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India is one of the world's largest agrarian economies and agriculture is the backbone of our country's economy. Despite of industrialization and liberalizations it provides employment to around 60% of the country's population. Agriculture sector includes Agriculture, Forestry & Logging and Fishing. Agriculture is India's largest Private sector industry. Agriculture is also "most free" private sector industry and it is the only profession that carries no burden of Income Tax. Its worth note that the tax on agriculture can be levied by the state Governments, the income in agriculture does not come under Income Tax collected by Income Tax Department. Agriculture also the Biggest Unorganized sector of Indian economy and accounts for around 90% of the unorganized work force of the country.

Share of Agriculture in GDP

During 2009-10, agricultural sector contributed to approximately **14.6 per cent of India's GDP** (at 2004-05 prices). The share in GDP is estimated to be 14.2 % in 2010-11. This is evident from the following table:

Share & Growth of Agriculture in India

Item	2008-09	2009-10	2010-11
GDP—Share and Growth (at 2004-05 prices)			
Growth in GDP in agriculture & allied sectors	-0.1	0.4	5.4
Share in GDP—Agriculture and allied sectors	15.7	14.6	14.2
Agriculture	13.3	12.3	
Forestry and logging	1.6	1.5	
Fishing	0.8	0.8	

Source : Economic Survey — 2010-11 are advanced estimates

The growth in share of agriculture in GDP as per the final figures of 2008-09 was -0.1%. It was 0.4% in 2009-10 and is estimated to be 5.4% in 2010-11.

- In terms of composition, out of a **total share of 14.6 per cent of the GDP in 2009-10 for agriculture and allied sectors, agriculture alone accounted for 12.3 per cent followed by forestry and logging at 1.5 per cent and fisheries at 0.8 per cent.**

During the period 2004-05 to 2007-08, the GDP for agriculture and allied sectors had increased from Rs. 5, 65,426 crore to Rs. 6,55,080 crore, at constant 2004-05 prices; thereafter it stagnated at this level for two years (2008-09 to 2009-10) (Figure 8.1). In 2009-10, it accounted for 14.6 per cent of the GDP compared to 15.7 per cent in 2008-09 and 19.0 per cent in 2004-05. Its share in GDP has thus declined rapidly in the recent past.

The Economic Survey 2010-11 said that **overall GDP has grown by an average of 8.62 per cent during 2004-05 to 2010-11, agricultural sector GDP has increased by only 3.46 per cent during the same period.** The role of the agriculture sector, however, remains critical as it accounts for about 58 per cent of employment in the country (as per 2001 census). Moreover, this sector is a supplier of food, fodder, and raw materials for a vast segment of industry. Hence the growth of Indian agriculture can be considered a necessary condition for 'inclusive growth'. More recently, the rural sector (including agriculture) is being seen as a potential source of domestic demand, a recognition that is even shaping the marketing strategies of entrepreneurs wishing to widen the demand for goods and services.

Decreasing Share in GDP

In our country, 58.2% work force contributes to only 14.6% of the GDP and this is the reasons that a farmer of India is poor and backward. Further, GDP per agricultural worker is currently around Rs 2000 per month, which is only about 75% higher in real terms than in 1950 compared to a four-fold increase in overall real per capita GDP.

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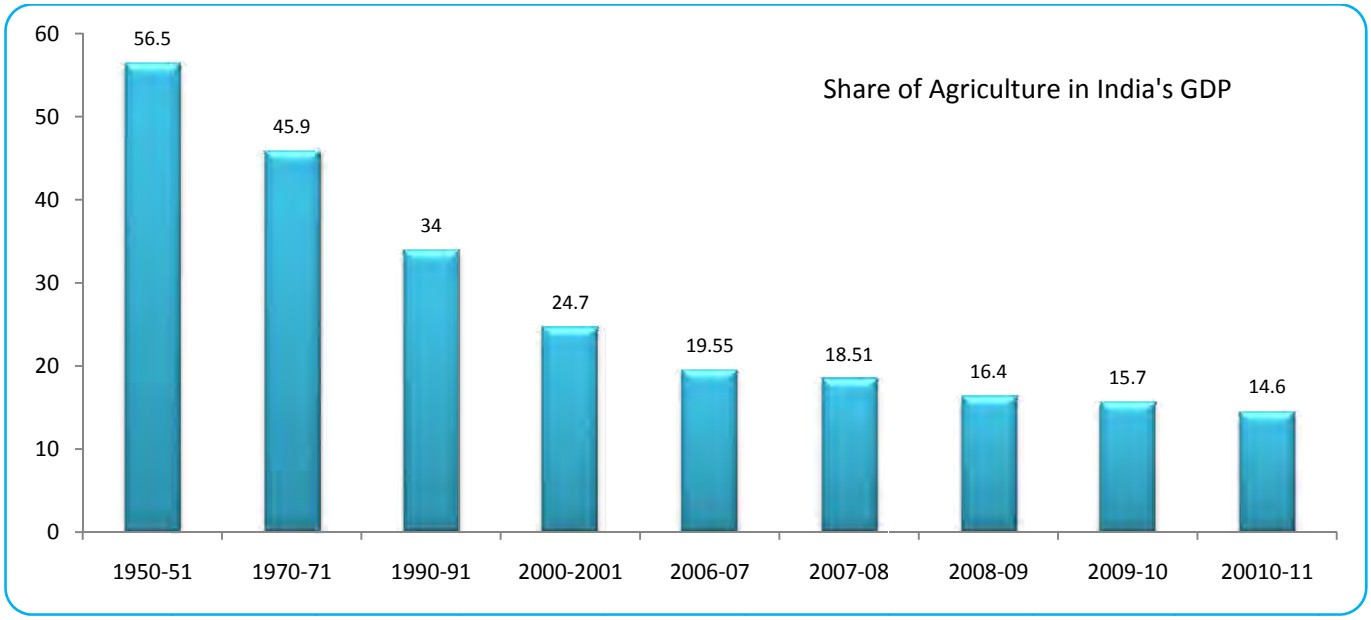
During the first three years of the current Five Year Plan, the agriculture sector (including allied activities) recorded an average growth of 2.03 per cent against the Plan target of 4 per cent per annum. In the first year, 2007-08, of the current Plan the agriculture sector had achieved an impressive growth of 5.8 per cent. However, this high growth could not be maintained in the following two years and agriculture-sector growth fell into the negative zone of - 0.1 per cent in 2008-09, although this was a year of a record 234.47 million tonnes food production.

The decline in growth of agricultural GDP was primarily due to the fall in the production of agricultural crops such as oilseeds, cotton, jute and mesta, and sugarcane. In 2009-10, despite experiencing the worst south-west monsoon since 1972 and subsequent significant fall in kharif food grain production, the growth marginally recovered to 0.4 per cent primarily due to a good rabi crop.

The following graphics shows the decreasing share of agriculture in the GDP since 1950-51:



Share of agriculture in Employment

Employment in the agriculture Sector as Share of Total Employment in 2004-05 was 52.1%, making it single largest private sector occupation. In 1951, when India's population was 361 million, the people engaged in agriculture were around **97.2 million out of 140 million total working population**. This comes out to be around 70%. We can say that in last 6 decades a substantial part of our working population has been dependent upon agriculture.

However, here I would like to add an important piece of information. Please note that NOT 70% of India's Population is agriculture workers. The agricultural workers population of India has been around 22-27% of Total Population in all these years. The following table shows the population versus agriculture population of India (Source: Ministry of Agriculture, Data 2010-11)

Population and Agricultural Workers

Year	Total Population	Average Annual Exponential Growth	Rural Population	Cultivators	Agricultural Workers	Total	% of Agriculture Population
1951	361.1	1.25	298.6	69.9	27.3	97.2	**26.9**
1961	439.2	1.96	360.3	99.6	31.5	131.1	**29.84**
1971	548.2	2.22	439.0	78.2	47.5	125.7	**23.00**
1981	683.3	2.20	523.9	92.5	55.5	148.0	**21.6**
1991	846.4	2.14	628.9	110.7	74.6	185.3	**21.8**

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2001	1028.7	1.95	742.6	127.3	106.8	234.1	**22.75**
Notes :							

1. For 2001, figures include estimated figures for those of the three sub-divisions viz. Mao Maram, Paomata and Purul of Senapati district of Manipur as census results of 2001 Census in these three sub-divisions were cancelled due to technical and administrative reasons.
2. The 1991 Census could not be held owing to disturbed conditions prevailing in Jammu & Kashmir. Hence the population figures for 1991 of Jammu & Kashmir have been worked out by 'interpolation'. The data on workers in columns 5-7 exclude J&K.
3. The 1981 census could not be held in Assam. The figures for 1981 for Assam have been worked out by interpolation. The data on workers in col. 5-7 exclude Assam.

Source: Registrar General of India (All data in Million)

Share of Agriculture in Foreign trade

Some of the agro products such as tea, sugar, oilseeds, tobacco, spices and fibres make India's main items of exports. The following table sourced Ministry of agriculture shows India's Imports and Exports of Agricultural commodities vis-à-vis National imports and exports.

India's Imports and Exports of Agricultural Commodities vis-à-vis Total National Imports/ Exports

Year	Agriculture Imports	Total National Imports	%	Agriculture Exports	Total National Exports	%
1990-91	1205.86	43170.82	2.79	6012.76	32527.28	18.49
1991-92	1478.27	47850.84	3.09	7838.04	44041.81	17.80
1992-93	2876.25	63374.52	4.54	9040.30	53688.26	16.84
1993-94	2327.33	73101.01	3.18	12586.55	69748.85	18.05
1994-95	5937.21	89970.70	6.60	13222.76	82673.40	15.99
1995-96	5890.10	122678.14	4.80	20397.74	106353.35	19.18
1996-97	6612.60	138919.88	4.76	24161.29	118817.32	20.33
1997-98	8784.19	154176.29	5.70	24832.45	130100.64	19.09
1998-99	14566.48	178331.69	8.17	25510.64	139751.77	18.25
1999-00	16066.73	215528.53	7.45	25313.66	159095.20	15.91
2000-01	12086.23	228306.64	5.29	28657.37	201356.45	14.23
2001-02	16256.61	245199.72	6.63	29728.61	209017.97	14.22
2002-03	17608.83	297205.87	5.92	34653.94	255137.28	13.58
2003-04	21972.68	359107.66	6.12	37266.52	293366.75	12.70
2004-05	22811.84	501064.54	4.55	41602.65	375339.53	11.08
2005-06	21499.22	660408.90	3.26	49216.96	456417.86	10.78
2006-07	29637.86	840506.31	3.53	62411.42	571779.28	10.92
2007-08	29906.24	1012311.70	2.95	79039.72	655863.52	12.05
2008-09	37183.03	1374435.55	2.71	85951.67	840755.06	10.22
2009-10 (P)	59367.62	1356468.65	4.38	89522.59	845125.21	10.59

P-Provisional , (Value in Rupees Crore)

Source:- Director General of Commercial Intelligence & Statistics, Ministry of Commerce,Kolkata.

From the above table, we derive the following graphics which shows share of India's agriculture imports in India's Total Imports.

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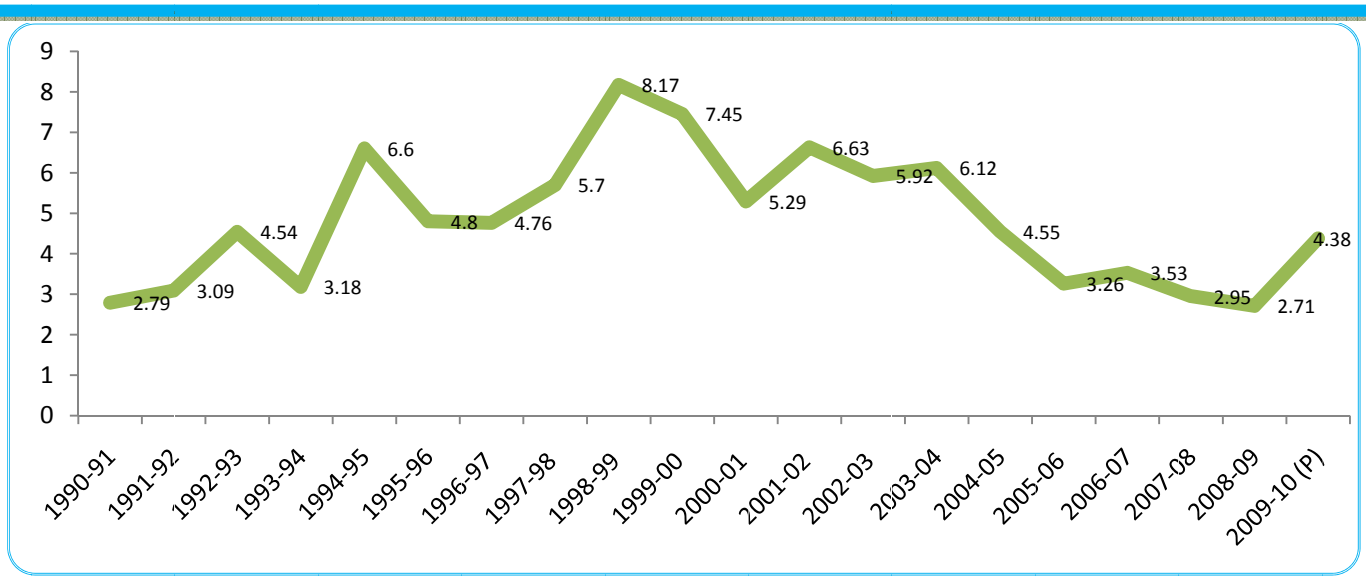

Figure 1: Share of India's agriculture imports in India's Total Imports.

We can see that the share of India's agriculture imports has been between 2.79% to 8.17 % in the years ranging from 1991-2010.

Similarly, the following graphics shows share of India's Agro exports in the total exports.

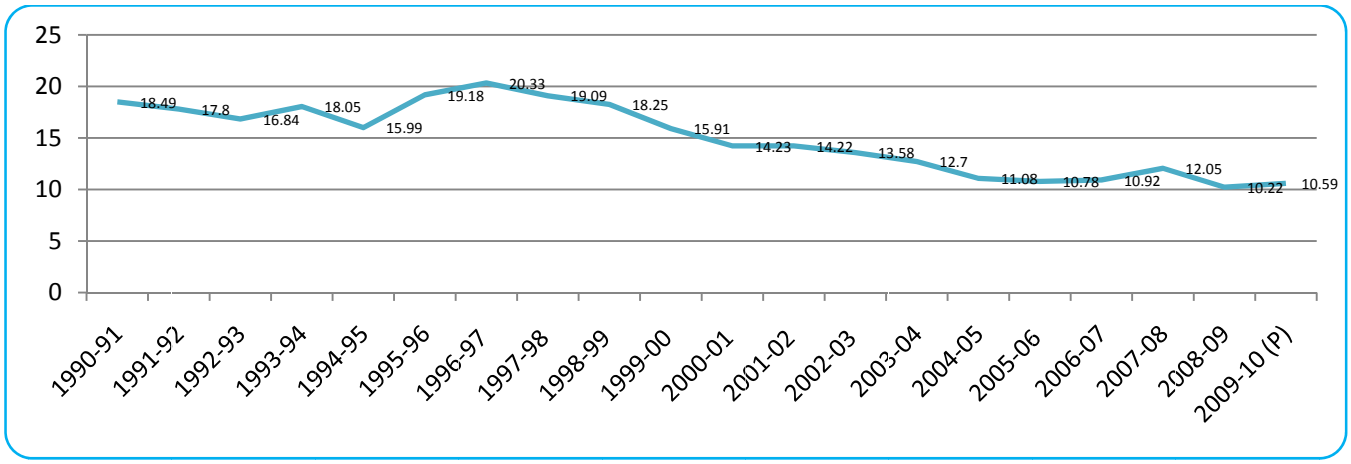

Figure 2: share of India's Agro exports in the total exports.

We note the following information from the above charts:

- On an average since 1991 share of agriculture in India's total exports has been 5.07% and in exports 15.80%.
- In 2009-10, share of agriculture in India's total importans was 4.38% and share of agriculture in India's total exports was 10.59%.
- The share of agriculture in India's exports was around 18-20 % in the 1990s which has now decreased to around 10-12%. This is important. Despite a large part of India's working population being based upon agriculture, there has been a decrease in share of agriculture in India's Export.
- The major reason for the above is that **India's Total exports have increased** , substantially added by **Service Exports.**

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India's Import of Agricultural Products

The following table shows India's import of agricultural products in decreasing order (Source Ministry of Agriculture)

India's Import of Agriculture Products in decreasing order	
Vegetable Oils Fixed (Edible)	26483.52
Pulses	9673.00
Wood & Wood Products	7461.34
Sugar	5961.24
Cashew Nuts	3050.09
Fruits & Nuts Excluding Cashew Nuts	2870.86
Spices	1419.36
Cotton (Raw & Waste)	1241.46
Tea	275.39
Wheat	230.82
Cereal Preparation	190.37
Oil Seeds	183.36
Jute (Raw)	149.49
Milk & Cream	77.55
Other Cereals	76.42
Vegetable & Animal fats	23.31
Rice	0.04
Total Agricultural Imports	59367.62
Vegetable Oils Fixed (Edible)	26483.52
% Share of Agricultural Import in National Imports	4.38%

Now we look at the following graphics:

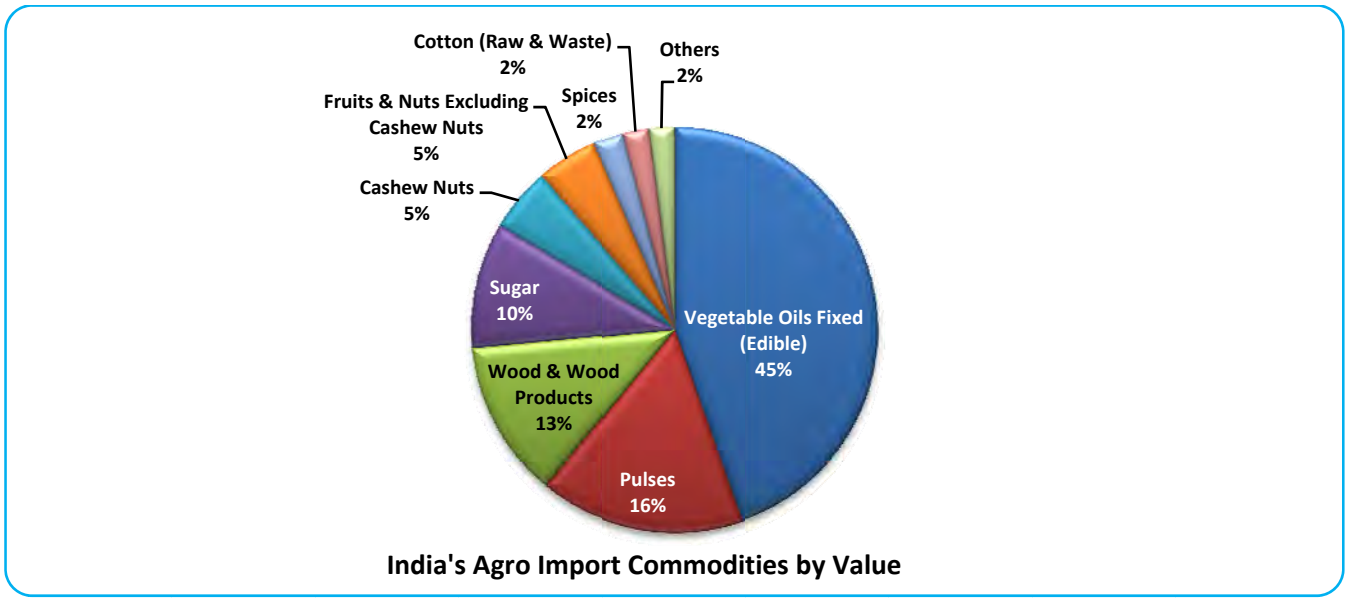

Figure 3: India's Agro Import Commodities by Value

- Edible Vegetable Oils are India's largest agricultural imports, followed by wood and wood products & Pulses sharing the 45%, 16%, 13%.
- Sugar is also a substantial import commodity of India with its share being 10%. This data is of 2010.
- Historically, Edible Oils have been India's largest import commodity. The import of edible oil is being shown in the following table:

India's Import of Edible Oils			
Year	Edible Oil Imports	Total Imports	%
2001-02	6464.97	16256.61	39.77
2002-03	8779.64	17608.83	49.86
2003-04	11683.24	21972.68	53.17
2004-05	11076.89	22811.84	48.56
2005-06	8960.99	21499.22	41.68

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2006-07	9539.9	29637.86	32.19
2007-08	10301.09	29906.24	34.44
2008-09	15837.46	37183.03	42.59
2009-10	26483.52	59367.62	44.61

The question is, why India needs so much of edible oil to import.

In simple language, the consumption is high, and productivity is low. Oilseeds and edible oils are two of the most sensitive essential commodities. India is one of the largest producers of oilseeds in the world and this sector occupies an important position in the agricultural economy. The major cultivated oilseeds are groundnut, mustard seed, sesame seed, safflower, linseed, Niger seed, castor seed, soyabean and sunflower. Coconut is the other important source of edible oil. Soya, Groundnut and mustard seed together contributes to a large percentage of the country's total oilseed production. Edible oil production has increased over the year but it has not been able to fulfill India's vast domestic demand for edible oil. There has been a large gap between the domestic demand and production. Thus after China, India is the world's biggest importer of vegetable oil. The country's meet half of its edible oil requirements through import. The policy and the business environment are conducive for the growth of the sector meeting the huge domestic demand and catering the international markets as well. The present study is comprehensive in terms of the identification of the markets and the import dependency of the sector. This paper enlightens that edible oil as an emerging sector of India and the policy implications for enhanced productivity, increasing the global competitiveness thereby improving the processing efficiency of the sector.

Importance of Edible Oils in the Country's Economy

Oilseeds and edible oils are two of the most sensitive essential commodities. India is one of the largest producers of oilseeds in the world and this sector occupies an important position in the agricultural economy and accounting for the estimated production of 24.88 million tonnes of nine cultivated oilseeds during the year 2009-10 (November-October). India contributes about 6-7% of the world oilseeds production. Export of oilmeals, oilseeds and minor oils has increased from 5.06 million Tones in the financial year 2005-06 to 6.2 million tons in the financial year 2010-11. In terms of value, realization has gone up from Rs. 5514 crores to Rs.14116 crores. India accounted for about 6.3% of world oilmeal export during last year.

Types of Oils commonly in use in India

India is fortunate in having a wide range of oilseeds crops grown in its different agro climatic zones. Groundnut, mustard/rapeseed, sesame, safflower, linseed, nigerseed/castor are the major traditionally cultivated oilseeds. Soyabean and sunflower have also assumed importance in recent years. Coconut is most important amongst the plantation crops. Efforts are being made to grow oil palm in Andhra Pradesh, Karnataka, Tamil Nadu in addition to Kerala and Andaman & Nicobar Islands. Among the non-conventional oils, ricebran oil and cottonseed oil are the most important. In addition, oilseeds of tree and forest origin, which grow mostly in tribal inhabited areas, are also a significant source of oils. Figures pertaining to estimated production of major cultivated oilseeds, availability of edible oils from all domestic sources (from Domestic and Import Sources) during the last few years are as under: -

Oil Year (Nov. - Oct.)	Production of Oilseeds*	Net availability of edible oils from all domestic sources	Availability of Edible Oils **(from domestic and import sources)****
2000-2001	184.40	54.99	96.76
2001-2002	206.63	61.46	104.68
2002-2003	148.39	46.64	90.29
2003-2004	251.86	71.40	124.30
2004-2005	243.54	72.47	117.89

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2005-2006	279.79	83.16	126.04
2006-2007	242.89	73.70	115.87
2007-2008	297.55	86.54	142.62
2008-09	277.19	81.83	166.39
2009-10	248.83	88.23	167.69
2010-11	311.01***	74.94(Nov.-Sept.)	To be estimated

Consumption Pattern of Edible Oils in India

India is a vast country and inhabitants of several of its regions have developed specific preference for certain oils largely depending upon the oils available in the region. For example, people in the South and West prefer groundnut oil while those in the East and North use mustard/rapeseed oil. Likewise several pockets in the South have a preference for coconut and sesame oil. Inhabitants of northern plain are basically hard fat consumers and therefore, prefer Vanaspati, a term used to denote a partially hydrogenated edible oil mixture. Vanaspati has an important role in our edible oil economy. Its production is about 1.2 million tonnes annually. It has around 10% share of the edible oil market. It has the ability to absorb a heterogeneous variety of oils, which do not generally find direct marketing opportunities because of consumers' preference for traditional oils such as groundnut oil, mustard oil, sesame oil etc. For example, newer oils like soyabean, sunflower, ricebran and cottonseed and oils from oilseeds of tree and forest origin had found their way to the edible pool largely through vanaspati route. Of late, things have changed. Through technological means such as refining, bleaching and de-odouraisation, all oils have been rendered practically colourless, odourless and tasteless and, therefore, have become easily interchangeable in the kitchen. Newer oils which were not known before have entered the kitchen, like those of cottonseed, sunflower, palm oil or its liquid fraction (palmolein), soyabean and ricebran. These tend to have a strong and distinctive taste preferred by most traditional customers. The share of raw oil, refined oil and vanaspati in the total edible oil market is estimated at 35%, 55% and 10% respectively. About 50% of domestic demand of edible oils is met through imports out of which palm oil constitutes about 80% of imports. Therefore, the consumption of refined palm oil (RBD palmolein) and in blending with other oils has increased substantially over the years specially in hotels, restaurants and in preparation of wide varieties of food products.

Major Features of Edible Oil Economy

There are two major features, which have very significantly contributed to the development of this sector. One was the setting up of the Technology Mission on Oilseeds in 1986. This gave a thrust to Government's efforts for augmenting the production of oilseeds. This is evident by the very impressive increase in the production of oilseeds from about 11.3 million tonnes in 1986-87 to 24.8 million tonnes in 1998-99. There was some setback in 1999-2000 because of the un-seasonal rain followed by inclement weather. The production of oilseeds declined to 20.7 million tonnes in 1999-2000. However, the oilseeds production went up to 27.98 million tones in 2005-06. As per the 4th advance estimate by Ministry of Agriculture dated 19.7.2011, the production of nine major oilseeds is estimated to be about 31.10 million tonnes during 2010-11 (Nov.-Oct.). The other dominant feature which has had significant impact on the present status of edible oilseeds/oil industry has been the programme of liberalisation under which the Government's economic policy allowing greater freedom to the open market and encourages healthy competition and self regulation rather than protection and control. Controls and regulations have been relaxed resulting in a highly competitive market dominated by both domestic and multinational players.

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India's Export of Agricultural Products

The following table shows India's export of agricultural products in 2009-10.

