 2006) adversely affected North-East India (deficiency of 17 per cent), Northwest India (deficiency of 6 per cent) and South Peninsula (deficiency of 5 per cent). Rainfall in Central India was in excess by 16

per cent. Out of the 36 meteorological sub-divisions in the country, monsoon rainfall was normal in 20, excess in 6, and deficient in the remaining 10 sub-divisions (Table 8.1).

8.2 At the end of the monsoon season, five meteorological sub-divisions namely Andaman & Nicobar Islands, Arunachal Pradesh, Assam & Meghalaya, Western Uttar Pradesh and Haryana experienced moderate drought conditions (seasonal rainfall deficiency of 26 per cent to 50 per cent). Out of 533 total meteorological districts that the 36 meteorological sub-divisions have, 130 districts experienced moderate drought and 30 districts experienced severe drought conditions, while rainfall departure in the rest of 373 meteorological districts was within normal.

**Table 8.1 : Monsoon Performance — 1998 to 2006
(June – September)**

Year	Number of meteorological sub-divisions			Percentage of districts with normal/excess rainfall	Percentage of long period average rainfall for the country as a whole
	Normal	Excess	Deficient / scanty		
1999	25	3	7	67	95
2000	23	5	7	65	92
2001	29	1	5	67	92
2002	14	1	21	39	81
2003	26	7	3	77	105
2004	23	0	13	56	86
2005	23	9	4	72	99
2006	20	6	10	60	99

Excess : +20 per cent or more of LPA; Normal: +19 per cent to –19 per cent of LPA;
Deficient : -20 per cent to –59 per cent of LPA; Scanty: -60 per cent to –99 per cent of LPA.
Source : India Meteorological Department.

	2006		2005		Avg. of last 10 years	
	Storage BCM	Percent of FRL	Storage BCM	Percent of FRL	Storage BCM	Percent of FRL
Beginning of monsoon season (as on 02-06-2006)	29.8	2.2	16.62	12	18.62	14
End of monsoon season (as on 05-10-2006)	120.2	90	109.6	82	93.25	70
Increase in storage during monsoon season	90.4	68	92.9	70	74.63	56
Source : Ministry of Water Resources.						

Reservoir storage

8.3 The Central Water Commission (CWC) monitors the total live storage of 76 important reservoirs, having their full reservoir level (FRL) of 133 Billion Cubic Meters (BCM). At the end of monsoon 2006, the total water availability in these reservoirs at 120.2 BCM was up 10 per cent from 109.6 BCM in the same period of 2005 (Table 8.2). These aggregates are quite favorable from the viewpoint of hydroelectricity generation as well as rabi crop.

Growth in Agriculture

8.4 Deviations in foodgrains and agricultural output from its long-term trend are

determined by, among other factors, variations of monsoon around its long-term trend. Furthermore, the negative impact of excess rainfall (compared to LPA) on such output appears to be not as high as the adverse impact of deficient rainfall. With this asymmetric response of foodgrains production to monsoon variability, the repetition of deficient rainfall in the monsoon in 2002, 2004 and 2006 during the Tenth Five Year Plan has led to—(a) poor agricultural growth; (b) reduction in the share of agriculture in GDP; (c) creating inflationary pressure in some primary products; and (d) reduction the potential growth of other sectors by dampening demand.

Five Year Plan	Overall GDP growth rate	Agriculture & Allied Sectors
Seventh Plan (1985-90)	6.0	3.2
Annual Plan (1990-92)	3.4	1.3
Eighth Plan (1992-97)	6.7	4.7
Ninth Plan (1997-2002)	5.5	2.1
Tenth Plan (2002-07)	7.6	2.3
2002-03	3.8	-7.2
2003-04	8.5	10.0
2004-05 (P)	7.5	0.0
2005-06 (Q)	9.0	6.0
2006-07 (A)	9.2	2.7
P: Provisional, Q: Quick estimates, A: Advance estimates		
Note : Growth rates prior to 2001 based on 1993-94 prices and from 2000-01 onwards based on new series at 1999-2000 prices.		
Source : CSO		

8.5 A moderate annual average growth of 3.0 per cent in the first six years of the new millennium starting 2001-02, notwithstanding a growth of 10 per cent in 2003-04 and 6 per cent in 2005-06, agriculture and allied sector has continued to be a cause of concern (Table 8.3). The structural weaknesses of the agriculture sector reflected in low level of public investment, exhaustion of the yield potential of new high yielding varieties of wheat and rice, unbalanced fertilizer use, low seeds replacement rate, an inadequate incentive system and post harvest value addition were manifest in the lacklustre agricultural growth during the new millennium.

8.6 Low yield per unit area across almost all crops has become a regular feature of Indian agriculture (Table 8.4). For example, though India accounted for 21.8 per cent of global paddy production, the estimated yield per hectare in 2004-05 was less than that in Korea and Japan, and only about a third of that in Egypt, which had the highest yield level in the reference year. Similarly, in wheat, while India, accounting for 12 per cent of global production, had average yield slightly lower

than the global average, it was less than a third of the highest level estimated for the UK in 2004-05. For coarse grains and major oilseeds, Indian yields are a third and 46 per cent, respectively, of the global average. In cotton, the situation is slightly better with Indian yields at 63 per cent of the global average. While agro-climatic conditions prevailing in countries may partly account for the differences in yield levels, nonetheless, for major food as well as commercial crops, there is tremendous scope for increasing yield levels with technological breakthroughs.

Agricultural Production and Growth in 2006-07

8.7 Agriculture, and especially a variety of crops produced under diverse climatic situations in different cropping systems, supports 115.5 million farm families. Rice-wheat is the main cropping system of Indo-Gangetic Plains in North-West and North-East Regions, while monoculture of rice is prevalent on the coastal belt of Eastern and Southern States. Cotton-based cropping system dominates in rainfed conditions of Central (Madhya Pradesh and Maharashtra),

**Table 8.4 : International comparisons of yield
Selected commodities – 2004-05**

<i>Metric tonnes/hectare</i>					
Rice/paddy		Wheat		Maize	
Egypt	9.8	China	4.25	U.S.A	9.15
India	2.9	France	7.58	France	7.56
Japan	6.42	India	2.71	India	1.18
Myanmar	2.43	Iran	2.06	Germany	6.69
Korea	6.73	Pakistan	2.37	Philippines	2.1
Thailand	2.63	U.K	7.77	China	4.9
U.S.A	7.83	Australia	1.64		
World	3.96	World	2.87	World	3.38
Cotton		Major Oilseeds			
China	11.10	Argentina	2.51		
U.S.A	9.58	Brazil	2.48		
Uzbekistan	7.98	China	2.05		
India	4.64	India	0.86		
Brazil	10.96	Germany	4.07		
Pakistan	7.60	U.S.A	2.61		
		Nigeria	1.04		
World	7.33	World	1.86		

Source : Ministry of Agriculture and Cooperation.

Southern (Karnataka, Andhra Pradesh and Tamil Nadu) and Western (Gujarat) regions and irrigated areas of Northern (Punjab and Haryana) and Western (Rajasthan) regions. Sugarcane is predominantly grown in Uttar Pradesh, Maharashtra, Tamil Nadu and Karnataka.

8.8 The distribution of farm holdings is dominated by small and marginal farmers. Rainfed agriculture constitutes about 60 per cent of the net sown area. These areas are the major domain of oilseeds, pulses and coarse cereals production. The intensity and distribution of rainfall determine the crop prospects in a majority of the areas. Heavy rains during August-September 2006 in Andhra Pradesh, Gujarat, Madhya Pradesh, Maharashtra and Rajasthan led to inundation/flooding in several parts of the States affecting a sizeable area of crops.

