

## Agriculture

### Overview:

Agriculture is the backbone of Indian Economy. About 65% of Indian population depends directly on agriculture and it accounts for around 22% of GDP. Agriculture derives its importance from the fact that it has vital supply and demand links with the manufacturing sector. During the past five years agriculture sector has witnessed spectacular advances in the production and productivity of food grains, oilseeds, commercial crops, fruits, vegetables, food grains, poultry and dairy. India has emerged as the second largest producer of fruits and vegetables in the world in addition to being the largest overseas exporter of cashews and spices. Further, India is the highest producer of milk in the world.

### Climate:

India has Monsoon climate in which a year has been divided into two distinct seasons of summer and winter. Rainfall occurs mainly in summer.

### Weather Forecasting System:

India has a strong weather forecasting system developed and maintained by Indian Meteorological Department (IMD). Apart from weather forecasting and severe weather warning, it also gives agro meteorological services to farmers in India.

### Agro Climatic Zones:

India has diverse agro-climatic zones from north to south and from east to west. It has been divided into fifteen different agro-climatic zones, which signifies its diversified agricultural production from tropical to temperate crops.

### Major Crops:

Rice, Wheat, Sugarcane, Oilseeds, Pulses, Cotton, Jowar, Bajra, Ragi, Tea, Coffee, Coconut, Cashew, Rubber, Spices, Cauliflower, Onion, Cabbage, Mango, Banana, Sapota, Acid lime.

### Farm Size:

Indian Agriculture is characterized by small and marginal operational holdings. About 85% of total cultivated land has been fragmented into less than 10-hectare land. About 60% of farmland is less than 4 hectare in size.

### Production Trend:

All the production figures are in million tones.

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
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
Pulses	13.4	11.1	14.9	13.4	13.4	14.5
Groundnut	7	4.1	8.1	6.8	8	4.4
Rapeseed	5.1	3.9	6.3	7.6	8.1	7.6
Soyabean	6	4.7	7.8	6.9	8.3	8.7

Other Oilseeds	2.6	2.1	3	3.1	3.6	2.9
Total nine Oilseeds	20.7	14.8	25.2	24.4	28	23.6
Sugarcane	297.2	284.7	233.9	237.1	270	315.5
Cotton #	10	8.6	13.7	16.4	18.5	21
Jute & Mesta @	11.7	11.3	11.2	10.3	10.8	11.4

\*Second advanced estimate

(Source: Ministry of Agriculture)

# Million bales of 180 kg each

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### Extent of Mechanization:

Mechanization in Indian agriculture is still at rudimentary stage showing regional variation. But it is increasing over the years. Power availability for carrying out various agricultural operations, which is one of the indicators of mechanization, has been increased from 0.3 kilowatt per hectare in 1971-72 to 1.4 kilowatt per hectare in 2003-04.

(Source: Economic Survey: 2004-05)

### Plantation:

Tea, Coffee, and Natural rubber are the main plantation crops in India that contribute in Indian export to a considerable extent. India is the largest producer and consumer of tea in the world. It contributes 4% to global coffee production and enjoys a niche market by producing both arabica and robusta coffee. In rubber also, it ranks third in production and fourth in consumption of natural rubber in the world.

### Horticulture:

India has a great potential in the production of horticultural crops, which includes fruits, vegetables, spices, floriculture, and plantations. Acreage under horticulture is around 20 million hectares. India is the second largest producer of both fruits and vegetables in the world. It occupies first position in the production of cauliflower, second in onion, and third in cabbage. Trends in area Production of horticultural crops have been given below:

Crops	2002-03		2003-04		2004-05		2005-06*	
	Area Million hectare	Production Million tones	Area Million hectare	Production Million tones	Area Million hectare	Production Million tones	Area Million hectare	Production Million tones
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	0.9	0.9	0.1	0.3	0.4	0.4	0.4	0.5
Total	17.2	152	20.6	165.5	19.2	177.4	20	184.9

(Source-National Horticultural Mission)

### Allied sectors

**Dairy:** India ranks first in the world in milk production, which was around 100 million tones in 2006-07. Strong networks of Milk Cooperatives, have been instrumental in this phenomenal performance of dairy sector in India. Presently, 1.13 lakh village level co-operative societies spread over 265 districts in the country form part of the national Milk Grid. This Grid links milk producers throughout India and consumers in 700 towns and cities. De-licensing of dairy sector in 1991 has directed considerable amount of private funds both from inside and outside country in this sector especially in manufacturing facilities while investment in cooperative sector are concentrated largely in procurement and processing of milk.