India's export of Agriculture Items (₹ Crore)	
Rice Basmati	10838.86
Marine Products	9891.10
Cotton Raw including Waste	9542.59
Oil Meals	7849.57
Meat & Preparations	6285.44
Spices	6161.02
Paper/Wood products	5638.90
Tobacco Unmanufactured	3621.24
Other Cereals	3004.93
Tea	2943.27
Fresh Vegetables	2904.35
Cashew	2801.98
Fresh Fruits	2268.95
Castor Oil	2177.57
Miscellaneous Processed Items	2136.85
Coffee	2033.00
Sesamum Seed	1495.38
Groundnut	1424.55
Processed Fruit Juices	1155.95
Guargum Meal	1132.87
Processed Vegetables	752.18
Tobacco Manufactured	724.17
Poultry & Dairy Products	549.29
Rice(Other than Basmati)	414.76
Pulses	407.36
Poultry Products	365.85
Jute Hessian	308.26
Floriculture Products	293.98
Fruits/Vegetable Seeds	145.25
Sugar	110.23
Shellac	71.27
Cashewnut Shell Liquid	27.62
Nigerseed	24.23
Molasses	19.77
Wheat	0.00
Total Agricultural Exports	89522.59
Total National Exports	845125.21
% Share of Agricultural Exports in	10.59
	Source: Ministry of Agriculture

The above table makes it clear that **Basmati Rice is India's largest agricultural commodity by export value**.

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Now we look at this myriad colour pie chart:

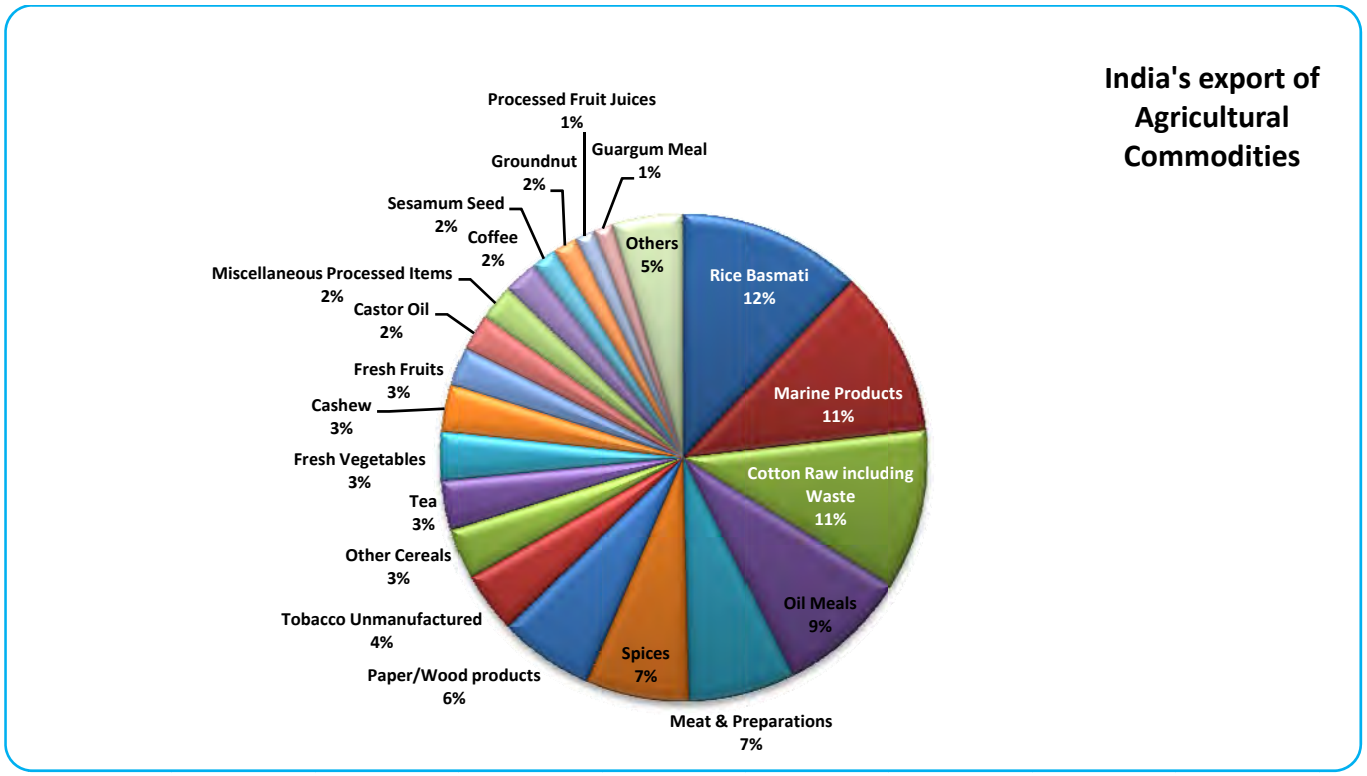

Figure 4: India's export of Agricultural Commodities

After Basmati Rice, the next important commodity which India exports in largest value is marine products.

Pattern of Expenditure in Agricultural sector in 5 year plans

Before we got independence, a first nationwide programme was launched in mid of 1940s. This was WWII period and in 1942, the British suffered a defeat in Singapore. The Japanese forced invaded Burma. Burma as mentioned above was responsible for 15% of India's overall rice and at that time was world's largest exporter of rice. 16 October 1942 the whole east coast of Bengal and Orissa was hit by a cyclone and the autumn crops in many core rice producing areas failed. The same was also the time for quit India Movement protests in Bengal and Bihar. The famine of Bengal claimed 3 million lives. The immediate reasons were

- The rice import from Burma was hindered
- Rice export from Bengal was not stopped which fed Indian and British troops in Middle east
- The cyclone hit
- Irresponsible reaction of the Bengal Government.

The Grow More Food campaign was organized to help India to overcome the effects of Bengal Famine. Since the campaign was launched by the British, it narrowly focused on the dissemination of the technical information related to agriculture through the posters and slogans. This campaign could not leave any mark and had almost no effect on food production.

After Independence, various programmes and schemes were launched.

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The following table shows the outlay on agriculture and allied sectors (horticulture, animal husbandry and fisheries).

% Plan Expenditure on Agriculture and allied sectors	
First Five Year Plan 1951-56	31
Second Five Year Plan 1956-61	20
Third Five Year Plan 1961-66	21
Fourth Five Year Plan 1969-74	24
Fifth Five Year Plan 1974-79	22
Sixth Five Year Plan 1980-85	24
Seventh Five Year Plan 1985-90	23
Eighth Five Year Plan 1992-97	21
Ninth Five Year Plan 1997-2002	20
Tenth Five Year Plan 2002-2007	20
Eleventh Five Year Plan 2007-12	18

- The above table makes it clear that the percentage of plan expenditure on Agriculture and allied sectors has been between 18-24 % except first five year plan when the expenditure was over 30%.

Community Development Programme: 1952

Post Independence, the **first major development programme** launched in India was Community Development Programme in 1952. Core philosophy was overall development of rural areas and people's participation.

This programme was formulated to provide an administrative framework through which the government might reach to the district, tehsil / taluka and village level. All the districts of the country were divided into "Development Blocks" and a "Block Development Officer (BDO)" was made in charge of each block. Below the BDO were appointed the workers called Village Level Workers (VLW) who were responsible to keep in touch with 10-12 villages. So, a nationwide structure was started to be created. Thousands of BDOs and VLW's were trained for the job of carrying out array of government programmes and make it possible to reach the government to villages. Top authority was "Community Development Organization" and a Community Development Research Center was created with best academic brains of the country at that time.

In the first five year plan, the emphasis was on agriculture. The food production started growing and by the end of first five year plan, the food import decreased substantially. However, the bad monsoon in the first two three years of second five year plan the food production again tumbled down and the production was now around pre-1954 levels.

The community development programme later became overburden and a need to sharply focus the agriculture was felt. So the first programme which sharply focused agriculture was launched in 1960-61 and this programme was called "**Intensive Agriculture Development program (IADP)**"

Intensive Agriculture Development program (IADP)

Intensive Agriculture Development program (IADP) was the first major experiment of Indian government in the field of agriculture and it was also known as a "package programme" as it was based upon the package approach. The core philosophy was to provide loan for seeds and fertilizers to farmers.

- Intensive Agriculture Development program was started with the assistance of Ford Foundation.
- It was launched as pilot basis in one district of 7 states at that time. These 7 districts were:

1. Thanjavur (Tamil Nadu)

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2. West Godavari (Andhra Pradesh)
3. Shahabad (Bihar)
4. Raipur (Madhya Pradesh)
5. Aligarh (Uttar Pradesh)
6. Ludhiana (Punjab)
7. Pali (Rajasthan)

The BDOs and VLWs were made double in number and "Agriculture Extension Officers" were appointed. The package which consisted of economic, institutional and technical innovations was having loans to farmers as the key part of this programme. The programme was expanded later.

- The major difference between the CDP and IADP was that CDP was a generalized development programme while the IADP was a "sectoral development programme"

However, when this programme was expanded to rest of the country, the staff of BDOs and VLWs was reduced, to compromise on economic backend. This withdrawal was also due to overstaffing in some districts. The success and failures of the IADP are as follows:

- Production of wheat as well rice increased. India produced 23.5 Lakh tones of wheat in 1964-65 compared to 17 Lakh tons in 1961.
- Some parts of the country tasted the "efforts of the Independent country's responsible government" for the development.
- Only some parts benefitted and farmers of those parts became rich, other parts failed to do good.
- The success was due to increased area rather than the increased productivity.
- The overstaffing created problems for the government.

The IADP was expanded and later a new Intensive Agriculture Area programme (IAAP) was launched to develop special harvest in agriculture area.

Intensive Agriculture Area programme (IAAP): 1964-65

The core philosophy of the IAAP was that "much greater emphasis should be given to the development of scientific and progressive agriculture in an intensive manner in the areas which have High production potentials". The idea was to cover at least 20% of the cultivated area of the country. The emphasis was on import crops such as Wheat, Rice, Millets, Cotton, Sugarcane, Potato, Pulses etc.

The Intensive Agriculture Area programme (IAAP) paved the way for Green Revolution in the country.

High Yielding Variety Programme (HYVP): 1966-67

The High Yielding Variety Programme (HYVP) was launched in the Kharif of 1966-67 with an objective to attain self-sufficiency in food by 1970-71. The core philosophy of the programme was to increase the productivity of food grains by adopting latest varieties of inputs of crops. Introduction of new high yielding varieties of improved seeds and enhanced application of the fertilizers and extended use of pesticides were its main features.

» The Farmers were extended finance through a relaxed mechanism by the Reserve Bank of India through the Central Cooperative Banks.
» This programme in the 4th five year plan was a major breakthrough and a turning point in the history of agriculture development in India.
» The programme was successful in the wheat producing zones of the country and some success in the rice and other crops was also achieved.

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Green Revolution

The High Yielding Variety Programme envisaged the introduction of

1. High-yielding varieties of seeds
2. Increased use of fertilizers
3. Increased irrigation.

These three are collectively as the Green Revolution.

The Green Revolution increased in production needed to make India self-sufficient in food grains. These three measures adopted for the improvement of agriculture, food grain production in India increased by 25% in 1967-68 as compared to 1966-67. It was a revolution because of so much increases in the production in just one year.

- The term "Green Revolution" was first used in 1968 by then USAID director William Gaud.

Was Green Revolution confined to India?

No, **It started from Mexico** with the efforts of Dr. Norman Borlaug and expanded to India, Pakistan, Philippines and other parts of the world.

Who was Dr. Norman Borlaug?

Dr. Norman Borlaug (1914-2009) was a United States agronomist and humanitarian who is called the **father of Green Revolution**. He won the Nobel Peace Prize in 1970 and was honored with Padma Vibhushan by the Government of India. After his PhD in plant pathology and genetics in 1942, he was on a agricultural research position in Mexico where he developed the high-yield, disease-resistant **wheat varieties**.

How Norman's efforts in Mexico expanded?

Dr. Norman started the agricultural development in Mexico and made it a success. The sponsor of this programme was Rockefeller Foundation, whose office later became the "**The International Maize and Wheat Improvement Center**" or CIMMYT. The foundation later sought to spread it to other countries.

In India, M. S. Swaminathan was the adviser of the Minister of Agriculture and he had invited Dr. Borlaug to India.

Which were the High Yielding Variety Seeds?

The following HYV seeds were used in the green revolution:

- Wheat: Sona, PB 18, Kalyan
- Bajra: HV 1
- Maize: Ganga 101, Ranjit
- Jowar : CSH 2

The seeds were first used under IADP but the HVYP used these seeds exhastively along with the other measures.

What was the result of the Green Revolution?

The following comparison of production of the major crops during the Green Revolution Era makes things clear:

Years	Total food Grains	Rice	Wheat	Jowar
1955-56	693	286	88	67
1960-61	823	247	110	99
1967-68	950	376	187	76
1971-72	1051	430	264	77
1977-78	1250	526	313	120

We can see from the above table that Total food grains production in the country got double from 1955-56 to 1977-78 and the role of Green Revolution is evident from the increased production in 1971-72.

The green revolution resulted in increased productivity in India.

What was role of Dr. M S Swaminathan?

Dr. MS Swaminathan is equally credited for Green Revolution in India. In words of Dr. Norman Borlaug:

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"The green revolution has been a team effort. However, to you, Dr. Swaminathan, a great deal of credit must go for "first recognizing" the potential of Mexican Dwarfs. Had this not occurred, it is quite possible that there would not have been a green revolution in Asia."

- Swaminathan is known for having lobbied with then Prime Minister Lal Bahadur Shastri to import 18000 tons of Mexican seed.
- He established National Bureau of Plant, Animal and Fish Genetic Resources of India and International Plant Genetic Resources Institute.

Dr. M S Swaminathan

- Dr. M S Swaminathan is known as the Father of the Green Revolution in India , for his leadership and success in introducing and further developing high-yielding varieties of wheat in India.
- He is the founder and Chairman of the MS Swaminathan Research Foundation, Chennai.
- TIME Magazine has called him "one of the twenty most influential Asians of the 20th century."
- The Indian Gover**nment has honored him with its prestigious national decorations and he has been the recipient of numerous awards and prizes and medals from all over the world.**
- He has been named Commandeur of the Order of the Golden Ark of the Netherlands, and has received the Magsaysay Award for Community Leadership, the Ordre du Merite Agricole of France, and the Golden Heart Presidential Award of the Philippines. He has been awarded the Charles
- Darwin International Science and Environment Medal, the Volvo Environment Prize, the UNESCO Gandhi Gold Medal, the Franklin Delano Roosevelt Four Freedoms Medal, and the Indira Gandhi Prize for Peace, Disarmament and Development — to name just a few. In 1987, he was the first recipient of the World Food Prize, considered equal to a Nobel in the field of agriculture.

Some Books:

- An Evergreen Revolution, 2006
- I Predict: A Century of Hope Towards an Era of Harmony with Nature and Freedom from Hunger, (1999)
- Gender Dimensions in Biodiversity Management, (ed.) (1998)
- Implementing the Benefit Sharing Provisions of the Convention on Biological Diversity: Challenges and opportunities (1997)
- Agrobiodiversity and Farmers' Rights, 1996
- Sustainable Agriculture: Towards Food Security
- Farmers' Rights and Plant Genetic Resources: A dialogue. (ed.) (1995)
- Wheat Revolution: a Dialogue (ed) (1993)

What is Call for Evergreen Revolution?

Dr. MS Swaminathan is at present chairman of National Commission on Farmers. He gives a new call for "Evergreen Revolution" for doubling the present production levels of the food grains. He stresses on adopting some best techniques and promotion of organic farming. The prerequisites as per Dr. Swaminathan are Promotion of soil health, Promotion of lab to land exhibitions, Making rainwater harvesting compulsory and providing credit to farmers on suitable conditions.

What is the second Green Revolution adopted in 11th Plan?

The 11th five year plan has targeted 4% growth in agriculture sector. However, the growth has not been achieved. The approach paper to the 11th five year plan had highlighted a framework which envisaged improvements such as doubling the rate of growth of irrigation area, improvement of water management, rainwater harvesting, watershed development, reclamation of degraded land, focusing on soil quality, bridging the knowledge gap, diversification into high value outputs etc. The National Commission on farmers had laid a foundation on such a network.

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Rainbow Revolution

What is Rainbow Revolution?

In July 2000, the Centre Government had announced the first-ever national agriculture policy. The policy aimed at achieving a growth rate of over 4 per cent per annum by introducing ₹rainbow revolution' in the next two decades so that the total GDP growth can be sustained at 6.5 per cent. the rainbow revolution includes the following.

Small Farmers Development Agency (SFDA)

In 1969, The RBI had appointed an All-India Rural Credit Review Committee in 1969. The chairman of this committee was B. Venkatappiah. This committee recommended establishment of Small Farmers Development Agency (SFDA). The core philosophy of the SFDA was

1. To investigate and identify the problems of small farmers and ensure that various services reach to them.
2. To ensure that the farmers secure loans from cooperative banks.
3. To ensure that the farmers have access to other assistances such as cooperative banks, improved seeds, fertilizers and other inputs.

This scheme was started in 1971-72 in select districts. It was financed by central as well as state government and a provision of subsidy was made for the farmers from 25% (nontribal farmers) to 50% (tribal farmers).

- The SFDA was the first programme in our country in which there was a proper linkage of the central Government, State Government and Financial Institutions.
- Later in 1980, this programme was merged with Integrated Rural Development programme (IRDP).

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Marginal Framers and Agricultural Laborers Development Agency (MAFALDA)

Marginal Framers and Agricultural Laborers Development Agency (MAFALDA) was also established with SFDA to assist the marginal farmers and agricultural laborers in maximum productive use of their small holdings and skills by undertaking animal husbandry horticulture etc.

Drought Prone Area Programme (DPAP) & Other Programmes

Drought Prone Areas Programme (DPAP) is the "**earliest area development programme**" launched by the Central Government in 1973-74 to tackle the special problems faced by those fragile areas which are constantly affected by severe drought conditions.

These areas are characterized by large human and cattle populations which are continuously putting heavy pressure on the already fragile natural resources base for food, fodder and fuel.

The major problems are continuous depletion of vegetative cover, increase in soil erosion, fall in ground water levels due to continuous exploitation without any effort to recharge the underground aquifers.

Please note that in 1977-78, **Desert Development Programme** (DDP) was launched for hot desert areas of Rajasthan, Gujarat, Haryana and cold desert areas of Jammu & Kashmir and Himachal Pradesh. Similarly, in 1989, **Integrated Watershed Development Programme (IWDP)** was launched under the aegis of National Wasteland Development Board for development of wastelands on watershed basis.

In this context, In 1994, a Technical Committee under Chairmanship of Professor **C.H. Hanumantha Rao** was appointed to appraise the impact of DPAP / DDP and suggest measures for improvement. The committee recommended a common set of operational guidelines and expenditure norms for the three programmes of Ministry of Rural Development.

Accordingly, the Guidelines for watershed Development were framed and brought into force from 1st April 1995. These guidelines were changed in 2001 and further in 2003 and were named " **Haryali Guidelines**". Later, the 11th Plan has stressed upon developing concerted action plans for rainfed areas in close consultation with the State Governments. Accordingly, the Common Guidelines for Watershed Development, 2008 have been issued and made effective from 1.4.2008. Since 26.2.2009, the three watershed programmes of the Department of Land Resources namely DPAP, DDP and IWDP have been consolidated as a comprehensive programme named '**Integrated Watershed Management Programme (IWMP)**'.

So, at present, the Integrated Wastelands Development Programme (IWDP), Drought Prone Areas Programme (DPAP) and Desert Development Programme (DDP) are running as a consolidated single programme named **Integrated Watershed Management Programme** (IWMP) in place of all the above mentioned three Area Development Programmes. (Information related to this topic is outdated in most books). This programme comes under Ministry of Rural Development.

Crop production in India

In 1951-52 India's total food grain production was 51 million tonnes. In 2007-08 total food grain production was 230.8 million tons. Since independence India's food grain production has increased by 4.5 times. The latest advanced estimates as of now are the Fourth Advanced Estimates of 2010-11, released in July 2011. As per these estimates, India has produced 241.56 million tonnes of foodgrains during 2010-11 compared to 218.11 million tonnes in the previous year. **This is highest ever foodgrains production, surpassing the earlier record of 234.47 million tonnes achieved in 2008-09.**

- It may also be noted that the production of wheat, estimated at 85.93 million tonnes, is an all time record. Similarly, production of pulses, estimated at 18.09 million tones, is an all time record.

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Despite a setback in the production of kharif rice due to drought in some of the major rice producing areas in the country, significant improvement in production of rabi rice, wheat, pulses and coarse cereals has resulted in the higher ever production of foodgrains. Estimated production of maize stands at record level of 21.28 million tonnes which is significantly higher than the earlier record production of 19.73 million tonnes achieved during 2008-09. The production of nine oilseeds estimated at 31.10 million tonnes is also an all time record.

- Cotton production has increased from 24.23 million bales in 2009-10 to 33.43 million bales in 2010-11.
- The production of sugarcane, which had attained a record level of 355.52 million tonnes during 2006-07 and declined in subsequent years, has again started witnessing increasing trend with an estimated production of 339.17 million tonnes in the current year.

The production estimates for major crops for 2010-11 are as follows:

- Foodgrains – 241.56 million tonnes: highest ever
- Rice – 95.32 million tonnes
- Wheat – 85.93 million tonnes: highest ever
- Coarse Cereals – 42.22 million tonnes: highest ever
- Maize – 21.28 million tonnes: highest ever
- Pulses – 18.09 million tonnes: highest ever
- Tur – 2.89 million tonnes
- Urad – 1.74 million tonnes: highest ever
- Moong – 1.82 million tonnes: highest ever
- Gram – 8.25 million tonnes: highest ever
- Oilseeds – 31.10 million tonnes: highest ever
- Soyabean – 12.66 million tonnes: highest ever
- Groundnut – 7.54 million tonnes
- Rabeseed & mustard – 7.67 million tonnes
- Cotton – 33.43 million bales (of 170 kg each): highest ever
- Sugarcane – 339.17 million tonnes
- Please note that Total food grains production in India has increased by 4.5 times since first five year plan
- Among wheat and rice, production of wheat has increased to 13 folds. This is because of green revolution which was mainly confined to wheat.
- The increase in production is also due to increase in the irrgable land so actual increase in real terms has been less than the above data.

Food grain Production: India v/s world

For the first two decade of India's independence, India was struggling and the main objective was to produce as much food grains as much possible. After 1965, the Green Revolution (discussed later) gave India the confidence and by the end of 1980s India was self sufficient in food production. However, later the situation became reverse. During the early 2000s, India was having more than 3 times of the Buffer stock of food grains in the central pool but in certain corners of the country people dying due to non availability of food. The situation was taken to Supreme Court via a PIL, which was filed by the People's Union For Civil Liberties.

Later a National level Food For Work Programme arrived. This programme was later merged with MGNREGA.

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Top 10 Producers of Wheat (Source FAO)

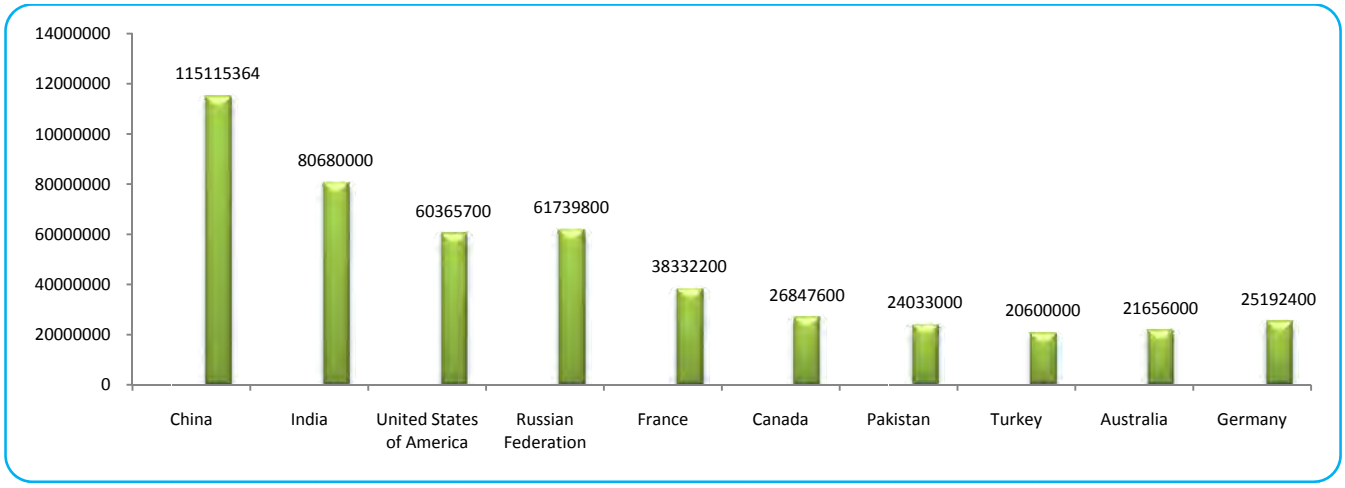

Figure 5: Largest Wheat Producer Countries. Data MT, Source FAO 2010.

» The above graphics makes it clear that India's is world's second largest producer of wheat after China.