8.9 Late monsoon rains during September in several States have not only brightened production prospects of kharif crops but also triggered early sowing of crops on residual moisture during rabi, especially of wheat in Madhya Pradesh, Maharashtra and Rajasthan. In view of this factor, target for foodgrains production for 2006-07 has been fixed at 220 million tonnes (MT) (Table 8.5).

Crop Production Prospects

8.10 The production of kharif foodgrains during 2006-07 is estimated at 107.2 MT (2nd AE), which is lower than 109.9 MT achieved during 2005-06 (Table 8.6). The production

Table 8.5 : Agriculture Production Targets for 2006-07

<i>(Million tonnes)</i>			
Name of the Crop	Kharif	Rabi	Total
Rice	80.78	12.02	92.80
Wheat	-	75.53	75.53
Jowar	4.28	3.33	7.61
Bajra	8.55	-	8.55
Maize	12.54	2.85	15.39
Ragi	2.79	-	2.79
Barley	-	1.65	1.65
Small Millets	0.53	-	0.53
Total Coarse Cereals	28.69	7.83	36.52
Total Pulses	5.78	9.37	15.15
Total Foodgrains	115.25	104.75	220.00
Cotton*	185.00	-	185.00
Jute**	101.20	-	101.20
Mesta**	11.60	-	11.60
Sugarcane	-	-	270.0

* Lakh bales of 170 kgs each
** Lakh bales of 180 kgs each

of kharif rice is estimated at 77.4 MT against 78.3 MT in 2005-06. Total foodgrains production in 2006-07 is estimated at 209.2 MT (2nd AE).

8.11 Second advance estimates for commercial crops show an improved performance. Sugarcane production is estimated to go up to 315.5 MT during 2006-07 (2nd AE) compared to 270.0 MT during 2005-06 (Table 8.7). The production of cotton at 209.6 lakh bales is the not only highest so far but also 13.5 per cent higher than 185 lakh bales produced in 2005-06. Production of jute

Table 8.6 : Foodgrains production

<i>(Million tonnes)</i>						
Crop/ Year	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07*
Rice	93.3	71.8	88.5	83.1	91.8	90.0
Wheat	72.8	65.8	72.2	68.6	69.4	72.5
Coarse Cereals	33.4	26.1	37.6	33.5	34.1	32.0
Pulses	13.4	11.1	14.9	13.1	13.4	14.5
Foodgrains						
(i) Kharif	112.1	87.2	117.0	103.3	109.9	107.2
(ii) Rabi	100.8	87.6	96.2	95.1	98.7	102.0
Total (i)+(ii)	212.9	174.8	213.2	198.4	208.6	209.2

* 2nd advance estimates (2nd AE).
Source : Ministry of Agriculture.

Table 8.7 : Commercial crops production*(Million tonnes)*

Crop	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07*
Groundnut	7.0	4.1	8.1	6.8	8.0	4.4
Rapeseed & Mustard	5.1	3.9	6.3	7.6	8.1	7.6
Soyabean	6.0	4.7	7.8	6.9	8.3	8.7
Other Oilseeds	2.6	2.1	3.0	3.1	3.6	2.9
Total nine Oilseeds	20.7	14.8	25.2	24.4	28.0	23.6
Cotton @	10	8.6	13.7	16.4	18.5	21.0
Jute & Mesta @@	11.7	11.3	11.2	10.3	10.8	11.4
Sugarcane	297.2	287.4	233.9	237.1	270.0	315.5

@ Million bales of 170 kg each @@ Million bales of 180 kgs. each.
* 2nd advance estimates.
Source : Ministry of Agriculture.

and mesta is also expected to be higher during 2006-07. Production of nine oilseeds at 23.6 million tonnes in 2006-07 (2nd AE) is estimated to decline by 15.7 per cent compared to their production in 2005-06.

Rabi Prospects (2006-07)

8.12 Area coverage under wheat has been encouraging. It is noteworthy that timely sowing of the crop ensures higher productivity by virtue of adequate time for the reproductive phase and consequent grain formation, which is shortened in delayed sowing. Further, the impact of higher temperature on grain formation during early March is also reduced to a minimum. The area sown under wheat (up to January 5, 2007) at 275.5 lakh hectare (ha) is 6.8 per cent higher than that during the corresponding period in 2005-06.

Horticulture

8.13 Acreage under horticulture – which includes fruits, vegetables, spices, floriculture and plantations – is expected to be 20 million hectares in 2006-07 (Table 8.8). With production of 53 MT and 108 MT, respectively, in 2005-06, India was the second largest producer of both fruits and vegetables in the world. India occupies first position in the production of cauliflower, second in onion and third in cabbage. The National Horticulture Mission (NHM) aims at doubling horticultural production by 2012. Under the NHM, action plans for 18 States, 2 Union Territories and

10 national level agencies have been approved during 2006-07. An amount of Rs. 560.29 crore has been released up to December 11, 2006.

8.14 A Centrally Sponsored Scheme on Technology Mission for Integrated Development of Horticulture in North Eastern region including Sikkim was approved with an outlay of Rs. 229.38 crore for the Ninth Five Year Plan period. The implementation of the scheme has been extended to the States of Jammu & Kashmir, Himachal Pradesh and Uttarakhand during the Tenth Plan with an additional outlay of Rs. 260.00 crore. The scheme aims at establishing convergence and synergy among numerous ongoing governmental programmes through horizontal and vertical integration of these programmes, to ensure adequate, appropriate, timely and concurrent attention to all the links in the production, post-harvest and consumption chain. During 2006-07, an amount of Rs. 157.50 crore was released, out of which Rs. 81.86 crore was for NE States and Rs.75.63 crore for Jammu & Kashmir, Himachal Pradesh and Uttarakhand.

Recent initiatives

Action Plan on Enhancing Production and Productivity of Wheat

8.15 To enhance the productivity and output of wheat in the country, Ministry of Agriculture has formulated a three-year rolling plan,

Table 8.8 : Area and production of major horticultural crops*(Area-Million hectare, Production-Million tonnes)*

Crops	2002-03		2003-04		2004-05*		2005-06*	
	Area	Production	Area	Production	Area	Production	Area	Production
Fruits	4.8	49.2	5.1	49.8	5.3	52.8	5.9	54.4
Vegetables	5.9	84.8	6.7	101.4	7.1	108.2	7.2	113.5
Spices	2.4	3.8	5.2	4	3.2	4.9	3.2	5.9
Plantation crops	3.1	13.1	3.3	9.4	3.1	10.4	3.2	9.8
Flowers	0.1	0.2	0.2	0.6	0.1	0.7	0.1	0.8
Others	0.09	0.9	0.1	0.3	0.4	0.4	0.4	0.5
Total	16.4	152.0	20.6	165.5	19.2	177.4	20.0	184.9

Source: National Horticultural Board * Estimates

targeting about 50 per cent of the area under wheat. A new scheme - 'Enhancing Sustainability of Dryland Farming Systems' has been formulated keeping in view the commitment of Government to launch a special programme for dry land farming in the arid and semi-arid regions of the country under the National Common Minimum Programme (NCMP). The proposed scheme aims at addressing issues like rainwater harvesting and its efficient utilization; in situ soil moisture conservation; use of organic manures; alternate land use; and adoption of improved dry land farming technologies.

National Rainfed Area Authority

8.16 Government has decided to set up a National Rainfed Area Authority to address the problems of rainfed areas for sustainable and holistic development of such areas including appropriate farming and livelihood system approaches.

Mini Mission-II of Jute Technology Mission

8.17 This Mission was approved in June 2006 and is being implemented from the next jute season. This will replace the on-going Scheme of Special Jute Development Programme being implemented under Macro Management.

8.18 There was considerable progress under the new schemes for the promotion of micro irrigation, National Bamboo Mission and Central Institute of Horticulture for the North

Eastern region, which were mentioned as being at advanced stages of approval in the last Economic Survey.