**Livestock:** Livestock sector contributes about 27% of the G.D.P. from agriculture and allied activities. This sector has excellent forward and backward linkages, which promote many industries and increase the incomes of vulnerable groups of the society such as agricultural labourers and small and marginal farmers. India possesses the second largest livestock population in the world. Production and export of poultry products have shown considerable growth in the recent decades. Export of such products to countries including Bangladesh, Sri Lanka, Middle East, Japan, Denmark, USA, and Angola augers well for this industry.

**Fishery:** Fishing, aquaculture and a host of allied activities are a source of livelihood to over 14 million people and a major source of foreign exchange earner. In 2005-06, this sector contributed about 1% of G.D.P. and 5.3% of G.D.P from agricultural sector. 8,118 k.m. of coastline gives geographical basis for the development of marine fishery sector and cultural factor boosts the inland fishery sector in India.

### Agricultural Finance

**Credit:** Availability of adequate credit is vital for every sector and agriculture is not an exception. In India, Commercial Banks, Cooperative Banks, and Regional Rural Banks (RRBs) are responsible for smooth flow of credit to agricultural sector. But a huge unorganized market exists for credit to agricultural sector in India, which provide timely fund to this sector but at the exorbitant rate of interest. Among organized credit disbursement to agriculture commercial banks play a vital role with a share of about 70% where as cooperative sector and RRBs contribute 20% and 10 % respectively. Kisan Credit Card (KCC) scheme was introduced to provide adequate and timely support from the banking system to the farmers for their cultivation needs. This scheme has made rapid progress and more than 645 lakh cards issued up to October 2006.

The 'Farm Credit Package' announced by the Government of India in June 2004 stipulated doubling the flow of institutional credit for agriculture in ensuing three years. Annual targets for this package are being surpassed in the two consecutive years from its introduction and it is likely to surpass in the third year also.

**Insurance:** Insurance is a prime necessity to mitigate uncertainty that persists in agriculture. In India, agriculture is still affected by such factors, which are beyond control of human being. So, there is a great need for agricultural insurance in India. Keeping this in mind, Government of India in coordination with the General Insurance Corporation of India (GIC), had introduced National Agricultural Insurance Scheme (NAIS) from rabi 1999-2000 season. The main objective of this scheme is to protect the farmers against losses suffered by them due to crop failure on account of natural calamities. Agricultural Insurance Company of India (AICIL) which was incorporated in December 2002 took over the implementation of NAIS.

AICIL introduced Rainfall Insurance Scheme called 'Varsha Bima' during 2004 southwest monsoon period. Varsha Bima provided for five different options suiting varied requirements of farming community:

1. Seasonal rainfall insurance based on aggregate rainfall from June to September.
2. Sowing failure insurance based on rainfall between June 15 and August 15.
3. Rainfall distribution insurance with the weight assigned to different weeks June and

September.

4. Agronomic index constructed on the basis of water requirements of crops.
5. A catastrophe option covering extremely adverse deviation of 50% and above in rainfall during the season.

During kharif 2006, this Varsha Bima scheme is being implemented in around 150 districts covering 16 states across the country. AICIL is also piloting another weather related insurance product for mango and coffee.

**Rural Infrastructure Development Fund (RIDF):** RIDF was announced by the Government of India in 1995-96 to boost public sector investment in agriculture and rural infrastructure. The Fund is raised from the commercial banks to the extent of their short fall in agricultural lending as priority sector. The activities, which have been made eligible for loans from RIDF, include rural roads and bridges, irrigation, mini and small hydel projects, community irrigation wells, soil conservation, watershed development and reclamation of waterlogged areas, flood protection, drainage, forest development, market yard, godowns, apna mandi, rural haats and other marketing infrastructure, cold storages, seed/agriculture/horticulture farms, plantation and horticulture, grading and certifying mechanisms such as testing and certifying laboratories, fishing harbors/jetties, reverine fisheries, animal husbandry, modern abattoir, drinking water supply, infrastructure for rural educational institutions, public health institutions, construction of toilet blocks in existing schools and 'pay and use' toilets in rural areas, village knowledge centers, desalination plants in coastal areas, infrastructure for information technology in rural areas, and construction of anganwari centers.

**Micro Finance:** Micro finance scheme has been introduced by National Bank for Agriculture and Rural Development (NABARD), the apex bank for agriculture and rural development in India, to improve the access of the rural poor to formal institutional credit and other financial products. In all 547 banks, which include 47 commercial banks, 158 RRBs, 342 cooperative banks are now actively involved in the operation of Self Help Group (SHG)-Bank Linkage Programme to spread the facility of micro finance to the needy small and marginal farmers and tiny entrepreneurs. The programme has enabled nearly 329 lakh poor families in the country to gain access to micro finance facilities from the formal banking system.