Largest Rice producing countries:

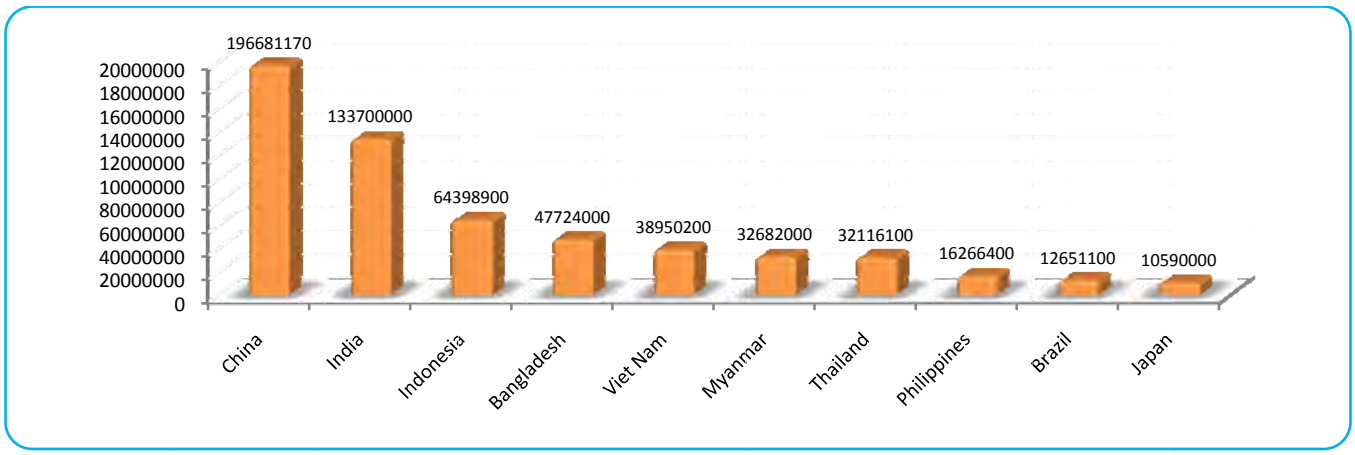

Figure 6: Largest Rice Producing Countries

Largest Producers of Various Crops in India

Three Largest Producing States of Important Crops during 2008-09			
Crop/ Group of Crops		States	Production
I. Foodgrains			
	Rice	West Bengal	15.04
		Andhra Pradesh	14.24
		Uttar Pradesh	13.10
		All - India	**99.18**
	Wheat	Uttar Pradesh	28.55
		Punjab	15.73
		Haryana	10.81
		All - India	**80.68**
	Maize	Andhra Pradesh	4.15
		Karnataka	3.03
		Rajasthan	1.83
		All - India	19.73

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	Total Coarse Cereals	Rajasthan	7.33
		Karnataka	6.25
		Maharashtra	5.97
		All - India	**40.04**
	Total Pulses	Madhya Pradesh	3.68
		Uttar Pradesh	2.00
		Rajasthan	1.83
		All - India	14.57
	Total Foodgrains	Uttar Pradesh	46.73
		Punjab	27.33
		Andhra Pradesh	20.42
II .Oilseeds		**All - India**	**234.47**
	Groundnut	Gujarat	2.66
		Andhra Pradesh	1.55
		Tamil Nadu	0.97
		All - India	**7.17**
	Rapeseed & Mustard	Rajasthan	3.50
		Uttar Pradesh	0.99
		Haryana	0.90
		All - India	**7.20**
	Soyabean	Madhya Pradesh	5.85
		Maharashtra	2.76
		Rajasthan	0.81
		All - India	**9.91**
	Sunflower	Karnataka	0.50
		Andhra Pradesh	0.33
		Maharashtra	0.16
		All - India	1.16
	Total Oilseeds	Madhya Pradesh	6.98
		Rajasthan	5.18
		Gujarat	4.02
		All - India	**27.72**
III . Other Cash Crops			
	Sugarcane	Uttar Pradesh	124.67
		Maharashtra	88.44
		Tamil Nadu	38.07
		All - India	348.19
	Cotton @	Gujarat	7.01
		Maharashtra	4.75
		Andhra Pradesh	3.57
		All - India	22.28
	Jute & Mesta$	West Bengal	7.97
		Bihar	1.22

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		Assam	0.67
		All - India	10.37
	Potato	Uttar Pradesh	10.81
		West Bengal	9.90
		Punjab	2.00
		All - India	34.39
	Onion	Maharashtra	3.93
		Karnataka	3.03
		Gujarat	1.41
		All - India	13.57
@ : Production in million bales of 170 kgs. each.			
$: Production in million bales of 180 kg. each.			
Source: Directorate of Economics and Statistics, Department of Agriculture and Cooperation., Data Million Tons			

FOOD MANAGEMENT

There are a few basic objectives of Food Management in India.

- Procurement of food grains from farmers at remunerable prices
- Distributing these food grains to the consumers & vulnerable sections of the society
- Maintenance of a Buffer Stock for adverse circumstances
- Maintenance of food security and price stability.

So, there are some instruments of food Management / price management. These instruments are :

1. **Minimum Support Price (MSP)**
2. **Central Issue Price**

The MSP is used to procure the food grains from the farmers at the remunerative prices and CIP is used to issue this food grain to the sections of society particularly poor and vulnerable section. We will discuss it in details.

The nodal agency for Food Management in India is Food Corporation of India. The FCI undertakes the procurement, distribution, storage of the food grains.

Food Corporation of India

The Food Corporation of India was setup under the Food Corporation Act 1964, in order to fulfill following objectives of the Food Policy:

1. Effective price support operations for safeguarding the interests of the farmers.
2. Distribution of food grains throughout the country for public distribution system
3. Maintaining satisfactory level of operational and buffer stocks of food grains to ensure National Food Security

Current MD is Siraj Hussain. Please note that FCI has 5 Zonal Offices viz. Zonal Office (North), Zonal Office (East), Zonal Office (West), Zonal Office (South), Zonal Office (North East). Out of them, the North Zonal Office which covers the 8 Regions i.e. Punjab, Haryana, UP, Rajasthan, J&K, HP, Delhi and Uttaranchal is the largest Zone in FCI , with two surplus states Punjab and Haryana.

Food items as Essential Commodities in India

The Central and State Governments have passed certain legislations in order to control production, supply, distribution as well as price of a number of commodities. The Essential Commodities Act,1955 is one such important legislation. Under the Act, the State Governments/UT Administrations have issued various control orders to regulate various

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aspects of trading in essential commodities such as foodgrains, edible oils, pulses, kerosene and sugar etc. The Central Government regularly monitors the action taken by State Governments/UT Administrations to implement the provisions of the Act.

The Government is empowered to enlist any class of commodity as essential commodity as well as regulate or prohibit the production, supply, distribution, price and trade in any of these commodities for the following purposes :-

- Maintaining or increasing their supplies.
- Equitable distribution and availability at fair prices of the commodities concerned.
- Securing any essential commodity for the defence of India or the efficient conduct of military operations.

The list of commodities declared as "essential" under the Essential Commodities Act, 1955 is reviewed from time to time in the light of changes in the economic situation and particularly with regard to their production and supply. For example, keeping in view production and demand of some of the commodities, it was felt that these could be removed from the list of essential commodities. Hence, with effect from 15.2.2002, Government removed 11 classes of commodities in full and one in part from the list of commodities declared as essential under the Essential Commodities Act, 1955. Similar efforts are underway to delete more commodities from the purview of the Act in order to facilitate free trade and commerce, for which alternative legal mechanism is being worked out for protection of consumers interest etc.

Please note that Essential Commodities in India have been declared in section 2 of Essential Commodities Act, 1955. The essential commodities in India are: (Kindly note them)

- Cattle fodder, including oilcakes and other concentrates.
- Coal, including coke and other derivatives.
- Components parts and accessories of automobiles.
- Cotton and woollen textiles.
- Drugs.
- Foodstuffs, including edible oilseeds and oils.
- Iron and Steel, including manufactured products of Iron & Steel.
- Paper, including newsprint, paperboard and strawboard.
- Petroleum and Petroleum products.
- Raw Cotton, either ginned or unginned and cotton seed.
- Raw Jute.

The following commodities are also declared as essential through notifications:

- Jute textiles.
- Fertilizer, whether inorganic, organic or mixed.
- Yarn made wholly from cotton.
    1. seeds of food crops and seeds of fruits and vegetables,
    2. seeds of cattle fodder and
    3. jute seeds.

Public Distribution System in India

PDS means distribution of essential commodities to larger section of the society, mostly vulnerable people, through a network of fair Price Shops on a recurring basis.

- The essential commodities under PDS at present are **wheat, rice, sugar and Kerosene**.

The first government intervention in the PDS in India started in 1940 during the interwar period.

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Further genesis of PDS occurred during the periods of India-China and India-Pak wars when country face critical shortages of food grains.

FCI was established in 1964 to handle the shortage of food grains clubbed with black marketing of the food grains by hoarders was a reason for the government to take some action for the containment of rise in food grains prices and ensured access of food to **urban consumers**. The PDS network expanded in 1970s and 1980s, after the Green Revolution.

In the 1980s, the PDS coverage was extended to the rural areas. By 1985, efforts were made to make it available to all the tribal blocks of the country.

Today, with the network of around 5 Lakh fair price shops PDS is virtually world's largest system of its kind.

However, PDS was criticized for several reasons. A few of them are as follows:

1. Its bias towards the urban consumers and inability to reach to the last corner of the country.
2. Some states such as Bihar and UP were virtually out of the PDS network.
3. There are no criteria of monitoring the high income group purchases more than low income purchases.
4. The coverage and network of PDS does not ensure that the poorest or the poor is benefited/
5. The PDS has been untargeted and proved to be regressive in some parts of the nations.
6. Consumers get inferior food grains in ration shops. Because, the dealers replace good supplies received from the F.C.I. with inferior stock.
7. Issue of the bogus cards in large numbers which are used to procure the grains from the PDS and sell them in open market.
8. The dealers have little profit so indulge in malpractices.
9. In other words, despite of having world's largest Public Distribution System, there are people dying in the country out of hunger.

Is PDS only central government's responsibility?

No, it is operated under the **joint responsibility of the Central and the State Governments**. The Central government, through FCI has following responsibilities:

- Procurement, storage, transportation of food grains
- Bulk allocation of food grains to the State Governments.

The state government's responsibility is operational. They are as follows:

- Identification of families below the poverty line
- Issue of Ration Cards
- Supervision of the functioning of FPS.

The PDS commodities viz. wheat, rice, sugar and kerosene, **are allocated to the States/UTs** for distribution by the Central Government. Cloth, exercise books, pulses, salt and tea, etc. are distributed by the state governments.

Revamped Public Distribution System (RPDS)

Till 1992, the PDS was untargeted and a general entitlement scheme for all consumers. Due to criticism & mismanagement allegations, in June 1992, the Revamped Public Distribution System (RPDS) was launched in 1775 blocks of the country. However, in 1997, the Targeted Public Distribution System (TPDS) was introduced with effect from June 1997.

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Targeted Public Distribution System (TPDS)

Targeted Public Distribution System (TPDS) was introduced with effect from June 1997. The focus of the Targeted Public Distribution System (TPDS) is on "poor in all areas" and TPDS involves issue of 10 Kg of food grains per family per month for the population Below Poverty Line (BPL) at specially subsidized prices.

The TPDS requires the states to

1. Formulate and implement foolproof arrangements for identification of poor,
2. Effective delivery of food grains to Fair Price Shops (FPSs)
3. Its distribution in a transparent and accountable manner at the FPS level.

The "Targeted" means that the focus is really poor and vulnerable sections of society. So we can say that "**Since 1997 the PDS in India has become pro-poor.**

But how to identify, who is poor and who is not?

The identification of the poor under the TPDS is the responsibility of the State governments. They identified as per the State-wise poverty estimation of the Planning Commission for 1993-94. These estimates are based upon "**Lakdawala formula".**

What is Lakdawala formula?

Poverty estimates of states in India by planning commission are estimated by the formula developed by late Prof. Lakdawala Committee. Please note that in Lakdawala formula, the following indices have been used in estimation of the poverty in states:

- Urban Poverty: CPI-IL (Consumer Price Index for Industrial Laborers)
- Rural Poverty: CPI- AL (Consumer Price Index for Agricultural Laborers)

How allocation is made to the states?

Allocation of food grains to the States/UTs was made on the basis of average consumption in the past. It was average annual off-take of food grains under the PDS during the **past 10 years** at the time of introduction of TPDS.

But, since TPDS is pro-poor, what happened to the APL (Above Poverty Limit) who were purchasing from the FPS?

The states are allowed in excess of the requirement of the BPL families and the TPDS allocation. This is called **"Transitory Allocation"** and it was meant for APL (Above Poverty Limits). The objective of this allocation was that, the sudden withdrawal of the APL families from the TPDS was not desirable. The prices of the Transitory Allocation are higher than the BPL prices.

What is the current allocation to the BPL families under TPDS?

The earlier allocation was 10 Kg. per month, which was increased this to 20 Kg. per family per month at 50% of the economic cost in April 2000. This was further increased to 25 kgs in 2001.

✍ The quantity of food grains available under TPDS has been increased from 25 kg. per month per family to **35 kg. Per month per family with effect from April 2002. This continues till date.**

Who fixes the end retail prices?

The end retail prices or Consumer End Prices (CEP) are fixed by the State Governments or UT administration. The government issues the PDS commodities on CIP (Central Issue Price) and the state government fix the Retail price after taking into consideration the margins for wholesalers/retailers, transportations charges, levies, local taxes etc. The states government are requested to not to have a **difference of over 50 paise per kg.**

Is any rate fixed for Antyodaya Anna Yojna?

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The states cannot interfere with the price issued by the government for AAY in which the end retail price is to be retained at ` 2/ a Kg. for wheat and ` 3/ a Kg. for rice.

Is TPDS not working in any states?

Please note that TPDS is working in the entire country.

What is the quantity of the allocation under TPDS at centre Level?

The following table shows the allotment and lifting by the states under the TPDS for recent years .

Allotment under TPDS

Year	Wheat		Rice	
	Allotment	Lifting	Allotment	Lifting
2004-05	37.2	11.0	34.5	13.6
2005-06	31.4	11.0	39.7	14.3
2006-07	14.4	10.1	43.3	15.9
2007-08	11.9	10.6	27.3	17.5
2008-09	14.4	9.7	23.7	16.0
2009-10	21.3	13.9	24.1	15.8

Source: FCI, all values in Million Tons

Central Pool

Central pool procured food grains by the **Central Government** with the Food Corporation of India.

» The procurement of food grains by the FCI is higher in the states of Punjab, Haryana, Uttar Pradesh and Andhra Pradesh.

» These 4 states have accounted for nearly 69.7% of the rice procured for central pool in 2006-07, 69.46% in 2007-08 and 67.47% in 2008-09.

» So these 4 states viz. of Punjab, Haryana, Uttar Pradesh and Andhra Pradesh account for two third of the procurement of the rice in the central pool.

» In the central pool, Punjab and Haryana accounted for 91.1% in 2007-08, 66.88% in 2008 and 69.53 % in 2008-09.

» So these two states Punjab and Haryana account for more than two third in the central pool wheat. In 2007-08 there was a record harvest so the procurement from these states was 91.1%.

What are Buffer Stocks and Buffer Norms?

The Food Corporation of India is the main agency for procurement, storage and distribution of food grains. In addition to the requirements of wheat and rice under the Targeted PDS, the Central Pool is required to have sufficient stocks of these in order to meet any emergencies like drought/failures of crop, as well as to enable open market intervention in case of price rise.

The Buffer norms are the minimum food grains the Centre should have in the Central pool at the beginning of each quarter to meet requirement of public distribution system and other welfare measures. The last changes in the Buffer norms were in April 2005 and according to the norm:

- The minimum rice in the Central pool should be 118 lakh tons on January 1, 122 lakh tons on April 1, 98 lakh ton on July 1 and 52 lakh tons on October 1.
- Similarly, the quantity of wheat should be 82 lakh tons on January 1, 40 lakh tons on April 1, 171 lakh tons on July 1 and 110 lakh ton on October 1.

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The above info is arranged in the following table:

Buffer Norms in India (from April 2005)			
DATE	RICE	WHEAT	TOTAL
1st April	122	40	162
1st July	98	171	269
1st Oct.	52	100	162
1st Jan.	118	82	200
All Values Lakh Tons, Source department of Food and Public Distribution			

Please note these points:

- The Central pool requires **maximum** (269 Lakh tons or 26.9 million tons) of Rice + Wheat on 1st July.
- The FCI has been constructing storage capacity for holding buffer and operational stocks of food grains at nodal points in the country. The storage capacities available with FCI are mainly used for storage of food grains and partly for other commodities and general warehousing. The allocations and actual expenditure for the aforesaid Plan Schemes for the years 1997-98, 1998-99 and 1999-2000 and allocation for 2000-2001 are given in the statement attached.
- In addition, the Government has decided to create a **Strategic Reserve of 50 lakh tonnes** of food grains out of the domestic procurement, in addition to the buffer stock already held by FCI.
- This 50 Lakh tones includes 30 lakh tonnes of Wheat w.e.f. 1.7.2008 and 20 lakh tonnes of Rice w.e.f. 1.1.2009.

What are objectives of Buffer Stocks:

The buffer stocks are required to

- Feed TPDS and other welfare schemes,
- Ensure food security during the periods when production is short of normal demand during bad agricultural years
- Stabilize prices during period of production shortfall through open market sales.

Any changes in the Buffer Norms in pipeline?

Yes, with the bulging procurement as well as the demand, the government had asked the **National Centre for Agricultural Economics and Policy Research** (NCAP) to study the buffer norm and make recommendation on increasing it if the demand has gone up. A technical group was also studying the report of NCAP. The new Buffer Norms have not been announced as of now.

What are the Current Buffer Stocks?

The stock position of food grains in the Central Pool as on December 2011 was 547.19 lakh tons comprising of 270.63 lakh tons of rice and 276.56 lakh tons of wheat. The buffer stocks norms have been maintained for rice and wheat for the entire Central Pool stocks on a quarterly basis.

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The following table shows the Buffer stock on December 1, 2011.

Buffer Stock in Central Pool On December 1, 2011		
Commodity	**Buffer Norm**	**Actual Stock**
Wheat	82	276.56
Rice	118	270.63
Total	200	547.19
Source: Ministry of Consumer Affairs, Food & Public Distribution		

The above table shows India's comfortable position in the buffer stock which is more than double than the required buffer norms.

The Government says that current stocks of food grains in the Central Pool are quite adequate to meet the food grain requirements of the country as per existing allocations for TPDS and Other Welfare schemes. The Government has been intensifying procurement operations and more States are encouraged to make decentralized procurement. Government has been reviewing the Minimum Support Price for food grains from time to time to encourage farmers to produce more. As a result, procurement during the last four years have recorded considerable increase from 36.24 million tons in 2006-07 to 62.34 million tons in 2010-11.

However, it has raised the questions over the storage capability of the FCI and rotting grains in the open godowns in the country. The issue was again taken to the Supreme Court which suggested that government should distribute the grains free to the poor. The problem is immense, but solution of this problem is not instant. The FCI has to increase the storage capacity to accommodate the record procurement. Even the Kharif production of 2011-12 is going to break all records!

The Government as of now as has formulated a Scheme for construction of storage godowns through private entrepreneurs, Central Warehousing Corporation (CWC) and State Warehousing Corporations (SWCs). Under the scheme, capacity of about 151 lakh tons is to be created in 19 States through private entrepreneurs and CWC and SWCs. 5.4 and 14.4 lakh ton storage capacities respectively are being constructed by CWC and SWCs under the Scheme. Out of the above, a capacity of about 4 lakh tons has already been completed by CWC/SWCs.

What is CAP (Cover and Plinth)?

The issue we read in the newspapers about the food grains rotting is on the CAP or Cover & Plinth. Cover & Plinth refers to the Outdoor stacks of bagged grain, which is covered with some waterproof material. India adopts cover and plinth (CAP) as standardized system. The CAP storage was born of necessity, because harvests increased faster than storage capacity over the period of time. Its worth note that during the years i.e 2005-06 to 2008-09 , the stocks were low and FCI rented out the excess capacity to optimize the utilisation of owned capacity. But now, when the stocks are high, the capacity gets short. An statement in the parliament was made that efforts are being made to utilize capacity upto 120% by increasing the height of stacks. Food Corporation of India has also hired godowns at places where it has its own capacity to accommodate procured stocks but is insufficient to accommodate the stocks or there are operational constraints, in the procuring regions.

Antyodaya Anna Yojna

AAY launched on 25 December 2000 provides food grains at a highly subsidized rate of ₹ 2.00 per kg for wheat and ₹ 3.00 per kg for rice to the poor families under the Targeted Public Distribution System (TPDS).

The scale of issue, which was initially 25 kg per family per month, was increased to 35 kg per family per month from April 1, 2002. The scheme initially for one crore families was expanded in June 2003 by adding another 50 lakh BPL families.

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During 2003-04, under the AAY, against an allocation of 45.56 lakh tonnes of food grains, 41.65 tonnes were lifted by the State/UT Governments. Budget 2004-05 expanded the scheme further from August 1, 2004 by adding another 50 lakh BPL families. With this increase, 2 crore families have been covered under the AAY. In other words Antyodaya Anna Yojana (AAY) families the Central Government shares more than **four-fifths of the burden.**

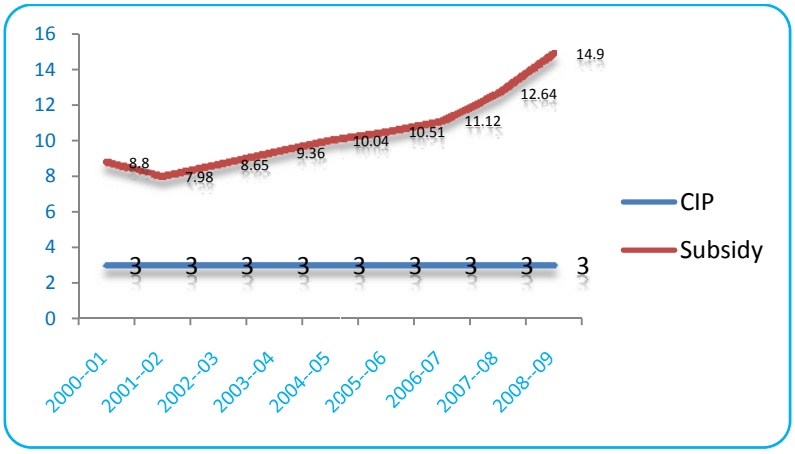
Central Issue Price & Food Subsidy for AAY, BPL & APL

One kilo of rice costs ₹ 17.90[1] which the Central Government issues to the States at the rate of ₹ 3 per kg, thus giving a subsidy of ₹ 14.90 for every kilo of rice issued to AAY beneficiaries.

The Central Issue Price (CIP) of rice to States for AAY beneficiaries has remained constant since 2000-01, at ₹ 3 per kg.

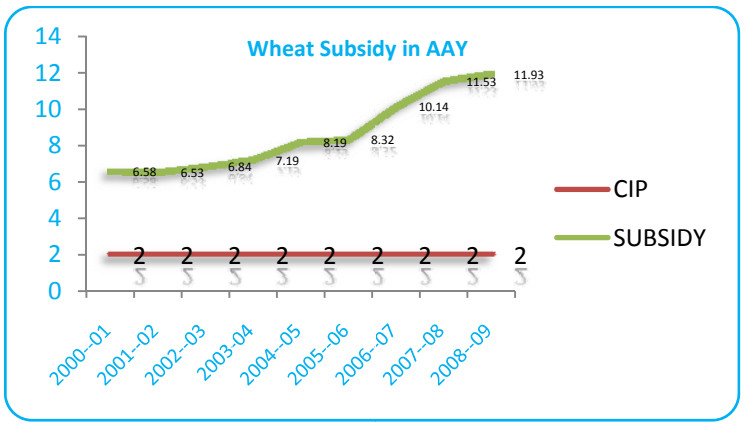
The following table & Graph shows the subsidy by the government in AAY on Rice.

Rice Subsidy in the AAY			
YEAR	COST	CIP	SUBSIDY
2000-01	11.80	3.00	8.80
2001-02	10.98	3.00	7.98
2002-03	11.65	3.00	8.65
2003-04	12.36	3.00	9.36
2004-05	13.04	3.00	10.04
2005-06	13.51	3.00	10.51
2006-07	14.12	3.00	11.12
2007-08	15.64	3.00	12.64
2008-09	17.90	3.00	14.90



Similarly, in the case of Wheat, the Central Government shares more than four-fifths of the cost burden. Out of the economic cost of Rs 13.93 per kg, the Central Government bears ₹11.93 per kg, thus issuing wheat for AAY beneficiaries at ₹ 2 per kg. The following table & Graph shows the subsidy in AAY on wheat.

Wheat Subsidy in AAY			
YEAR	COST	CIP	SUBSIDY
2000-01	8.58	2.00	6.58
2001-02	8.53	2.00	6.53
2002-03	8.84	2.00	6.84
2003-04	9.19	2.00	7.19
2004-05	10.19	2.00	8.19
2005-06	10.32	2.00	8.32
2006-07	12.14	2.00	10.14
2007-08	13.53	2.00	11.53
2008-09	13.93	2.00	11.93



What is the Central Issue Price (CIP) for BPL & APL Families? (Very Important)

- The issue price of wheat to States for BPL beneficiaries has remained constant since 2000-01at ₹ 4.15 per kg.
- The Central Issue Price of rice to States for BPL beneficiaries has remained constant since 2000-01, at ₹ 5.65 per kg.
- The issue price of rice to States for APL beneficiaries has remained constant at ₹ 8.30 per kg since July 2002. Please note that this is the price for A-grade rice, for common rice it is ₹ 7.95.
- The issue price of wheat to States for APL beneficiaries has remained constant since July 2002, at ₹ 6.10 per kg.

[1] Wholesale rate in December 2009.

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The following table summarizes the above data. Please remember these facts.

	AAY	BPL	APL
Wheat	₹ 2.00	₹ 4.15	₹ 6.10
Rice	₹ 3.00	₹ 5.65	₹ 7.95 & ₹ 8.30
All values ₹ per kilograms			

Allocation of food grains during 2009-10:

Total BPL and AAY allocations made during 2009-10 were 276.77 Lakh tons which comprised 181.05 lakh tons of rice and 95.72 lakh tons of wheat. The allocations under the APL are made dependent upon the availability of stocks of the food grains in the central pool.

Allocation of Food grains during 2010-11

The Government has made allocation of a quantity of 612.07 lakh tons of rice and wheat under Targeted Public Distribution System (TPDS) and Other Welfare Schemes (OWS) during the current year, thus making substantial quantity of food grains available through the Public Distribution System at subsidized prices. This includes additional allocation of 50 lakh tons of food grains to Below Poverty Line (BPL) families at BPL prices in May 2011 and 50 lakh tons to Above Poverty Line (APL) families at APL prices in June 2011. In addition to the above, 23.67 lakh tons of food grains have been allocated at Antyodaya Anna Yojana(AAY) and BPL prices to 27 States for distribution in 174 poorest/backward districts.

Conclusion - Food Management in India:

India has world world's largest Public Distribution System, but still a big part of the population is devoid of physical and economical access to food. The corruption and mismanagement in the PDS are the main bugbears which hinder the system of the country to create a "welfare state". It's a challenge and India needs a revolution to take on this challenge successfully. There is a dire need of procurement and storage of the food grains.

National Food Security Mission

The National Development Council (NDC) on 29th May, 2007 adopted a resolution to launch a Food Security Mission comprising rice, wheat and pulses to increase the production of rice by 10 million tons, wheat by 8 million tons and pulses by 2 million tons by the end of the Eleventh Plan (2011-12).

National Food Security Mission aims to **increase Area Production** and NOT to increase access to food.

As per this resolution, A Centrally Sponsored Scheme, 'National Food Security Mission', has been launched from 2007-08 with an outlay of **₹ 4,882 crore in the 11th Plan Period.**

Components:

The National Food Security Mission has 3 components

1. Rice
2. Wheat
3. Pulses.

Key Features:

1. The scheme to be implemented in a mission mode through a farmer centric approach
2. All the Stakeholders to be actively associated at the District levels for achieving the set goal.
3. The scheme aims to target the select districts by making available the improved technologies to the farmers through a series of planned interventions.
4. A close monitoring mechanism proposed to ensure that interventions reach to the targeted beneficiaries.

