Agriculture and Food

8
CHAPTER

Agriculture has been a way of life and continues to be the single most important livelihood of the masses. Agricultural policy focus in India across decades has been on self-sufficiency and self-reliance in foodgrains production. Considerable progress has been made on this front. Foodgrains production rose from 52 million tonnes in 1951-52 to 244.78 million tonnes in 2010-11. The share of agriculture in real GDP has fallen given its lower growth rate relative to industry and services. However, what is of concern is that growth in the agricultural sector has quite often fallen short of the Plan targets. During the period 1960-61 to 2010-11, foodgrains production grew at a compounded annual growth rate (CAGR) of around 2 per cent. In fact, the Ninth and Tenth Five Year Plans witnessed agricultural sectoral growth rate of 2.44 per cent and 2.30 per cent respectively compared to 4.72 per cent during Eighth Five Year Plan. During the current Five Year plan, agriculture growth is estimated at 3.28 per cent against a target of 4 per cent. The Approach Paper to the Twelfth Five Year Plan emphasises the need to "redouble our efforts to ensure that 4.0 per cent average growth" is achieved during the Plan if not more. Without incremental productivity gains and technology diffusion across regions, achieving this higher growth may not be feasible and has implications for the macroeconomic stability given the rising demand of the 1.2 billion people for food. Achieving minimum agricultural growth is a pre-requisite for inclusive growth, reduction of poverty levels, development of the rural economy and enhancing of farm incomes.

8.2 Agriculture including allied activities, accounted for 14.5 per cent of gross domestic product (GDP) at 2004-05 prices, in 2010-11 as compared to 14.7 per cent in 2009-10. Notwithstanding the declining trend in agriculture's share in the GDP, it is critical from the income distribution perspective as it accounted for about 58 per cent employment in the country according to Census 2001. Hence growth in agriculture and allied sectors remains a 'necessary condition' for inclusive growth. In terms of composition, out of the total share of 14.5 per cent that agriculture and allied sectors had in GDP in 2010-11, agriculture alone accounted for 12.3 per cent, followed by forestry and logging at 1.4 per cent and fishing at 0.7 per cent (Table 8.1). Reasonable growth in agriculture is important both from the nutritional point of view as well as to control food prices and overall headline inflation.

Performance of the Agriculture Sector during the current five Year Plan (2007-2012)

8.3 The average annual growth in agriculture and allied sectors realized during the first four years of the Eleventh Plan Period, i.e. 2007-08 to 2010-11, is 3.5 per cent against the targeted growth rate of 4 per cent. Agriculture and allied sectors recorded

Table 8.1 : Agriculture Sector: Key Indicators

(per cent)

Sl. No.	Item	2009-10@	2010-11*	2011-12 **
1	GDP – share and growth (at 2004-05 prices)			
	Growth in GDP in agriculture & allied sectors	1.0	7.0	2.5
	Share in GDP - Agriculture and allied sectors	14.7	14.5	13.9
	Agriculture	12.4	12.3	
	Forestry and logging	1.5	1.4	
	Fishing	0.8	0.7	
2	Share in total Gross Capital Formation in the Country (per cent at 2004-05 prices) Share of agriculture & allied sectors in total			
	Gross Capital *Formation*	7.1	7.2	
	Agriculture	6.6	6.6	
	Forestry and logging	0.1	0.1	
	Fishing	0.5	0.5	
3	Employment in the agriculture sector as share of total workers as per census 2001	58.2		

Source **: Central Statistics Office (CSO) and Department of Agriculture and Cooperation.**

Notes*:* @ Provisional Estimates *Quick Estimates **Advance Estimates

slightly lower average growth than targeted in the Eleventh Plan period due to severe drought experienced in most parts of the country during 2009-10 and drought/deficient rainfall in some states, namely Bihar, Jharkhand, eastern UP and West Bengal in 2010-11. However, timely and corrective measures taken by the government helped boost agricultural production and growth in agriculture and allied sectors reached 7.0 per cent in 2010-11, the highest growth rate achieved during the last six years. In 2011-12 agriculture and allied sectors are estimated to achieve a growth rate of 2.5 per cent. However a matter of great concern is the fact that agricultural growth is still, to an extent, characterized by fluctuations due to the vagaries of nature.

Gross capital formation in agriculture and allied sectors

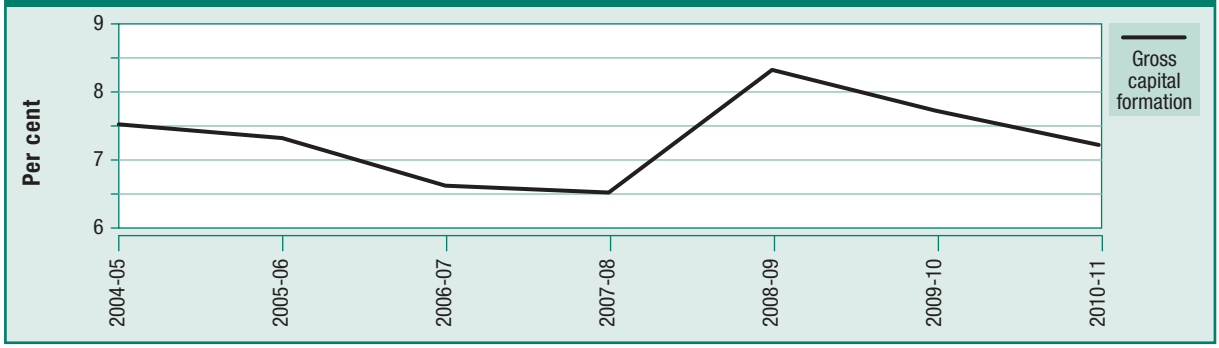
8.4 As a proportion of the value added by agriculture to GDP, Gross Capital Formation (GCF) in agriculture and allied sectors rose to 20.1 per cent in 2010-11 from 13.5 per cent in 2004-05 at 2004-05 prices (Table 8.2). This is a positive trend. However, the share of agriculture and allied sectors' GCF in overall GCF of the economy at 2004-05 prices shows a mixed trend during the same period (Figure 8.1)

Table 8.2 : GCF in Agriculture and Allied Activities (Figures in ₹ crore at 2004-05 prices)

Year	Agriculture & allied activities		GCF/GDP in agriculture & allied activities
	GCF	GDP	
2004-05	76096	565426	13.5
2005-06	86604	594487	14.6
2006-07	92057	619190	14.9
2007-08	105741	655080	16.1
2008-09	127127	655689	19.4
2009-10	131139	662509	19.8
2010-11	142254	709103	20.1

Source **: Central Statistics Office.**

Figure 8.1 **Share of agriculture and allied sector's Gross Capital Formation in total GCF (at 2004-05 prices)**



Crop Production

8.5 For five consecutive years, from 2004-05 to 2008-09, foodgrains production recorded an increasing trend. However, it declined to 218.11 million tonnes in 2009-10 due to severe drought conditions in various parts of the country. Normal monsoon in the subsequent year, 2010-11, helped the country reach a significantly higher level of 244.78 million tonnes of foodgrains production. As per the second Advance Estimates, production of foodgrains during 2011-12 is estimated at an all time record level of 250.42 million tonnes which is a significant achievement mainly due to increase in the production of rice and wheat (Table 8.3).

Growth Rates of Area, Production, and Yield of Major Agricultural Crops

8.6 Growth in the production of agricultural crops depends upon acreage and yield. Given the obvious limitations in expansion of agricultural land, long-term growth primarily depends on improvement in yields. An analysis of trends in indices of area, production, and yield indices of different crops during the period 1980-81 to 2011-12 (base triennium ending (T.E.) 1981-82=100) indicate a mixed picture (Table 8.4.).

8.7 **Rice and Wheat:** During the 1980s, growth in area under rice was marginal at 0.41 per cent; however, growth in production and yield was above 3 per cent. During 2000-01 to 2011-12 the situation changed, whereas growth in area is 0.04 per cent, the growth in production and yield at 1.72 per cent and 1.68 per cent respectively. In wheat also, during 1980s growth in area was marginal at 0.46 per cent but growth in production and yield was above 3 per cent. During 2000-01 to 2011-12, although growth in area under wheat was 1.22 per cent, growth in production and yield was 2.37 per cent and 1.14 per cent respectively. This clearly reflects that in these two crops the growth rate in yield levels are plateauing and there is need for renewed research efforts to

Table 8.3 : Agricultural Production (Kharif) (million tonnes)

Crops	2010-2011	2011-2012 (2nd Advance Estimates)	Percentage increase
Rice	95.98	102.75	7.1
Coarse cereals	43.68	42.08	-3.7
Pulses	18.24	17.28	-5.3
Oilseeds	32.48	30.53	-6.0
Sugarcane	342.38	347.87	1.6
Cotton (Million bales of 170 kgs each)	33.00	34.09	3.3
Jute and Mesta (Million bales of 180 kgs each)	10.60	11.61	9.3

Source **: Department of Agriculture and Cooperation.**

Table 8.4 : Compound Growth Rates of Area, Production, and Yield Indices of Principal Crops during 1980-1990, 1990-2000 and 2000-2011 (Base: TE 1981-82=100)

	1980-81 to 1989-90			1990-91 to 1999-2000			2000-01 to 2011-12*		
	Area	Production	Yield	Area	Production	Yield	Area	Production	Yield
Rice	0.41	3.62	3.19	0.68	2.02	1.34	0.04	1.72	1.68
Wheat	0.46	3.57	3.10	1.72	3.57	1.83	1.22	2.37	1.14
Coarse Cereals	-1.34	0.40	1.62	-2.12	-0.02	1.82	-0.75	3.01	4.39
Total Pulses	-0.09	1.52	1.61	-0.60	0.59	0.93	1.70	3.47	1.91
Sugarcane	1.44	2.70	1.24	-0.07	2.73	1.05	1.37	1.96	0.58
Total Oilseeds	1.51	5.20	2.43	-0.86	1.63	1.15	2.08	4.45	3.39
Total Foodgrains	-0.23	2.85	2.74	-0.07	2.02	1.52	0.43	2.32	2.91

Source **: Department of Agriculture and Cooperation.**

Notes **: * Growth rates are based on the second advance estimates (AE) 2011-12 released on 03 February 2012;Total oilseeds include nine oilseeds, cotton seed, and coconut.**

boost production and productivity (Figures 8.2 and 8.3). Both public and private-sector investment in research and development (R&D) in these crops needs to be encouraged.