**Capital Formation in Agriculture:** The share of the agriculture sector's capital formation in G.D.P. declined from 2.2% in the late 1990s to 1.9% in 2005-06. Stagnation or fall in the public investment in irrigation is partly responsible for this fall. 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% in 2005-06.

### **Marketing of Agricultural Products**

- **Form of Markets exists in India:** Agricultural markets in India are dominated by the existence of unorganized and unregulated agricultural mandies with the presence of a large number of middlemen and widespread prevalence of malpractices. Absence of proper warehousing facilities in the villages, lack of proper transportation facilities and infrastructure such as rails and good quality all weather roads and ignorance about the market prices of their products are some of the important factors for exploitation of farmers from middle men. They are forced to sell their products to these middlemen at the farm gate at throwaway prices.
- **Agricultural Market Reforms in India:** Ministry of Agriculture had formulated a model law on agricultural marketing in consultation with State/Union territory Governments to bring about marketing reforms in line with emerging trends. This model act enables establishment of private markets/yards, direct purchase centers, 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 onion, 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 Standard 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.

- **E-Chaupal:** E-Chaupal is a business platform consisting of a set of organizational subsystems and interfaces connecting farmers to global markets. It has been initiated by International Tobacco Company (ITC) who are quite active in agricultural sector in India. This e-chaupal business platform consists of three layers each of different level of geographic aggregation. Each of the three layers is characterized by three key elements
  1. the infrastructure(physical or organizational)through which transaction takes place
  2. the entity( person or organization) orchestrating the transactions , and
  3. the geographical coverage of the layer.

The first layer consists of the village level kiosks with internet access (e-chaupals), managed by an ITC trained local farmer and within walking distance(1-5 kilometers) of each target farmer. Each cluster of five villages gets an e-chaupal, which is justified by sparse population in rural India. The second layer consists of a brick and mortar infrastructure called hubs managed by the traditional intermediary who has local knowledge/skills called a Samayojak and within tractorable distance (25-30 kilometer) of then target farmer.

- **Agricultural Commodities Exchanges:** To introduce future trading in agricultural commodities in India, two commodity exchanges have been introduced in 2003 for future trading. They are, National Commodity & Derivatives Exchange Limited (NCDEX) and Multi Commodity Exchange of India Limited (MCX). These exchanges are majorly dealing in agricultural commodities. They are involved in forward trading to mitigate price risks of the farmers.

### International Trade & Indian Agriculture:

**Agricultural Export:** India's total exports of agricultural and allied products at \$10.5 billion in 2005-06 constitute 10.2% of its export share. Developed country markets account for nearly 35% of India's agri-exports. In agricultural exports there are varied performances across commodities. Contribution of various agricultural commodities in world exports has been listed below.

Product	Percentage share in World Export
Lac, gums, resins, vegetable products	10
Vegetable planting materials, vegetable products	4.9
Coffee, tea, mate & spices	3.7
Marine products	2.3
Residues, waste of food industry, animal fodder	2.1
Cereals	1.3
Fruits & nuts	1.1

\*Source: NCTI based on UN-ITC Trade Map Data.

Export of Marine products, which after a decline in 2003-04 had picked up in subsequent years, grew by 6.3% in April- October-2006. In terms of export earnings, among marine products, frozen shrimp contributed to be the largest export item, followed by frozen fish,

cuttlefish, squid, and dried items. European Union accounted for the largest share of India's export of marine products, followed by US and Japan. This sector, however, faced a number of hurdles in the major export destinations. Indian shrimp imports to USA have been subject to anti dumping duty of 10.17% from August 2004. In European markets, India's marine products have been facing problem due to multiplicity of standards-in addition to the EU's own standards, the standards of each of the own member states.

### **Agricultural Imports:**

Agricultural import contributes about 3% in total merchandise import to India. Major imports during April-October 2005 included vegetable oils (US\$ 1237.3 million), raw cashew nut (US\$ 287.8 million), pulses (US\$ 281.8 million) and sugar (US\$ 138.7 million). Vegetable oils and pulses are largely imported to augment domestic supplies and raw cashew is imported for processing and re-exports, as domestic production is not adequate to meet the demand of processing capacity installed in the country.

- Agri Export Zones: In the Export Import (EXIM) Policy 2001-02, the Government of India announced the proposal to set up Agri-Export Zones for the purpose of developing and sourcing raw materials and their processing/packaging leading to final exports. The concept essentially embodies a cluster approach of identifying the potential products and the geographical region in which such products are grown and adoption of an end to end approach of integration of the entire process, right from the stage of production to consumption.