Objectives:

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1. Increasing production of rice, wheat and pulses through area expansion and productivity enhancement in a sustainable manner;
2. Restoring soil fertility and productivity at individual farm level;
3. Enhancing farm level economy (i.e. farm profits) to restore confidence of farmers of targeted districts

Strategy:

1. **Expansion of area of Pulses and Wheat, No expansion of area in rice**
2. Bridging the yield gap between the potential and the present level of productivity through
3. Acceleration of seed production
4. Integrated Nutrient Management and Integrated Pest Management
5. Promotion of new production technologies like hybrid rice, timely planting of wheat and promotion of new improved variety of Pulses
6. Supply of input ensuring their timely availability
7. Farmers Training and Visits

Assistance is provided for the various components under the NFSM. Following are the components of NFSM:

Components of NFSM-Rice

1. Demonstration of improved technology including hybrid and System of Rice Intensification (SRI)
2. Incentive for quality seeds of HYVs/hybrids
3. Popularization of new varieties through seed mini kits
4. Promotion of micro nutrients, lime and gypsum
5. Promotion of mechanical weeders and other farm implements
6. Integrated pest management
7. Extension, training and mass media campaign
8. Awards for best performing district in each State.
9. Assistance for innovative interventions at local level

Components of NFSM: Wheat

1. Demonstration of improved Technology
2. Incentive for quality seeds of HYVs to raise the SRR
3. Promotion of micronutrient use in deficient areas
4. Incentive for promotion of application of Gypsum
5. Popularization of Zero till Machines and rotavator
6. Providing subsidy on diesel pumpsets and community generators for irrigation
7. Extension, training and mass media campaign awards for best performing districts
8. Assistance for innovative interventions at local level

Components of NFSM Pulses

1. Increasing seed replacement rate to 25% from present level of 7-8%
2. Promotion of improved production technologies
3. Integrated Nutrient Management (INM)
4. Integrated Pest Management (IPM)
5. Promotion of micronutrients/gypsum/bio-fertilizers
6. Promotion of sprinkler irrigation
7. Pilot Project on tackling the menace of blue bull

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8. Extension, training and mass media campaign
9. Awards for best performing districts
10. Pilot project on demonstration ICRISAT Technologies.

Area of Operation:

1. The program covers now 17 states and 311 districts and has become operational from Rabi 2007-08.
2. The identified districts are given flexibility to adopt any local area specific interventions as are included in the Strategic Research & Extension Plan (SERP).
3. ₹ 2 crore for those districts with NFSM for 2 crops and ₹ 1 crore for districts with NFSM for 1 crop.
4. Under the NFSM, initial reports indicate an increase in wheat seed distribution from 43% in Rajasthan to as high as 10 times in Bihar.
5. In pulses also, the increase in use of improved seed range from 29% in Rajasthan to more than 400% in Chhattisgarh.

Flow of Funds:

1. Funds for the Mission's programmes are directly released to the State Food Security Mission (SFSM) agency after approval by the National Executive Committee.
2. State Mission agency would ensure implementation of the programmes, in a time-bound manner and would make available funds to the District level implementing agency in accordance with their approved programmes.
3. Funds would be released in installments based on progress reports and furnishing of utilization certificates

NFSM & Pulses: The expansion of NFSM

Despite producing 14.76 million tonnes of pulses from an area of 23.63 million hectare, the largest in the world, about 2 to3 million tonnes of pulses are imported annually costing more than ₹5000 crore to meet the domestic consumption requirement.

There was a need to accelerate the production of pulses in the country by more intensive promotion.

Brainstorming session on Pulses organized by Ministry of Agriculture in June 2009 recommended that plant nutrient and plant protection centric technology promotion needs to be demonstrated to farmers in compact blocks.

Accordingly, in February 2010, the Cabinet Committee on Economic Affairs approved the strengthening of the National Food Security Mission to take up more intensive promotion of production programmes of pulses to meet the consumption requirement of pulses by 2011-12.

To accelerate pulses production, the scope of National Food Security Mission was enhanced through the following changes:

1. **Merger of Integrated Scheme on Oilseeds Pulses, Oil palm and Maize (ISOPOM) Pulses components and area with NFSM pulses. Merger of major schemes of NFSM and ISOPOM would bring in all pulses areas under single umbrella and also provide uniformity in implementation at ground level.**
2. Inclusion of additional programmes such as innovative "Accelerated Pulses Production Programme (A3P)" with nutrient and plant protection centric block demonstrations over 1 million hectares of pulses crop area
3. Inclusion of innovative development and research projects.

NFSM : Progress Report:

The NFSM has been quite successful in increasing the area under crops and production. There has been an impressive increase in expenditure during last 3 years of NFSM implementation in the States and the expenditure in 2007-08, 2008-09 and 2009-10 is 42%, 68% and 84% respectively.

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1. Significant achievements under NFSM have been recorded during last three years i.e. during 2007-08, 2008-09 and 2009-10 as per the progress reports received from the States. New farm practices have been encouraged through 3.00 lakh demonstrations of improved package of practices.
2. As many as 53438 demonstrations on **System of Rice Intensification** (SRI) as well as 24189 demonstrations on hybrid rice have also been conducted.
3. Nearly, 85.79 lakh qtls of seeds of high yielding varieties of Rice, Wheat and Pulses and hybrid rice have been distributed.
4. About 65.88 lakh ha of area has been treated with soil ameliorants (gypsum/lime/micro nutrients) to restore soil fertility for higher productivity.
5. An area of about 25.77 lakh ha has been treated under Integrated Pest Management (IPM).
6. Further, nearly 15.31 lakh numbers of improved farm machineries including water saving devices have been distributed.
7. Capacity building of farmers has been encouraged through arranging 28821 farmers' field schools (FFS) at the farm level so far. (based upon statement of Prof. K.V. Thomas, Minister of State for Agriculture, Consumer Affairs, Food and Public Distribution, in Parliament on August 3, 2010)

National Food Security Bill

The National Food Security Bill 2011 proposes an act to ensure public provisioning of food and related measures to enable assured economic and social access to adequate food, for all persons in the country, at all times, in pursuance of their fundamental right to live with dignity.

Inspiration for Food Security Bill 2011

The preamble of the National Food Security Bill 2011 gets its inspiration from:

- Article 25 of the **Universal Declaration of Human Rights** (1949) that recognizes the right of everyone to adequate food
- Article 11 of the **International Covenant on Economic, Social and Cultural Rights** (1966) and General Comment 12 of the Committee on Economic, Social and Cultural Rights that further elaborate the responsibilities of all State Parties to recognize the right of everyone to be free from hunger
- Articles 22, 23, 24, 26, 27.1 and 27.3 of the **Convention of the Rights of the Child**
- Article 12, 13 and 14 of the **Convention on the Elimination of All Forms of Discrimination against Women** that call for the end of discrimination against women in healthcare and recognise the special needs of rural women;
- Articles 5, 25 and 28 of the **Convention on the Rights of Persons with Disabilities** that recognises the special measures required to accelerate disabled persons de facto equality of access to nutrition
- Articles **14 and 15 of the Constitution of India** enjoin the state to ensure equality before the law and allows to this end the enactment of special provisions for women, children, Schedule Castes, Schedule Tribes and indeed any socially and educationally backward classes of citizens;
- Article **21 of the Constitution of India** guarantees a fundamental right to life and personal liberty, which necessarily includes the right to life with dignity
- **Article 39 (a) of the Constitution of India** obliges the State to direct its policy towards ensuring that the citizens, men and women, equally have the right to an adequate means of livelihood

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- **Article 41 of the Constitution of India** obliges the State to make effective provision for securing the right to public assistance in cases of unemployment, old age, sickness and disablement, and in other cases of undeserved want.
- **Article 42 of the Constitution of India** obliges the State to make provision for securing just and humane conditions of work and for maternity relief
- **Article 47 of the Constitution of India** makes it a primary duty of the State to raise the standard of nutrition and the standard of living of its people and to improve public health

The summary is that it inspired from:

1. **Universal Declaration of Human Rights**
2. **International Covenant on Economic, Social and Cultural Rights**
3. **Convention of the Rights of the Child**
4. **Convention on the Elimination of All Forms of Discrimination against Women**
5. **Convention on the Rights of Persons with Disabilities**
6. **Fundamental Rights (Constitution of India)**
7. **Directive Principles of State Policy (Constitution of India)**

Sharing of Costs between Central & State Governments

The bill provides that the Central Government shall provide to the State governments the Food grains free of cost, including costs of storage and transportation; or the cash equivalent of the procurement costs borne by State Governments in case of decentralized procurement, to State Governments. The central Government will also provide administrative expenses of a minimum of **six percent for the implementation** of this act and all other costs incurred under this Act, shall be shared between Central and State governments in such a way that Central Government bears at **least 70% of all costs.**

What is Right to Food Security?

The act says that Every person shall have physical, economic and social access, at all times, either directly or by means of financial purchases, to quantitatively and qualitatively adequate, sufficient and safe food, which ensures an active and healthy life.

What is Lifecycle Approach?

Food Security and the obligations created under this Act of appropriate governments, shall be based on access to adequate and appropriate food throughout the life cycle of a human being from pregnancy to old age so as to ensure a healthy body and mind. This has been described as follows:

- **Right to Food at Pregnancy:** When the bill becomes an act, the State Government shall provide all pregnant and nursing women the - Take-home rations or nutritious and freshly cooked meals, free of charge, during pregnancy and 6 months thereafter through the local Anganwadis so as to meet the nutrition standards as well as maternity benefits of Rs. 1000 per month, for a period of six month. (Women in Government service don't come under this rule).
- **Right to food for Children between 0-6 years:** When the bill becomes an act, State Government shall provide nutritious Take Home Rations and/or local and freshly cooked meals throughout the year through the local Anganwadi to all children in the age group of 0 – 3 years. The State Government will also provide the local and freshly cooked meal in the local Anganwadis, for at least 300 days in a year to all children in the age group of 3 to 6 years.

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- **For Children of 6-14 years:** When the bill becomes an act, the State Government shall provide all children of the age group 6 to 14 years, at least one freshly cooked nutritious midday meal in all schools run by local bodies, government and government-aided schools up to Class 8 or beyond, as may be specified by the central and state governments from time to time, everyday of the year, except school holidays, of equal or greater amount, as per norms specified. The bill says that Every school shall have appropriate facilities for the purpose of hygienic cooking and clean drinking water as maybe prescribed. The food provided through the mid-day meal shall be locally appropriate and nutritious. *Please note that the bill provides that a child can not be denied of food in whatever condition. Any child below the age of 14, including those that are out-of-school, may approach any feeding facility such as Anganwadis centre, school mid-day meal for a freshly cooked nutritious meal. This is* ***one of the most novel features of the bill****. Thus we see that Mid0day meal Scheme and ICDS have been brought under the umbrella of NFS Bill.*
- **Above 14 Years**: The bill has various provisions which shall be discussed ahead.

Identification of Households

When the bill becomes an act, the State Government shall, based on the criteria notified by the Central Government identify households known as the Priority households and General households and issue to them appropriate Ration Cards to enable them to receive food grains at the rates applicable to them.

- For Priority Group that is below poverty line, the bill provides 7 Kg grain per month per person.
- Under this, the rice would be at Rs. 3 /kg and Wheat at Rs. 2 /kg, and coarse grains at Rs. 1 /kg. These rates can not be revised upwardly for at least 10 years.
- For general group, the entitlement is 3kg. per person per month at half of the minimum support price given to farmers.
- Please note that the State Government may exclude persons who fulfil the exclusion criteria notified by the Central Government, to be known as the excluded category and such households shall not be entitled to subsidized food grains. However, the bill provides that NOT less than 46% of all rural households shall be designated as Rural Priority Households and 90% of all rural households are entitled to subsidized food grains.
- Similarly, in Urban Areas, not less than 28% of all urban households are categorised as Urban Priority Households and 50% of all urban households are entitled to subsidized food grains.

Issue of the Ration Cards

Please note that every identified household shall receive a ration card which shall be designed to include a clear entitlements page', written in simple words in the official language(s) of the state, with details of foodgrain entitlements as well as helpline numbers and grievance redressal mechanisms. **Here you must note that Ration cards shall be issued in the name of an adult woman member of the family.**

Distribution of the Food

The distribution of the food has to take place via improvised Public Distribution System.

Constitution of National Food Commission

As per the bill, Central Government shall constitute a body known as the National Food Commission, which shall be a body corporate to acquire, hold and dispose of property and to contract.

- It will be consisted of a Chairperson, a Member Secretary and five other Members.
- The headquarters of the National Food Commission shall be at Delhi.
- There shall be not less than two women, one person belonging to Scheduled Castes and one person belonging to the Scheduled Tribes whether from amongst the Chairperson, Member Secretary or Member.

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- Chairperson, Member Secretary and Members shall be **appointed by the President** by warrant under his or her hand and seal.
- A person who is Member of Parliament or Member of the Legislature of any State or Union territory, or holds any other office of profit or connected with any political party shall be disqualified to get inside the food commission.
- The President will get a recommendation of the name by a selection committee that shall be comprised of Prime Minister (as chair), Minister of the Nodal Ministry, The Leader of Opposition, Chairpersons of the National Human Rights Commission, National Commission for Women, National Minorities Commission, National Commission for the Protection of Child Rights, National Commission for Scheduled Caste, and National Commission for Scheduled Tribes.
- A person appointed as a Chairperson/Member shall hold office for a term of three years from the date on which he enters upon his office and shall be eligible for re-appointment for another term of three years.
- The functions would be to inquire into various breaches and monitor the implementation.

State Food Commission

State Government shall constitute a body known as the State Food Commission.

- It will consist of a Chairperson, a Member Secretary and five other Members.
- The Member Secretary shall be the Chief Executive Officer of the State Food Commission. Headquarters of the State Food Commission shall decided by the State Government by notification.
- A person who is Member of Parliament or Member of the Legislature of any State or Union territory, or holds any other office of profit or connected with any political party shall be disqualified to get inside the food commission.
- Chairperson/ Member Secretary and Members shall be appointed by the Governor by warrant under his or her hand and seal.
- The recommendation of the name will be given by a state level selection committee which shall comprise Chief Minister (as chair), Minister concerned of the nodal Ministry , The Leader of Opposition of the Legislative Assembly, Chairpersons of the following state level statutory commissions: State Human Rights Commission, National Commission for Women, State Minorities Commission, State Commission for the Protection of Child Rights, and State Commissions for Scheduled Castes and Scheduled Tribes

Nutrition Standards:

The Nutrition standards for children in the age group of 0 – 14 years, pregnant and lactating women as well destitute persons required to be met whether by providing of take home rations or local and freshly cooked meals in accordance with this Act, are as follows:

Category	Calories (K Cal)	Protein (g)
Children (0 – 6 years)	500	12 – 15
Children (0 – 6 years) who are malnourished	800	20 – 25
Pregnant and Lactating mothers	600	18 – 20
Destitute Persons	1000*	
Primary schools/sections	450^	12
Upper-primary schools/sections	700 ^	20
*** Including 200 grams of cereals. ^ Including 100 grams and 150 grams of food grains, respectively**		

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National Food Security Bill : Important Points

» The Bill seeks to provide subsidized food grains to 75 per cent of the rural population and about 50 per cent of urban households.

» The entitlements would cost the government about Rs. 94,973 crore per annum, as against the existing food subsidy bill estimated at Rs. 67,310 crore.

» The food grains required to be procured to meet the obligations under the Bill is estimated at about 65 million tonnes, up from the average 50 to 55 million tonnes at present.

» The Centre shall set up a National Food Commission and every State government shall constitute a State Food Commission for monitoring and reviewing the implementation of the Act.

» The 'priority' and 'general' beneficiaries and the exclusion criteria shall be prescribed by the Central government. Already identification of rural beneficiaries is being done under a Socio-Economic Caste Census. A similar exercise shall be undertaken for urban beneficiaries.

» The Bill provides for women above 18 years to be considered the head of the beneficiary household for purpose of issue of ration cards.

» The Bill also provides for "food security allowance" from state governments to such beneficiaries who do not receive the entitled quantities of foodgrains or meals.

» The state governments shall identify through anganwadis and provide free meals to children who suffer from malnutrition.

Critical Analysis of the Food Security Bill

Is food security just a concept or is achievable?

There are two main issues. First is availability of food in the market. For which farmers have to produce more. Second is access to food, whether one has or has not the money to buy it. That's what the (food security) Bill aims to achieve.

What should be the approach to ensure food for all?

The National Food Security Bill has a novel concept of conception **to cremation lifecycle approach**. That is why there are different programmes such as the school meal programme, programmes for pregnant women and so on to feed right from conception stage to death. The important issue is to enlarge the food basket through the public distribution system. Not only wheat and rice but nutria-millets such as jowar, ragi, bajra, madua should be included in the PDS.

Secondly, as the bill says that the Ration Cards will be issued in the name of a adult woman, women must be declared head of households for entitlement under the PDS and food security Act. They should be considered in-charge of food security in the family. That is important because women can ensure nutrition from newborns to the eldest in the family.

What are major defects in the Food Security Bill?

The Bill is somewhat defective in some respects. **It calls for selective PDS**. Many argue that there should be universal PDS as is in Tamil Nadu and Kerala. The country should follow the principle of exclusion as against inclusion. Categorization of below poverty line (BPL), above poverty line (APL) and targeted PDS are controversial issues and there is large amount of corruption in such classification. In India, one has to pay money to be a BPL. When the bill becomes an act, there would be such issuing looming larger. There should be transparent criteria to exclude people. For example income tax payers, those who own a car and so on can be excluded from food security provisions. The proposed food security Act is the largest social protection against hunger anywhere in the world. Its success will depend upon how far we are able to reach all those who need food. In the current approach, lots of street children and the destitute will be left out.

How principle of self exclusion is needed?

Besides putting a number of transparent criteria for excluding those from food security, self exclusion should be the guiding principle. The people who do not need food should not ask for it. Even if you include a man who should be excluded doesn't matter. But never should a deserving man be excluded. Freedom from hunger is freedom from corruption. The Bill must be based on a culture of honesty.

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Minimum Support Prices

The Minimum Support Prices were announced by the Government of India for the first time in 1966-67 for Wheat in the wake of the Green Revolution and extended harvest, to save the farmers from depleting profits.

Since then, the MSP regime has been expanded to many crops.

Minimum Support Price is the price at which government purchases crops from the farmers, whatever may be the price for the crops.

How many crops and When?

The MSP is announced by the Government of India for **27 crops** at the beginning of each season viz. Rabi and Kharif. Following are the crops covered by MSP:

- **Cereals :** Paddy, Wheat, Jowar, Bajra, Maize, Ragi, And Barley
- **Pulses :** Moong, Urad, Arhar, Gram, Lentils, And Peas
- **Oilseeds:** Groundnut, Rapeseed And Mustard, Niger Seeds, Soyabean, Sunflower, Sesamum, And Safflower.
- **Fiber Crops :** Cotton And Jute
- **Others :** Sugarcane, VFC Tobacco, Onion, Potato, And Coconut

What is the benefit of MSP?

If there is a fall in the prices of the crops, after a bumper harvest, the government purchases at the MSP and this is the reason that the priced cannot go below MSP. So this directly helps the farmers.

How Government decides MSP?

The government decided the support prices for various agricultural commodities after taking into account the

1. Recommendations of Commission for Agricultural Costs and Prices
2. Views of State Governments
3. Views of Ministries
4. Other relevant factors.

What are the Current MSP?

There are three types of Crops: Rabi, Kharif and Zaid. The following table describes them:

Crop Seasons in India

Type	Sowing	Harvesting	Major Crops
Kharif	July	October	Rice (Paddy), Jowar, Bajra, Maize, Cotton, Sugarcane, Seasamum , Soyabean, Groundnut
Rabi	October	March / April	Wheat, Barley, Gram, Rapeseed, Mustard
Zaid	March	June	Muskmelon, Watermelon, Cucumber etc.

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The Current MSP for Kharif Season was announced in **October 2011**.

Minimum Support Prices : Kharif 2011-12			
Sl.No.	**Commodity**	**Variety**	**2011-12**
1	Paddy	Common	1080
		Grade 'A'	1110
2	Jowar	Hybrid	980
		Maldandi	1000
3	Bajra		980
4	Maize		980
5	Ragi		1050
6	Arhar (Tur)		3200
7	Moong		3500
8	Urad		3300
9	Cotton	F-414/H-777/J34	2800*
		H-4	3300**
10	Groundnut in shell		2700
11	Sunflower seed		2800
12	Soybean	Black	1650
		Yellow	1690
13	Sesamum		3400
14	Niger seed		2900
RABI CROPS (201112 crop to be sold in 201213)			
15	Wheat		1285
16	Barley		980
17	Gram		2800
18	Masur (Lentil)		2800
19	Rapeseed (Mustard)		2500
20	Safflower		2500
21	Toria		2425
OTHER CROPS			
22	Copra	Milling	4525
		Ball	4775
23	Dehusked coconut		1200
24	Jute		1600
25	Sugarcane		139.12
26	Tobacco	Black soil (F2 grade)	
	(Rs. per kg.)	Light soil (L2 grade)	

Every season, the government tried to raise the MSP as per the demands and circumstances.

Prices for Oil Crops & Pulses: Price Support Scheme (PSS)

The above MSP is for food crops. The Department of Agriculture and Cooperation implements the Price Support Scheme for **Oil Seeds and Pulses** through the National Agricultural Cooperative Marketing Federation of India Ltd. (NAFED). NAFED is the nodal procurement agency for Oilseeds and pulses, apart from the Cotton Corporation of India.

So, when the prices of oilseeds, pulses and cotton fall below MSP, **NAFED purchases them from the farmers.**

Price Stabilization Fund Scheme:

The price stabilization fund scheme is for **Tea, Coffee, Rubber and Tobacco**. This scheme was launched in 2003.

Objective: Objective of the Price PSF was to safeguard the interest of the growers and provide them financial relief when prices fall below the a specified level.

Method: The scheme requires enrolment and contribution as enrollment fee. Contribution to the Members' PSF Saving Bank account by the Price stabilization Fund Trust and/or the Member, in a given year is on the basis of categorization of the year as Boom/Normal/Distress year which is done on the basis of a Price Spectrum Band, fixed and announced every year.

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Area Coverage under major Crops

The area under coverage changes from season to season and there is no fixed areas under which the crops are cultivated. However, there is a normal area coverage which is average of the data of many years. The following table shows the average area under cultivation for Kharif Crops.

Crop-wise area sown-kharif

(Area in lakh hectares)

S. No.	Crop	Normal Area	Area Sown		Increase/ decrease over last year (+/-)	Percentage change in 2010-11 as compared to 2009-10
			2010-11	2009-10		
Major cereal crops						
1.	Paddy	395.10	358.64	335.33	23.3	7.0
2.	Jowar	35.98	30.55	30.93	-0.4	-1.2
3.	Bajra	93.29	86.38	85.18	1.2	1.4
4.	Maize	68.65	75.84	70.97	4.9	6.9
Oilseeds						
5.	Groundnut	53.81	49.84	44.65	5.2	11.6
6.	Soyabean	84.00	93.35	95.82	-2.5	-2.6
7.	Sunflower	8.15	2.91	5.85	-2.9	-50.3
8.	Sesamum	17.76	17.06	17.62	-0.6	-3.2
9.	Nigerseed	4.23	3.30	2.85	0.4	15.8
10	Casterseed	7.78	9.05	7.64	1.4	18.5
Pulses						
11.	Arhar	35.53	44.86	36.48	8.4	23.0
12.	Urad	22.82	26.19	23.22	3.0	12.8
13.	Moong	26.14	29.88	24.83	5.0	20.3
14.	Others	23.46	25.12	20.78	4.3	20.9
Other Crops						
15.	Cotton	90.86	108.47	100.09	8.4	8.4
16.	Sugarcane	44.97	50.60	42.02	8.6	20.4
17.	Jute	7.85	7.59	6.92	0.7	9.7

Source: Department of Agriculture & Cooperation (DAC)

Rashtriya Krishi Vikas Yojna

Rashtriya Krishi Vikas Yojana is a special Additional Central Assistance Scheme which was launched in 2007 to orient agricultural development strategies, to reaffirm its commitment to achieve 4 per cent annual growth in the agricultural sector during the 11th plan. It's a Flagship scheme of the UPA government.

Core idea is to **incentivize the States** to provide additional resources in their State Plans over and above their baseline expenditure to bridge critical gaps.

- The total outlay of this scheme is ₹ 25,000 Crore for the 11th plan period in the form of Additional Central Assistance (ACA)
- In 2008-09, the funds worth ₹ 4100 Crore were released for this scheme.
- The Union Budget 2010-11 has made a provision of ₹ 6,722 crore for 'Rashtriya Krishi Vikas Yojana' .
- Rashtriya Krishi Vikas Yojana (RKVY), the biggest scheme in the agriculture sector.
- Areas of Focus of this scheme are Seeds, fertilizers, IPM Testing laboratories, Horticulture, Farm Mechanization, Extension, Crops, Marketing and Cooperatives,, animal husbandry etc.

RKVY in Budget 2010-11

Two new sub-components, budgeted at Rs.700 crore, to be introduced as part of RKVY in the Union Budget 2010-11 have been approved for 2010-11, viz.

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- Special initiative for pulses and oilseeds development in selected pulses/oilseed growing villages as a supplementary programme specifically targeted to rainfed areas and will be implemented on same parameter as ongoing programmes for oilseed and pulses.
- Scheme to bridge yield gap in agriculture in Eastern India. These new subcomponents will be designed by the States in consultation with Government of India, including Department of Agriculture and Cooperation, National Rained Area Authority & Planning Commission and would form part of the approved process of RKVY.

RKVY in Budget 2011-12

The Rashtriya Krishi Vikas Yojana (RKVY) is to be implemented in the 2011-12 with a budget of ₹ 7860 crore and nine sub-schemes. This represents a quantum jump in funds from ₹ 6775 crore in 2010-11 and wide expansion in the scope of the scheme. At present RKVY has nine sub-schemes. Three of the sub-schemes were introduced in 2010-11 and being continued this year also. The sub-schemes are as follows:

1. **Extending Green Revolution to the Eastern Region of the Country:** This sub-scheme gets an allocation of Rs. 400 crore and targets improvement in the rice based cropping systems of Assam, West Bengal, Orissa, Bihar, Jharkhand, eastern Uttar Pradesh and Chhattisgarh.
2. **Integrated Development of 60,000 Pulses Villages in Rainfed Areas:** This sub-scheme aims at attaining self-sufficiency in production of pulses within the next three years. An amount of Rs.300 crores has been proposed to promote 60,000 pulses villages in rainfed areas for increasing crop productivity and strengthening market linkages.
3. **Promotion of Oil Palm:** It seeks to achieve a major breakthrough, special attention will be paid to oil palm as it is one of the most efficient oil crops. Accordingly, an amount of Rs. 300 crores has been provided to bring 60,000 hectares under oil palm plantation, by integrating the farmers with the markets.
4. **Initiative on Vegetable Clusters:** Growing demand for vegetables will be met by a robust increase in the productivity and market linkage. For this purpose, an efficient supply chain will be established, to make quality vegetables available at competitive prices. An amount of Rs.300 crores has been provided for this.
5. **Nutri-cereals:** To promote balanced nutrition, higher production of bajra, jowar, ragi and other millets will be promoted. Additionally, projects will be taken up to upgrade their processing technologies and create awareness regarding their health benefits. This initiative would provide market linked production support to ten lakh millet farmers in the arid and semi-arid regions of the country. The programme would be taken up in 1000 compact blocks covering about 25,000 villages. Outlay for this programme is Rs. 300 crores.
6. **National Mission for Protein Supplements:** This Mission is being launched with an allocation of Rs.300 crores to take up activities to promote animal based protein production through livestock development, dairy farming, piggery, goat rearing and fisheries in selected blocks.
7. **Accelerated Fodder Development Programme:** To accelerate the production of fodder through intensive promotion of technologies to ensure its availability throughout the year, Rs. 300 crores have been provided for Accelerated Fodder Development Programme. It will benefit farmers in 25,000 villages.
8. **Rainfed Area Development Programme:** This programme aims at improving productivity of crops in rainfed areas.
9. **Saffron Mission:** This programme aims at revival of saffron cultivation in Jammu & Kashmir. It gets an allocation of Rs. 105 Crores during 2011-12.