Micro-irrigation

8.19 A Centrally Sponsored Scheme on micro-irrigation was launched in January, 2006 for covering a total area of 6.2 lakh ha. The scheme aims to achieve greater water use efficiency to result in enhanced productivity and better quality of produce. During 2006-07, Annual Action Plan of 14 States have already been approved for implementation as per the guidelines and a sum of Rs. 279.40 crore has been released to the States till November, 2006 to cover an area of 3.31 lakh hectare.

National Bamboo Mission

8.20 India possesses the world's second largest reserves of bamboo, and a vast legacy of usage and traditional skill. Department of Agriculture and Cooperation has launched the National Bamboo Mission with 100 per cent central assistance at a total cost of Rs.568.23 crore, including an outlay of Rs.90 crore during 2006-07 (Tenth Plan) and the first four years of the Eleventh Plan.

8.21 Exciting development over the past year, in the form of new and substantively industrial applications of bamboo, have reinforced the belief that value-added bamboo products can generate substantial incremental income and employment. The National Mission on Bamboo Applications of the

Department of Science and Technology has developed and inducted a wide range of products and applications, including wood substitutes and composites, pre-fabricated housing and structures, gasification of bamboo to provide electricity to remote and off-grid locations, and moulded products. The development of high density corrugated roofing and durable and thermally efficient bamboo composite material has led to the growing induction of pre-fabricated structures in high altitude and other climatically adverse locations.

8.22 Formerly closed plywood units have been re-commissioned and new units are being established for the manufacture of these products. Indigenously developed bamboo processing machinery is not only finding local markets, but has been exported as well. Breakthroughs in micro-propagation have enabled the production of tissue-cultured plant material of bamboo, paving the way for large-scale intensive cultivation. For the first time, tissue-cultured plant material has been exported as well. In the coming year, a new range of applications, including thermoplasts, hygiene products and activated carbon are expected to be placed in the market. Having witnessed unprecedented growth in the last two years and with continued efforts at technological upgradation and product diversification, the bamboo economy of the country is likely to continue to grow and contribute to employment generation, especially in the North East and other tribal areas.

Central Institute of Horticulture, Nagaland

8.23 Recognizing the importance for institutional support for development of horticulture in the North Eastern Region, Government sanctioned a Central Institute of Horticulture in Nagaland during January, 2006, with a financial outlay of Rs. 20 crore spread over a period of five years.

National Bee Board

8.24 In June 2006, Department of Agriculture & Cooperation restructured the National Bee Board (NBB), which was formed in 2000 and registered as a society under the

Societies Registration Act XXI of 1860, with public-private partnership including the farmers, beekeepers, processors and other stakeholders. The main objective of NBB is the overall development of beekeeping in India by popularizing state of the art technologies relating to nucleus stock production, capacity building and training of bee breeders and beekeepers, and processing and quality control of bee products. This step is expected to supplement the incomes of farmers engaged in bee keeping.

Livestock, Poultry, Dairy and Fisheries

Livestock Sector

8.25 The livestock sector, which contributes 27 per cent to the GDP from agriculture and allied activities, is of special importance and a main source of family income in the arid and semi-arid regions of the country. In the arid and semi-arid regions, the contribution of livestock to agricultural GDP is as high as 70 per cent and 40 per cent, respectively. The sector has excellent forward and backward linkages, which promote many industries and increase the incomes of vulnerable groups such as agricultural labourers and small and marginal farmers.

8.26 In 2005-06, livestock sector produced 97.1 million tonnes of milk (Table 8.9), 46.2

Table 8.9 : Production and per-capita availability of milk

Year	Per capita availability (grams/day)	Production in million tonnes
1950-51	124	17.0
1960-61	124	20.0
1970-71	112	22.0
1980-81	128	31.6
1990-91	176	53.9
2000-01	220	80.6
2001-02	225	84.4
2002-03	230	86.2
2003-04	231	88.1
2004-05	233	92.5
2005-06	241	97.1
2006-07*	245	100.0

* Provisional.

Source: Department of Animal Husbandry and Dairying

billion eggs, 44.9 million kg of wool and around 2.31 million tonnes of meat from organized sector. The All India Summary Reports of the 17th Livestock Census released in July 2006 points out that India possesses the largest livestock populations in the world after Brazil. It accounts for about 56 per cent of the world's buffalo population and 14 per cent of the cattle population. It ranks first in respect of buffalo and second in respect of cattle population, second in goat population and third in respect of sheep in the world.

Livestock Insurance

8.27 Livestock Insurance Scheme was approved in February 2006 for its implementation during the remaining part of 2005-06, and in 2006-07 on a pilot basis in 100 selected districts across the country with a total outlay of Rs. 120 crore. The scheme aims at protecting the farmers against losses due to un-timely death of animals. The Central Government is providing subsidy to the tune of 50 per cent of the premium under the scheme.

8.28 An amount of Rs. 24.21 crore was released during 2005-06 to the implementing agencies in the States. An additional amount of Rs. 25.10 crore out of Rs. 51 crore allocated for the year 2006-07 has been released.

Poultry

8.29 The poultry sector, with total value of output exceeding Rs.15,000 crore and providing direct and indirect employment to over three million people, produced around 1.9 MT of chicken-meat in 2005. Between the 1970 and 2006, the annual per capita availability of eggs has quadrupled from 10 to 41, while the corresponding increase in chicken meat has been even faster from 146 grams to 1.6 kgs. While India's share of world trade in poultry and poultry products continues to be very small, in the last decade the value of such exports has increased from Rs.11 crore in 1993-94 to Rs. 326 crore in 2005-06. Exports of products, such as live poultry, eggs, hatching eggs, frozen eggs, egg powder and poultry meat, to countries including Bangladesh, Sri Lanka, Middle East, Japan,

Denmark, Poland, USA and Angola augurs well for the industry. Uninterrupted supplies of feed as well as preparedness for external shocks such as avian influenza (Box 8.1) are critical for the continued robust growth of this sector.

8.30 An active surveillance programme is being carried out all over the country focusing on early detection of avian influenza. Though vaccination has not yet been introduced in the country, Government maintains strategic reserve of poultry vaccine. India has a fully equipped Bio-Security Level 3 laboratory at Bhopal. More than 85,000 samples have been tested at Bhopal after the first outbreak of avian influenza on February, 2006 in a small area in Maharashtra. A second outbreak was reported from Maharashtra itself a few months later. India was declared free of avian influenza on August 18, 2006 after following stipulated guidelines of World Organisation of Animal Health. Targeted surveillance continues and focuses on areas where outbreak took place, areas visited by migratory birds with poultry concentrations around them and areas of major poultry population.

Dairying

8.31 India ranks first in the world in milk production, which rose from 17 MT in 1950-51 to around 100 MT by 2006-07. The per capita availability of milk has also increased from 112 grams in 1968-69 to 230 grams per day in 2005-06 and is expected to reach about 245 grams per day in 2006-07.