8.8 **Coarse Cereals**: The growth rate in index of area of total coarse cereals during 1980-81 to 2011-12 was negative reflecting either shift to other crops or relatively dry area remaining fallow. However, the growth in production and yield which was 0.40 per cent and 1.62 per cent respectively in the 1980s has improved significantly to 3.01 per cent and 4.39 per cent respectively in the 2000-01 to 2011-12 period. This increase is primarily driven by rise in production and yield of maize and bajra. It also refectes growing popularity of coarse cereals as nutri-food (Figure 8.4).

8.9 **Pulses**: Pulses are the main source of protein for a large section of population in India. Gram and tur are the major contributors to total production of pulses in the country. During the 1980s there was negative growth in area of total pulses and growth in production and yield was 1.52 per cent and 1.61 per cent respectively. During the period 2000-01 to 2011-

Figure 8.2 Indices of area, production and yield of rice

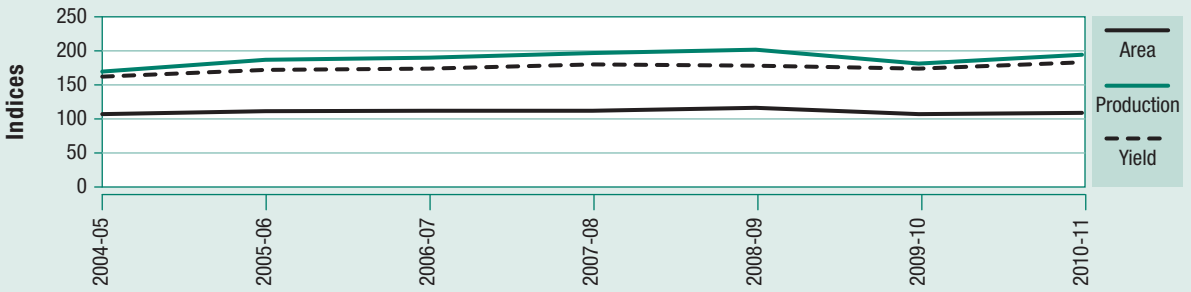


Figure 8.3 Indices of area, production and yield of wheat

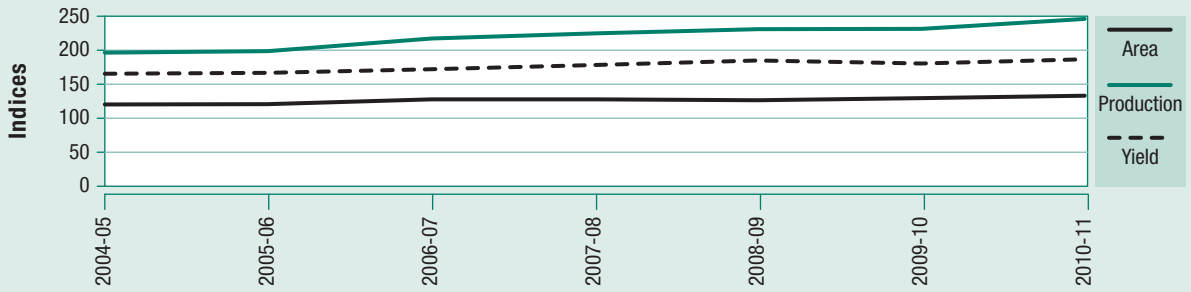
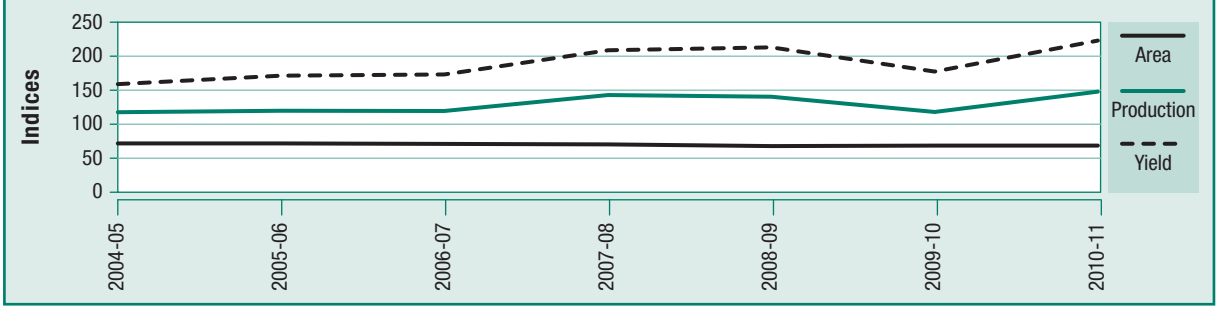


Figure 8.4 Indices of area, production and yield of coarse cereals



12, the indices of area, production and yield of pulses have grown by 1.70 per cent, 3.47 per cent, and 1.91 per cent respectively. The growth in indices of area and production during 2000-01 to 2011-12 is mainly on account of gram. A breakthrough in pulses production technology is necessary to keep pace with rising demand for this commodity (Figure 8.5).

8.10 **Sugarcane**: The compound growth rates of indices of area, production, and yield of sugarcane during 2000-01 to 2011-12 has declined compared to the 1980s. The decline in yield during this period is because of relatively higher decline in growth rate of production. A concerted effort is required to increase yield of this crop to avoid fluctuations in production and spikes in price of sugar (Figure 8.6).

The production of sugar in the 2011-12 sugar season is estimated at about 246.65 lakh tonnes against the estimated demand of about 220 lakh tonnes.

8.11 **Oilseeds**: There has been improvement in annual growth in the indices of yield and area under oilseeds during 2000-01 to 2011-12 as compared to the 1980s. India, however, still imports about 50 per cent of its requirement of edible oil. The current level of growth rate in yield index needs to be maintained to ensure a reasonable level of self-sufficiency in this crop (Figure 8.7). The production of oilseeds during 2011-12 and net availability of edible oil from all domestic sources (primary) are estimated at 305.29 lakh tonnes and 72.69 lakh tonnes respectively.

Figure 8.5 Indices of area, production and yield of total pulses

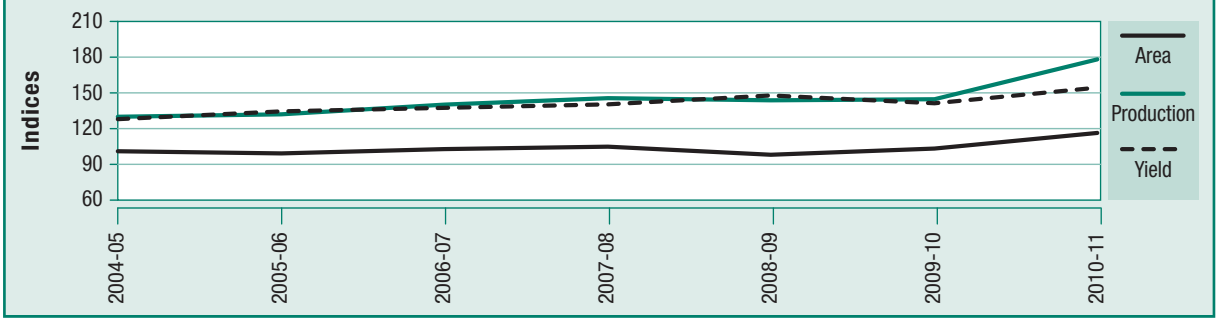


Figure 8.6 Indices of area, production and yield of sugarcane

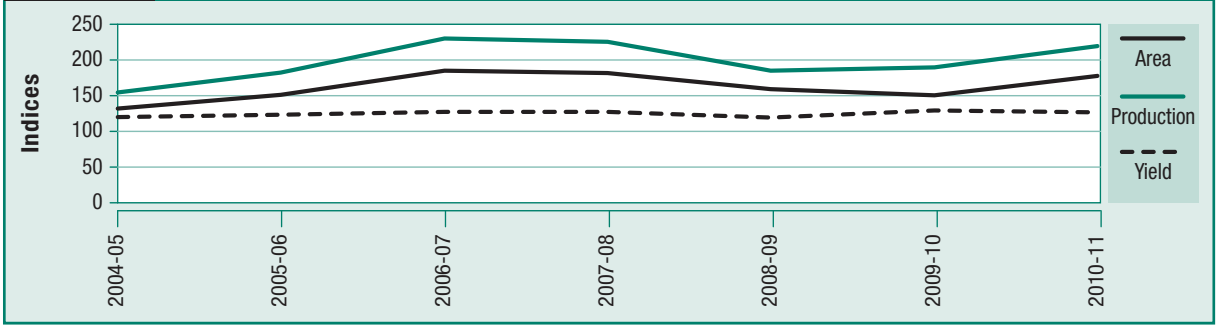
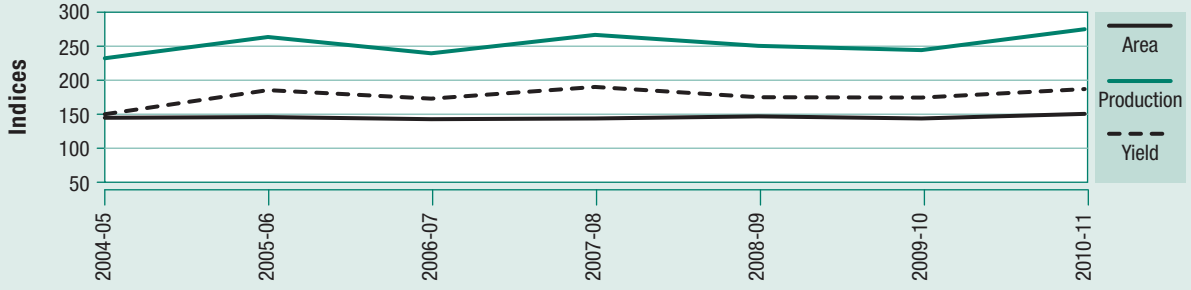


Figure 8.7 Indices of area, production and yield of oilseeds



Increased requirements of food consumption

8.12 Given the growth rate of population, the rise in demand for food is a natural concomitant. Further, the rise in income levels and change in tastes and preferences of people have also contributed to the increased demand for diverse food products. The recent spurt in food prices was mainly driven by increase in prices of items like fruits and vegetables, milk, meat, poultry, and fish, which account for approximately 70 per cent of the wholesale price index (WPI) basket for primary food items. An examination of food consumption expenditure in the country during the period 1987-88 to 2009-10 clearly reveals that there has been a shift in expenditure towards milk and milk products, egg, fish, meat, and vegetables both in rural and urban areas, whereas the share of consumption of cereals in the total food basket has gone down (Table 8.5). Some of the short-term, medium-term, and long-term measures that could be undertaken to achieve higher production and productivity in the agriculture sector to ensure that the higher demand for food items is met include measures related to supply response, storage, and marketing (Box 8.1).