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ISOPOM

The first programme on Oilseeds was launched in 1986 as Technology Mission on Oilseeds (TMO). The core idea was to increase the production and productivity of oilseeds to make the country self-reliant in this vital sector. Later Pulses, Oil Palm & Maize were brought in its ambit in the 1990s. The scheme was later **restructured in 2004** as Integrated Scheme of OilSeeds, Pulses,Oilpalm and Maize (ISOPOM).

- Please note that in February 2010, the Scheme of ISOPOM has been merged with National Food Security Mission. Inclusion of additional programmes such as innovative "Accelerated Pulses Production Programme (A3P)" with nutrient and plant protection centric block demonstrations over 1 million hectares of pulses crop area was also merged in NFSM. Accelerated Pulse Production Programme (A3P) has been launched recently for integrated development of 60000 pulses and oilseeds villages in the rained areas of the country.
- Merger of major schemes of NFSM and ISOPOM would bring in all pulses areas under single umbrella and also provide uniformity in implementation at ground level. The focused efforts would lead to increase in production and productivity of pulses. Implementation of A3P in 1 million hectares is estimated to bring in additional pulses production of 0.5 million tonnes. Innovative development and research projects would also assist in solving the constraints of pulses production, thereby helping in increased pulses production and productivity.

Pulses:

It is being implemented in **14 states of the country** for oilseeds & pulses as follows:
Andhra Pradesh, Bihar, Chhattisgarh, Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, and West Bengal.

Maize:

Under ISOPOM, maize development programmes are under **implementation in 15 states,** i.e., Andhra Pradesh, Bihar, Chhattisgarh, Gujarat, Himachal Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, J&K, Tamil Nadu, U.P., and West Bengal.

Oil Palm:

Under ISOPOM Oil Palm , the programme is being **implemented in the 8 states** of Andhra Pradesh, Karnataka, Tamil Nadu, Gujarat, Goa, Orissa, Kerala, and Mizoram.

National Agricultural Cooperative Marketing Federation of India Ltd

National Agricultural Cooperative Marketing Federation of India Ltd.(NAFED) was established 2nd October 1958. Nafed is registered under the Multi State Co-operative Societies Act. (see text box)

Multi State Cooperative Societies Act 1984

'Cooperative Societies' is a State Subject i.e. they are listed in the State List). So the cooperative societies formed under State Acts have to restrict their activities to only one State. So, this is a road block to Multi State Cooperative Societies. To overcome this hurdle, Multi State Cooperative Societies Act was passed in 1942, which was replaced by a Multi State Cooperative Societies act 1984 . This 1984 Act was later replaced by 2002 Act. This act makes provision for creation of Federal Cooperative Societies.

Nafed was setup with the object to promote Co-operative marketing of Agricultural Produce to benefit the farmers. Agricultural farmers are the main members of Nafed, who have the authority to say in the form of members of the General Body in the working of Nafed.

The Department of Agriculture and Cooperation is implementing a Price Support Scheme (PSS) for the procurement of oilseeds and pulses at the Minimum Support Price (MSP) declared by the Government, through NAFED, which is the central nodal agency for this purpose.

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- NAFED is the national level marketing agency for agricultural products in the Cooperative Sector.

The core objective of NAFED is to organise, promote and develop marketing, processing and storage of agricultural, horticultural and forest produce, distribution of agricultural machinery, implements and other inputs, undertake inter-State, import and export trade, wholesale or retail as the case may be and to act and assist for technical advice in agricultural production for the promotion and the working of its members and cooperative marketing, processing and supply societies in India.

Tribal Cooperative Marketing Development Federation of India - TRIFED

TRIFED is Tribal Cooperative Marketing Development Federation of India Limited (TRIFED). It was established in August 1987 by the then Ministry of Welfare, Government of India, under the Multi State Cooperative Societies Act 1984 (which has now been replaced by the Multi-State Cooperative Societies Act, 2002).

The core objective was institutionalizing the trade of Minor Forest Produce (MFP) and Surplus Agriculture Produce (SAP) collected/cultivated by tribals as tribals are heavily dependent on these natural products for their livelihood. However, they did not use to get remunerative prices due to middle-men and unscrupulous traders exploiting the naiveté of Tribals. TRIFED also works as an agency to the FCI for procurement of Wheat and Rice.

National Rainfed Area Authority (NRAA)

NRAA has been constituted by the government of India to give focused attention to the problem of rain fed areas of the country.

- The NRAA is an advisory, policymaking and monitoring body charged with examining guidelines in various existing schemes and in the formulation of new schemes including all externally aided projects in this area.

Its mandate is wider than mere water conservation and covers all aspects of sustainable and holistic development of rainfed areas, including appropriate farming and livelihood systems approaches. It would also focus on issues pertaining to landless and marginal farmers, since they constitute the large majority of inhabitants of rainfed areas.

The NRAA has formulated common guidelines for the Watershed Development Project and is in consultation with all the States for its implementation as per instructions contained in the guidelines. (Discussed in irrigation Module)

Dr. Ashok Mitra Committee on Input Costs

Dr. Ashok Mitra Committee was a Standing Technical Committee on Indices of Input Costs , which was constituted in 1967. On the recommendation of this committee Comprehensive Scheme for Studying the Cost of Cultivation of Principal Crops in India was launched in 1971. This scheme is for Studying the Cost of Cultivation of Principal Crops in India. The main objectives of the scheme are

- Collection and compilation of field data on Cost of Cultivation and Cost of Production in respect of 28 principal crops and
- Generation of state-wise and crop-wise estimates of Cost of Cultivation (CoC) and Cost of Production (CoP).

Agro-Economic Research (AER) Scheme

The Agro-Economic Research (AER) Scheme was launched in 1954-55 for undertaking research studies on the agro-economic problems of the country.

- The scheme is being implemented through **12 Agro-Economic Research Centers** and 3 Regional Units, which are fully funded by the Government through a Central Sector Plan Scheme.
- These Centers have been established to take up problem-oriented studies on a regional basis, with a view to generating the requisite feedback from the grass roots level, ways and means for improving the effective monitoring of various programmes and schemes implemented by the Ministry, while three

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units undertake interregional and all-India level studies. The centers undertake regional and state-level studies.

- For North East India, the Agro-Economic Research Centre is located in Jorhat, which was was set up in 1960.
- In the last module we studied some basics of the food management in India and some schemes in agriculture.

SEEDS & SEED BILL

Important Seed Terminology

Breeder Seeds:

A breeder is a person who raises plant primary for breeding purpose. A seed or vegetative propagating material directly controlled by the originating or sponsoring plant breeder of the breeding programme or institution (such as seed company or organization) and/ or seed whose production is personally supervised by a qualified plant breeder and which provides the source for the initial and recurring increase of foundation seed is called a Breeder Seed. The breeder uses breeder's seeds for breeding which refers to propagation and genetic modification of the seeds for the purpose of selecting improved offspring's. The breeder is protected by some rights called as Breeder's rights.

- Breeder seed is the primary stage of seed production cycle.
- The Breeder seed is further multiplied into the foundation and certified seeds.
- In India main institution which produced Breeder seeds is Indian Council of Agricultural Research. The other institutions are National Seeds Corporation, States Farms Corporation and agricultural universities in India.
- India faces a short supply of Oil and Pulses Breeder seeds, the efforts to improve supply of oil and pulses seeds are on.

Foundation Seeds

Offspring's of the Breeder seed which can be clearly traced to Breeder seed are called Foundation Seeds. They are further breaded to give rise to certified seeds. The production of the foundation seeds must be acceptable to a certification agency. A person or company who grows and distributes the certified seeds in accordance with the procedure and specifications of the certification agency is called Certified Seed Producer.

- The national Seeds Corporation, State farms Corporation of India (SFCI) have the responsibility to produce foundation seeds which suit to demand of national varieties.
- The State Seed Corporations produce the foundation seeds to suit to local demands.

Certified Seeds:

Certified seed is the progeny of foundation seed and must meet the standards of seed certification prescribed in the Indian Minimum Seeds Certification Standards, 1988. Its production is handled as to maintain specific genetic identity and purity according to the standards prescribed for the crop being certified. In case of self pollinated crops, certified seeds can also be produced from certified seeds provided it does not go beyond three generations from foundation seed stage-I.

- The percentage of area sown out of total area of crop planted in the season by using certified/quality seeds other than the farm saved seed is called Seed Replacement Rate. A better seed replacement rate shows a better utilization of the Certified / Quality Seeds.

Hybrid Seeds:

Hybrid seed is produced by artificially cross-pollinated plants and they are the first generation resulting from crossing of two varieties or parents which are two approved inbred lines or parents , one of which is male sterile.

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India's Seed Production

The Indian Seeds Programme recognizes three generations of seeds, namely, breeder, foundation, and certified Seeds. The following table shows the Seed Production in India in recent years.

Production of breeder, foundation and certified/quality seeds

(Figures in Metric Tons)

Type of Seeds	2005-06	2006-07	2007-08	2008-09	2009-10	2010- 11 (Anticipated)
Breeder Seed production	6865	7382	9196	9441	10604	11,000*
Foundation Seed production	74000	79654	85254	96274	180817*	185000*
Certified / Quality seed Production	1405000	1481800	1943100	2503500	2797200	3213592

All values in tons, Source: Ministry of Agriculture

It is clear from the above table that Certified/Quality seed production has increased from 140.51 lakh quintals during 2006-07 to 279.72 lakh quintals during 2009-2010. The same has increased to 321.3 Lakh Tons in 2010-11.

Seed Act 1966

Seeds Act 1966 was passed by the Parliament in 1966, which created a climate to make good quality seeds available to the cultivators. Under this act Seed rules were framed and notified in September 1968 and the Act was implemented in its entirety in October 1969.

- Systematic Seed Certification started in India in 1969.

The Seeds Act 1966 (section 8). The various aspects and activities of Seed Certification carried out in accordance with Seeds Act. This act provides for

- Establishment of Seed Certification Agency in the state,
- Establishment of Seed certification Board,
- Establishment of Central Seed Committee,
- Establishment of State Seed Testing Laboratories part from making other provisions.
- Please note that to ensure that farmers get suitable certified quality seeds is the responsibility of the State Governments. At present there are 21 state Seed Certification Agencies in the country which carry out the certification of the seeds in India.

National Seeds Policy 2002

The National Seeds Policy 2002 provided a framework for growth of the seed sector in India. The National Seeds Policy 2002 seeks to provide the farmers with a wide range of superior quality of seeds and planting materials.

Following were some of the features of the **National Seeds Policy 2002:**

Thrust Areas:

National Seed Policy 2002 envisages the following 10 thrust areas.

1. Varietal Development And Plant Variety Protection
2. Seed Production
3. Quality Assurance
4. Seed Distribution And Marketing
5. Infrastructure Facilities
6. Transgenic Plant Varieties
7. Import Of Seeds And Planting Material
8. Export Of Seeds

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9. Promotion Of Domestic Seed Industry
10. Strengthening Of Monitoring System

Plant Varieties and Farmers' Rights Authority

India having ratified the Agreement on Trade Related Aspects of the Intellectual Property Rights (TRIPS[2]) has to make provision for giving effect to Agreement. To give effect to the aforesaid objectives the Protection of Plant Varieties and Farmers' Rights Act, 2001 has been enacted in India. This was reiterated in the National Seed Policy 2002 that a Plant Varieties & Farmers' Rights Protection (PVP) Authority as per Protection of Plant Varieties and Farmers' Rights Act, 2001 has to be established. The Plant Varieties and Farmers' Rights Authority works under the Ministry of Agriculture, Government of India.

What is Plant variety Protection?

The breeding activities and exploitation of new varieties are the decisive factors for improving rural income and their overall economic development. Since the process of plant breeding is long and expensive, it is important to provide an effective system of plant variety protection with an aim to encourage the development of new varieties of plants for the benefit of society. A Farmer who has bred or developed a new variety is entitled for registration and other protection under PPV&FR Act, 2001 in the same manner as a breeder of a variety. This protection is provided for 18 years in respect to trees and vines, 15 years for other crops. Any traditionally cultivated plant variety which has undergone the process of domestication / improvement through human interventions can be registered and protected subjected to fulfillment of the eligible criteria.

What is DUS Test?

DUS stands for distinctness, uniformity and stability (DUS) of new varieties of plants for the purpose of granting the Breeders' Right. The new variety should be distinct from the other varieties for at least one characteristic to pass in the DUS test. The authority has DUS monitoring centers. The breeder is required to deposit the seed or propagating material including parental line seeds of registered variety to the Authority. The DUS test is done for a fee of ₹20,000/- and other applicable fees. The person after getting the right can sell the seeds / propagating material in his / her name.

Seeds Bill 2004

In response to the changes that have taken place in the seeds sector, the existing Seeds Act, 1966, is proposed to be replaced by a suitable legislation to:

1. Create a facilitative climate for the growth of the seed industry
2. Enhance seed replacement rates for various crops,
3. Boost the export of seeds and encourage import of useful germplasm,
4. Create a conducive atmosphere for the application of frontier sciences in varietal development and for enhanced investment in research and development.

The highlights of this bill are as follows:

1. The Seeds Bill, 2004 aims to regulate the quality of seeds sold, and replaces the Seeds Act, 1966.
2. All varieties of seeds for sale **have to be registered**. The seeds are required to meet certain prescribed minimum standards.
3. The Bill does not restrict the farmer's right to use or sell his farm seeds and planting material, provided he does not sell them under a brand name. All seeds and planting material sold by farmers will have to conform to the minimum standards applicable to registered seeds.

[2] TRIPS have been discussed in Exim Trade Modules.

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4. If a registered variety of seed fails to perform to expected standards, the farmer can claim compensation from the producer or dealer under the Consumer Protection Act, 1986.
5. The Bill permits self certification of seeds by accredited agencies and allows the central government to recognize certification by foreign seed certification agencies.
6. Every seed producer and dealer, and horticulture nursery has to be registered with the state government

This bill proposes to establish a Central Seed Committee (CSC), which may appoint as many Sub-Committees as needed. One of the sub-committees that would be established is the Registration Sub-Committee, which shall maintain a National Register of Seeds for all varieties of seed. Every state government would establish a State Seed Committee which would have an advisory role. The CSC may, after consulting with state governments, establish a State Seed Certification Agency in the respective states.

What is the Key Concern?

The Bill though protects the right of a farmer to save, use, exchange, share or sell his farm seeds and planting material, yet the farmer cannot sell seeds or planting material under a brand name. Also, all seeds sold by farmers need to **conform to the minimum standards regarding germination, physical purity and genetic purity applicable to registered seeds**. The key issue is that all farmers may not be able to conform to these standards. The antagonists to this bill say that seeds are the only things which a farmer can grow independently and this bill may create the problem for the farmers. This bill is a direct violation of the farmer's fundamental rights to produce, use, save, sell or exchange own seeds, and thus takes away the rights given by Plant varieties and Farmer's rights Protection act.

Amendments to the Seed Bill and Seed Bill 2010

The Government had introduced the Seeds Bill in the Rajya Sabha in December 2004. The Bill was referred to the Parliamentary Standing Committee on Agriculture, which recommended several modifications to the Bill. Accordingly, the Government moved the official amendments to the Seeds Bill 2004 twice, first in December 2008 and then in February 2009 but it was not listed for business in the House.

Then in April 2010, the Government made some amendments to the bill. The present draft of the Seed Bill 2004 which is pending before Rajya Sabha, read together with the amendments proposed by Agriculture Minister Sharad Pawar, will become the new Seed Bill 2010. These amendments are listed in the following table:

Comparison of Seeds Bill, 2004 and the Amendments to Seeds Bill, 2004	
Seeds Bill, 2004	**Amendments to Seeds Bill, 2004**
Exemption of farmers	
The Bill exempted farmers from the requirement of compulsory registration. However, it stipulated that a farmer cannot sell any seed under a brand name and any seed sold by the farmer has to conform to the prescribed minimum limits of germination, physical purity and genetic purity	The issue has been addressed by allowing farmers to sow, exchange or sell his farm seeds and planting material without having to conform to the prescribed minimum limits of germination, physical purity and genetic purity (as required by registered seeds). However, farmers cannot sell any seed under a brand name.
Defines a farmer as any person who cultivates crops either by cultivating the land himself or through any other person but does not include any individual, company, trader or dealer who engages in the procurement and sale of seeds on a commercial basis	Expands the definition of a farmer by including any person who conserves jointly with any person any traditional varieties or adds value to such traditional varieties. Excludes farmers from the definition of producer.
Transgenic varieties	
No transgenic variety of seed would be registered unless the applicant has obtained clearance under the provisions of the Environment (Protection) Act, 1986.	In addition to this requirement, the registered seeds have to conform to specified standards for transgenic events and corresponding traits for transgenic seeds which registered seeds. Also, the label of a seed container has to indicate the above mentioned information.
Allows transgenic variety of seeds to be registered provisionally for two years if it has been cleared under the Environment (Protection) Act, 1986.	This provision has been deleted

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Registration of seeds	
Any type of seed for sale has to be registered with the Registration Sub-Committee. The registration is valid for 15 years for annual/biennial crops and 18 years for long duration perennial crops	Amended the registration time limit. The registration is valid for 10 years for annual/biennial crops and 12 years for long duration perennial crops.
Central Seeds Committee	
Central Seeds Committee may specify minimum standard of germination, physical purity, and genetic purity applicable to registered seed	Amends the clause by stating that the central government may notify minimum standard on recommendation of the Central Seeds Committee
Compensation	
For all registered varieties, seed producers, distributors and vendors have to disclose the expected performance under certain given conditions. If the seed fails to perform to expected standards, the farmer can claim compensation from the dealer, distributor or vendor under the Consumer Protection Act, 1986	Amends the provision by setting up a Compensation Committee where farmers can claim compensation if seeds fail to perform to expected standards
Accreditation of Seed Certification Agencies	
Any seller of seeds can get the seed certified by the State Seed Certification Agency or any other accredited certification agency; self certification may also be permitted to accredited agencies. The accreditation shall be done by the CSC in consultation with state government and state seed committee.	Amends the provision by allowing only organizations owned or controlled by the central or state government to be accredited. The accreditation can be done only by the state government with prior approval of the central government.
Power of Seed Inspector	
The Seed Inspector does not require a warrant to take samples of any variety from a seed seller; send the samples for analysis to the Seed Analyst; enter and search any place where he has reason to believe that an offence has been committed against the provisions of the Act; and break open any container of seeds or any door where any such seed may be kept for sale.	The provision has been amended by adding that the prior written authorization of the District Magistrate is required by the Seed Inspector if he wants to enter and search a place.
Penalties	
The penalty for selling substandard seeds is between Rs 5,000 and Rs 25,000. Increased the range of penalty to be between Rs 5,000 and Rs 30,000. The penalty for giving false information is a prison term up to six months and/or a fine up to Rs 50,000.	Increased the range of penalty to be between Rs 5,000 and Rs 30,000. Increased fine up to Rs. 1 Lakh.
Source: PRS Legislative Research	

Seed Crop Insurance in India

The seed crop insurance scheme has been introduced to provide financial security & income stability to the Seed Growers in the event of failure of seed crop and build confidence in the existing seed growers & stimulate participation of new growers to undertake seed production programme of newly released hybrid/ improved varieties.

- The scheme has been introduced from Rabi 1999-2000.
- This scheme is being implemented by Agricultural Insurance Company of India Ltd.
- This scheme is being implemented in Andhra Pradesh, Gujarat , Haryana , Karnataka , Madhya Pradesh , Maharashtra , Orissa , Punjab , Rajasthan , Uttar Pradesh (10) states of India.
- Wheat, Paddy, Maize, Jowar, Bajra, Sunflower, Cotton, Groundnut, Red Gram, Castor, Bengal Gram, Ragi, Mustard, Black Gram etc.

The scheme covers the following risks:

1. Failure of seed crop either in full or in part due to natural risk
2. Loss in expected raw seed yield.
3. Loss in seed crop after harvest,

National Seed Research and Training Centre

National Seed Research and Training Centre (NSRTC) is located at Varanasi. This institute has been has been notified as a Central Seed Testing and Referral Laboratory (CSTL), with effect from 1 April 2007. The primary objective for establishing the NSRTC is to have a separate National Seed Quality Control Laboratory to serve as CSTL and a referral

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laboratory for courts in India, and also to act as a human resource development centre in the field of seed quality. The CSTL of the NSRTC has become a member laboratory of the International Seed Testing Association (ISTA), Zurich, Switzerland with effect from 2007.

Seed Village Programme

Seed Village Programme aims at upgrading the quality of farm saved seeds. The government has covered about 64,000 villages under this component since inception in 2005-06 and up to 2008-09. An impetus has been provided to this programme in 2009-10. Hence, ₹214 crore has already been released in 2009-10 (up to January, 2010), which is more than twice the amount released in the earlier four years put together. The programme is expected to cover 70,000 villages in the current financial year.

Seed Bank:

The government of India has set up a Seeds Bank in 1999-2000. The core idea is to meet the contingency in seeds demand in the country. The Seeds Bank Scheme is being implemented through National Seeds Corporation, States Farms Corporation of India and 12 State Seeds Corporations in the country.

National Seeds Corporation and the State Farms Corporation of India

The DAC has two central Public Sector Undertakings, namely, the National Seeds Corporation and the State Farms Corporation of India.

National Seeds Corporation was established in 1963, under the control of the Ministry of Agriculture of Government of India. It undertakes production, processing and marketing of agricultural seeds. It's product range include cereals, pulses, oilseed, fodder, fiber and vegetable crops. NSC is the pioneer in the development of India Seed Industry on scientific lines with its involvement in the formulation of seed certification standards. The Head Office is located at Delhi and there are 11 Regional Offices in the state capitals and over 80 area offices located throughout the country.

In 2008-09, the National Seeds Corporation earned a profit after tax of ₹26.54 crore as compared to ₹22.73 crore during 2007-2008, and declared a dividend of ₹1.85 crore @ 9% on the paid-up capital of the corporation. Sales of seeds by the National Seeds Corporation have increased to 9.96 lakh quintals in 2008-2009 from 8.15 lakh quintals in 2007-2008.

State Farms Corporation of India Limited (SFCI) was established in 1969. However, its genesis goes back to 1956 when first mechanized farm in the Thar Desert of Rajasthan was set up with the machinery gifted by erstwhile USSR. The State Farms Corporation of India has achieved a profit after tax of ₹9.77 crores in 2008-2009, as compared to ₹12.29 crore during 2007-2008. The dip in profit is due to a payment of ₹11.84 crore on account of implementation of revised pay scales in the corporation. Seed production has increased to 5.63 (estimated) lakh quintals in 2008-2009, as compared to 4.44 lakh quintal in 2007-2008.

IRRIGATION

Irrigation is one of the most important critical inputs for enhancing the productivity that is required at different critical stages of plant growth of various crops for optimum production. The Government of India has taken up irrigation potential creation 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.

The total irrigation potential in the country has increased from 81.1 million ha in 1991-92 to 102.77 million ha by March 2007.

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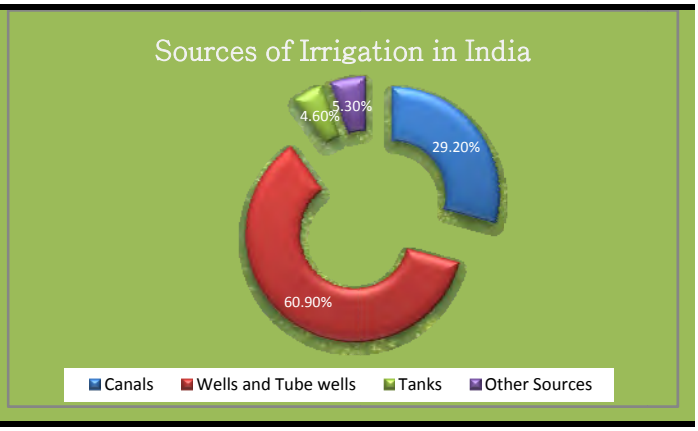
Sources of Irrigation

The area irrigated in India in the pre-plan period was 23 million hectares. The average rate of growth in the created irrigation potential during the I Plan to X Plan is about 1.47 Million Hectares per year. The ultimate irrigation potential has been assessed to be about 139.9 Mha against which creation of irrigation potential of about 102.7 Mha has been reported by the States up to the end of X Plan. Creation of irrigation potential of 5.51 Mha has also been reported during the first three years of XI Plan. The revised target of creation of irrigation potential during XI Plan is about 9.5 Mha. The report of the Task Force on Irrigation constituted by the Planning Commission has assessed that most of the ultimate irrigation potential would be created by XIII Plan. Further, additional irrigation potential of about 35 Mha is also envisaged Inter-Basin Water Transport.

- Around, 45% of the 1750 Lakh hectare of India's total Cropped Area was irrigated by the beginning of this century.
- However, the 9th Plan document says that total irrigated area in the country is **890 Lakh hectares at the end of 1996-97**.
- India has the largest irrigated area in the world. The increase in the irrigation area as well as potential as contributed to the increase in food grains production in India from 51 million tonnes in 1950-51 to 234 million tons in 2008-09.

The area irrigated by sources has been shown in the following table and Graphics:

Source	Percentage
Canals	29.2%
Wells and Tube wells	60.9%
Tanks	4.6%
Other Sources	5.3 %
Total	100 %



States under Tank irrigation:

The Tank irrigation is more in the rocky plateau area of the county, where the rainfall is uneven and highly seasonal. The Eastern Madhya Pradesh, Chhattisgarh, Orissa, Interiors of Tamil Nadu and some parts of Andhra Pradesh have more land under tank irrigation.

States under Canal irrigation:

Canals are second most important source of irrigation in India. The Canals are irrigating those lands which have large plains, fertile soils and perennial rivers. The plains of North India are mostly canal irrigated. Other parts are coastal low lands and some parts of Peninsular India. The states are: Andhra Pradesh, Assam, Haryana, Jammu & Kashmir, West Bengal, Punjab Rajasthan, Bihar, Karnataka, Tamilnadu and UP.

States under Wells Irrigation:

Well Irrigation is common in alluvial plains of the country except the deserts of Rajasthan. Plains of UP, Bihar, Gujarat, Karnataka & Tamil Nadu are the states which are more prominently under the well irrigation.