8.32 Presently, about 1.13 lakh village level co-operative societies spread over 265 districts in the country form part of the National Milk Grid. The Grid links the milk producers throughout India with consumers in over 700 towns and cities smoothing the seasonal and regional variations in the availability of milk, and ensuring a remunerative price to the producers and a reasonable price for quality milk and milk products to the consumers. Almost an equal quantity of milk is handled by the cooperative and private sectors. Consequent to de-licensing of the dairy sector in 1991, the Milk and Milk Products Order (MMPO) 1992 promulgated under the

Box 8.1 : Avian Influenza in India: Preparedness, Control and Containment

In 2006, the first outbreak of avian influenza occurred February 18 in the western part of country in a small area in Maharashtra running contiguously over an adjoining territory of Gujarat. A second outbreak was reported from Maharashtra itself. The isolated appearances of bird flu received widespread media attention and caused some panic. Public announcements made by domestic airlines, Indian Railway and the Armed Forces further fuelled the public misgivings about consuming chicken and other poultry products. Many States imposed ban on the inter-State movement of poultry and poultry products. As a result, the consumption and prices of poultry products nosedived. The poultry industry suffered substantial financial losses on account of drastic decline in the demand for poultry and poultry products, leading to difficulties in meeting its debt service obligations to banks and financial institutions. Government initiated various strategic actions to control and contain the outbreak in accordance with the Action Plans for the Department of Animal Husbandry, Dairying and Fisheries (DADF) and the Ministry of Health and Family Welfare (MOHFW):

- Carrying out demarcation of the relevant area of 3 kms. as the infected zone and a further area of 7 kms. as the surveillance zone.
- Culling out over a million poultry, both backyard and commercial, in a radius of 10 kms around the affected farm premises.
- Destroying more than 8,500 MT of feed material, nearly 17 lakh eggs, and other infected materials such as egg product, feathers, and protective cloth used by the staff engaged in operations.
- Cleaning and disinfecting the infected premises/area, and concluding the operations in each area with the issue of a sanitization certificate by the respective States.
- Post-operation surveillance in the affected area, including ensuring that no birds are stocked for the next three months after culling has been carried out.
- Compensating the owners for culled poultry by sharing the cost with the State Government on an equal basis. More than Rs. 3 crore has been paid as compensation soon after carrying out culling, especially for backyard poultry.
- Providing personnel involved in containment work with personal protective equipment and cover of Tami lu by the health authorities. Government announced relief measures for poultry farmers consisting of a one-time reduction of four percentage points in the interest payment liability on all bank loans availed of by poultry units, a moratorium of one year on payment of principal and interest, conversion of working capital into term loans, rescheduling of term loans and sanction of additional working capital, wherever necessary. The poultry sector was also provided relief by way of release of maize at concessional rate. There has been no outbreak after April 18, 2006. After following stipulated guidelines of World Organization of Animal Health (OIE), India declared freedom from avian influenza on August 18, 2006.

Essential Commodities Act, 1955, continues to regulate the milk sector. As per the provisions of this order, any person/dairy plant handling more than 10,000 litres per day of milk or 500 MT of milk solids per annum has to be registered with the registering authority appointed by Government. Post- liberalization, private entrepreneurs as well multinational milk products companies have made investments in the dairy sector, especially in putting up manufacturing facilities. Investments in the cooperative sector, however, are concentrated largely in milk procurement and processing.

8.33 Under Integrated Dairy Development Project, 73 projects with an outlay of Rs.407.58 crore and spread over 25 States and 1 UT have been approved. Cumulative

expenditure incurred up to end-March 2006 was Rs.274.33 crore. By end-March 2006, the programme had benefited 10.56 lakh farmers through 16,469 village-level dairy cooperative societies procuring 13.6 lakh litres of milk per day.

Fisheries

8.34 Fish production in the country has increased from 0.75 MT in 1950-51 to 6.50 MT in 2005-06 (Table 8.10). Fishing, aquaculture and a host of allied activities, a source of livelihood to over 14 million people as well as a major foreign exchange earner, in 2005-06 contributed about one per cent of the total GDP and 5.3 per cent of the GDP from agriculture sector. The geographic base of Indian marine fisheries has 8,118 km. coastline, 2.02 million sq.km. of Exclusive

Year	Fish production (Million tonnes)			Export of marine products	
	Marine	Inland	Total	Quantity (‘000 tonnes)	Value (Rs. crore)
1950-51	0.5	0.2	0.7	20	2
1960-61	0.9	0.3	1.2	20	4
1970-71	1.1	0.7	1.8	40	35
1980-81	1.5	0.9	2.4	80	235
1990-91	2.3	1.5	3.8	140	893
2000-01	2.8	2.8	5.6	503	6288
2002-03	3.0	3.2	6.2	521	6793
2003-04	3.0	3.4	6.4	412	6086
2004-05	3.52	2.78	6.30	482	6460
2005-06(P)	3.76	2.81	6.57	551	7019

Source : Department of Animal Husbandry, Dairying and Fisheries.

Economic Zone including 0.5 million sq. km. of continental shelf, and 3,937 fishing villages. There are 189 traditional fish landing centres, 59 minor fishing harbours and 6 major fishing harbours, which serve as bases for about 2,80,000 fishing craft consisting of 1,81,000 non-motorized traditional craft, 45,000 motorised traditional craft and 54,000 mechanised boats. Out of 180 deep sea fishing vessels, only 60 are in operation at present.

8.35 National Fisheries Development Board has been set up to realize the untapped potential of fishery sector with the application of modern tools of research and development including biotechnology. The Board was registered in July, 2006 under Andhra Pradesh

Society Registration Act 2001 and has become operational. The Coastal Aquaculture Authority Bill, 2005 passed by both Houses of Parliament became an Act on June 23, 2005. Rules have already been framed under the Act.

Plantation

Tea

8.36 Production of tea, after stagnating between 1997-98 and 2004-05 at around 830-850 million kgs, increased by over 12 per cent in 2005-06 (Table 8.11). The current year also looks promising as the April-October output is estimated to be 8.2 per cent higher than in the comparable period in 2005-06. With nine major tea producing States in India — Assam,

Year	Production Quantity	Exports		Imports		Domestic consumption \$ Quantity
		Quantity	Value	Quantity	Value	
1997-98	835.6	211.3	2003.2	2.6	17.8	597
1998-99	855.2	205.9	2191.8	8.9	64.7	615
1999-00	836.8	188.9	1796.3	10.4	62.0	633
2000-01	848.4	203.6	1889.8	15.2	95.5	653
2001-02	847.4	190.0	1695.8	16.8	86.7	673
2002-03	846.0	184.4	1665.0	22.5	105.3	693
2003-04	850.5	183.1	1637.0	11.1	67.0	714
2004-05	830.7	205.8	1924.7	32.5	145.0	735
2005-06	930.9	181.1	1631.60	16.40	99.26	757
2006-07(April-Oct.)@	722.5	114.3	1048.50	13.75	70.84	NA

@ Estimated NA Not available \$ Relates to calendar year.
Source : Ministry of Commerce and Industry.

West Bengal, Tripura, Arunachal Pradesh, Nagaland, Himachal Pradesh, Tamilnadu, Kerala and Karnataka — India is the largest producer and consumer of tea in the world. With consumption of tea in quantity terms growing more or less steadily at about 3 per cent per year, net exports (exports less imports) of tea has declined over the years. Government has approved setting up of a Special Purpose Tea Fund (SPTF) under the Tea Board for funding replantation and rejuvenation activities aimed at improving the age profile of tea plantations. A total outlay of Rs. 567.1 crore has been proposed during 2006-07 which will spill over to the 11th Five-year plan. The estimated area to be taken up for replantation/rejuvenation is expected to be 85,044 hectares comprising replantation of 68,154 hectares and 16,890 hectares of rejuvenation. This is expected to improve yield levels.

Coffee

8.37 Coffee output, which after growing rapidly between 1997-98 and 2000-01 to over 3 lakh tonnes had stagnated in 2001-02, fell to around 2.7 lakh tonnes in the next four years ending in 2005-06 (Table 8.12). Coffee prices declined from US \$1700 per tonne in 1998 to around US \$580 per tonne in 2003. International coffee (robusta) averaged US cents 79.3 per kilogram in January-December, 2004, but recovered to US cents 174.5 in

January, 2007. Wholesale price index of coffee also improved from 90 as on January 24, 2004 (1993-94=100) to 196.2 on January 27, 2007. With an increase in prices, there appears to be a resurgence in coffee production in 2006-07 so far.