Under the Scheme, the State Government identifies products with export potential, which have comparative advantage in local production. Agricultural and Processed Food Products Development Authority (APEDA) is the nodal agency of the Central Government to promote setting up of Agri Export Zones.

Till December 2005, 60 Agri Export Zones of different products had been set up in different parts of the country.

### **W.T.O. & Indian agriculture:**

India, and other developing countries have been insisting that special and differential treatment for developing countries must be integral to all aspects, including to negotiated outcome, on agriculture under the Doha Round in the WTO.

Mitigating the risk facing the low income, resource poor, and subsistence farmers associated with price declines, price volatility, and predatory competition and other market imperfections, including the huge amount of production and trade-distorting subsidies provided by some developed countries to their agricultural sector, remains paramount.

Therefore, along with other developing countries, particularly it's alliance partners in the G-20 and G-33, India has been emphasizing that the Doha agricultural outcome must include at its core:

1. Removal of distorting subsidies and protection by developed countries to level the playing field, and
2. Appropriate provisions designed to safeguard food and/or livelihood security, and to meet the rural development needs in developing countries.

India has also taken the stand that governments must be able to foster stable and remunerative prices for domestic producers in order to increase productivity and gradually move away from dependence on low productivity agriculture. For these, meaningful and effective instruments i.e. Special Products and the Special Safeguards Mechanism is important for developing countries like India. At Hong Kong, where 6th ministerial meeting of the WTO took place it has been argued that Special Products and Special Safeguard Mechanism shall be an integral part of the modalities and the outcome of the negotiations in

agriculture. Moreover, developing countries shall have the right to self designate an appropriate number of special products, guided by indicators based on the three fundamental criteria of food security, livelihood security, and/or rural development needs. These designated products will attract more flexible treatment. Developing country members will also have the right to have recourse to a Special Safeguard Mechanism based on import quantity and price triggers, with precise arrangements to be further defined.

### **National Commission on Farmers:**

To improve the condition of Indian farmers, National Commission on Farmers have been set up by the Government of India. It has been submitted five reports between December 2005 and October, 2006. Key recommendations of the commission have been incorporated in the Revised Draft National Policy for farmers. These include: asset reforms covering land, livestock and bio reserves, farmer friendly support services covering extension, training and knowledge, connectivity, credit and insurance, assured and remunerative marketing, inputs and delivery systems, and curriculum reforms in the agricultural universities.

### **Recent government policies affecting Indian Agriculture:**

In the recent Union Budget (2007-08), agriculture has got considerable attention with the various policy initiatives from the side of finance ministry. Some of the important policies are:

- During 2006-07 (until December 2006), 53.37 lakh new farmers were brought into the institutional credit system. A target of Rs. 225,000 crore as farm credit and an addition of 50 lakh new farmers to the banking system have been fixed for the year 2007-08. The two per cent interest subvention scheme for short-term crop loans will continue in 2007-08, and a provision of Rs.1,677 crore has been made for that purpose.
- A special purpose tea fund has been launched for re-plantation and rejuvenation of tea. Government soon plans to put in place similar financial mechanism for coffee, rubber, spices, cashew and coconut.
- Accelerated Irrigation Benefit Programme (AIBP) has been revamped in order to complete more irrigation projects in the quickest possible time. As against an outlay of Rs.7,121 crore in 2006-07, the outlay for 2007-08 has been increased to Rs.11,000 crore.
- Rs.17,253 crore had been budgeted for fertilizer subsidies in 2006-07. However, according to the Revised Estimates, this will rise to Rs.22,452 crore.
- The National Insurance Scheme (NAIS) will be continued for Kharif and Rabi crops during the year 2007-08.
- The two per cent interest subvention scheme will continue in 2007-08.
- Rs. 100 crores have been allocated to new Rain fed Area Development Programme, set up for coordinating all schemes for watershed development.

### **Research and Extension:**

Government of India has created a widespread network of agricultural universities and institutes all over India to facilitate research and extension works in Indian agriculture. The Indian Council of Agricultural research (ICAR) is an apex body in India at the national level, which promotes science and technology programmes in the area of agricultural research, education, and extension education.

### **Agriculture and Employment:**

About 65% of Indian population is dependent on agriculture for their livelihood. This sector has strong forward and backward linkages and its performance affects each and every sector of the country.

### **Sustainable Agriculture: Organic Farming:**

In the recent decades, there is an increasing demand of organic foods in the developed world. Organic farming is an important pillar of sustainable agriculture, which is beneficial for producers and consumers both. India has a great potential for organic farming using traditional wisdoms prevailing in the villages of India. In fact, a large section of Indian agriculture uses more or less organic method of farming using minimum level of chemical inputs. Promotion of organic farming in India could prove beneficial to increase share of Indian agricultural export in the world export.