Classification of the Irrigation Schemes:

The Planning commission has classified the irrigation in India in 3 types:

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1. **Major irrigation Scheme:** Major irrigation schemes are those schemes which have a Culturable Command Areas[3] of More than 10,000 hectares.
2. **Medium irrigation Schemes:** The Medium Irrigation Schemes have a CCA of 2,000-10,000 hectares.
3. **Minor Schemes:** Those with Culturable command areas up to 2000 hectares.

Major and Medium Irrigation (MMI) Projects

For the country as a whole, 66% of the ultimate irrigation potential of major and medium projects has been created. The average rate of creation of irrigation potential through Major and Medium projects from 1951 to 1997 has been found to be of the order of 0.51 Mha per year. During the year 1997 to 2005, the rate for creation has been found to be 0.92 Mah per year. The pace of creation of new irrigation potential through Major and Medium projects has increased in the recent past. This is probably due to fruition of projects started much earlier, which have been expedited due to increased support through AIBP.

Minor Irrigation Schemes

There is considerable variation in creation of irrigation potential through minor irrigation (both surface and ground water) schemes from State to State. While full potential through minor irrigation has been tapped in some of the States, it is relatively very low in others. The Report of the National Commission for Integrated Water Resources Development points out that the carrying capacity of tanks has decreased over time for a variety of reasons and that the restoration and renovation of tanks and other local sources is a priority task. Since 2004-05, a pilot scheme for "repair, renovation and restoration of water bodies directly linked to agriculture" has been taken up by the Government as a state-sector scheme in the 16 districts of the country which is proposed to be expanded.

Irrigation Potential of the Country

In all the five year plans considerable importance has been given to the creation of additional irrigation potential in the country. When five year planning started in our country, the irrigation potential was 23 million hectares which included 10 million hectares from major and medium irrigation works and 13 million hectares from the minor irrigation works.

The ultimate irrigation potential for the country has been assessed to be about **139.9 million hectare.** As per the available information, about 105.8 Mha of irrigation potential has been created so far.

Total area under irrigation varies from year to year. As per the Land Use Statistics of Ministry of Agriculture, gross irrigated area and net irrigated area during 2006-07 have been estimated to be 85.8 Mha and 60.9 Mha respectively.

Total irrigation potential created during 2005-09 is 6.71 Mha. The Maximum Irrigation Potential was created for Uttar Pradesh.

Command Area Development Programme

The planned development of irrigation sector started in a big way since the First Five Year Plan (1951–56). New projects were taken up in the Second Five Year Plan, the Third Five Year Plan, and the Annual Plans 1966–69. During the Fourth Five Year Plan emphasis was shifted to the completion of ongoing schemes.

- The widening gap between potential creation and utilization was felt in the Fifth Plan (1974– 78) and accordingly Command Area Development (CAD) programme was launched.
- The Command Area development programme was launched in 1974-75 as a centrally sponsored scheme and its main objective was to improve the utilization of the created irrigation potential and optimizing the agricultural

[3] Cultural command area is the basis for the design of water course and basis for the design of an irrigation project. It is the proportion of the Gross Command Area which is Culturable and cultivable.

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production and productivity from the irrigated lands. A multidisciplinary team was given this responsibility under the Area Development Authority.

This programme was restructured and renamed as Command Area Development and Water Management Programme (CADWMP) since April 1, 2004.

- The overall outlay for XI Plan for major and medium irrigation, minor irrigation, flood control and command area development sectors under State Plan and Central Plan are Rs. 1, 82,050 crores and Rs. 50,261 crores respectively.
- As of August 2010, 145 projects are on-going under Command Area Development and Water Management (CADWM) Programme in the country.
- The Government has also launched a 'Reclamation of Water-Logged Area Scheme' under the programme. So far, 579 proposals of 'Reclamation of Water-Logged Area Scheme' have been approved.

Irrigation in Bharat Nirman

Irrigation is one of the 6 components of Bharat Nirman.

Bharat Nirman envisaged 10 million hectares of additional irrigation capacity to be created by 2009 as follows:

Irrigation in Bharat Nirman		
Goal		Target
Completion of ongoing Major & medium Irrigation Projects		4.2
Minor irrigation schemes		2.8
Enhancing utilization of completed projects 2.0 Mha		2.0
Ground water development in area with unutilized ground water potential (for benefit of small and marginal farmers and Tribals & Dalits)		1.0
All Values Million Hectares. Source: Bharat Nirman Document	**Total**	10.0

Accelerated Irrigation Benefits programme

- **AIBP is a Programme of Ministry of Water Resources not Agriculture.**

The Accelerated Irrigation Benefits programme (AIBP) was launched in 1996-97. This programme extends financial assistance to the States for completion of identified ongoing irrigation projects. As per the present pattern of assistance under the AIBP, the Centre is providing only the grant component of the Central Assistance and States are arranging the loan component. The AIBP has to now meet the demands of the Bharat Nirman programme under which a major thrust on irrigation is included.

Accordingly the guidelines were changed in 2006 and an enhanced assistance of 90% of the cost was approved to be granted to special category states, Drought Prone Area Programme (DPAP), Tribal Area/ flood Prone areas and Koraput-Balangir-Kalahandi (KBK) states of Orissa.

- Total Outlay in 11th Plan under Accelerated Irrigation Benefits programmes (AIBP) is Rs. 43700 crores.

Micro Irrigation & National Mission on Micro Irrigation (NMMI)

A Centrally sponsored scheme on micro irrigation (MI) was launched in January 2006 for promoting water-use efficiency by adopting drip and sprinkler irrigation. All States and Union Territories and all horticultural as well as agricultural crops are covered under the scheme. The National Committee on Plasticulture Applications in Horticulture (NCPAH) provides the required technical guidance in association with Precision Farming Development Centers (PFDCs) at 22 locations. The PRIs are involved in selecting the beneficiaries. Since its inception, about 10 lakh ha has been covered under drip and sprinkler irrigation and a sum of ₹ 1425.23 crore has been released as Government of India share (40 per cent of the total cost) in the scheme.

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⇒ The technology involves irrigating crops at the root zone as per the crop requirement comprising drip and sprinkler systems. This technology greatly enhances water use efficiency and can also be used for fertilizer application.

⇒ Since the inception of the Scheme, an area of 17.92 lakh hectare has been brought under micro irrigation in 18 States by utilizing Rs.2013.39 crore as the central share.

⇒ MIS comprises 40% as Central share, 10% as State Government share and 50% as the beneficiary's share.

⇒ In June 2010, the Cabinet Committee on Economic Affairs approved the implementation of the existing Micro Irrigation Scheme (MIS) as the **National Mission on Micro Irrigation** (NMMI) during the Eleventh Plan period with an outlay of ₹ 8032.90 crore, of which ₹ 3409.26 crore will be contributed by the Department of Agriculture and Cooperation (DAC) as Central share comprising 40% subsidy for general farmers and 50% subsidy for small and marginal farmers.

⇒ This decision has been taken on the basis of recommendations of a Task Force on Micro Irrigation constituted by the Government of India.

✍ This Mission will result in 2.85 million hectare to be brought under micro irrigation; savings in use of irrigation water, fertilizer and electricity; increase in production and productivity of crops; convergence with other ongoing schemes of DAC and other Ministries on creation of water harvesting structures and linking the same with Micro Irrigation system for higher water use efficiency and enhanced return to the farmers.

National Rainfed Area Authority (NRAA)

The Union Government has constituted a National Rainfed Area Authority on 3 November, 2006 to give focused attention to the problems of rainfed areas of the country. The Authority is an advisory, policymaking and monitoring body charged with examining guidelines in various existing schemes and in the formulation of new schemes including all externally aided projects in this area. Its mandate is wider than mere water conservation and covers all aspects of sustainable and holistic development of rainfed areas, including appropriate farming and livelihood systems approaches. It would also focus on issues pertaining to landless and marginal farmers, since they constitute the large majority of inhabitants of rainfed areas. The NRAA has formulated common guidelines for the Watershed Development Project and is in consultation with all the States for its implementation as per instructions contained in the guidelines. The Authority has published the Common Guidelines for Watershed Development Projects with a fresh framework for next generation watershed programmes.

The NRAA has a two tier structure. The first tier is the Governing Board that provides necessary leadership and appropriate coordination in implementation of programmes. The Governing Board is chaired by Union Agriculture Minister and co-chaired by Union Minister of Rural Development. The second tier is the Executive Committee consisting of technical experts and representatives from stakeholder Ministries. The Executive Committee is headed by a full time Chief Executive Officer who should be a recognized expert on the subject. The CEO is supported by five full-time technical experts. The Authority is serviced by the Ministry of Agriculture and is located at Delhi.

Mandate:

The Authority's mandate is wider than mere water conservation and covers all aspects of sustainable and holistic development of rainfed areas, including appropriate farming and livelihood system approaches. Issues pertaining to landless and marginal farmers, who constitute the large majority of inhabitants of rainfed areas, are to be addressed by the Authority.

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The mandate of the Authority includes:

1. To prepare a perspective plan, outlining the national strategy and road map for holistic and sustainable development of rainfed farming areas.
2. To evolve common guidelines for all schemes of different Ministries, including EAPs for development of Rainfed/Dry land Farming systems.
3. To coordinate and bring convergence within and among agricultural and wasteland development programmes being implemented in rainfed areas of the country.
4. To identify rainfed areas in different States which need priority attention and prepared watershed development programmes for integrated natural resource management in consultation with States, focusing on multi dimensional crop, livestock, horticulture, agri-pasture integrated systems and programmes for landless farming communities.
5. To identify gaps in input supply, credit availability, dissemination of appropriate technology and other requirements relevant for rainfed areas.
6. Guide the implementing agencies on priority setting and monitor the specific interventions required.
7. To develop plans/programmes for capacity building of Centre/State Government functionaries in rainfed areas.
8. To suggest modalities to strengthen National and State Level Institutions concerned with Rainfed/Dryland areas, and establish institutional linkages with prioritized watersheds.
9. Monitor disbursement of rural credit/insurance cover/safety net programmes developed for rainfed areas.
10. Set the research agenda including a critical appraisal of on-going programmes and promote diffusion of required knowledge for integrated farming in rainfed areas to district and lower level authorities.
11. To evaluate the effectiveness of completed watersheds and concurrent evaluation of on-going programmes.

Integrated Watershed Management

Three World Bank assisted integrated watershed management projects are being implemented in **Uttarakhand, Himachal Pradesh and Assam** under the supervision of Ministry of Agriculture. The World Bank gives funds for these projects directly to State Governments.

Other Watershed Development programs

A German Technology Cooperation (GTZ) assisted project for decentralized watershed development is being implemented in Karnataka, Rajasthan and Uttarakhand on a pilot basis. It aims at capacity development system for watershed management at the regional and state level. A national consortium comprising Ministry of Agriculture, GTZ, International Crops Research Institute for Semi-Arid Tropics (ICRISAT) and the National Institute of Agricultural Extension Management (NIAEM) have been constituted to achieve the objectives of the project.

NABARD's Watershed Development Fund (WDF) is utilized for creating necessary framework to replicate and consolidate isolated but successful initiatives under different programmes in the Government, semi-government and NGO sectors. Initially, 18 states were identified for the project but ultimately only 13 states came forward.

In 2006, after Prime Minister's Rehabilitation Package to 31 distressed districts in Andhra Pradesh, Karnataka, Kerala and Maharashtra, it was decided to implement participatory watershed development programmes in all these districts through WDF. At present, 1,196 watersheds have been selected, out of which 416 are in non-distressed districts of 13 states and 780 in 31 distressed districts under the PM's package.

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Animal Husbandry

Animal Husbandry and Dairying play an important role in development of India's economy. Animal Husbandry, Dairying and Fisheries sectors play an important role in the national economy and in the socio-economic development of the country. These sectors also play a significant role in supplementing family incomes and generating gainful employment in the rural sector, particularly, among the landless laborers, small and marginal farmers and women, besides providing cheap nutritional food to millions of people.

- Livestock are the best insurance against the vagaries of nature like drought, famine and other natural calamities.

Contribution to the Economy & Agriculture Sector

As per Central Statistical Organization (CSO) estimates, the value of output from livestock and fisheries sectors together at current prices was about Rs. 2,82,779 crore during 2007-08 (Rs.2,40,601 crore for livestock sector and Rs.42,178 crore for fisheries),which is about **31.6 per cent of the value of output of Rs.8,94,420 crore from Agriculture & Allied Sectors**. The contribution of these sectors to the total GDP during 2007-08 was 5.21%.

- ★ The livestock and fisheries sector contributed over 4.07 per cent of the total GDP during 2008-09 and about 26.84 per cent value of output from total agriculture and allied activities.
- ★ The Eleventh Five Year Plan envisages an overall growth of 6-7 per cent per annum for the sector.
- ★ In 2008-09, this sector contributed 108.5 million tonnes of milk, 55.6 billion eggs, 42.7 million kg wool and 3.8 million tonnes of meat.
- ★ The 17th Livestock Census (2003) has placed the total livestock population at 485 million and total of poultry birds at 489 million.

Employment Generation by Animal Husbandry

Animal Husbandry sector provides large self-employment opportunities. According to the National Sample Survey Organization's latest survey (NSS 61st round) 5.5% of the workforce in the country was engaged in Animal Husbandry sector in 2004-05. The total employment in Animal Husbandry and Fisheries is around 5.80%.

Contribution of Livestock Sector to the Food Basket

Livestock Sector not only provides essential proteins and nutritious human diet through milk, eggs, meat etc., but also plays an important role in utilization of non-edible agricultural by-products. Livestock also provides raw material by-products such as hides, skin, blood, bone, fat etc during 2007-08.

The contribution of milk alone (Rs.1, 62,136 crore) was higher than paddy (Rs.95,038 crore), wheat (Rs.71,579 crore) and sugarcane (Rs.33,691 crore).

The value of output from meat group as per the estimates of Central Statistical Organization (CSO) at current prices in 2007-08 was Rs. 40,399 crore.

- Total export earnings from livestock, poultry and marine products was Rs. 16,277 crore during 2007-08 (Rs.8,656 crore from livestock & poultry and Rs. 7,621 crore from marine products

Livestock resources & Population

India has vast resources of livestock and poultry, which play a vital role in improving the socio-economic conditions of the rural masses. India ranks

- first in respect of buffalo,
- Second in cattle & goats,
- Third in sheep,
- Fourth in ducks,
- Fifth in chickens

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- Sixth in Camel population in the world.
- India has 57% of the world's buffalo population.

The following table shows India's Livestock Population:

S. No.	Species	Livestock Census	
		1997	2003
1	2	3	4
1	Cattle	198.9	185.2
2	Buffalo	89.9	97.9
3	Yaks	0.06	0.07
4	Mithuns	0.18	0.28
	Total Bovines	289.0	283.4
5	Sheep	57.5	61.5
6	Goat	122.7	124.4
7	Pigs	13.3	13.5
8	Other animals	2.8	2.2
	Total Livestock	485.4	485.0
9	Poultry	347.6	489.0

Source: Department of Animal Husbandry, Dairying and Fisheries, values in millions

- The above table makes it clear that India had 283.4 million total bovines in 2003 census out of which the largest share was of Cattle.
- Total Population of Goats is more than that of sheep.
- India's Total Livestock was 489 million in 2003.

India's Milk Production

India ranks first in world milk production, its production having increased from 17 million tonnes in 1950-51 to 108.5 million tonnes by 2008-09. The per capita availability of milk has increased from 112 grams per day in 1968-69 to 258 grams per day in 2008-09, but is still low compared to the world average of 265 grams per day. The following Table shows this comparison:

India's per capita Milk Availability		
Year	Per capita Gms per day	Production Million Tones
1990-91	176	53.9
2000-01	220	80.6
2005-06	241	97.1
2006-07	246	100.9
2007-08	252	104.8
2008-09	258	108.5
Source: Economic Survey 2009-10		

- About 80 per cent of milk produced in the country is handled in the unorganized sector.
- Remaining 20 per cent is equally shared by cooperatives and private dairies.
- Over 1.33 lakh village-level dairy cooperative societies, spread over 265 districts in the country, collect about 25.1 million liters of milk per day and market about 20 million liters.

The efforts of the Government in the dairy sector are concentrated in promotion of dairy activities in non-Operation Flood areas with emphasis on building cooperative infrastructure, revitalization of sick dairy cooperatives and federations and creation of infrastructure in the States.

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National Dairy Development Board (NDDB)

National Dairy Development Board, located at Anand, Gujarat, is a premier institution in Dairy Sector in India. National Dairy Development Board (NDDB) was created in 1965, fulfilling the desire of the then Prime Minister of India - the late Lal Bahadur Shastri - to extend the success of the Kaira Cooperative Milk Producers' Union (Amul) to other parts of India. It was set up by Dr. Verghese Kurien to accelerate the pace of dairy development on cooperative lines in the country.

Dr. (Ms.) Amrita Patel is the Chairperson of the Board since 26th November 1998.

The NDDB has drafted a proposed **National Dairy Plan** (NDP), on the basis of which the Department of Animal Husbandry and Dairying of the Government of India has concluded a series of high level consultations with 14 major dairying states (accounting for more than 90 percent of India's milk production) on initiatives to launch a scientifically planned programme to increase bovine productivity and milk production.

National Dairy Plan

The National Dairy Plan is a programme aimed at increasing milk production through higher productivity and enhancing the incomes of rural milk producers by providing them improved access to the organized milk sector.

As in the case of Operation Flood, the NDP is proposed to be implemented by NDDB as a multi state focused initiative in phases with financial assistance largely from the World Bank.

- The first phase (NDP- I) would be from April 2011 to March 2017.

IDA credit, a soft loan (interest free) repayable over 35 years, is being proposed for funding activities related to increasing bovine productivity, expanding coverage of milk producers and procurement and human resource development. However, during the consultations, all the states underlined the need for financial assistance to be provided only as a grant, not a loan. The Central Government is to take a decision in this regard. Considering the interest shown by the states in the consultations and the urgent need to expedite action to increase milk productivity and milk production to meet the rapidly growing demand, NDDB would now prepare Detailed Project Reports for five to six states to begin with. Once the Government of India and the World Bank approve the projects, implementation will commence.

Operation Flood

Operation Flood was started by National Dairy Development Board (NDDB) in 1970s. The objective of this programme was to create a nationwide milk grid. The result was that India became the largest producer of Milk and Milk Products.

Operation flood is called White Revolution of India.

White Revolution followed the Green Revolution and both these revolutions contributed to a large extent to alleviate poverty from India. Gujarat-based co-operation "Anand Milk Union Limited" (Amul) was the engine behind the success of the programme.

- Amul was founded by Tribhuvandas Patel and Verghese Kurien was the chairman of NDDB. Dr. Verghese Kurien, who was then 33, gave the professional management skills and necessary thrust to the cooperative, and is considered the architect of Operation Flood.

His work has been recognized by the award of a Padma Bhushan, the Ramon Magsaysay Award for Community Leadership, the Carnegie-Wateler World Peace Prize, and the World Food Prize

Intensive Dairy Development Project (IDDP)

There were some areas in the country which remained untouched by the Operation Flood and its effects. The 'Integrated Dairy Development Project' (IDDP) was launched in the Non-Operation Flood, Hilly and Backward Areas' in 1993-94 on 100% grant-in-aid basis. The main objectives of the scheme are as under:

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1. Development of milch cattle
2. Increasing milk production by providing technical input services
3. Procurement, processing and marketing of milk in a cost effective manner
4. Ensure remunerative prices to the milk producers
5. Generate additional employment opportunities
6. Improve social, nutritional and economic status of residents of comparatively more disadvantaged areas.

Please note that the Intensive Dairy Development Project was modified in March, 2005. The modified scheme has been named as '**Intensive Dairy Development Programme** (IDDP)' and is being implemented in hilly and backward areas and also in districts, which received less than Rs.50.00 lakh for dairy development activities under Operation Flood programme. The funds under the revised scheme are released directly to the implementing agencies (State Milk Federations/Unions) and the projects are implemented by the State Milk Federations/Unions in view of their expertise and professionalism. There is no discrimination of gender and class under the scheme.

Central Herd Registration Scheme

Central Herd Registration Scheme is for registration of elite cow and buffalo breeds of national importance and provides incentive for rearing of elite cows and male calves. It plays a vital role in sourcing indigenous germplasm required for the National Project for Cattle and Buffalo Breeding. The scheme has a significant role in assisting the Department of Animal Husbandry of States and Union Territories, Private Sector and Government Undertakings in procuring elite dairy cows and buffaloes as well as bulls and progeny of high genetic potential for use in the development programme.

Veterinary Council of India

Veterinary Council of India is a corporate body under the Indian Veterinary Council Act, 1984. At present, 25 States and all UTs have adopted the Indian Veterinary Council Act, 1984. Veterinary Council of India regulates veterinary education by developing syllabus and licensing veterinary institutes to maintain uniform standards of activity across the country.

National Project for Cattle & Buffalo Breeding

Genetic improvement in bovines is a long-term activity and Government initiated a major programme 'National Project for Cattle and Buffalo Breeding' (NPCBB) in October 2000 for a period of ten years, to be implemented in two phases, with an allocation of Rs.402 crore for Phase-I. The Project envisages genetic up-gradation on priority basis. The project also has its focus on the development and conservation of important indigenous breeds. The project provides 100% grant-in-aid to the State Implementing Agencies (SIAs). The objectives of the scheme are:

1. To arrange delivery of vastly improved artificial insemination (AI) service at the farmers' doorstep;
2. Bring all breedable females among cattle and buffalo under organized breeding through artificial insemination or natural service by high quality bulls within a period of 10 years;
3. Undertake breed improvement programme for indigenous cattle and buffaloes so as to improve the genetic makeup as well as their availability.

This was a 10 years project in two phases. The allocation for Phase I was ₹ 442 Crore and for the second phase was ₹ 775.9 Crore. This scheme is currently in phase II and is valid up to December 2010.

Phase-II of NPCBB has been formulated taking into account recommendations of the evaluating agency (NABARD) and initiated in December 2006 with an allocation of Rs. 775.87 crore for a duration of five years from 2006-07 to 2010-11.

A major new component of Phase-II is **bull production programme**.

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India is well known for world famous Murrah buffaloes. Murrah buffaloes are high milk producers with high fat content in addition to being efficient feed converters even when fed poor quality roughages. Murrah is the breed of choice in various parts of the country as well as broad in order to upgrade non-descript population in different states of India and also to upgrade the locally available low producing buffaloes in various countries e.g. Brazil, Italy, Philippines and Bulgaria. In spite of having best genetic resources, the productivity of Murrah buffaloes has not increased, as expected, mainly because of negative selection pressure due to poor acceptability of artificial insemination among buffalo population, availability of poor quality of sires at semen stations and use of bulls with unknown genetic potential under natural service. This situation has left the Murrah population in a state of genetic stagnation. In order to develop buffalo population, Murrah bull production programme with an allocation of Rs 128.28 crore has been taken up in Phase-II.

FISHERIES

India's Fish Production & Export

Fisheries sector occupies a very important place in the socio-economic development of the country. It has been recognized as a powerful income and employment generator as it stimulates growth of a number of subsidiary industries, and is a source of cheap and nutritious food besides being a foreign exchange earner. Most importantly, it is the source of livelihood for a large section of economically backward population of the country. The main challenges facing fisheries development in the country includes accurate data on assessment of fishery resources and their potential in terms of fish production, development of sustainable technologies for fin and shell fish culture, yield optimization, harvest and post-harvest operations, landing and berthing facilities for fishing vessels and welfare of fishermen.

Fish production in India has increased from 7.1 million tonnes in 2007-08 to 7.6 million tonnes in 2008-09. Fishing, aquaculture and allied activities are reported to have provided livelihood to over 14 million persons in 2006-07 apart from being a major foreign exchange earner. The following presents the data:

India's Fish Production (In Lakh Tonnes)			
Year	Marine	Inland	Total
1991-92	24.47	17.10	41.57
1992-93	25.76	17.89	43.65
1993-94	26.49	19.95	46.44
1994-95	26.92	20.97	47.89
1995-96	27.07	22.42	49.49
1996-97	29.67	23.81	53.48
1997-98	29.50	24.38	53.88
1998-99	26.96	26.02	52.98
1999-00	28.52	28.23	56.75
2000-01	28.11	28.45	56.56
2001-02	28.30	31.26	59.56
2002-03	29.90	32.10	62.00
2003-04	29.41	34.58	63.99
2004-05	27.78	35.26	63.04
2005-06	28.16	37.55	65.71
2006-07	30.24	38.45	68.69
2007-08	29.29	42.07	71.26
2008-09	29.78	46.38	76.16

There has been steady growth in the export of fish Products. During 2009-10 the country exported 6.64 lakh tonnes of marine products, which resulted in export earning of Rs. 9921.46 crore. Efforts are being made to boost the export potential through diversification of products for export. The country has now started exports of frozen squid, cuttle fish and variety of other finfishes.

Under the Centrally Sponsored Scheme for development of infrastructure of marine fisheries the Government of India has sanctioned 7 major fishing harbours, 58 minor fishing harbours and 189 fish landing centres. Out of these, 7 Major

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Fishing Harbours , 44 Minor Fishing Harbours and 189 Fish Landing Centres have been completed and put to use. The remaining fishing harbours and fish landing centres are at various stages of construction.

Export of marine production during April - March 2010-11 have achieved the US$ 2.67 billion mark by registering a growth of 10.96% in quantity and 20.42% in Rupee value and 25.55% in US$ realisation compared to the same period of last year. This was for the first time in the history of India's Marine Products Industry that the export figures are crossing the US$ 2.5 billion mark.

National Fisheries Development Board (NFDB)

National Fisheries Development Board (NFDB) was set up in September 2006 with its headquarter at Hyderabad to realize the untapped potential of fisheries sector, fish culture, processing & marketing of fish, application of modern tools of research & development₹ for optimizing production and productivity in fisheries. The mandate was to give focused attention to the development of the fisheries sector and to meet the aspirations of the fishing industry.

The National Fisheries Development Board (NFDB), ever since its inception in 2006, has been executing various programmes to enhance the national fish production and to augment the fish processing and marketing infrastructure in the country.

- The national fish production is increasing and is expected to reach the 10.0 million tonnes by 2012.
- Though, the 11th plan had put an ambitious target of 10.0 million tons fish production by the end of the plan period.

The NFDB organizes Fish Festivals every year. One such festival, "Indian Fish Festival (INFISH-2009)" was a big success. In 2010 also NFDB organized INFISH 2010 from 9th to 12th July, 2010 at Hyderabad. Besides exhibition of aquarium fishes, there was a focus on value added fish products and fish technologies. This would be a great occasion to interact with scientists, officials, farmers and private entrepreneurs alike.

The Board, in collaboration with the Marine Products Development Authority (MPEDA), Central Institute of Brackish Water Aquaculture and the Coastal Aquaculture Authority (CAA), is establishing a quarantine facility at Chennai for testing SPF Brood Stock of White Prawn i.e. L. Vannamei.

Coastal Aquaculture Authority

The Coastal Aquaculture Authority Bill, 2005 passed by both the Houses of Parliament became an Act as notified on 23.06.2005 in the Official Gazette. Rules framed under the Act were notified in the Gazette on 22.12.2005. The composition of Coastal Aquaculture Authority under the Chairmanship of Justice A.K.Rajan was notified on 22.12.2005.