8.38 Indian coffee by contributing 4 per cent to global production enjoys a niche market. Farm productivity and production slumped in many producing countries during the crisis years of 2002-2005, perhaps due to which the demand has finally caught up with supply and prices have started firming up. To mitigate the problems of coffee growers arising from the low prices of coffee in the crisis years, Government has taken a series of steps including: (i) re-phasing/restructuring of loans taken by the coffee growers including interest relief; (ii) interest subsidy on working capital loans of 5 per cent for small growers and 3 per cent for large growers; (iii) campaigns to promote domestic consumption of coffee; (iv) reduction of import duty on specified machinery to 5 per cent for the coffee sector to enable the industry to improve productivity, quality and consumption of coffee; (v) an International Coffee Festival in Bangalore in February 2007 to reinforce the salient and unique features of Indian coffees to the entire coffee fraternity across the globe; and (vi) implementation of weather (rainfall) insurance as a risk management support for coffee growers in collaboration with Agriculture

Table 8.12 : Coffee production, consumption and trade

Year	Production Quantity (lakh tonnes)	Export		Domestic Consumption (lakh tonnes)	
		Quantity (lakh tonnes)	Value (Rs crore)		Value US\$ million
1997-98	2.28	1.79	1708	477	0.50
1998-99	2.65	2.12	1752	431	0.50
1999-00	2.92	2.45	1901	372	0.55
2000-01	3.01	2.47	1374	243	0.60
2001-02	3.01	2.14	1050	216	0.64
2002-03	2.75	2.07	1051	234	0.68
2003-04	2.70	2.33	1158	262	0.70
2004-05	2.75	2.11	1224	295	0.75
2005-06	2.74	2.02	1510	349	0.80
2006-07*	3.00 @	1.31 @	1016 @	227 @	0.80

* (April-October) @ including re-exports
Source : Ministry of Commerce and Industry

Insurance Company of India Ltd. After a prolonged and unprecedented crisis, India as one of the sixty odd coffee producing countries of the world seems to be managing to stage a recovery in the current year.

Natural rubber

8.39 India ranks third in production and fourth in consumption of natural rubber in the world. Rubber plantations are spread over 5.9 lakh hectares in 16 States. Rubber is primarily grown in Kerala and adjoining Kanyakumari district of Tamilnadu, the traditional rubber growing areas of the country. In 2005-06, these traditional areas accounted for 86 per cent of total planted area and 95 per cent of total production. Other States contributing to the remaining area/production are Tripura, Assam, Meghalaya, Mizoram, Manipur, Goa and coastal Karnataka. Production of natural rubber is dominated by small holdings, which accounts for 88 per cent of the production as well as area with an average holding size of 0.5 hectare.

8.40 Production of natural rubber, which grew almost by a quarter between 2002-03 and 2005-06, is expected to increase by 3.5 per cent in 2006-07 over 2005-06 (Table 8.13). Consumption of natural rubber, which had exceeded domestic production in each year between 1999-2000 and 2004-05, was below domestic output in 2005-06. With consumption growth exceeding growth in

domestic output, 2006-07 is likely to see a reversion to the trend of the earlier years. The improvement in yield, observed since 2003-04, however, appears to be continuing in the current year. Wholesale price index of raw rubber which was 176 as on January 24, 2004 (1993-94=100) increased to 324.1 as on January 27, 2007. International Prices of Rubber also increased from US\$ 1.48 per kg during January-December 2004 to US\$ 2.11 per kg in January, 2007. Higher prices, while exerting pressure on general price level and products using rubber as an input, nonetheless, provided higher income to the growers.

National Commission on Farmers

8.41 The National Commission on Farmers (NCF) chaired by Dr. M.S. Swaminathan submitted five Reports between December 2005 and October, 2006. Key recommendations of the Commission are incorporated in the Revised Draft National Policy for Farmers. These include: asset reforms covering land, water, livestock and bio resources; farmer-friendly support services covering extension, training and knowledge, connectivity, credit and insurance; assured and remunerative marketing; inputs and delivery services; and curriculum reforms in the agriculture universities. Other major initiatives recommended include bringing Agriculture in the Concurrent List of the Constitution; setting up of a National Food Security and Sovereignty Board; universalization of PDS; setting up of an Indian Trade Organization; making the Commission on Agriculture Cost and Prices into an autonomous statutory organization with MSP at least 50 per cent more than the cost of production, and launch of a Rural Non-farm Livelihood Initiative (RNFLI). RNFLI when implemented would be able to absorb higher number of people dependent on agriculture. The recommendations are under active consideration of Government. However, there are several programmes already under implementation by the Department of Agriculture & Cooperation on the lines recommended by the Commission.

Table 8.13 : Natural Rubber-Consumption, production & yield

Year	Consumption ('000 tonnes)	Production ('000 tonnes)	Yield (kg/ha)
1997-98	572	583	1549
1998-99	592	605	1563
1999-00	628	622	1576
2000-01	631	630	1576
2001-02	638	631	1576
2002-03	695	649	1592
2003-04	719	711	1663
2004-05	755	749	1705
2005-06	801	803	1796
2006-07*	841	831	1857

*Anticipated

Source : Ministry of Commerce and Industry.

Agricultural Inputs

Irrigation

8.42 The Accelerated Irrigation Benefit Programme (AIBP) was launched during 1996-97 to give loan assistance to the States to help them complete some of the incomplete major/medium irrigation projects which were in an advanced stage of completion. The Surface Minor Irrigation Schemes of North-Eastern States; Hill States of Sikkim; Uttarakhand; Jammu and Kashmir; Himachal Pradesh and Kalahandi; Bolangir and Koraput (KBK) Districts of Orissa have also been provided Central Loan Assistance (CLA) under this programme since 1999-2000. Grant component was introduced in the programme from April, 2004 like other Central sector schemes. The criteria for AIBP have been further relaxed from April, 2005 to include minor irrigation schemes of non-special category States with potential of more than 100 hectare, with preference to tribal and drought-prone areas which benefit dalits and adivasis. The assistance being provided since 2004-05 is on the pattern of normal central assistance, that is, 70 per cent loan and 30 per cent grant in the case of non-special category States and 10 per cent loan and 90 per cent grant in the case of special category States and KBK Districts of Orissa. For funding purposes, the drought-prone, tribal, and flood-prone areas in the country are treated at par with Special Category States.

8.43 Up to March 2006, under AIBP, the State Governments were provided Rs.19,437.88 crore as CLA/grant for 200 major/medium irrigation projects and 5,562 Surface Minor Irrigation Schemes. So far 50 major/medium and 4,187 surface MI schemes have been completed. An additional irrigation potential of 3.25 million hectare has been created through major/medium irrigation projects up to March 2005, and an irrigation potential of 162.85 thousand hectare has been created through Surface MI Schemes up to March 2006. Relaxation in criteria for all approved projects in (a) drought-prone areas, (b) tribal areas, (c) States with lower irrigation

development as compared to National average and (d) districts identified under PM's package for agrarian distress was approved by the Cabinet in November 2006.

8.44 The Centrally Sponsored Command Area Development (CAD) Programme started in 1974-75 with an objective to bridge the gap between the irrigation potential created and its utilization to optimize agriculture productivity/production through an integrated and coordinated approach for efficient land and water management in the irrigated commands. It was restructured in April 2004 and was renamed as Command Area Development and Water Management (CADWM) Programme. Some components were deleted from the programme and two new components — correction of system deficiencies up to distributaries of 150 cusec capacity and renovation and desilting of existing irrigation tanks within CAD Projects — were included under the restructured programme. Mandatory 10 per cent beneficiary contribution in some of the components was also introduced in the restructured programme. Between its inception and December 31, 2006, 311 projects with total Culturable Command Area (CCA) of 28.58 million ha have been covered. By end-March 2006, the construction of field channels has been completed in an area of 17.43 million ha. The programme is presently going on in 136 projects with balance executable CCA of 7.70 million ha.