Area Coverage of Foodgrains in 2011-12

8.13 There has been a decline in overall area under foodgrains during 2011-12 (2nd Advance Estimates) as compared to 2010-11. The area coverage under foodgrains during 2011-12 stood at 1254.92 lakh ha compared to 1267.65 lakh ha last year. The lower area under foodgrains has been due to a shortfall in the area under jowar in Maharashtra, Rajasthan and Gujarat; bajra in Maharashtra, Gujarat and Haryana; and in pulses in Maharashtra, Uttar Pradesh, Andhra Pradesh, and Rajasthan. However the area under coarse cereals and oilseeds has also come down as compared to the previous year. The area coverage under rice during 2011-12 is around 444.06 lakh ha which is 15.44 lakh ha more than the previous year. The area coverage under sugarcane during the current year has slightly improved to 50.81 lakh ha, higher by about 1.96 lakh hectares as compared to the previous year, and the area under cotton has increased significantly to 121.78 lakh ha as compared to 112.35 lakh ha during 2010-11.

Table 8.5: Item-wise Share of Expenditure to Total Food Expenditure

	Rural		Urban	
	1987-1988	2009-2010	1987-1988	2009-2010
Cereals	41.1	29.1	26.6	22.4
Pulses and products	6.3	6.9	6.0	6.6
Milk and products	13.4	16.0	16.8	19.2
Egg, fish, and meat	5.2	6.5	6.4	6.6
Vegetables	8.1	11.6	9.4	10.6
Sugar	4.5	4.5	4.3	3.7
Food total	100	100	100	100

Source **: Key Indicators of Household Consumer Expenditure in India 2009-10, National Sample Survey (NSS) 66th Round**

Box 8.1 : Options for addressing supply-side constraints

- Given the compositional shift in foodbasket of a common household and its impact on consumption demand, improved supply response is critical for ensuring price stability in food items.
- Extension programmes and guidance to farmers regarding fertilizer and insecticide usage and alternate cropping pattern based on soil analysis could be undertaken and intensified.
- As a strategy, regular imports of agricultural commodities in relatively smaller quantities with an upper ceiling on total quantity could be considered. The upper ceiling can be decided annually, relatively well in advance, after assessing the likely domestic situation in terms of production and consumption requirements.
- Setting up special markets for specific crops in states/regions/areas producing those crops would facilitate supply of superior commodities to the consumers.
- Mandi governance is an area of concern. A greater number of traders must be allowed as agents in the mandis. Anyone who gets better prices and terms outside the Agricultural Produce Marketing Committee (APMC) or at its farm gate should be allowed to do so. For promoting inter-state trade, a commodity for which market fee has been paid once must not be subjected to subsequent market fee in other markets including that for transaction in other states. Only user charges linked to services provided may be levied for subsequent transactions.
- Perishables could be taken out of the ambit of the APMC Act. The recent episodes of inflation in vegetables and fruits have exposed flaws in our supply chains. The government-regulated mandis sometimes prevent retailers from integrating their enterprises with those of farmers. In view of this, perishables may have to be exempted from this regulation.
- Considering significant investment gaps in post-harvest infrastrure of agricultrual produce, organised trade in agriculture should be encouraged and the FDI in multi-brand retail once implemented could be effectively leveraged towards this end.
- Government should step up creation of modern storage faclities for food grains.

Rubber

8.14 India is the fourth largest producer of natural rubber (NR) with a share of 8.2 per cent in world production in 2010. Despite not having geographically very favourable regions for growing NR, India continued to record the highest productivity among major NR-producing countries. The production of NR in 2011-12 is projected at 9.02 lakh tonnes, an increase of 4.6 per cent over 2010-11. India continues to be the second largest consumer of NR with 8.8 per cent share of world consumption in 2010. Consumption of NR in 2011-12 is projected at 9.77 lakh tonnes, an increase of 3.1 per cent over the previous year.

Coffee

8.15 India is the sixth largest producer of coffee after Brazil, Vietnam, Colombia, Indonesia, and Ethiopia. With 2 per cent share in global area under coffee, India contributes about 4 per cent to world coffee production as well as international trade. Coffee is cultivated in an area about 4.0 lakh ha primarily in the southern states of Karnataka, Kerala, and Tamil Nadu. Presently consumption in the country is over 1 lakh tonnes and India produces about 3 lakh tonnes of coffee comprising both Arabica (32 per cent) and Robusta (68 per cent) coffee. The country's coffee production reached a high of 3.02 lakh tonnes during 2011-12 and is expected to touch an all-time record production of 3.22 lakh tonnes during 2011-12, an increase of 6.7 per cent over 2010-11 production.

8.16 Over the past two decades, coffee cultivation has been promoted in the tribal regions of Andhra Pradesh, Orissa, and the north-eastern states primarily with the objective of tribal development and afforestation. Indian coffee is primarily an export-oriented commodity with about 70 per cent of production being exported.

Tea

8.17 India is the largest producer and consumer of black tea in the world. Tea is grown in 16 states in India. Assam, West Bengal, Tamil Nadu, and Kerala account for about 95 per cent of total tea production. Tea production in India during the year 2010-11 has been estimated at 0.97 million tonnes as against 0.99 million tonnes in 2009-10.

Exports and Imports

8.18 India's trade policy on agricultural items is guided by the twin objectives of ensuring food security and building export markets for enhancing the income of farmers, depending on domestic availability. In

September 2011, government has put the exports of wheat, non-basmati rice, and cotton under open general licence.

8.19 India is among 15 leading exporters of agricultural products in the world. As per the International Trade Statistics 2011, published by the World Trade Organization (WTO), India's agricultural exports amounted to US $ 23.2 billion with a 1.7 per cent share of world trade in agriculture in 2010. On the other hand, India's agricultural imports amounted to US $ 17.5 billion with a 1.2 per cent share of world trade in agriculture in 2010.

Agricultural Inputs

8.20 Improvement in yield, which is key to long-term growth, depends on a host of factors including technology, use of quality seeds, fertilizers, pesticides, micronutrients, and irrigation. Each of these plays a role in determining yield level and in turn augmentation in the level of production.

Seeds

8.21 Good quality seed is one of the most important inputs for enhancing agricultural productivity and production. Efficacy of other agricultural inputs such as fertilizers, pesticides, and irrigation is largely determined by it. Seed quality is estimated to account for 20-25 per cent of productivity. It is, therefore, important that quality seeds are made available to the farmers. Since the year 2005-06, the central government has been implementing a central-sector scheme known as 'Development and Strengthening of Infrastructure Facilities for Production and Distribution of Quality Seeds' to address the gaps in infrastructure and to increase availability of quality seeds for different crops through various interventions. The objective of the scheme is to ensure production and multiplication of high-yielding certified/quality seeds of all crops in sufficient quantities and make them available to farmers at affordable prices. An amount of ₹1987.83 crore (till 15 February 2012) has been released as grants-in-aid under different components of the scheme. Although this scheme has contributed to doubling the availability of quality seeds in the last five years, it requires major changes and upgradation to meet the challenges of the rapidly evolving seed sector and ensure wider use of quality seeds. Accordingly, a National Mission on Seeds for the Twelfth Plan Period has been proposed.

8.22 The New Policy on Seed Development (NPSD) was formulated way back in 1988 with a view to providing the best planting material available abroad to Indian farmers. The policy has, over the years, facilitated import of seeds under various categories. The policy permits initial import of small quantities of seeds of cereals, oilseeds, pulses, etc. for in-house trial by the importer. Based on satisfactory results of multi-location trials, importers are permitted to import in bulk. Subsequently, NPSD 1988 was revised to allow import of seeds of wheat and paddy, coarse cereals, pulses, and oilseeds under prescribed conditions. The revisions in NPSD could usher in an enabling environment for speedy trial and evaluation of seeds, thereby facilitating timely imports.

8.23 In response to the changes that have taken place in the seed sector, the Seed Act 1966 is proposed to be replaced by a suitable legislation to (i) create an enabling climate for growth of the seed industry, (ii) enhance the seed replacement rates, (iii) boost export of seeds and encourage import of useful germplasm, and (iv) create a conducive atmosphere for the application of frontier sciences in variety development and enhanced investment for R&D. Presently, the Bill is under consideration for moving official amendments to it based on suggestions received from various quarters.

8.24 FDI policy for agriculture sector was amended to allow 100 per cent FDI under automatic route for 'development of seed'. Earlier, FDI was permitted for 'development of seed under controlled condition'.

Mechanization and Technology

8.25 Farm mechanization has immense potential for improving farm productivity. Empirical data reaffirm that availability of farm power has a direct correlation to agricultural productivity. Appropriate crop and region-specific agricultural equipment enable efficient utilization of farm inputs making farming viable and attractive. Though the country has been witnessing considerable progress in farm mechanization, its spread across the country still remains uneven. Current farm power availability hovers around 1.7 kw/ha which is much lower than that of Korea (7+ kw/ha), Japan (14+kw/ha), and the USA (6+kw/ha). It is estimated that in order to upscale farm productivity so as to grow more food given the stagnant net sown area, farm power availability must reach at least 2.0 kw/ha by the end of Twelfth Five Year Plan. Gradual increase in farm mechanization will also help release agricultural labour for other emerging and valued sectors, thus contributing more towards GDP.

8.26 So far in India, 'tractors' have been the major symbol of agriculture mechanization. Indian agriculture is dominated by small and marginal farmers, whose smaller landholding and weaker economic status render single ownership of much high-value agricultural machinery and equipment. In this context, supporting and franchising rural entrepreneurs for establishing custom hiring or farm service centers will help extending benefits of farm mechinization to so far 'excluded farmers' category.

Fertilizers

8.27 India is meeting 80 per cent of its urea requirement through indigenous production but is largely import dependent for meeting the requirements of potassic (K) and phosphatic (P) fertilizers (Table 8.6). Chemical fertilizers have played a significant role in the development of the agricultural sector. Consumption of chemical fertilizers has steadily increased over the years (Table 8.7).

8.28 The Nutrient Based Subsidy (NBS) Policy for fertilizers was implemented in 2010. Under the NBS Policy, a fixed subsidy is announced on per kg basis of nutrient annually. An additional subsidy is also given to micro-nutrients. With the objective of providing a variety of subsidized fertilizers to farmers depending upon soil and crop requirements, the government has included seven new grades of complex fertilizers under the NBS. Under this scheme, manufactures/marketers are allowed to fix the maximum retail price (MRP). Farmers pay only 50 per cent of the delivered cost of P and K fertilizers, the rest is borne by the Government of India in the form of subsidy.