POULTRY

Poultry continues to be one of the fastest growing segments of the agricultural sector in India today. The growth rates of egg production during last two to three years for eggs and poultry meat are averaging at nearly 6% and 9% annually respectively. In India, poultry sector growth may be attributed to many factors like rising incomes and a rapidly expanding middle class, together with the emergence of vertically integrated poultry producers that have reduced consumer prices by lowering production and marketing costs. Integrated production, market transition from live birds to chilled and frozen products, and policies that ensure supplies of competitively priced corn and soybeans are keys to future poultry industry growth in India. Further, disease surveillance, monitoring and control will also decide the fate of this sector. Concurrently, India's unorganised and backyard poultry sector is also one of the potent tool for subsidiary income generation for many landless/ marginal farmers and also provides nutritional security to the rural poor. The poultry population in the country is around 648 million and the egg production of the country is 59.84 billion (2009-10 estimates) and 61.45 billion numbers anticipated achievement in 2010-11 as per Animal Husbandry Statistics.

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The poultry meat production is estimated to be 2.03 million metric tonnes as per 2009-10 estimates. Exports of poultry products are currently at around 372 Crores in 2008-09 as per available data from Agricultural and Processed Food Products Export Development Authority (APEDA). Poultry plays an important role in providing livelihood support and food security, especially to the rural population.

India's Egg Production:

- India produces more than 55.6 billion eggs per year, with **per capita availability of 47 eggs per annum.**
- As per the estimate provided by the Food and Agriculture Organization (FAO) for 2008, the annual chicken meat production in India is around 2.49 million tonnes.
- The value of exports was around Rs 422 crore during 2008-09. Eggs and poultry are among the cheaper source of animal protein.

During 2009-10, a new centrally sponsored Poultry Development Scheme with an outlay of Rs 150 crore was launched. The scheme, through its Rural Backyard Poultry Development component is expected to cover below poverty line (BPL) sections of the society to help them gain supplementary income and nutritional support. In order to encourage entrepreneurship skills of individuals, a Poultry Venture Capital Fund is also being implemented covering various poultry activities.

HORTICULTURE

Horticulture involves eight areas of study, which can be grouped into two broad sections - ornamentals and edibles. The branches of horticulture are as follows:

- **Arboriculture**: Study of, and the selection, planting, care, and removal of, individual trees, shrubs, vines, and other perennial woody plants.
- **Floriculture:** Production and marketing of floral crops.
- **Landscape horticulture: P**roduction, marketing and maintenance of landscape plants.
- **Olericulture:** Includes the production and marketing of vegetables.
- **Pomology:** Production and marketing of fruits.
- **Viticulture:** Production and marketing of grapes.
- **Oenology:** All aspects of wine and winemaking.
- **Postharvest: M**aintaining the quality of and preventing the spoilage of horticultural crops.

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India's Horticultural Production

India is bestowed with varied agro-climate, which is highly favourable for growing a large number of horticultural crops. The following table shows the area and production of horticultural production in the country.

AREA AND PRODUCTION ESTIMATES FOR HORTICULTURE CROPS

Area in 000 HA, Production in 000 MT and Productivity = MT/HA

	2007-08			2008-09			2009-10		
	AREA	PRODUCTION	PDY.	AREA	PRODUCTION	PDY.	AREA	PRODUCTION	PDY.
Fruits									
Banana	658	23823	36.2	709	26217	37.0	770	26470	34.4
Mango	2201	13997	6.4	2309	12750	5.5	2312	15027	6.5
Citrus	867	8015	9.2	924	8623	9.3	987	9638	9.8
Papaya	83	2909	35.1	98	3629	37.1	96	3913	40.9
Guava	179	1981	11.1	204	2270	11.1	220	2572	11.7
Apple	264	2001	7.6	274	1985	7.2	283	1777	6.3
Pineapple	80	1245	15.5	84	1341	16.0	92	1387	15.1
Sapota	152	1258	8.3	156	1308	8.4	159	1347	8.5
Grapes	68	1735	25.4	80	1878	23.6	106	881	8.3
Pomegranate	124	884	7.2	109	807	7.4	125	820	6.6
Litichi	69	418	6.1	72	423	5.9	74	483	6.5
Others	1112	7321	6.6	1083	7234	6.7	1105	7201	6.5
Fruits-Total	**5857**	**65587**	**11.2**	**6101**	**68466**	**11.2**	**6329**	**71516**	**11.3**
Vegetables									
Potato	1795	34658	19.3	1828	34391	18.8	1835	36577	19.9
Tomato	566	10303	18.2	599	11149	18.6	634	12433	19.6
Onion	821	13900	16.9	834	13565	16.3	756	12159	16.1
Brinjal	561	9678	17.2	600	10378	17.3	612	10563	17.2
Tapioca	270	9056	33.6	280	9623	34.3	232	8060	34.8
Cabbage	266	5910	22.2	310	6870	22.1	331	7281	22.0
Cauliflower	312	5777	18.5	349	6532	18.7	348	6569	18.9
Okra	407	4179	10.3	432	4528	10.5	452	4803	10.6
Peas	313	2491	8.0	348	2916	8.4	365	3029	8.3
Sweet Potato	123	1094	8.9	124	1120	9.0	119	1095	9.2
Others	2414	31402	13.0	2275	28006	12.3	2300	31168	13.6
Veg.-Total	**7848**	**128449**	**16.4**	**7981**	**129077**	**16.2**	**7985**	**133738**	**16.7**
Aromatic	397	396	1.0	430	430	1.0	509	573	1.1
Almond/Walnut	132	177	1.3	136	173	1.3	142	193	1.4
Flowers Loose	166	868		167	987		183	1021	
Flowers Cut*		43644			47942			66671	
Plantation Crops	3190	11300	3.5	3217	11336	3.5	3265	11928	3.7
Spices	2617	4357	1.7	2629	4145	1.6	2464	4016	1.6
Mushroom		37			37			41	
Honey		65			65			65	
Grand Total	**20207**	**211235**	**10.5**	**20662**	**214716**	**10.4**	**20876**	**223089**	**10.7**

Source: National Horticulture Database 2010

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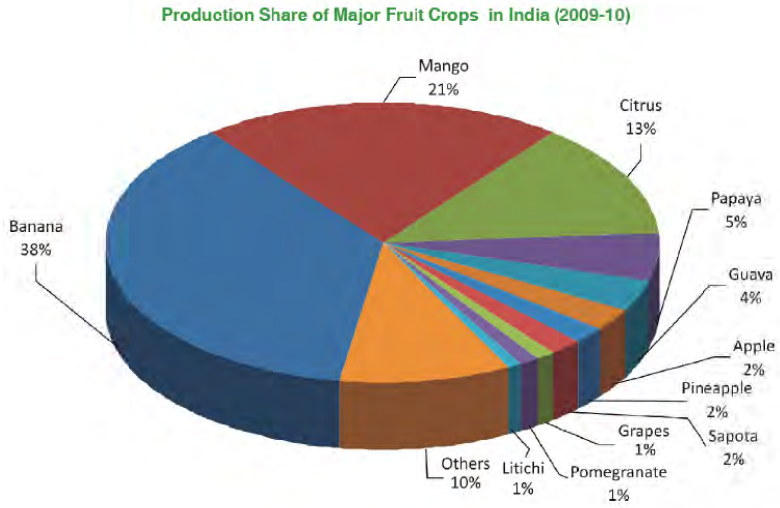
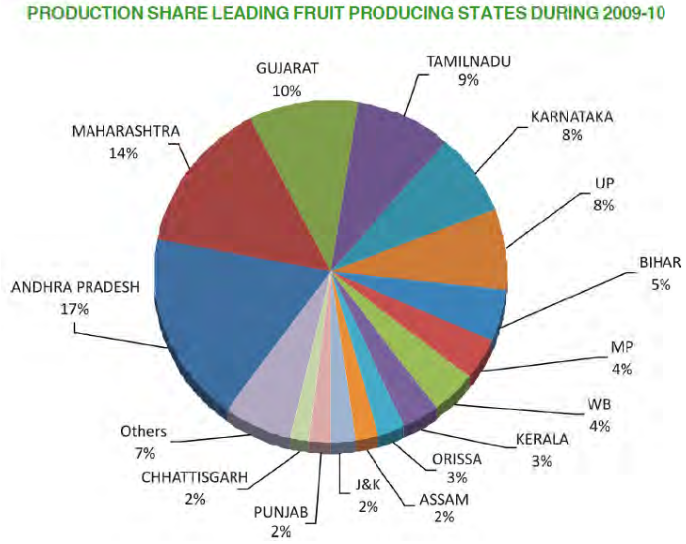
India's Fruit Production

The following graphics shows the 2009-10 share of production of Fruits and India.

- The Largest Production in India is of Banana followed by Mango.



- Andhra Pradesh is India's Largest Food Producing State in 2009-10. The following graphic shows share of states in



- However, as far as area under Fruit Cultivation is concerned, Maharastra tops the list of state.

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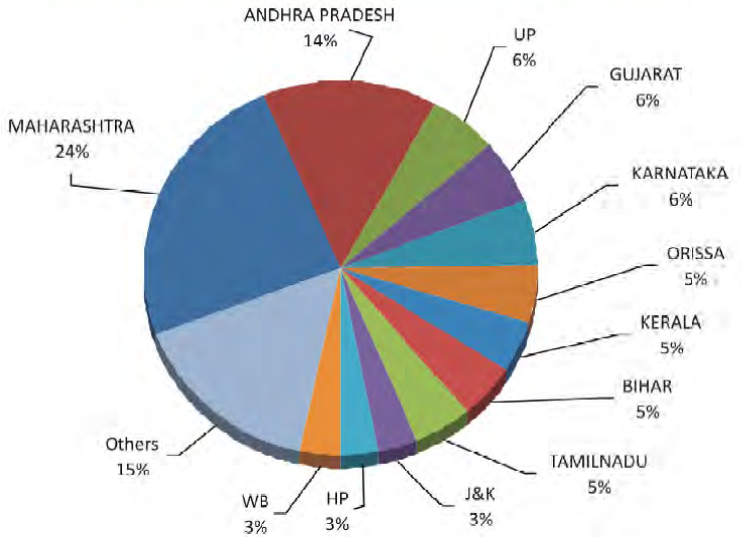
AREA SHARE OF LEADING FRUIT PRODUCING STATES DURING 2009-10



- The largest fruits producing states in India are Andhra Pradesh, Maharastra and Gujarat with 17%, 14% and 10% share. However, in area wise, Maharastra leads all the states of the country with 24% area share in Fruit Production.

India's Vegetable Production

The following table shows India's Vegetable Production in 2009-10:

Area and Production of Vegetables in India (NHD: 2010)

Area in 000 HA, Production in 000 MT and Productivity = MT/HA

	2007-08			2008-09			2009-10		
	AREA	PRODUCTION	PDY.	AREA	PRODUCTION	PDY.	AREA	PRODUCTION	PDY.
Vegetables									
Potato	1795	34658	19.3	1828	34391	18.8	1835	36577	19.9
Tomato	566	10303	18.2	599	11149	18.6	634	12433	19.6
Onion	821	13900	16.9	834	13565	16.3	756	12159	16.1
Brinjal	561	9678	17.2	600	10378	17.3	612	10563	17.2
Tapioca	270	9056	33.6	280	9623	34.3	232	8060	34.8
Cabbage	266	5910	22.2	310	6870	22.1	331	7281	22.0
Cauliflower	312	5777	18.5	349	6532	18.7	348	6569	18.9
Okra	407	4179	10.3	432	4528	10.5	452	4803	10.6
Peas	313	2491	8.0	348	2916	8.4	365	3029	8.3
Sweet Potato	123	1094	8.9	124	1120	9.0	119	1095	9.2
Others	2414	31402	13.0	2275	28006	12.3	2300	31168	13.6
Veg.-Total	**7848**	**128449**	**16.4**	**7981**	**129077**	**16.2**	**7985**	**133738**	**16.7**

- **The production as well as Area of Potato is maximum among all the vegetables produced in the country.** In Potato production, India is on second place in the world after China.
- Next largest grown vegetable is Onion. In Onion production, India stands second after China.

Following Graphics shows the production share of the vegetables in the country:

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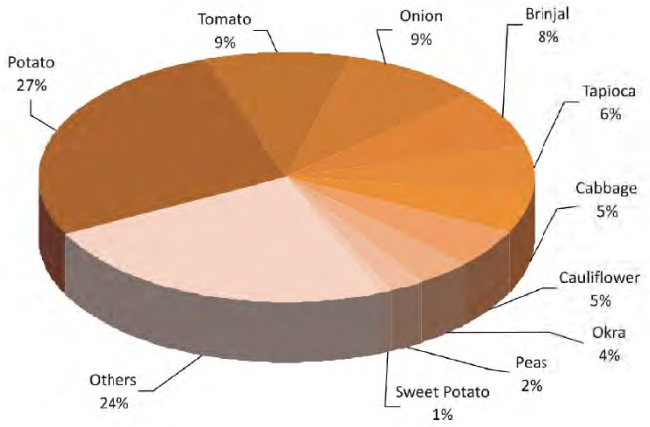
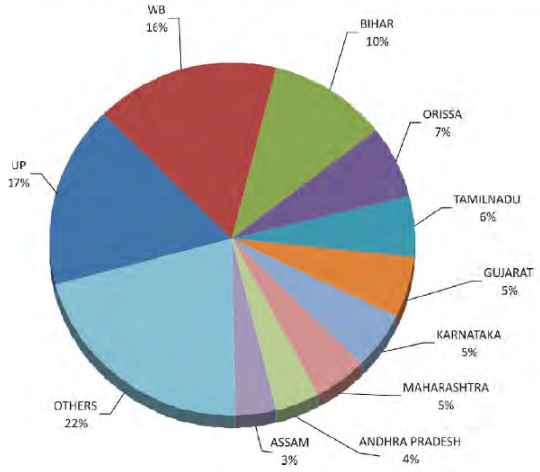
Production Share of Major Vegetables Crops in India (2009-10)



Source: National Horticulture Database 2010

Uttar Pradesh is India's largest vegetable Producing state in 2009-10. Following graphic shows the share of states in vegetable production:

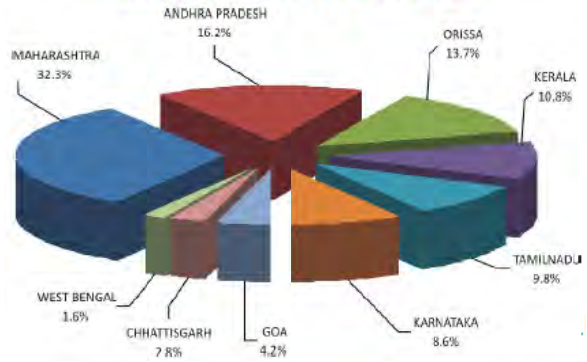
PRODUCTION SHARE OF LEADING VEGETABLES PRODUCING STATES DURING 2009-10



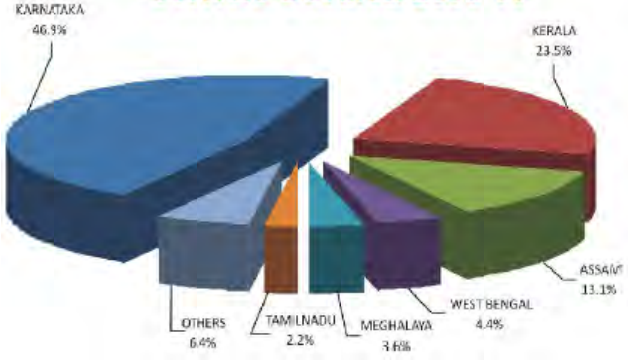
India's production of Plantation Crops:

The following table shows the production of major Plantation Crops in India during 2009-10:

LEADING CASHEWNUT PRODUCING STATES DURING 2009-10



EADING ARECANUT PRODUCING STATES DURING 2009-10



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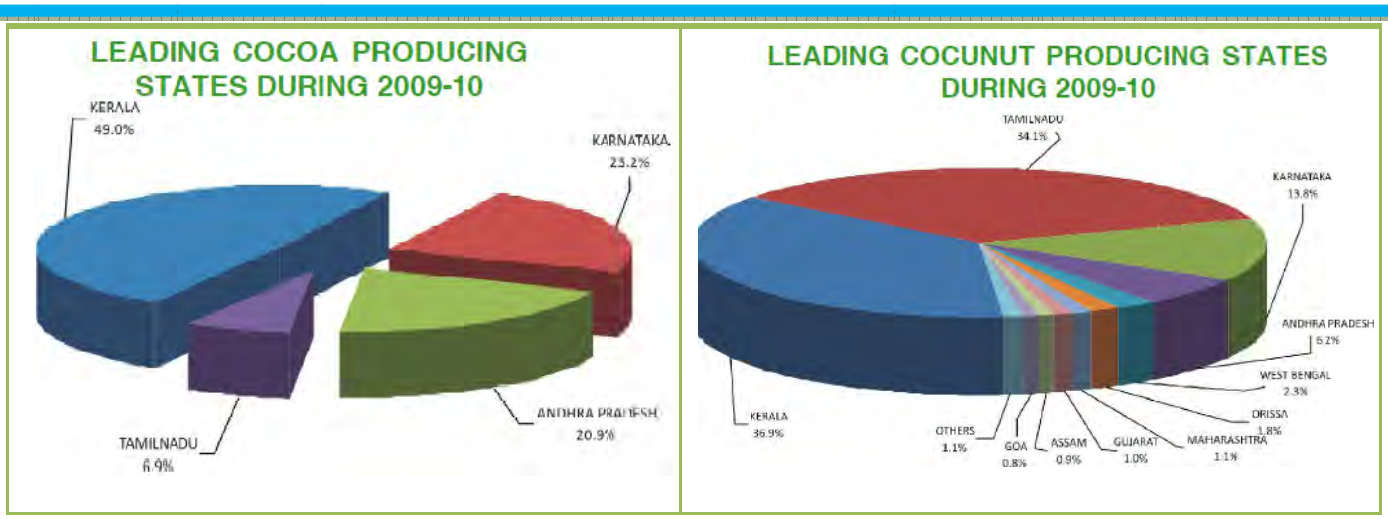
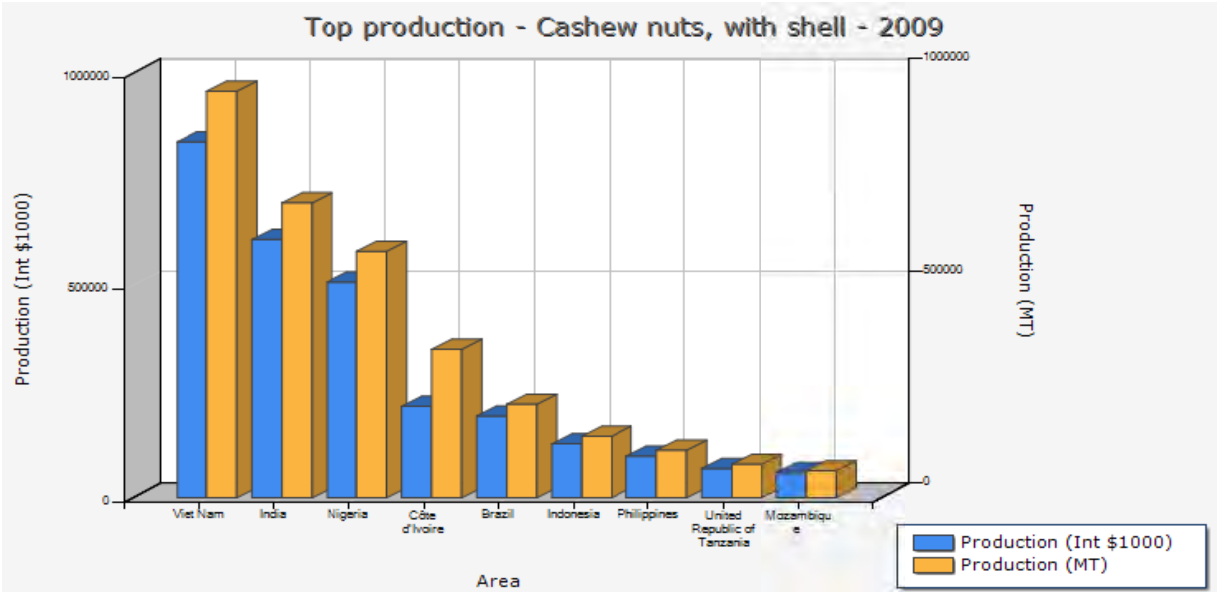


- Among the 4 major plantation Crops, India produces maximum of the Coconut, followed by Cashew nut and Areca Nut.

Crop	Area	Production
Coconut	1903.2	10148.3
Cashew nut	893.2	695
Areca nut	387.1	481.3
Cocoa	34	11.8
		Values: 000'MT, 000HT

- In Cashew nut production, **India is second largest producer after Vietnam. (FAO)**



- In Coconut India is third largest producer after Indonesia and Philippines.

Following Graphic shows the area and production of the major plantation crops in India:

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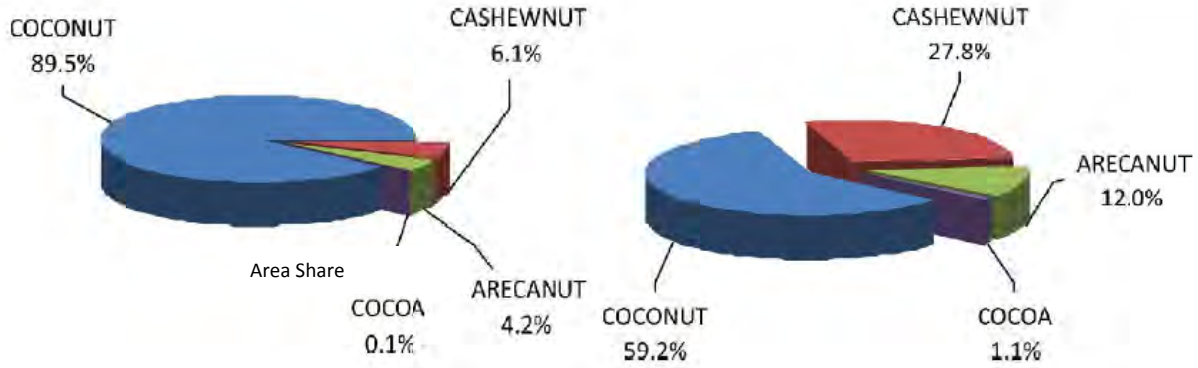

India's Spice Production

The following graphic shows India's major spices Production in till Year 2009-10:

The largest produced spice in India is Chillies, followed by Turmeric and Garlic. India is the largest producer of Red Dry chilly in the world. India is second largest producer of Garlic in the world after china. The state wise area, production and productivity of species is shown in the following table:

STATEWISE AREA, PRODUCTION & PRODUCTIVITY OF MAJOR SPICES IN INDIA

Area in 000 HA, Production in 000 MT and Productivity = MT/HA

	2007-08			2008-09			2009-10		
	AREA	PRODUCTION	PDY.	AREA	PRODUCTION	PDY.	AREA	PRODUCTION	PDY.
Andhra Pradesh	318.52	1235.12	3.88	318.40	1225.29	3.85	312.52	1159.67	3.71
Rajasthan	579.50	534.03	0.92	567.40	471.76	0.83	489.65	437.18	0.89
Gujarat	320.05	518.15	1.62	306.99	426.61	1.39	266.31	400.85	1.51
Karnataka	229.04	325.61	1.42	233.48	341.65	1.46	217.66	303.24	1.39
Madhya Pradesh	192.17	275.77	1.44	197.01	250.41	1.27	197.11	236.27	1.20
Tamil Nadu	137.90	264.84	1.92	125.08	235.13	1.88	125.09	235.01	1.88
Orissa	147.00	199.20	1.36	146.72	198.22	1.35	146.72	198.22	1.35
West Bengal	94.40	185.80	1.97	95.87	188.40	1.97	95.87	188.40	1.97
Uttar Pradesh	59.11	194.90	3.30	56.48	170.06	3.01	54.83	163.02	2.97
Kerala	261.88	128.17	0.49	301.07	126.24	0.42	264.39	136.03	0.51
Maharashtra	114.00	97.00	0.85	113.64	96.57	0.85	113.64	96.57	0.85
Mizoram	9.00	38.30	4.26	22.67	80.62	3.56	22.67	80.63	3.56
Meghalaya	16.64	71.25	4.28	16.60	69.91	4.21	17.41	72.01	4.14
Punjab	5.15	23.69	4.60	5.15	23.69	4.60	17.53	66.68	3.80
Arunachal Pradesh	9.20	53.10	5.77	7.63	43.34	5.68	7.63	43.34	5.68
Sikkim	20.60	43.20	2.10	26.58	41.73	1.57	26.58	41.73	1.57
Nagaland	4.50	26.20	5.82	7.22	38.62	5.35	7.22	38.62	5.35
Haryana	6.75	24.84	3.68	5.15	24.52	4.76	5.15	24.52	4.76
Hima. Pradesh	7.60	23.60	3.11	4.44	18.62	4.19	4.44	18.62	4.19
Assam	28.63	18.76	0.66	27.37	18.55	0.68	27.37	18.55	0.68
Uttaranchal	9.26	24.42	2.64	1.94	13.06	6.73	1.94	13.05	6.72
Bihar	11.60	13.70	1.18	11.28	12.36	1.10	11.28	12.36	1.10
Tripura	4.20	13.70	3.26	4.50	10.28	2.28	3.96	12.10	3.06
Manipur	10.98	8.22	0.75	8.98	7.84	0.87	8.98	7.84	0.87
Chhattisgarh	12.86	10.51	0.82	11.56	7.18	0.62	11.56	7.18	0.62
A & N Islands	1.70	3.12	1.84	1.66	3.15	1.90	1.66	3.15	1.90
J& Kashmir	4.39	1.31	0.30	3.89	0.91	0.23	3.89	0.91	0.23
Goa	0.70	0.20	0.29	0.65	0.17	0.26	0.65	0.17	0.27
Pondicherry	0.02	0.00	0.00	0.02	0.03	1.23	0.02	0.03	1.23
Total	**2617.36**	**4356.71**	**1.66**	**2629.44**	**4144.91**	**1.58**	**2463.73**	**4015.93**	**1.63**

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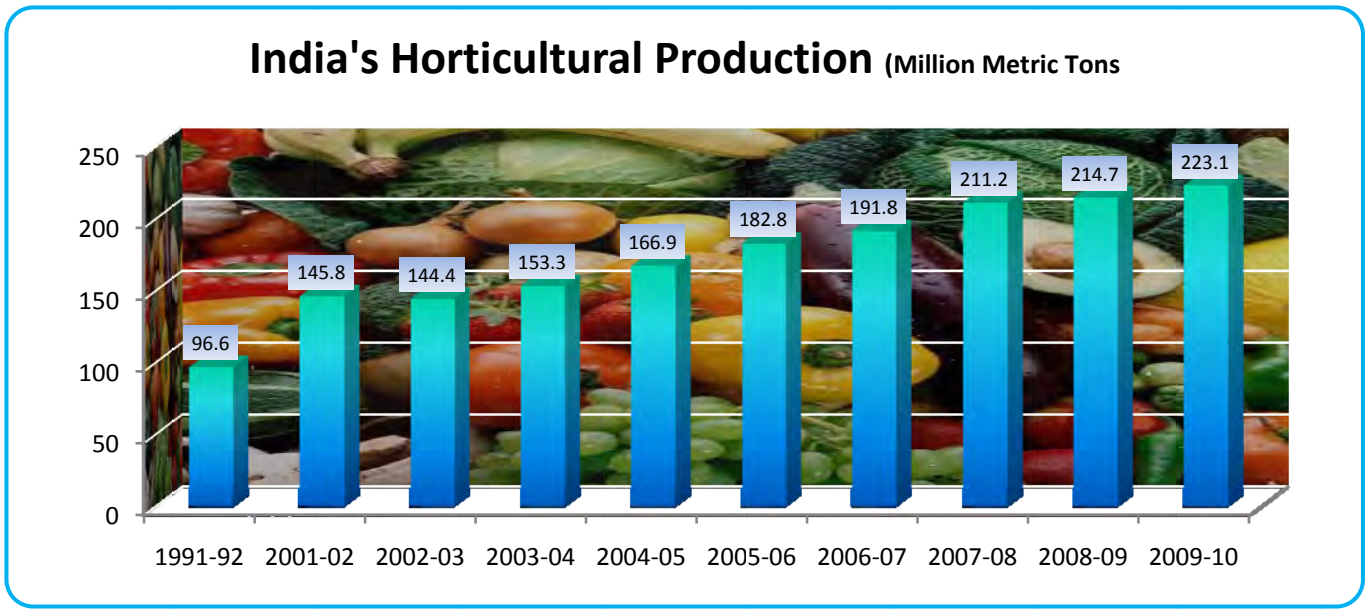
The above table makes it clear that India's largest spices producing state in 2009-10 was Andhra Pradesh, followed by Rajasthan. Rajasthan is largest producer of red chillies.