8.45 Government sanctioned a Pilot Scheme for "National Project for Repair, Renovation & Restoration of Water Bodies directly linked to Agriculture" in January, 2005 with an estimated cost of Rs. 300 crore to be shared by Centre and States in the ratio of 3:1. The water bodies having cultivated command area of more than 40 ha and up to 2000 ha were included under the pilot scheme in one or two districts in each States. The objective of the scheme is to restore and augment storage capacities of water bodies and to recover and extend their lost irrigation potential. The scheme has been approved in 24 district projects in 14 States, namely, Andhra Pradesh, Chhattisgarh, Jharkhand,

Table 8.14 : Agency-wise Ground Level Credit Flow for Agriculture and Allied Activities*(Rs. crore)*

Agency	2002-03	2003-04	2004-05	2005-06	2006-07*
Cooperative Banks	23,716	26,959	31,424	39,404	33,174
RRB's	6,070	7,581	12,404	15,223	15,170
Commercial Banks	39,774	52,441	81,481	1,25,859	1,00,999
Total	69,560	86,981	1,25,309	1,80,486	1,49,343

* Upto December 31, 2006
Source : NABARD.

Karnataka, Madhya Pradesh, Orissa, Rajasthan, Tamil Nadu, West Bengal, Himachal Pradesh, J&K, Gujarat, Kerala and Maharashtra at an estimated cost of Rs. 296.87 crore. Central share of Rs. 132.01 crore has been released to the States by December 31, 2006. These projects cover 1,076 water bodies with total original cultivable command area of 2.99 lakh ha. The physical work for restoration has been completed for 232 water bodies and the work is in progress in the remaining 844 water bodies. The potential created will be part of the 'Bharat Nirman'. It has been decided, as announced in the Budget Speech 2006-07, that the project will be expanded throughout the country through external assistance. The proposals from Andhra Pradesh, Karnataka, Orissa and Tamil Nadu have been posed to the World Bank for external assistance. The proposal for Andhra Pradesh is at an advanced stage of negotiations with the World Bank and the proposal in respect of Tamil Nadu was concluded on January 23, 2007.

8.46 Irrigation is one of the six components for development of rural infrastructure under Bharat Nirman. The irrigation component of Bharat Nirman aims at creation of irrigation potential of 10 million ha during 2005-06 to 2008-09 mainly through completion of ongoing major and medium irrigation projects. Utilization of completed projects / schemes is also emphasized. Further, development of new projects of minor irrigation to cater to the requirement of specific areas, particularly to provide benefit to small and marginal farmers and dalits and tribals, has also been included in Bharat Nirman. During 2005-06, against the

target of 1.90 million ha, the reported irrigation potential created was 1.45 million ha.

Agricultural Credit

Flow of institutional Credit to Agriculture

8.47 The 'Farm Credit Package' announced in June 2004 stipulated doubling the flow of institutional credit for agriculture in the ensuing three years. The target of 30 per cent growth in agricultural credit in 2004-05 was surpassed by the actual growth of 44 per cent in overall credit by all agencies to Rs.1,25,309 crore in 2004-05 (Table 8.14). Based on this encouraging performance, the target for flow of institutional credit for agriculture and allied activities for 2005-06 was raised to Rs. 1,41,000 crore, which again was surpassed by the actual achievement of Rs.1,80,486 crore (provisional). The target for such credit for 2006-07 was fixed at Rs.1,75,000 crore, of which 85 per cent (Rs. 1,49,343 crore) was achieved by December 31, 2006.

Kisan Credit Card Scheme

8.48 To provide adequate and timely support from the banking system to the farmers for their cultivation needs, including purchase of all inputs in a flexible and cost effective manner, a model Kisan Credit Card Scheme (KCC) was introduced in August 1998. NABARD had advised banks for extensive coverage through expanding its outreach by lending to more farmers including non-willful defaulters, oral lessees, tenant farmers, share-croppers, who may have been outside the fold of the scheme, for whatever reasons, as also new farmers. The co-

operative banks and RRBs were advised to cover all farmers under KCC by end-March 2007 and to make the renewal process of KCCs more user friendly.

8.49 The KCC scheme made rapid progress with cumulatively more than 645 lakh cards issued up to October, 2006. The scheme has also been extended to the borrowers of the long-term cooperative credit structure to address all the loan requirements of borrowers of State Cooperative Agriculture Rural Development Banks (SCARDBs) under KCC Scheme.

8.50 Government has decided that from Kharif 2006-07, farmers would receive crop loans up to a principal amount of Rs. 3 lakh at 7 per cent rate of interest. This year, the Government of India is providing interest subvention of 2 per cent per annum to Public Sector Banks, Regional Rural Banks (RRBs) and Cooperative Banks on amount of short term agriculture credit disbursed out of their own resources. Concessional refinance to Cooperative Banks at 2.5 per cent per annum and to RRBs at 4.5 per cent per annum will also be provided through NABARD for this purpose. Further, in order to provide relief to the farmers who have availed of crop loans from Commercial Banks, RRBs and Primary Agriculture Cooperatives (PACs) for kharif and rabi 2005-06, an amount equal to two percentage points of the borrower's interest liability on principal amount up to Rs. one lakh has been credited to his/her bank account.

8.51 In January, 2006, Government announced the package for revival of Short-Term Rural Cooperative Credit Structure involving financial assistance of Rs.13,596 crore. NABARD has been designated as the implementing agency for the purpose. States are required to sign memorandum of understanding (MOU) with NABARD, committing to implement the legal, institutional and other reforms as envisaged in the revival package. So far 8 states, namely Andhra Pradesh, Maharashtra, Madhya Pradesh, Rajasthan, Orissa, Uttarakhand, Uttar Pradesh and Gujarat, have signed MOU with GOI and NABARD.

8.52 The self-help group (SHG) Bank Linkage Programme has emerged as the major micro-finance programme in the country. Since inception of the scheme (upto December 31, 2006) 24.8 lakh. SHGs have been provided credit aggregating Rs.13,512 crore by the banking system.

Rehabilitation Package for distressed farmers

8.53 A special relief package for farmers was announced for 31 districts in Andhra Pradesh, Maharashtra, Karnataka and Kerala where there was high incidence of farmers' suicides. As regards credit, the package envisages: (a) Waiving of interest on overdue loans as on July 1, 2006 so that farmers have no past burden. This would make them eligible for fresh loan from the banking system. It is estimated that an amount of Rs. 2,718 crore will be waived in 31 affected districts. The Government of India and respective State Governments will share this amount equally. (b) The overdue loans of the farmers as on July 1, 2006 will be rescheduled over a period of 3—5 years with a one year moratorium. (c) A credit flow of Rs. 21,422 crore will be ensured in these 31 districts in 2006-07.

Agricultural Insurance

8.54 The Government of India in coordination with the General Insurance Corporation of India (GIC), had introduced a scheme called the National Agricultural Insurance Scheme (NAIS) from rabi 1999-2000 season. The main objective of the scheme is to protect the farmers against losses suffered by them due to crop failure on account of natural calamities, such as drought, flood, hailstorm, cyclone, fire, pest/diseases, so as to restore their credit worthiness for the ensuing season. Agricultural Insurance Company of India Ltd. (AICIL) which was incorporated in December, 2002 and started operating from April, 2003 took over the implementation of NAIS.