Table 8.6 : Production of Urea, DAP and Complex Fertilizers

(in lakh tonnes)

Year	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12*
Urea	203.10	198.60	199.20	211.12	218.80	222.88
Di-ammonium phosphate.	48.52	42.12	29.93	42.46	35.37	39.41
Complex fertilizers	74.64	58.50	68.48	80.38	87.27	90.69

Source **: Department of Fertilizers.**
***Estimated**

Table 8.7 : Per Hectare Consumption of Fertilizers in Nutrient Terms

(in lakh tonnes)

Year	2006-07	2007-08	2008-09	2009-10	2010-11
Nitrogenous (N)	137.73	144.19	150.90	155.80	165.58
Phosphatic (P)	55.43	55.15	65.06	72.74	80.50
Potassic (K)	23.35	26.36	33.13	36.32	35.14
Total (N+P+K)	216.51	225.70	249.09	264.86	281.22
Per hectare consumption (kg)	111.8	116.50	127.2	135.76	144.14

Source **: Department of Fertilizers.**

Rainfall and Reservoir Levels

8.29 Rainfall continues to influence crop production and productivity in a substantial way. Around 75 per cent of annual rainfall is received during the south-west monsoon season (June-September). During the south-west monsoon season 2011, the country as a whole received 1 per cent more rainfall than the long period average (LPA). Central India and north-west India experienced excess rainfall over the LPA by 10 per cent and 7 per cent respectively. The southern peninsula received normal rainfall. North-east India received 14 per cent less rainfall than the LPA. At district level, 24 per cent of districts received excess rainfall, 52 per cent normal rainfall, 23 per cent deficient rainfall, and 1 per cent scanty rainfall.

8.30 Out of 36 Subdivisions, 3 recorded deficient rainfall during the south-west Monsoon in 2011. Out of the 33 remaining subdivisions, 7 recorded excess rainfall and the remaining 26 recorded normal rainfall (Table 8.8).

8.31 The total designed storage capacity at full reservoir level (FRL) of 81 major reservoirs in the country monitored by the Central Water Commission (CWC) is 151.77 billion cubic meters (BCM). At the end of monsoon 2011, the total live storage in these reservoirs was 131.076 BCM which is more than the live storage of 115.23 BCM at the end of monsoon 2010 and 102.759 BCM which is the average of the last 10 years. Given the vagaries of the monsoon, augmenting irrigation potential is key to sustained growth in agriculture.

Irrigation

8.32 Irrigation is one of the most important inputs required at different critical stages of plant growth of various crops for optimum production. The Government of India has taken up augmentation of irrigation potential through public funding and is assisting farmers to create potential on their own farms. Substantial irrigation potential has been created through major and medium irrigation schemes.

Table 8.8 : Monsoon Performance : 2001 to 2011 (June – September)

Year	Number of meteorological subdivisions			Percentage of districts with normal/ excess rainfall	Percentage of long period average rainfall for the country as a whole
	Normal	Excess	Deficient/ Scanty		
2001	28	1	6	68	91
2002	14	1	21	37	81
2003	23	8	5	76	105
2004	23	0	13	56	87
2005	24	8	4	72	99
2006	21	6	9	60	100
2007	18	13	5	72	106
2008	31	2	3	76	98
2009	11	3	22	42	78
2010	17	14	5	70	102
2011	26	7	3	76	101

Source **: Indian Meteorological Department.**

8.33 The central government initiated the Accelerated Irrigation Benefit Programme (AIBP) from 1996-97 for extending assistance for the completion of incomplete irrigation schemes. Under this programme, projects approved by the Planning Commission are eligible for assistance. Under the AIBP, ₹ 50,380.64 crore of central loan assistance (CLA)/grant has been released up to 30 November 2011. As on 31 March 2011, 290 projects were covered under the AIBP and 134 completed. During 2010-11, an irrigation potential of 566.24 thousand ha is reported to have been created by states, from major / medium /minor irrigation projects under the AIBP. While the higher irrigation potential would help augment production and productivity, assured remuneration from such production is vital for development of agriculture.

Price Policy for Agricultural Produce

8.34 Government's price policy for agricultural produce seeks to ensure remunerative prices to growers for their produce with a view to encouraging higher investment and production and safeguarding the interests of consumers by making available food supplies at reasonable prices. The price policy also seeks to evolve a balanced and integrated price structure in keeping with the overall needs of the economy. To achieve this end, the government announces minimum support prices (MSPs) for major agricultural commodities each season and organizes purchase operations through the Food Corporation of India, and cooperative and other agencies designated by state governments. The

Figure 8.8 Recent trends in MSPs of some important crops

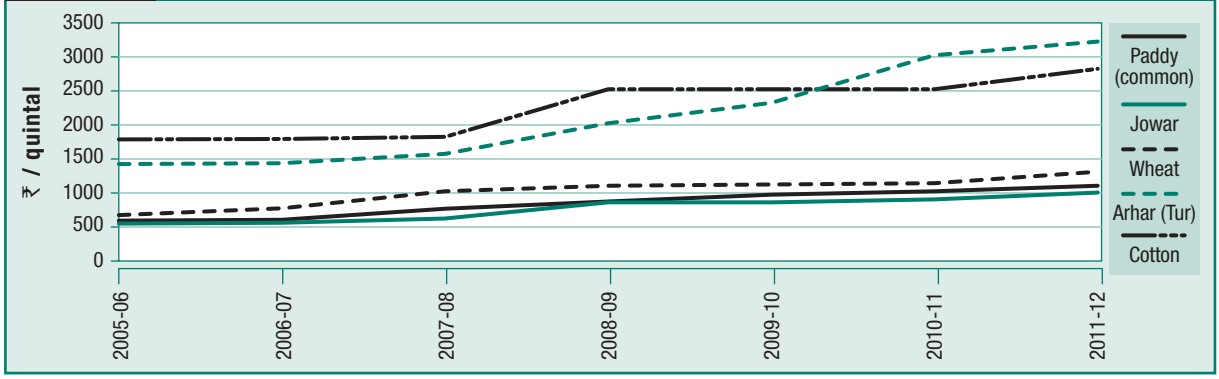


Table 8.9 : Minimum Support Prices

(₹ per quintal)

	2010-11	2011-12	Difference between 2011-12 and 2010-11 Prices
Kharif Crops			
Paddy (common)	1000	1080	80
Paddy (Gr.A)	1030	1110	80
Jowar (hybrid)	880	980	100
Jowar (maldandi)	900	1000	100
Bajra	880	980	100
Maize	880	980	100
Ragi	965	1050	85
Arhar (tur)	3000*	3200*	200
Moong	3170*	3500*	330
Urad	2900*	3300*	400
Groundnut in shell	2300	2700	400
Sunflower	2350	2800	450
Soyabean (black)	1400	1650	250
Soyabean (yellow)	1440	1690	250
Sesamum	2900	3400	500
Nigerseed	2450	2900	450
Cotton (F-414/H-777/J34)[a]	2500	2800	300
Rabi crops			
Wheat	1120[b]	1285	165
Barley	780	980	200
Gram	2100	2800	700
Masur (lentil)	2250	2800	550
Rapeseed/mustard	1850	2500	650
Safflower	1800	2500	700

Source **: Department of Agriculture and Cooperation.**
Note **: * An additional incentive at the rate of ₹ 500 per quintal for tur, urad, and moong is given to procurement agencies during the harvest/arrival period of two months. a- Staple length (mm) of 24.5 and 25.5 and micronaire value of 4.3-5.1. b-An additional incentive bonus of ₹ 50 per quintal over the MSP.**

government decides on the MSPs for various agricultural commodities taking into account the recommendations of the Commission for Agricultural Costs and Prices (CACP), the views of state governments and central ministries as well as such other relevant factors which are considered important for fixation of support prices. In the year 2011-12, the MSPs of various agricultural crops have been increased as reflected in Table 8.9. The MSPs of some major crops exhibit a rising trend in line with costs and as incentive for higher output (Figure 8.8).

8.35 NAFED appoints state agencies to undertake Price Support Scheme (PSS) operations. The losses, if any, incurred by the central agencies on undertaking PSS operations are reimbursed up to 15 per cent by the central government. Apart from this, government provides working capital to the central agencies for undertaking PSS operations. The government also implements the Market Intervention Scheme (MIS) for horticultural and agricultural commodities, generally perishable in nature and not covered under the PSS, thus helping farmers get remunerative prices for their produce. The MIS is contingent on the specific request of a state/union territory (UT) government which is ready to bear 50 per cent loss (25 per cent in the case of north-eastern states), if any, incurred on its implementation. However, the loss is restricted up to 25 per cent of total procurement value. Profit earned, if any, in implementing the MIS is retained by the procuring agencies.

Major Schemes/Programmes in The Agriculture Sector

8.36 Agriculture being a state subject, the primary responsibility for increasing agriculture production, enhancing productivity, and exploring the vast untapped potential of the sector rests with the state governments. However, in order to supplement the efforts of the state governments, a number of centrally sponsored and central-sector schemes are being implemented for enhancing agricultural production and productivity in the country and increasing the income of the farming community.

National Food Security Mission (NFSM)

8.37 The NFSM, launched in 2007, is a crop development scheme of the Government of India that aims at additional production of 10, 8, and 2 million tonnes of rice, wheat, and pulses respectively by the end of 2011-12.The scheme was approved with an outlay of ₹ 4,883 crore for the period from 2007-08 to 2011-12. A sum of about ₹ 3,381 crore has been spent till 31 March 2011. The Mission interventions consist of a judicious mix of proven technological components covering seeds of improved variety, soil ameliorants, plant nutrients, farm machines/implements, and plant protection measures. In addition, a special initiative under the name of the Accelerated Pulses Production Programme was initiated in 2010 to boost the production of pulses by active promotion of technologies in 1,000 clusters of 1,000 ha each. Considerable achievements under the NFSM have been recorded during the course of implementation of the programme such as new farm practices, distribution of seeds of high yielding varieties of rice, wheat, pulses, and hybrid rice, and treating area with soil ameliorants to restore soil fertility for higher productivity. Through targeted interventions, the mission has already achieved, a year in advance, 25 millions tonnes of additional production of food grains exceeding the target of 20 million tonnes of production set for the terminal year 2011-12, of the Eleventh Year Plan.