8.55 In the implementation of NAIS (Table 8.15), certain limitations/shortcomings relating to unit area of insurance, calculation of guaranteed income, low indemnity level, and

Table 8.15 : Performance of National Agricultural Insurance Scheme

Sl. No.	Season	Number of farmers covered (lakhs)	Area (lakh ha.)	Sum assured (Rs. crore)	Premium (Rs. crore)	Total claims (Rs. crore)
1	Rabi 1999-2000	5.8	7.8	356.4	5.4	7.7
2	Kharif 2000	84.1	132.2	6,903.4	206.7	1,222.5
3	Rabi 2000-01	20.9	31.1	1,602.7	27.8	59.5
4	Kharif 2001	87.0	128.9	7,502.5	261.6	493.5
5	Rabi 2001-02	19.6	31.5	1,497.5	30.2	64.7
6	Kharif 2002	97.7	155.3	9,431.7	325.5	1,824.3
7	Rabi 2002-03	23.3	40.4	1,837.6	38.5	188.6
8	Kharif 2003	79.7	123.6	8,114.1	283.3	649.9
9.	Rabi 2003-04	44.2	64.7	3,049.5	64.1	490.7
10.	Kharif 2004	126.9	242.7	13,170.5	458.9	1,037.6
11.	Rabi 2004-05	35.3	53.4	3,774.2	75.9	160.6
12.	Kharif 2005	126.7	205.3	13,517.7	449.9	1,054.8
13.	Rabi 2005-06	40.5	72.2	5,069.5	104.8	252.3
14.	Kharif 2006*	66.5	101.1	7,500.3	233.2	—
Total		858.0	1,390.1	83,327.5	2,565.7	7,506.6

* Provisional

delay in settlement of insurance claims were observed. Keeping in view the above limitations in the existing scheme, National Common Minimum Programme (NCMP) provided for redesigning the crop insurance schemes. The recommendations of a Joint Group constituted for suggesting improvements in the existing crop insurance schemes and the comments received from States/UTs and other concerned Departments/agencies have been internalized in a modified draft which is under consideration, by the Government.

Rainfall Insurance Scheme “Varsha Bima”

8.56 AICIL introduced Rainfall Insurance Scheme known as “Varsha Bima” during 2004 south-west monsoon period. Varsha Bima provided for five different options suiting varied requirements of farming community: (i) seasonal rainfall insurance based on aggregated rainfall from June to September, (ii) sowing failure insurance based on rainfall between June 15 and August 15, (iii) rainfall distribution insurance with the weight assigned to different weeks between June and September, (iv) agronomic index constructed on the basis of water requirements of crops, (v) a catastrophe option covering extremely adverse deviation of 50 per cent and above

in rainfall during the season. Varsha Bima was piloted in 20 rain-gauge areas spread over Andhra Pradesh, Karnataka, Rajasthan and Uttar Pradesh in 2004-05.

8.57 Based on the experience of the pilot project, the scheme was fine-tuned and implemented as “Varsha Bima-2005” in around 130 districts across Andhra Pradesh, Chhatisgarh, Gujarat, Karnataka, Maharashtra, Madhya Pradesh, Orissa, Tamil Nadu, Uttarakhand and Uttar Pradesh during kharif 2005. On an average, 2 or 3 block/tehsils were covered under each IMD rain gauge station. The scheme covered the major crops and provided at least two coverage options namely, Seasonal Rainfall Insurance or Rainfall Distribution Index and Sowing Failure Insurance. Varsha Bima-2005 covered 1.25 lakh farmers with a premium income of Rs. 3.17 crore against a sum insured of Rs. 55.86 crore. Claims amounting to Rs. 19.96 lakh were paid for the season.

8.58 During kharif 2006, the scheme is being implemented as Varsha Bima-2006 in and around 150 districts/rain gauge station areas covering 16 states across the country. AICIL is also piloting another weather related insurance product for mango and coffee.

Seeds

8.59 Seed, which is the carrier of new technology for crop production and higher crop yields, is a critical input for sustained growth of agriculture. In India, more than four-fifths of the farmers rely on farm-saved seed leading to a low seed-replacement rate. The Indian Seed Programme includes the participation of Central and State Governments, Indian Council of Agricultural Research (ICAR), State Agricultural Universities, and the cooperative and private sectors. There are 14 State Seed Corporations (SSCs) besides two national level corporations. Though the private sector started to play a significant role in production and distribution of seed, particularly after introduction of the Seed Policy of 1988, the organized seed sector, particularly for food crops and cereals, continues to be dominated by the public sector. However, it is estimated that about 46 per cent of the seed

commercially sold in the country is by private seed companies.

8.60 Indian seeds programme recognizes three kinds of seeds generation, namely breeder, foundation and certified seeds. The annual rate of growth of certified/quality seeds distribution is targeted to accelerate from 12.1 per cent in 2005-06 to 18.1 per cent in 2006-07. During 2006-07, 69,980 quintal breeder seed is anticipated to be produced by the National Agricultural Research System (Table 8.16).

Fertilisers

Consumption

8.61 The consumption of chemical fertilizers (in terms of nutrients) grew by 10.6 per cent to 20.34 MT during 2005-06 (Table 8.17). Though the nitrogenous fertilizers account for over 60 per cent of total

Table 8.16 : Production of Breeder and Foundation Seeds and Distribution of Certified Seed

Year	Production of Breeder Seed (quintals)	Production of Foundation Seed (lakh quintals)	Distribution of Certified/Quality Seed (lakh quintals)
2003-04	61,826	6.5	108.59
2004-05	66,460	6.9	113.10
2005-06	65,880	7.4	126.74
2006-07	69,980 (Anticipated)	8.0 (Anticipated)	149.63 (Anticipated)

Table 8.17 : Consumption of major fertilizers

(in lakh, tonnes)

Fertiliser	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07 (Apr-Sep 06)*
Urea	199.17	184.93	197.67	206.65	222.97	113.66
DAP	61.81	54.73	56.24	62.56	67.64	32.06
MOP	19.93	19.12	18.41	24.06	27.31	10.02
Nitrogenous Fertilizers (N)	113.10	104.74	110.77	117.13	127.23	64.68
Phosphatic Fertilizers (P)	43.82	40.19	41.24	46.24	52.04	25.75
Potassic Fertilizers (K)	16.67	16.01	15.98	20.61	24.13	9.67
N+P+K	173.60	160.94	167.99	183.98	203.40	100.10
Percentage increase	3.94	-7.29	4.38	9.52	10.56	8.84

Source: Ministry of Chemicals and Fertilisers * Provisional

consumption (in terms of nutrients), the share of potassic fertilisers is increasing in recent years. Compared to a share of 9.6 per cent in 2001-02, the share of pottasic fertilisers increased to 11.8 percent in 2005-06.

8.62 Per hectare fertilizer application was quite high in Punjab, Haryana, Andhra Pradesh and Tamil Nadu, but quite low in Rajasthan, Orissa and Madhya Pradesh, apart from in the States in the North-Eastern region (Table 8.18). The all-India average consumption of fertilizers per ha was up at 104.50 kgs in 2005-06 from 94.52 kgs in 2004-05.

Capital Formation in Indian Agriculture

8.63 The share of the agricultural sector's capital formation in GDP declined from 2.2

Table 8.18 : Per hectare Fertiliser consumption of N.P.K fertilizers during 2004-05 and 2005-06 (in Kg.)
(Based on 2004-05 provisional Gross Cropped Area)

S.No.	State/U.T.	2004-05	2003-04
1	Andhra Pradesh	203.61	158.57
2	Karnataka	117.34	99.51
3	Kerala	57.00	56.74
4	Tamil Nadu	183.67	159.07
5	Pondicherry	1100.26	1086.30
6	A & N Island	12.63	10.92
7	Gujarat	111.07	99.49
8	Madhya Pradesh	47.13	53.42
9	Chhatisgarh	67.36	65.19
10	Maharashtra	84.52	74.68
11	Rajasthan	36.29	31.33
12	Goa	32.66	34.08
13	Dadra & N.Havali	43.97	41.25
14	Haryana	166.72	155.10
15	Himachal Pradesh	48.75	47.00
16	Jammu & Kashmir	81.31	66.30
17	Punjab	210.06	194.56
18	Uttar Pradesh	140.37	134.13
19	Delhi	10.51	13.08
20	Uttaranchal	94.24	88.93
21	Bihar	152.32	99.78
22	Jharkhand	67.61	62.10
23	Orissa	57.33	51.59
24	West Bengal	127.50	129.73
25	Arunachal Pradesh	2.94	2.98
26	Assam	49.26	41.25
27	Tripura	39.21	34.74
28	Manipur	59.84	85.97
29	Meghalaya	17.98	18.05
30	Nagaland	1.50	1.46
31	Arunachal Pradesh	2.94	2.98
32	Mizoram	25.45	5.85
33	Sikkim	2.83	5.01
All India		104.50	94.52

Source : Ministry of Chemicals and Fertilizers.

per cent in the late 1990s to 1.9 per cent in 2005-06 (Table 8.19). This disturbing decline was partly due to the stagnation or fall in public investment in irrigation, particularly since the mid-1990s. However, there is indication of a reversal of this trend with public sector investment in agriculture accelerating since 2002-03. The share of public investment in gross investment in agriculture increased by 6.5 percentage points from 1999-2000 to reach 24.2 per cent in 2005-06.

Agricultural Marketing

8.64 Efficient marketing with a dynamic supply chain is essential for the development of the agriculture sector. Agricultural production in the country end-March 2006 was serviced through 7,566 regulated agricultural markets. There were 21,780 rural primary/periodic agricultural markets, out of which about 15 per cent functioned under the ambit of regulation. There are already some examples of novel private sector initiatives to improve the marketing channels in agriculture (Box 8.2)

8.65 Ministry of Agriculture had formulated a model law on agricultural marketing in consultation with State/UT Governments to bring about marketing reforms in line with emerging trends. This model Act enables establishment of private markets/yards, direct purchase centres, consumers/farmers markets for direct sale, and promotion of public-private-partnership (PPP) in the management and development of agricultural markets in the country. It also provides for exclusive markets for onions, fruits, vegetables and flowers. Regulation and promotion of contract farming arrangement has also been made a part of this legislation. A provision has also been made for constitution of State Agricultural Produce Standards Bureau for promotion of grading, standardization and quality certification of agricultural produce. So far 15 States and 5 Union Territories have amended their Agricultural Produce Marketing Committee (APMC) Act to derive the benefits of market reforms.

Table 8.19 : Gross Capital Formation in Agriculture

Year	Investment in Agriculture (Rs. crore)			Share in agricultural gross investment (per cent)		Investment in Agriculture as a per cent of GDP at constant prices
	Total	Public	Private	Public	Private	
Old Series (at 1993-94 prices)						
1990-91	14836	4395	10441	29.60	70.40	1.92
1995-96	15690	4849	10841	30.90	69.10	1.57
1996-97	16176	4668	11508	28.90	71.10	1.51
1997-98	15942	3979	11963	25.00	75.00	1.43
1998-99	14895	3870	11025	26.00	74.00	1.26
1999-00	17304	4221	13083	24.40	75.60	1.37
New Series (at 1999-00 prices)						
1999-00	43473	7716	35757	17.7	82.3	2.2
2000-01	38735	7155	31580	18.5	81.5	1.9
2001-02	47043	8746	38297	18.6	81.4	2.2
2002-03	46823	7962	38861	17.0	83.0	2.1
2003-04	45132	9376	35756	20.8	79.2	1.9
2004-05	48576	10267	38309	21.1	78.9	1.9
2005-06*	54539	13219	41320	24.2	75.8	1.9

* Quick Estimates.
Source : CSO

Box 8.2 : Agricultural Marketing: Private initiatives by ITC

TE-choupal is a business platform consisting of a set of organizational subsystems and interfaces connecting farmers to global markets. This common structure can be leveraged to procure/provide a host of product and services for the farmer as a producer as well as a consumer. The e-choupal business platform consists of three layers each at different levels of geographic aggregation. Each of the three layers is characterized by three key elements: (a) the infrastructure (physical or organizational) through which transactions take place, (b) the entity (person or organization) orchestrating the transactions, and (c) the geographical coverage of the layer. The first layer consists of the village-level kiosks with internet access (or e-Choupal), managed by an ITC-trained local farmer (called a Sanchalak) and within walking distance (1-5 kilometres) of each target farmer. The relatively sparse population density in rural India justified the location of one e-Choupal per cluster of five villages. The second layer consists of a bricks-and-mortar infrastructure (called hubs) managed by the traditional intermediary who has local knowledge/skills (called a Samyojak) in his new role) and within tractorable distance (25-30 kilometers) of the target farmer.

ITC chose to operate the platform on the following three business principles:

- (a) Free Information and knowledge which ensures wider participation by the farmer,
- (b) freedom of choice in transactions (farmers, after accessing information at the e-Choupal, are free to transact their own way),
- (c) transaction-based income stream for the Sanchalak by tying his revenue stream to transaction (on a commission basis).

Towards another Big Push to Agriculture- Second Green Revolution

8.66 The urgent need for taking agriculture to a higher trajectory of 4 per cent annual

growth can be met only with improvement in the scale as well as quality of agricultural reforms undertaken by the various States and agencies at the various levels. These reforms

must aim at efficient use of resources and conservation of soil, water and ecology on a sustainable basis, and in a holistic framework. Such a holistic framework must incorporate financing of rural infrastructure such as water, roads and power.

8.67 The Approach Paper to the Eleventh Five Year Plan has aptly highlighted such a holistic framework and suggested the following strategy to raise agricultural output: (a) doubling the rate of growth of irrigated area; (b) improving water management, rain water harvesting and watershed development; (c) reclaiming degraded land and focusing on soil quality; (d) bridging the knowledge gap through effective extension; (e) diversifying into high value outputs, fruits, vegetables, flowers, herbs and spices, medicinal plants, bamboo, bio-diesel, but with adequate measures to ensure food security; (f) promoting animal husbandry and fishery; (g) providing easy access to credit at affordable rates; (g) improving the incentive structure and functioning of markets; and (h) refocusing on land reforms issues. National Commission on Farmers has already laid the foundation for such a framework.

8.68 Programme formulation as well as their implementation in the States must be based on unique regional contexts incorporating agro-climatic conditions; and availability of appropriate research and development (R&D) backed by timely and adequate extension and finance.

8.69 Varietal break-through has been a major constraint in achieving higher level of productivity in pulses. These are genetically low yielding and less input responsive as compared to cereals and their cultivation has continued to be done on marginal and sub-marginal lands under rainfed conditions. With the limited availability of pulses overseas, development of hybrid varieties becomes a pre-requisite for increasing domestic production.

8.70 R&D expenditure on agriculture in India is low by international standards despite

its high social return. Development of area specific seeds and their application, particularly in water abundant eastern belt can increase the yield levels in these areas. Increased R&D expenditure backed by modern technologies and compatible institutions must be focused in the coming years. R&D has to focus on areas such as rainfed, and drought-prone; crops such as drought-resistant and amenable to biotechnological applications; and biotechnology which has growth as well as export potential. With proper implementation, the National Agricultural Innovation Project initiated in July, 2006 for enhancing livelihood security in partnership mode with farmers' groups, panchayati raj institutions and private sector would go a long way in strengthening basic and strategic research in frontier agricultural sciences.

Outlook

8.71 The short-term outlook for agricultural sector appears bright. With a welcome rainfall in early February, prospects of wheat and other rabi crops have brightened. The production of cotton, sugarcane and jute & mesta would set a new record in the current year. However, the production of oilseeds is expected to witness a decline of 15.7 per cent. There has been a sharp increase in the area under wheat with high domestic and international prices providing incentives to the farmers. World Bank's commodity price index for agriculture with 1990=100, which was 104.7 in January-December, 2004 reached 133.7 in January, 2007. Wholesale prices of most agricultural products were also firm in 2006-07. Together with better crop prospects, this augurs well for farm income. In the medium-term, the prospects for agriculture will be determined by the pace and quality of reforms in this sector; the ability to increase investment in surface irrigation, ground water recharge of aquifers, and restoration of water bodies; and developing high-yielding varieties of non cereal food and cash crops.