Macro Management of Agriculture (MMA)

8.38 The MMA Scheme was revised in 2008 to improve its efficacy in supplementing/complementing the efforts of the states towards enhancement of agricultural production and productivity. It also provides opportunity to draw upon agricultural development programmes out of ten sub-schemes relating to crop production and natural resource management, and give it the flexibility to use 20 per cent of resources for innovative components. The revised MMA scheme has formula-based allocation criteria and provides assistance in the form of grants: loan to the states/UTs on 90:10 ratio basis, except in case of the north-eastern states where the central share is 100 per cent grant. Out of the total outlay for the Eleventh Plan, i.e. ₹ 5,500 crore, funds to the tune of ₹ 3,845 crore have been utilized/released to the states/UTs during the first four years of the Plan period. An outlay of ₹ 780 crore has been approved for 2011-12, out of which an amount of ₹ 772 crore has been released to states till 21 February 2012.

Rashtriya Krishi Vikas Yojana (RKVY)

8.39 The RKVY was launched in 2007-08 with an outlay of ₹ 25,000 crore in the Eleventh Plan for incentivizing states to enhance public investment to achieve 4 per cent growth rate in agriculture and allied sectors during the Eleventh Five Year Plan period. The states have been provided ₹ 14,598.31 crore under the RKVY during 2007-08 to 2010-11. Allocation under the RKVY for the current year is ₹ 7,810.87 crore.

8.40 The RKVY format permits taking up national priorities as sub-schemes, allowing the states flexibility in project selection and implementation. The sub-schemes include Bringing Green Revolution to Eastern Region; Integrated Development of 60,000 Pulses Villages in Rainfed Areas; Promotion of Oil Palm; Initiative on Vegetable Clusters; Nutri-cereals; National Mission for Protein Supplements; Accelerated Fodder Development Programme; Rainfed Area Development Programme; and Saffron Mission. The RKVY links 50 per cent of central assistance to those states that have stepped up percentage of State Plan expenditure on agriculture and allied sectors. States have indeed increased allocation to agriculture and allied sectors from 4.88 per cent of total State Plan expenditure in 2006-07 to 6.04 per cent of in 2010-11 (Revised Estimates—RE).

Integrated Scheme of Oilseeds, Pulses, Oil Palm, and Maize (ISOPOM)

8.41 Oilseeds are raised mostly under rainfed conditions and are important for the livelihood of small and marginal farmers in the arid and semi-arid areas of the country. The centrally sponsored ISOPOM have been under implementation during the Eleventh Plan in 14 states for oilseeds and pulses, 15 for maize, and 9 for oil palm. The pulses component

has been merged with the NFSM with effect from 1 April 2010.

National Mission for Sustainable Agriculture (NMSA)

8.42 The NMSA aims at enhancing food security and protection of resources such as land, water, biodiversity, and genetic resources by developing strategies to make Indian agriculture more resilient to climate change. The Prime Minister's Council on Climate Change has approved the Mission in September 2010 and the Ministry of Agriculture has initiated activities under this Mission during the current financial year (Box 8.2).

Extension Services

8.43 The Support to State Extension Programmes for Extension Reforms Scheme was launched in 2005-06, aiming at making the extension system farmer driven as well as accountable to farmers by providing for new institutional arrangements for technology dissemination. This has been done through setting up of Agricultural Technology Management Agencies (ATMA) at district level to operationalize the extension reforms. The ATMA has active participation of farmers/farmer groups, non-government organizations (NGOs) and other stakeholders operating at district level and below. Gender concerns are being mainstreamed by mandating that 30 per cent of resources on programmes and activities are utilized by women farmers and women extension functionaries. Since inception, 1.70 crore farmers of which 25 per cent are women farmers, have been benefited under various extension activities.

8.44 Certain other schemes which support agriculture sector are mass media support to agriculture focusing on Doordarshan infrastructure and All India Radio (AIR) broadcasting agriculture-related information; kisan call centres to provide agricultural information to the farming community through toll free telephone lines; agri-clinic and agri-business centres by agriculture graduates to provide extension services to farmers on payment basis through setting up of economically viable self–employment ventures, and information dissemination through agri fairs. Further, extension education institutes at Nilokher (Haryana), Rajendra Nagar, (Andhra Pradesh), Anand (Gujarat), and Jorhat (Assam) are operating at regional level to improve the skills and professional competence of extension field functionaries of agriculture and allied departments. In addition, there are model training courses on thrust areas of agriculture, horticulture, animal husbandry, and fisheries with the objective of improving the professional competence, upgrading the knowledge, and developing technical skills of subject matter specialists/extension workers of agriculture and allied departments. MANAGE, Hyderabad, an apex Institute at the national level, provides training to middle and senior level officers of agriculture and allied departments of the states/UTs.

National Horticulture Mission (NHM)

8.45 The horticulture sector includes a wide range of crops, such as fruits, vegetables, roots and tuber crops, flowers, aromatic and medicinal plants, spices, and plantation crops, which facilitate diversification in agriculture. It has been recognized that growing horticulture crops is now an ideal option to improve

Box 8.2 : Impacts of Climate Change on Indian Agriculture

Indian agriculture, with two-third rainfed area remains vulnerable to various vagaries of monsoon, besides facing occurrence of drought and flood in many parts of the country. Natural calamities such as drought and flood occur frequently in many parts of the country. Climate change will aggravate these risks and may considerably affect food security through direct and indirect effects on crops, soils, livestock, fisheries, and pests. Building climate resilience, therefore, is critical. Potential adaptation strategies to deal with the adverse impacts of climate change are developing cultivars tolerant to heat, moisture, and salinity stresses; modifying crop management practices; improving water management; adopting new farm practices such as resource-conserving technologies; crop diversification; improving pest management; making available timely weather-based advisories; crop insurance; and harnessing the indigenous technical knowledge of farmers.

The Indian Council of Agricultural Research has initiated a scheme on National Initiative on Climate Resilient Agriculture with an outlay of ₹ 350 crore for 2010-12. This initiative has been planned as a multi-disciplinary, multi-institutional effort covering crops, livestock, and fisheries and focusing mainly on adaptation and mitigation of climate change in agriculture. It also has a component for demonstration of climate-coping technologies on farmers' fields in 100 most vulnerable districts. State-of-the-art infrastructure is being set up at key research institutes to undertake frontier research on climate change adaptation and mitigation.

livelihood security, enhance employment generation, attain food and nutritional security, and increase income through value addition. Over the years, there have been noticeable achievements and significant improvement in the production and productivity of various horticulture crops.

8.46 The NHM scheme was launched during the Tenth Plan for holistic development of the horticulture sector, duly ensuring forward and backward linkages by adopting a cluster approach, with the active participation of all the stakeholders. At present 372 districts in 18 States and 3 UTs have been covered under the NHM. The supply of quality planting material through establishment of nurseries and tissue culture units, production and productivity improvement programmes through area expansion and rejuvenation, technology promotion, technology dissemination, human resource development, creation of infrastructure for post-harvest management and marketing in consonance with the comparative advantages of each state/region and their diverse agro-climatic conditions are the major programmes of the Mission. A major initiative has been taken during 2011-12 for enhancing the supply of good quality vegetables to metro cities under the Vegetable Initiative in Urban Clusters.

National Bamboo Mission (NBM)

8.47 The NBM, a centrally sponsored scheme of the Ministry of Agriculture for harnessing the potential of the bamboo crop in the country, is under implementation in 27 states with a total outlay of ₹ 568.23 crore. The Mission envisages promoting holistic growth of the bamboo sector by adopting an area-based, regionally differentiated strategy to increase the area under bamboo cultivation and marketing. Under the Mission, steps have been taken to increase the availability of quality planting material by supporting the setting up of new nurseries/tissue culture units and strengthening existing ones. To address forward integration, the Mission is taking steps to strengthen marketing of bamboo products, especially those of handicraft items. During 2011-12, 9,349 ha of forest and 5,526 ha of non-forest area has so far been covered under bamboo plantation and 1,074 ha of existing bamboo plantation has been improved for higher productivity. Since the inception of the Mission, 1,89,466 ha has been covered with bamboo plantation. Besides the Mission has provided financial assistance to different institutions/ universities for twenty-three R&D projects aimed at higher productivity of bamboo. Agro-forestry trials comprising bamboo grown along with agricultural/ horticultural crops and medicinal plants under different agro-climatic conditions in various states have been initiated.

Animal Husbandry, Dairying, and Fisheries

8.48 The Eleventh Five Year Plan envisages overall growth of 6-7 per cent per annum for the sector. In 2010-11, this sector contributed 121.84 million tonnes of milk, 63.02 billion eggs, 42.99 million kg wool, and 4.83 million tonnes of meat. The Eighteenth Livestock Census (2007) has placed total livestock population at 529.7 million and total of poultry birds at 648.8 million.

Dairy Sector

8.49 India ranks first in the world in milk production, which went up from 17 million tonnes in 1950-51 to 121.84 million tonnes in 2010-11. The per capita availability of milk has also increased from 112 grams per day in 1968-69 to 281 grams in 2010-11. However, world average per capita availability was 284 grams per day in 2009-10 compared to 273 grams per day for India.

8.50 The Indian dairy sector acquired substantial growth momentum from the Ninth Plan onwards, achieving an annual output of 121.84 million tonnes of milk during 2010-11 (Table 8.10). This represents sustained growth in the availability of milk and milk products for the growing population of the country. Dairying has become an important secondary source of income for millions of rural families and has assumed an important role in providing employment and income-generating opportunities.

Table 8.10 : Production and Per Capita Availability of Milk

Year	Per capita availability (grams/day)	Production (million tonnes)
1990-91	176	53.9
2000-01	217	80.6
2005-06	241	97.1
2006-07	251	102.6
2007-08	260	107.9
2008-09	266	112.2
2009-10	273	116.4
2010-11#	281	121.8

Source **: Department of Animal Husbandry, Dairying and Fisheries.**
Note **: # : Provisional**

8.51 The Ministry of Agriculture is implementing important schemes, namely the Intensive Dairy Development Programme, Strengthening Infrastructure for Quality and Clean Milk Production, and Assistance to Cooperative and Dairy Entrepreneurship Development Scheme, in the dairy sector. A major programme for genetic improvement called the National Project for Cattle and Buffalo Breeding (NPCBB) was also launched in 2000. The NPCBB envisaged genetic upgradation and development of indigenous breeds on priority basis.

8.52 A centrally sponsored scheme for livestock insurance is being implemented in all the states with the twin objectives of providing protection mechanism to farmers and cattle rearers against any eventual loss of their animals due to death and to demonstrate the benefit of the insurance of livestock and popularize it with the ultimate goal of attaining qualitative improvement in livestock and its products. The scheme benefits farmers and cattle rearers with indigenous/cross-bred milch cattle and buffaloes in 300 selected districts. The benefit of subsidy is to be restricted to two animals per beneficiary per household. During 2010-11, 8.16 lakh animals (indigenous crossbreed milch cattle and buffalo) were insured against the target of 6.55 lakh. In 2011-12, ₹ 30.99 crore had been released up to December 2011 and 29.10 lakh animals were insured from 2006-07 to 2010-11.

Poultry

8.53 The poultry sector encompasses a range of farming systems from highly industrialized and export-oriented at one end to backyard, small and marginal model (or systems), addressing livelihood issues at the other end. The per capita availability is around 53 eggs per year in the year 2010-11. Exports of poultry products were around ₹ 372 crore in 2009-10 as per the Agricultural and Processed Food Products Export Development Authority (APEDA).

8.54 Four regional Central Poultry Development Organizations located at Chandigarh, Bhubaneswar, Mumbai, and Hessarghatta are focusing on production of stocks suitable for backyard rearing, training to the farmers to upgrade their technical skills. The Central Poultry Performance Testing Centre gives valuable information relating to different genetic stock available in the country. The "Poultry Development" scheme comprising three components, namely Assistance to State Poultry Farms, Rural Backyard Poultry Development, and Poultry Estates, is being implemented. Further, in order to encourage entrepreneurship skills of individuals, a central-sector 'Poultry Venture Capital Fund' Scheme is also being implemented on capital subsidy mode since 1 April 2011, covering various poultry activities.

Livestock health

8.55 Animal wealth in India has increased manifold prompting the animal husbandry sector to adopt skilled practices. With increased trade activity and extensive cross-breeding programmes, the chances of ingress of exotic diseases into the country have increased. To ensure disease-free status and be compatible with the standards laid down by the World Animal Health Organization, many animal health schemes have been initiated. The Government of India provides financial assistance to states/UTs to control major livestock diseases and strengthen veterinary services including reporting of animal diseases through various centrally sponsored schemes. Major achievements include carrying out 81 million vaccinations and maintaining the country's Rinderpest-free and contagious bovine pleuro-pneumonia-free status.

8.56 The Ministry of Agriculture is also implementing a World Bank- assisted project on 'Preparedness, Control and Containment of Avian Influenza' which envisages surveillance, capacity building in terms of training and laboratory infrastructure, and logistical support for undertaking control and containment measures at the time of outbreaks. All avian influenza outbreaks reported in the country have been effectively controlled. The last outbreak was reported in February, 2012 in Odisha where Control & Containment operations are being carried out. In the last five occurrences of avian influenza in the country, the disease has been brought under control within 10 to 15 days' time through a robust Action Plan for Prevention, Control and Containment of the disease.

Fisheries

8.57 The fisheries sector contributed 0.7 per cent of total GDP at factor cost and 5.0 per cent of GDP at factor cost from agriculture, forestry, and fishing in the year 2010-11 (QE). Fish production increased from 3.8 million tonnes in 1990-91 to 8.29 million tonnes in 2010-11 (Table 8.11). Fishing, aquaculture, and allied activities are reported to have provided livelihood to over 14 million people in 2010-11, apart from being a major foreign exchange earner.

Table 8.11 : Production and Export of Fish

Year	Fish production (million tonnes)			Export of marine products	
	Marine	Inland	Total	Qty ('000 tonnes)	Value (₹ crore)
1990-91	2.3	1.5	3.8	140	893
2000-01	2.8	2.8	5.6	503	6,288
2003-04	3.0	3.4	6.4	412	6,087
2004-05	2.8	3.5	6.3	482	6,460
2005-06	2.8	3.8	6.6	551	7,019
2006-07	3.0	3.8	6.8	612	8,363
2007-08	2.9	4.2	7.1	541	7,620
2008-09	3.0	4.6	7.6	602	8,608
2009-10	3.1	4.8	7.9	678	10,048
2010-11	3.2	5.1	8.3	813	12,901

Source : Department of Animal Husbandry, Dairying and Fisheries.

Feed and fodder

8.58 Adequate availability of feed and fodder for livestock is very vital for increasing milk production and sustaining the ongoing genetic improvement programme. Green fodder shortage in the country is estimated at about 34 per cent. The Ministry of Agriculture has been implementing a modified centrally sponsored Fodder and Feed Development Scheme since 2010 to supplement the efforts of the states to improve fodder production. Under the Central Minikit Testing Programme, fodder seed minikits of high-yielding fodder varieties are distributed free of cost to farmers. During the current year (2011-12), 12.67 lakh fodder seed minikits have been allotted to states for distribution.

Credit and Insurance

Agricultural Credit

8.59 Agricultural credit plays an important role in improving agricultural production and productivity and mitigating distress of farmers. Government has taken several measures for improving agricultural credit flow and bringing down the rate of interest on farm loans. Important achievements/ initiatives taken by the government in recent years are the following.

(i) The flow of agricultural credit since 2003-04 has consistently exceeded the target. In the year 2010-11 the achievement was 119 per cent of target. The target of credit flow for the year 2011-12 has been fixed at ₹ 4,75,000 crore and achievement as on November 2011 is ₹ 2,94,023 crore.

(ii) Farmers have been receiving crop loans up to a principal amount of ₹ 3 lakh at 7 per cent rate of interest since 2006-07. In 2009-10, government provided an additional 1 per cent interest subvention to those farmers who repaid their short-term crop loans as per schedule. This subvention was raised to 2 per cent in 2010-11 and further to 3 per cent in 2011-12. Thus the effective rate of interest for such farmers will be 4 per cent per annum.

(iii) Initiative has been taken to provide kisan credit cards (KCC) to all eligible and willing farmers in a time-bound manner. The scheme includes reasonable components of consumption credit and investment credit within the overall credit limit to provide adequate and timely credit support to farmers for their cultivation needs. About 10.78 crore KCCs had been issued up to October 2011.

(v) The government is implementing a revival package for Short-term Rural Cooperative Credit Structure involving financial outlay of ₹ 13,596 crore. Twenty-five state governments have signed a memorandum of understanding with the Government of India and the National Bank for Agriculture and Rural Development (NABARD). This covers 96 per cent of the primary agricultural cooperative societies (PACS) and 96 per cent of the central cooperative banks in the country. As of November 2011, an amount of ₹ 9,002.98 crore had been released by NABARD as Government of

India share for recapitalization of 53,205 eligible PACS in seventeen states.

Agricultural Insurance

8.60 There are various major crop insurance schemes under implementation in the country.

i) National Agricultural Insurance Scheme (NAIS)

The NAIS is a government-sponsored central-sector crop insurance scheme being implemented in the country since 1999-2000 season with the objective of providing financial support to farmers in the event of failure of crops as a result of natural calamities, pests, and diseases. The Agriculture Insurance Company of India Ltd. is the implementing agency for the Scheme. At present, the scheme is being implemented by 25 states and two UTs. Claims to the tune of about ₹ 22142 crore have been paid against the premium income of about ₹ 6593 crore benefiting about 487 lakh farmers.

During the last 23 crop seasons, i.e. from rabi 1999-2000 to rabi 2010-11, 1,762 lakh farmers over an area of about 2,685 lakh ha have been covered, insuring a sum amounting to about ₹ 2,21,307 crore.

ii) Modified NAIS (MNAIS)

With the aim of further improving crop insurance schemes, the MNAIS is under implementation on pilot basis in 50 districts in the country from rabi 2010-11 season. Some of the major improvements made in the MNAIS are actuarial premium with subsidy in premium at different rates, all claims liability to be on the insurer, unit area of insurance reduced to village panchayat level for major crops, indemnity for prevented/sowing/planting risk and for post-harvest losses due to cyclone, on account payment up to 25 per cent advance of likely claims as immediate relief, more proficient basis for calculation of threshold yield, and allowing private-sector insurers with adequate infrastructure. Only upfront premium subsidy is shared by the central and state governments on 50: 50 basis and claims are the liability of the insurance companies. The scheme has been notified by 17 states in a total of 50 districts for rabi 2011-12 season. During rabi 2010-11, about 3.58 lakh farmers over an area of about 3.23 lakh hectares have been covered, insuring a sum amounting to ₹ 69,406 lakh. The claims amounting to ₹ 15.96 crore have been provided to 46,224 farmers. 4.89 lakh farmers have been covered over an area of 7.18 lakh ha insuring a sum amounting to ₹ 1,47,074 lakh

iii) Pilot Weather Based Crop Insurance Scheme (WBCIS)

Similarly, the WBCIS is also being implemented as a central-sector scheme from kharif 2007 season. The scheme is intended to provide insurance protection to farmers against adverse weather incidence, such as deficit and excess rainfall, high or low temperature, and humidity that are deemed to adversely impact crop production. The WBCIS is based on actuarial rates of premium but to make the scheme attractive, premium actually charged from farmers has been restricted to be on a par with the NAIS. From kharif 2007-08 to kharif 2010-11, 195.33 lakh farmers over an area of about 278 lakh ha with sum insured of about ₹ 31,953 crore have been covered under the scheme. Claims to the tune of about ₹ 991 crore have been paid against the premium of about ₹ 2868 crore. Detailed fund requirements as estimated by the implementing agency for these schemes for the year 2012-13 are to the tune of ₹ 2,200 crore.

Agricultural Marketing

8.61 The role of the agriculture market is to deliver agricultural produce from the farmer to the consumer in the most efficient way. Agriculture markets are regulated in India through the APMC Acts. According to the provisions of the APMC Acts of the states, every APMC is authorized to collect market fees from the buyers/traders in the prescribed manner on the sale of notified agricultural produce. The relatively high incidence of commission charges on agricultural /horticultural produce renders their marketing cost high, which is an undesirable outcome. All this suggests that a single point market fee system is necessary for facilitating free movement of produce, bringing price stabilization, and reducing price differences between the producer and consumer market segments. Another point to be highlighted is that the cleaning, grading, and packaging of agricultural produce before sale by the farmers have not been popularized by these market committees on a sufficient scale.

8.62 Nevertheless, there have been some achievements in leading states like Maharashtra, Karnataka, Andhra Pradesh and Gujarat since the Model APMC Act 2003 has been implimented in those states. Some state governments have granted licences to the private sector for setting up of markets and direct purchase from the farmers in order to provide alternative marketing channels. There is

considerable potential for agricultural markets to be competitive. As the APMC was created to protect the interests of farmers it will be in the fitness of things to give farmers the choice of going to the APMC or not. In the light of this, the need is to pursue further reforms in the state APMC Acts.

Food Management

8.63 The main objectives of food management are procurement of foodgrains from farmers at remunerative prices, distribution of foodgrains to consumers, particularly the vulnerable sections of society, at affordable prices, and maintenance of food buffers for food security and price stability. The instruments at the disposal of the government are the MSP and central issue price (CIP). The nodal agency which undertakes procurement, distribution, and storage of foodgrains is the Food Corporation of India (FCI). Procurement at MSP is open-ended, while distribution is governed by the scale of allocation and its offtake by beneficiaries. The offtake of foodgrains is primarily under the targeted public distribution system (TPDS) and other welfare schemes of the Government of India.

Procurement and Offtake of Foodgrains

8.64 During rabi marketing season (RMS) 2011-12, 28.35 million tonnes of wheat was procured against 22.52 million tonnes in 2010-11. In kharif marketing season (KMS) 2011-12, as on 1 November 2011, the total procurement of rice was 8.5 million tonnes as against 7.68 million tonnes in the corresponding period of the previous year. Procurement of coarse grains in 2010-11 was 1.28 lakh tonnes as compared to 4.07 lakh tonnes in 2009-10. Procurement of foodgrains is mainly from states like Punjab, Haryana, Uttar Pradesh, Madhya Pradesh, Andhra Pradesh, and Chhattisgarh. Increased MSP along with various other steps taken by the government has resulted in higher levels of procurement. This has paved the way for comfortable levels of food stocks to meet TPDS needs and buffer stock norms. Offtake of wheat and rice from the central pool for the TPDS and other welfare schemes has also gone up in the recent years (Table 8.12). This poses a challenge to FCI operations given the shortage of storage capacity. Initiatives taken by the government to augment storage capacity is given in Box 8.3.

Decentralized Procurement Scheme

8.65 A number of states have opted for implementation of the Decentralized Procurement Scheme (DCP) introduced in 1997, under which foodgrains are procured and distributed by the state governments themselves. Under this scheme, the designated states, procure, store, and issue foodgrains under the TPDS and welfare schemes of the Government of India. The difference between the economic cost fixed for the state and the CIP is passed on to the state government as subsidy. The decentralized system of procurement has the objectives of covering more farmers under MSP

Table 8.12 : Procurement and Offtake of Wheat and Rice (million tonnes)

	2007-08	2008-09	2009-10	2010-11	2011-12
Procurement					
Rice	28.8	34.1	32.03	34.2	18.1*
Wheat	11.1	22.7	25.4	22.5	28.3
Total	**39.9**	**56.8**	**57.4**	**56.7**	**46.4**
Offtake from the central pool					
	2007-08	**2008-09**	**2009-10**	**2009-10**	**2010-11 (Up to Dec. 2011)**
Rice	25.23	24.62	27.37	29.93	24.18
Wheat	12.20	14.87	22.34	23.07	17.80
Total	**37.43**	**39.49**	**49.71**	**52.00**	**41.98**

Source **: Department of Food and Pubic Distribution.**

Note **: Figures of procurement of wheat and rice are marketing season-wise, while the figures of offtake are financial year-wise. *- As on 10.01.2012.**

Box 8. 3 : Procurement and Storage Capacity

As on 01.02.2012, total stock in central pool was 318.26 lakh tonnes of rice(including unmilled paddy in terms of rice) and 234.25 lakh tonnes of wheat totalling to 552.51 lakh tonnes. Highest level of stock is generally reached at the end of wheat procurement. On 01.06.2011, the central pool had 276.41 lakh tonnes of rice (including unmilled paddy in terms of rice) and 378.32 lakh tonnes of wheat. Thus, the total stock in central pool was 654.73 lakh tonnes. The FCI has a covered storage capacity of 300.83 lakh tonnes (owned and hired) as on 01.02.2012 while the State Agencies/(SWCs)have covered capacity of 153.54 lakh tonnes which is being used for storage of central pool stock of foodgrains. Thus, the total covered storage capacity for central pool stock is 454.37 lakh tonnes. Recognizing the problem of acute shortage of storage capacity, the government has already set up a High Level Committee under the chairmanship of Chairman and Managing Director, FCI, to look into storage issues. Additional storage capacity has to be created at suitable locations in order to meet the challenge of achieving the broad objectives of food security and meaningful results of various government interventions/programmes. In this regard, Government has formulated a scheme for construction of godowns under Private Entrepreneurs Guarantee (PEG) Scheme in 19 states. High Level Committee has already approved creation of about 151 lakh tonnes of storage capacity through Private Entrepreneurs and Central and State Warehousing Corporations.

operations, improving efficiency of the PDS, providing foodgrains varieties suited to local tastes, and reducing transportation costs. The DCP operations of the states have shown a healthy trend leading to increase in procurement of rice.

Buffer Stock

8.66 The stock position of foodgrains in the central pool as on 1 February, 2012 was 55.2 million tonnes comprising 31.8 million tonnes of rice and 23.4 million tonnes of wheat, which is adequate for meeting the requirements under the TPDS and welfare schemes during the current financial year (Table 8.13).

Economic Cost of Foodgrains to the FCI

8.67 The economic cost of foodgrains consists of three components, namely the MSP (and bonus if applicable) as the price paid to the farmers, procurement incidentals, and the cost of distribution. The economic cost for both wheat and rice witnessed significant increase during the last few years due to increase in MSPs and proportionate increase in the incidentals (Figure 8.9).

Food Subsidy

8.68 Provision of minimum nutritional support to the poor through subsidized foodgrains and ensuring

Table 8.13 : Stock Position of Wheat and Rice in the Central Pool vis-à-vis Minimum Buffer Norms

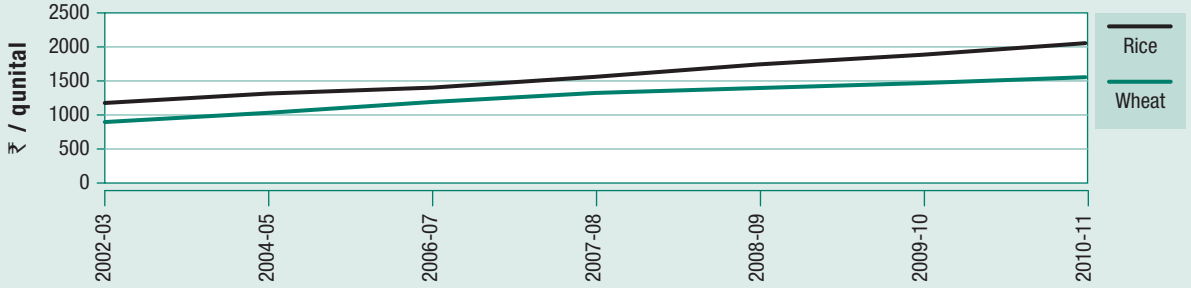
(lakh tonnes)

As on	WHEAT		RICE		TOTAL	
	Minimum Buffer Norms	Actual Stock	Minimum Buffer Norms	Actual Stock	Minimum Buffer Norms	Actual Stock
January 2009 #	112	182.12	138	175.76	250	357.88
April	70	134.29	142	216.04	212	350.33
July	201	329.22	118	196.16	319	525.38
October	140	284.57	72	153.49	212	438.06
January 2010	112	230.92	138	243.53	250	474.45
April	70	161.25	142	267.13	212	428.38
July	201	335.84	118	242.66	319	578.50
October	140	277.77	72	184.44	212	462.21
January 2011	112	215.40	138	255.80	250	471.20
April	70	153.64	142	288.20	212	441.84
July	201	371.49	118	268.57	319	640.06
October	140	314.26	72	203.59	212	517.85
January, 2012	112	256.76	138	297.18	250	553.94

Source **: Department of Food and Public Distribution.**

Note: **# Buffer norms include food security reserve of 30 lakh tonnes of wheat from 1 June 2008 and 20 lakh tonnes of rice from 1 June 2009 onwards.**

Figure 8.9 Economic cost of rice and wheat



Notes: Weighted average of common and grade 'A' rice taken together. For rice, from 2006-07, in the procurement incidental weightage of levy rice incidentals is also being taken.

price stability in different states are the twin objectives of the food security system. In fulfilling its obligation towards distributive justice, the government incurs food subsidy. While the economic cost of wheat and rice has continuously gone up, the issue price has been kept unchanged since 1 July 2002. The government, therefore, continues to provide large and growing amounts of subsidy on foodgrains for distribution under the TPDS, other nutrition-based welfare schemes, and open market operations. The food subsidy bill has increased substantially in the past few years putting severe strain on the public exchequer (Table 8.14 and Figure 8.10). The fiscal outgo is expected to be more once the proposed National Food Security Act is implemented (Box 8.4).

Table 8.14 : Quantum of Food Subsidies Released by Government

Year	Food subsidy	Annual growth
	(₹ crore)	(per cent)
2001-02	17,494.00	45.66
2002-03	24,176.45	38.20
2003-04	25,160.00	4.07
2004-05	25,746.45	2.33
2005-06	23,071.00	-10.39
2006-07	23,827.59	3.28
2007-08	31,259.68	31.19
2008-09	43,668.08	39.69
2009-10	58,242.45	33.38
2010-11	62,929.56	8.05

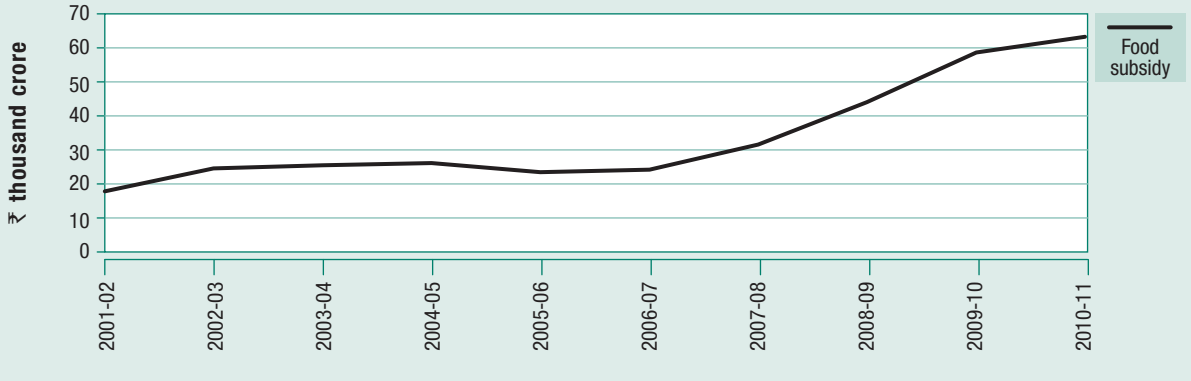
Source : Department of Food & Public Distribution.

Allocation of Foodgrains under TPDS and Other Welfare Schemes

8.69 Allocations for the Antyodaya Anna Yojana (AAY) and below poverty line (BPL) families are being made at 35 kg per family per month. For above poverty line (APL) families, allocation varies from 15 kg to 35 kg in different states. During 2011-12, the following allocations have been made so far:

- Normal TPDS allocation made is 438.65 lakh tonnes covering AAY, BPL, and APL families.
- Additional allocations of 123.67 lakh tonnes of rice and wheat have also so far been made. This comprises (i) 50 lakh tonnes to BPL families made in May 2011, (ii) 50 lakh tonnes to APL families in June 2011, and (iii) 23.67 lakh tonnes to 174 poorest/backward districts (allocated as per the Supreme Court's order) (iv) 3.31 lakh tonnes for calamity relief, etc.

Figure 8.10 Quantum of food subsidies released by government



BOX 8.4: National Food Security Bill

The National Food Security Bill was introduced in the Lok Sabha on 22 December 2011. As per the provisions of the Bill, it is proposed to provide 7 kg. of foodgrains per person per month belonging to priority households at prices not exceeding ₹ 3 per kg of rice, ₹ 2 per kg of wheat, and ₹ 1 per kg of coarse grains and to general households not less than 3 kg of foodgrains per person per month at prices not exceeding 50 per cent of the MSP for wheat and coarse grains and derived MSP for rice. It will benefit up to 75 per cent of rural population (with at least 46 per cent belonging to priority households) and up to 50 per cent of urban population (with at least 28 per cent belonging to priority households), besides providing nutritional support to women and children and meals to special groups such as destitute and homeless, emergency and disaster affected, and persons living in starvation. Pregnant and lactating women will also be entitled to maternity benefit of ₹ 1,000/ per month for six months. In case of non-supply of foodgrains or meals, entitled persons will be provided food security allowance by the concerned state/UT governments. Provisions for reforms in the TPDS such as doorstep delivery of foodgrains , application of information and communication technology (ICT) including end to end computerization, leveraging 'aadhaar' for unique identification of beneficiaries have also been made in the Bill. Provisions have also been made for transparency and accountability including disclosure of records relating to the PDS, social audits, and setting up of vigilance committees besides an elaborate grievance redressal mechanism.

- 49.05 lakh tonnes allocated for other welfare schemes such as the Midday Meals Scheme, Wheat Based Nutrition Programme under the Integrated Child Development Services, Annapurna, etc.
- Total release of foodgrains during the current year so far has been 614.69 lakh tonnes.

Open Market Sale Scheme (Domestic) [OMSS (D)]

8.70 In addition to maintaining buffer stocks and providing foodgrain stocks for meeting the requirements of the TPDS and other welfare schemes, the FCI on behalf of the Government of India has been undertaking sale of wheat and rice at predetermined prices in the open market from time to time to enhance market supply of foodgrains to have a moderating influence on open market prices.

Commodity Futures Market

8.71 The commodity futures market facilitates the price discovery process and provides a platform for price risk management in commodities. Currently, 113 commodities are notified for futures trading of which 50 are actively traded in five national and 16 commodity specific exchanges. Agricultural commodities, bullion, energy, and base metal products account for a large share of the commodities traded in the commodity futures market. The total value of trade in the commodity futures market rose significantly in 2011 compared to that of the previous year due to increased awareness, the advent of new commodity exchanges, increase in global commodity prices, and improved regulation.

8.72 During the year 2011-12 (up to January 2012), in value terms bullion accounted for the maximum share of traded value among the commodity groups (57.7 per cent) followed by energy (15.9 per cent), metals (15.2 per cent), and agricultural commodities (11.2 per cent). However, in quantity terms, trade in energy accounted for 57.5 per cent followed by agricultural commodities (33.2 per cent), metals (9.3 per cent), and bullion (0.1 per cent) (Table 8.15).

8.73 To strengthen and broad base the market, the Forward Markets Commission (FMC), which is the regulator for commodity futures trading under the provisions of the Forward Contracts (Regulation) Act 1952, has taken many initiatives and conducted awareness programmes during 2011 such as a media campaign under the Jago Grahak Jago Programme about the Dos and Don'ts of trading in the commodity futures market; Police training programmes in the states of Madhya Pradesh, Chhattisgarh, Tamil Nadu, and Delhi with regard to dabba trading/ illegal trading; a massive awareness and capacity-building programme for various stakeholder groups, with primary focus on farmers. On the regulatory front, the FMC undertook measures for the development of the commodity futures market which include ensuring more effective inspection of members of the exchanges on regular basis and in a comprehensive manner covering all aspects of regulatory regime; bringing out a guidance manual for improving audit practices, prescribing penalty structure for client code modification and for executing trade; and granting exemptions for short hedge for soyabean / oil futures, issuing directives for segregation of client accounts.

Table 8.15 Trade in Commodity Futures Market

(Volume of trading in lakh tonnes, value ₹ in crore)

Commodity	2009-10		2010-11		2011-12 (up to Jan'12)	
	Volume	Value	Volume	Value	Volume	Value
Agricultural commodities	3991.21(39.3)	1217949(15.7)	4168(32.6)	1456390(12.2)	3878.45(33.2)	1695550.8 (11.2)
Bullion	4.73(0.05)	3164152(40.8)	7.38(0.1)	5493892(46.0)	8.86(0.1)	8758384.3 (57.7)
Metals	982(9.7)	1801636(23.2)	1410(11.0)	2687673(22.5)	1081.10(9.3)	2311689.0 (15.2)
Energy	5163(50.9)	1577882(20.3)	7220.12(56.4)	2310959(19.3)	6714.96(57.5)	2423261.2 (15.9)
Other	2.12(0.02)	3134(0.04)	*0	29.04	*0.01	5.9
Total	**10143**	**7764754**	**12805.57**	**11948942**	**11683.38**	**15188891.3**

Source **: Department of Consumer Affairs.**

Note **: * volume of certified emission reduction (CER), electricity, heating oil and gasoline not included in the total volumes of other commodities.**

Figures in bracket show the percentage share to total.

Outlook and Challenges

8.74 Agriculture and allied sectors have made substantial progress in terms of production and productivity since the beginning of the Planning process. The successive Five Year Plans have emphasized growth in the agriculture sector, as a result of which foodgrains production reached a record level of 244.78 million tonnes in 2010-11. However, the challenges are far from over. Agricultural growth in the current Five Year Plan is expected to be less than the target. A number of supply-side constraints exist and thereby achieving the food and nutritional security is a challenge. In order to make 4 per cent agricultural growth a reality, adequate efforts are required to focus on addressing the challenges in this sector.

8.75 The area under foodgrains has declined in the last three decades. This calls for speedy improvement in yield in order to increase production through adequate investment in research and development. In yield parameters, India is lagging behind global levels in most crops. With very little growth in area and marginal growth in yields of many crops during the last decade, increasing agricultural production remains a challenge. A holistic approach, spanning agricultural R&D, dissemination of technology, and provision of agricultural inputs such as quality seed, fertilizers, pesticides, and irrigation, would help achieve higher levels of productivity. Access of small and marginal farmers to formal sources of agricultural credit is still inadequate, though the flow of agricultural credit has increased in the recent past. Effective coordination and monitoring of ongoing agriculture and allied sectors programmes need to be ensured for optimum results.

8.76 Indian farmers are mostly small and marginal farmers with small and fragmented landholdings. The average farm size in the country has declined over the years. This poses a challenge in terms of adoption of farm mechanization as well as generating productive income from farm operation. Pooling of many landholdings may yield better economies of scale, for which land laws for leasing with sufficient safeguards in place should be considered.

8.77 Higher levels of purchasing power is supporting higher demand for protein rich food items. The country has to step up efforts for increasing production of milk and other dairy products, egg, poultry, fish, meat, etc. There have been increases in the prices of these items because supply has not kept pace with demand.

8.78 Declining per capita availability of foodgrains has been a matter of major concern. For ensuring nutritional security, it is not only important to increase per capita availability of foodgrains but also to ensure that right quantities of food items are there in the food basket of the common man. A thrust on horticulture products is required for enhancing per capita availability of food items as well as ensuring nutritional security.

8.79 Indian agriculture is still dependent on the monsoon. This adds to the risks a farmer faces. The dependency of the Indian farmer on the monsoon

has to be reduced largely by increasing the irrigation facilities. Climate change and extreme weather conditions impacting agriculture; there is need to devise insurance schemes linked to indices of various vulnerability parameters. The insurance policy framework needs to be dynamic, incorporating the perspectives of the insured, insurers, and public policy so that it covers a large section of population.

8.80 Storage capacity is a major problem facing the country. Adequate storage facility would help reduce post-harvest losses. Adoption of modern farm implements and tools especially by small farmers is still low because of their lack of resources. This, in turn, hampers the development of the agriculture sector. Addressing infrastructure requirements in the agriculture sector, especially storage, communication, roads, and markets should be a priority. Public private partnership models can be of help in ensuring faster development of these requirements which are of vital importance for the growth of the agriculture sector.

8.81 Another area for improvement is the generation of real-time market intelligence and also agricultural market reforms. Enhancing the returns farmers get on their production is essential for incentivizing them to produce more. Farmers need to realize the market price for their produce. Setting up of efficient supply chains is essential not only for ensuring adequate supplies of essential items at reasonable prices but also so that producers get adequately compensated. Linking farmers to the market is, therefore, very important. The successful experience of cooperatives in the milk sector in managing the supply chain and providing remunerative prices to the producers may be emulated in the case of agricultural products.

8.82 The level of secondary food processing in India is very low compared to many western countries. With increasing income and population, demand for processed food is likely to increase. It is necessary to cater to this changing demand and at the same time enhance the income of farmers. So far the focus in food management has been on cereals, mainly rice and wheat. However, the demand for processed food is expected to increase. Investment in food processing, cold chains, handling, and packaging of processed food needs encouragement.

8.83 There has been substantial increase in the MSPs of various crops over the last few years. This is considered necessary for incentivizing farmers to increase production and productivity. At the same time, the MSP signals the floor price for the produce which, in turn, has the potential of increasing prices. Addressing the welfare of agricultural producers and consumers simultaneously poses a challenge. Further, inability of a large number of small and marginal farmers to directly access the agriculture market puts a question mark on increases in MSP actually benefiting such farmers. Record procurement of rice and wheat in the last few years has helped build up the buffer stock and strategic reserve of wheat and rice. There is, however, a huge cost involved in the process, in the form of food subsidy. The issue of efficient food stocks management and offloading of stocks in time needs urgent attention.

8.84 We need to address the challenges of the agriculture sector through comprehensive and coordinated efforts directed at improving farm production and productivity of foodgrains as well as high value crops, developing rural infrastructure, renewing thrust on the irrigation sector, strengthening marketing infrastructure, and supporting investment in R&D with due emphasis on environmental considerations. These efforts will in time rejuvenate agriculture sector and bring about inclusive growth of the economy.