Please also note that Jammu & Kashmir is India's largest nut producing state with 88.4% share in the country. Next largest nut producing state is Uttarakhand which accounts for 9.44% nuts in India. Himachal Pradesh accounts for 2.1% production of Nuts in India.

India's Horticulture Production in Recent years

India's Horticultural production in 1990-91 was 96.6 million metric tons. In 2008-09, it has increased and become 214 million metric tons. The following graphic shows India's horticultural production in recent years.



The above graphic shows that the production has increased yet, there are constraints which hinder the proper growth of Horticulture in India. These are:

1. India has poor quality of seeds and planting materials and there is a weak assessment mechanism.
2. The management of orchards is in obsolete and outdated way.
3. The orchards are of small and uneconomic size.
4. There is absence of adequate standards of quality produces.
5. There is poor risk management in the country

National Horticulture Mission

India is a major producer of fruits and vegetables in the world. For the holistic development of the horticulture sector, a centrally sponsored scheme called the National Horticulture Mission (NHM) was launched in 2005-06.

Objectives:

The objectives of the Mission are to enhance horticulture production and improve nutritional security and income support to farm households and others through area-based regionally differentiated strategies.

Coverage:

All States and two Union Territories (Andaman & Nicobar Islands and Lakshadweep) are covered under the Mission except the eight north-eastern States including Sikkim and the States of Jammu & Kashmir, Himachal Pradesh and Uttarakhand which are covered under the Technology Mission for Integrated Development of Horticulture in the North Eastern States (TMNE).

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- At present, 367 districts have been included under the NHM, covering 18 States and 3 UTs in the country. However, the guidelines for this programme have been changed since April 1, 2010. The revised guidelines have been summarized at the end of this article.
- All crops except coconut and medicinal plants are covered under NHM. Coconut Development Board is implementing schemes for the development of coconut in the country. Similarly, the National Medicinal Plants Board is implementing the Scheme.

NHM : Convergence of Programmes:

National Horticulture Mission has been able to achieve convergence of programme of different Ministries. He elaborated that 'the Ministry of Rural Development has taken initiative to provide road connectivity in NHM clusters for linking with markets under the Prime Minister's Grameen Sadak Yojana. The Ministry of Food Processing Industries has initiated dialogue for operationalising food processing units in NHM clusters. There is a close coordination between Ministry of Health and Family Welfare for the development of Medicinal Plants. The Krishi Vigyan Kendras and State Agriculture Universities are being closely involved in providing technical support and expertise for the mission activities apart from directly implementing some key activities such as production of quality planting material, demonstration of technologies and training of farmers. The ICAR has been closely involved in developing a package for responding to the Bacterial Blight Disease in Pomegranate, which has affected large areas in the States of Maharashtra, Karnataka and Andhra Pradesh. Special incentives have also been provided under the NHM to contain the Blight infestation in pomegranate.

National Horticulture Mission: Revised Guidelines: April 1, 2010

The revised guidelines have come into force from April 1, 2010. As per these guidelines;

- The Scheme will be operated in all States and Union Territories, except North Eastern States including Sikkim, Himachal Pradesh, Jammu & Kashmir and Uttarakhand, for which a separate Technology Mission for Integrated Development of Horticulture exists, to promote holistic growth of the horticulture sector covering fruits, vegetables, root & tuber crops, mushroom, spices, flowers, aromatic plants, cashew and cocoa.
- Similarly, programme for development of coconut will be implemented by Coconut Development Board (CDB).
- NHM is a Centrally Sponsored Scheme in which Government of India contributes 85%, and 15% is met by the State Governments.
- Minister of agriculture is the chairman of this mission and Ministers of Commerce, Health, Finance, Food Processing Industries, Panchayati Raj, Science & Technology, Rural Development, Micro, Small and Medium Enterprises are its members.
- State Level Executive Committee (SLEC) under Chairmanship of Agricultural Production Commissioner or Principal Secretary Horticulture/Agriculture, having representatives from other concerned Departments of State Government, the State Agricultural Universities (SAU), Institutes under Indian Council of Agricultural Research (ICAR), Growers' Associations, etc will oversee implementation of NHM programmes of respective States
- The Mission will have a strong technical component and domain experts will be central to management of the Mission. Technical support to Mission at National and State Levels will be provided by National Horticulture Board, which will be suitably strengthened by experts and technical personnel to advise, formulate, appraise and monitor implementation of Mission's programmes.

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- While selecting the cluster, preference should be given to those areas where natural resource base and water resources have been developed under watershed development programmes, Rashtriya Krishi Vikas Yojana (RKVY), Mahatma Gandhi National Rural Employment Guarantee Scheme (MNREGS), etc. Priority should be given for development of such crops, which are required to meet current and future demands.

Role of Agencies in the National Horticulture Mission

National Horticulture Board (NHB), Gurgaon

NHB will house national level TSG and arrange to make payments to personnel engaged and also for **c**onducting other activities envisaged under TSG An officer of NHB will be exclusively dedicated for interacting with DAC. NHB will also implement programmes as per its mandate.

Directorate of Cashew and Cocoa Development (DCCD), Kochi

Responsible for coordinating and monitoring activities relating to plantation crops, excluding coconut and areca nut and will also be responsible for organizing National level training programmes, seminars & workshops on cashew and cocoa on regular intervals.

Directorate of Arecanut and Spices Development (DASD), Calicut

Responsible for coordinating and monitoring the activities on development of areca nut, spices,
and aromatic plants and will be responsible for organizing National level training programmes, seminars and workshops on Arecanut, spices and medicinal & aromatic plants on regular intervals.

National Committee on Plasticulture Applications in Horticulture (NCPAH), New Delhi

NCPAH will be responsible for coordinating and monitoring activities relating to precision farming and hitech horticulture through Precision Farming Development Centres (PFDCs).

Coconut Development Board (CDB), Kochi

Although, CDB will function and implement its schemes on development of coconut, CDB will be involved in programmes related to coconut based farming system for intercropping of vegetables, flowers spices, aromatic plants etc.

Agricultural and Processed Food Products Export Development Authority (APEDA), New Delhi

APEDA, Ministry of Commerce will be involved in promoting coordinated development of AgriExport Zones (AEZ) for horticultural crops and coordinate with National Horticulture Mission, for promoting export of horticulture crops.

Directorate of Marketing & Inspection (DMI), New Delhi

DMI will be responsible for providing market intelligence and monitoring of programmes relating to marketing of horticulture crops.

Ministry of Food Processing Industries (MFPI), New Delhi

MFPI will be responsible for implementing and monitoring programmes relating to processing of horticultural produce, out of their own budget provision. MFPI will ensure convergence of their schemes with NHM cluster.

National Medicinal Plants Board (NMPB), New Delhi

NMPB would implement its scheme relating to development of medicinal plants in coordination with NHM.

National Horticulture Research & Development Foundation (NHRDF), Nasik

NHRDF will be involved for monitoring programmes relating to development of vegetables and vegetable seeds.

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Tea Industry in India

Basic Info

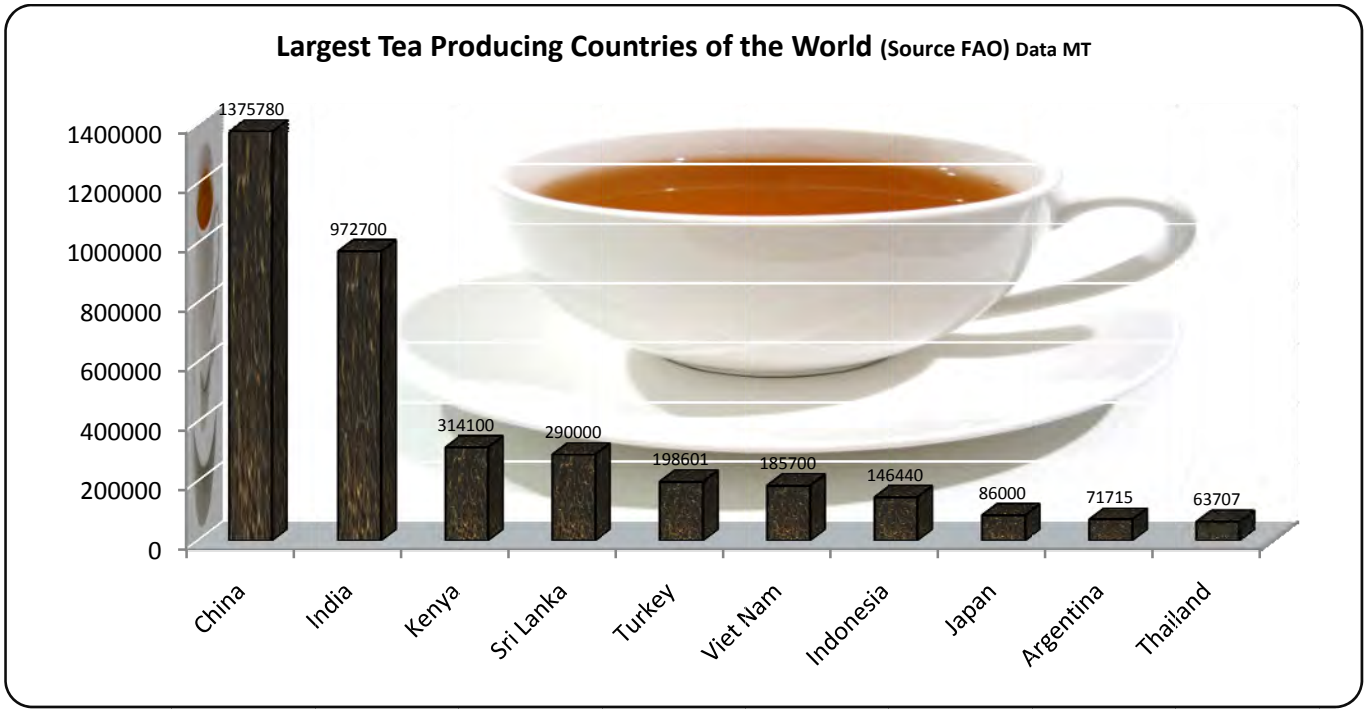
Botanical name of Tea is *Camellia sinensis.* After water, tea is the most widely consumed beverage in the world. Tea is an evergreen plant that mainly grows in tropical and subtropical climates.

Tea cultivation requires the following:

- **Climate:** A moderately hot and humid climate, which is preferred for better yield, crop distribution and quality.
- **Temperature:** An ambient temperature within 13°C and 28-32°C is conducive for growth of tea. Maximum ambient temperature above 32°C is unfavorable for optimum photosynthesis. It is synergically disastrous for the crop if it is accompanied by low humidity.
- **Winter Dormancy:** In India, the temperature in winters is around or below 12°C and there is hardly any growth during this period. Flushing in the tea plants starts from March with the rise in temperature.
- **Soil:** Acidic Soil with around 4.5-5.5 pH. Well-drained fertile acid soil on high lands with moderate to high rainfall.

Tea Production in the World

India is world's second largest tea producer after China. In 2008-09, India's estimated tea production was 9.73 Lakh metric tons. The following table and chart shows world's top 10 Tea producers.



Total world production was around 32 Lakh tons. India accounts for world's one fourth of Total tea production.

✓ The story of Tea cultivation in India starts from 1774, when Warren Hastings sent a selection of China seeds to George Bogle, the then British emissary in Bhutan for planting the same in Bhutan. This experiment could not produce any substantial results.

✓ In 1780, Robert Kyd experimented with tea cultivation in India with seeds, the consignment of which was stated to have arrived from China.

✓ Robert Bruce in 1823 discovered tea plants growing wild in Upper Brahmaputra valley.

✓ In May 1838 the first Indian tea from Assam was sent to England for public sale.

Area under Tea cultivation

✓ In 2007, in India, there was an area of 578568 hectares under tea cultivation.

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✓ Out of these 458718 hectares was in North India and 119740 hectares in South India. Around 4.16 Lakh hectares was under big growers and around 1.62 Lakh hectares was under small growers.

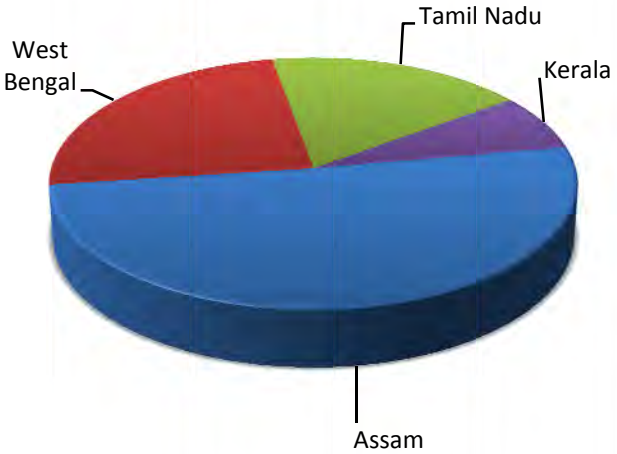
Tea Producing Districts/ Areas:

- **Assam:** Darrang, Goalpara, Kamrup, Lakhimpur , Dibrugarh, Nowgong, Sibsagar, Cachar , Karbi Anlong , North Cachar
- **West Bengal :** Darjeeling, Terai (west Dinajpur), Doors (Cooch Bihar) .
- **Tamil Nadu:** Kanyakumari, Tirunelveli, Madurai, Coimbatore , Nilgiris
- **Kerala:** Cannanore, Palghat, Kozhikode, Malapuram, Trichur, Trivandrum, Quilon, Kottayam, Ernakulam, Idukki, Wynaad
- **Karnataka:** Chikmagalur, Coorg, Hassan

The Largest state with area under Tea Plantations in India is Assam. The following table shows the states in India with Tea Plantations.

State	Area
Assam	321319
West Bengal	115095
Tamil Nadu	80462
Kerala	37137
Tripura	8962
Arunachal Pradesh	2570
Himachal Pradesh	2348
Karnataka	2141
Bihar	2000
Nagaland	1898
Uttaranchal	1585
Manipur	1319
Mizoram	650
Meghalaya	564
Orissa	214
Sikkim	194

Area under states



The above chart makes it clear that Assam has an area of tea cultivation in India which is more than half of India's Total Tea plantation area. In South India Tamil Nadu covers the maximum plantations.

Tea Production in Quantity

✓ **In 2008-09, as per Tea Board data, India produced 980820 Metric Tons as shown in the following table sourced from Tea Board of India.**

PRODUCTION OF TEA IN INDIA

1. Calendar Year

(Quantity in Million Kgs.)

Year	North India	South India	Total
2002	631.75	206.72	838.47
2003	648.28	229.85	878.13
2004	662.19	230.78	892.97
2005	718.42	227.55	945.97
2006	753.24	228.56	981.80
2007	764.74	221.69	986.43
2008 (E)	733.92	246.90	980.82

(E) Estimated and subject to revision

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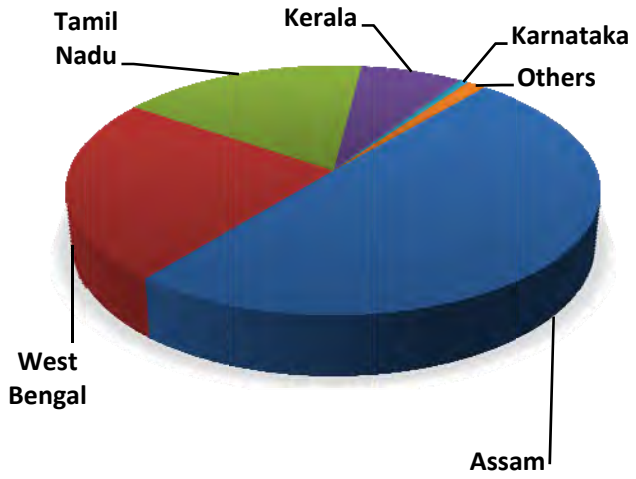
- ✓ **North India produces approximately thrice the quantity produced in South India.**
- ✓ In 2008-09, while North India produced 733920 tons, South India produced 24690 metric tons.
- ✓ The following table and graphic shows the largest Tea Producing states in India.
- ✓ Assam roughly accounts for Half of India's Tea Production.

State	Production
Assam	487497
West Bengal	233133
Tamil Nadu	170532
Kerala	70287
Karnataka	6079
Others	13290
Total India	980818

All values Metric Tons

Source: Tea Board

Graphic Representation



Tea Exports from India

- ✓ India roughly accounts to the 13% of Total World Trade in Tea.
- ✓ India's tea export is around 20% of production.
- ✓ In 2008-09, India's estimated export was 203120 Metric tones which roughly accounts for ₹ 2393 Crore.
- ✓ From April 2008 to March 2009 India exported 190640 metric tons of tea at Unit price of Rs. 124.94 per kilogram accounting for an foreign exchange earning of US$ 518.01 Million.

The Share of countries in India's Tea Exports is as follows:

India's Tea Exports		
Country	Quantity (Million Kgs)	Value ₹ Crores
Russia	40.44	407.73
U.A.E.	24.8	282.53
UK	19.3	215.08
Iran	15.9	210
U.S.A.	9.55	153.62
Kazakhstan	11.33	139.62
A.R.E.	15.04	111.75
Australia	4.91	103.63
Germany	4.33	90.39
Afghanistan	10.74	75.83
Others	34.3	591.61

The above table makes it clear that

- **Largest quantity of Indian Tea goes to Russia, followed by UAE and UK.**

Tea Imports:

Apart from being a major player in world's tea exports, India also imports tea from various countries of the world. In 2008, India imported 20272 metric tons of tea, which is equivalent to ₹ 162 Crores.

- Maximum amount of Tea, India imports from Nepal.

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The following table shows India's import of Tea from major countries.

India's Tea Imports	
Nepal	7857
Indonesia	3386
Kenya	3319
Vietnam	1769
China	1374
Others	2567
Total	20272

Values Metric Tons. Source: Tea Board

India's Position in World Tea Exports

- ✓ India is world's 4th largest exporter of world.
- ✓ The largest exporter of Tea in the world is Kenya, followed by Sri Lanka and China.
- ✓ World's largest tea exporters are shown below:

World's Largest Tea Exporters	
Kenya	383.44
SriLanka	298.79
China	296.94
India	203.12
Vietnam	115
Indonesia	95
Values: Million Kilograms	

Tea Varieties in India:

In India, there are three distinctly different tea growing regions. These regions are geographically separated, thereby producing three entirely different teas both in style and in taste/flavor. The three regions are:

- Darjeeling (North-Eastern India),
- Assam (far North-East India)
- Nilgiri (South India).

Darjeeling Tea:

- Darjeeling Tea is also known as "**The Champagne of Teas**".
- Darjeeling grows this exclusive tea at altitudes ranging from 600 to 2,000 meters.
- The cool and moist climate, the soil, the rainfall and the sloping terrain all combine to give Darjeeling its unique "Muscatel" flavor and exquisite bouquet.
- The combination of natural factors that gives Darjeeling tea its unique distinction is not found anywhere else in the world, hence this finest and most delicately flavored of all teas has over the years acquired such reputation as "Champagne enjoys amongst wine"
- Darjeeling is normally made from the small-leaved Chinese variety of *Camellia sinensis var. sinensis.*

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- **Darjeeling tea became the first Indian product to receive a GI tag, in 2004-05 through the Indian Patent Office.**

Definition of Darjeeling Tea

"Darjeeling Tea" means: tea which has been cultivated, grown, produced, manufactured and processed in tea gardens / 'Estates' in the hilly areas of Sadar Sub-Division, only hilly areas of Kalimpong Sub-Division consisting of Samabeong Tea Estate, Ambiok Tea Estate, Mission Hill Tea Estate and Kumai Tea Estate and Kurseong Sub-Division excluding the areas in jurisdiction list 20,21,23,24,29,31 and 33 comprising Siliguri subdivision of New Chumta Tea Estate, Simulbari and Marionbari Tea Estate of Kurseong Police Station in Kurseong Sub-Division of the District of Darjeeling in the State of West Bengal, India grown on picturesque steep slopes up to 4000 ft

Government is promoting Darjeeling Tea thorough Tea Board by supporting its promotional campaigns, Buyer Seller Meets, Tea Tasting Sessions, Trade Fairs and International Conventions. Darjeeling Tea has also been promoted in domestic markets.

Tea Board spends a substantial amount of its Market Promotion Scheme budget on promotion of Darjeeling Tea both within the country and outside.

Apart from extending financial assistance under regular plan schemes of the Tea Board for field and factory modernization, the Government has sanctioned an amount of ₹ 5.68 crore in the 11th Plan to upgrade the Darjeeling Tea Research and Development Centre as a Centre of Excellence.

Assam Tea:

- Assam is the single largest contiguous tea growing area in the world.
- The Assam tea is generally known as Breakfast tea or English Breakfast Tea.
- The variety is *C. sinensis var. assamica*

Nilgiri Tea:

- Nilgiri Tea is grown in the hills of the Nilgiris district of Tamil Nadu as well as some other parts of South India.
- They are a picturesque range of undulating hilly landscapes where tea is grown at elevations ranging from 1,000 meters to 2,500 meters.
- Rainfall varies from 60 inches to 90 inches annually.
- Roughly 50% of the Nilgiri tea produced in India is exported.

Tea Board of India

- In 1903 Indian Tea Cess Bill was passed which provided for levying a cess on tea exports - the proceeds of which were to be used for the promotion of Indian tea both within and outside India. It was a predecessor to present Tea Board of India.
- The Tea Board of India was set up under section 4 of the Tea Act 1953 was constituted on 1st April 1954. It has succeeded the Central Tea Board and the Indian Tea Licensing Committee which functioned respectively under the Central Tea Board Act, 1949 and the Indian Tea Control Act, 1938 which were repealed.
- The Board is constituted of 31 members (including Chairman) drawn from Members of Parliament, tea producers, tea traders, tea brokers, consumers, and representatives of Governments from the principal tea producing states, and trade unions
- It is reconstituted every 3 years.
- Its head office is located at Kolkata.

Its Functions are:

1. Rendering financial and technical assistance for cultivation, manufacture and marketing of tea.

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2. Export Promotion
3. Aiding Research and Development activities for augmentation of tea production and improvement of tea quality.
4. Extend financial assistance in a limited way to the plantation workers and their wards through labour welfare schemes.
5. To encourage and assist both financially and technically the unorganised small growers sector.
6. Collection and maintenance of Statistical data and publication
7. Such other activities as are assigned from time to time by the Central Government.

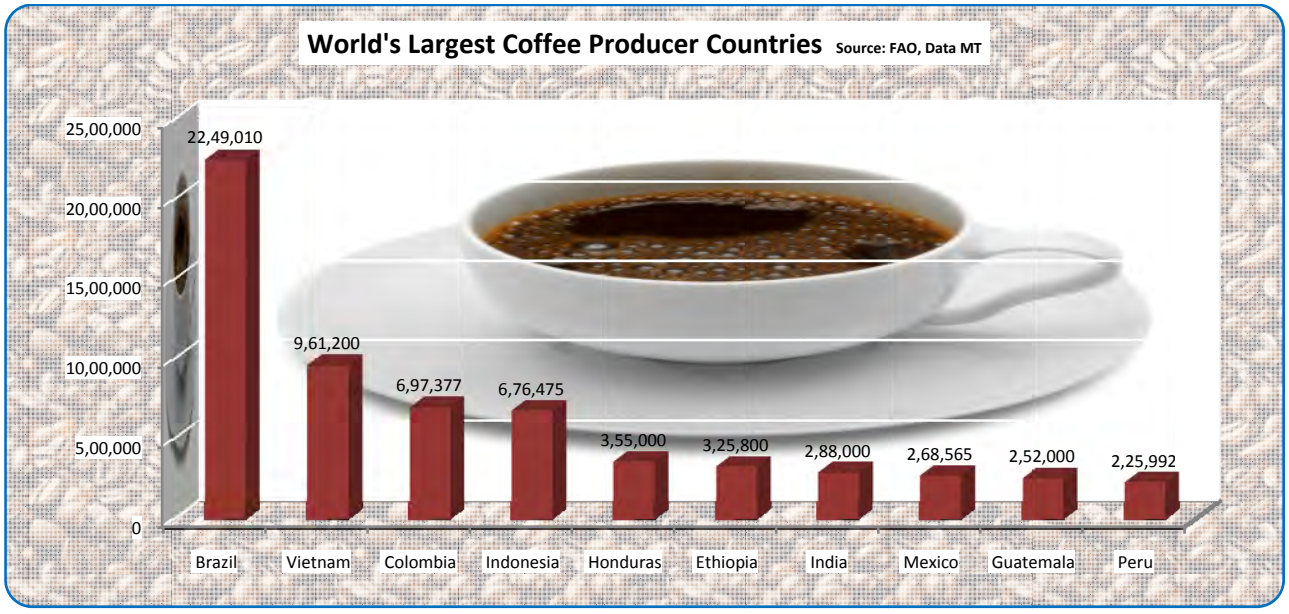
COFFEE INDUSTRY OF INDIA

Basic Info

- Coffee is prepared from the roasted seeds called as Coffee beans.
- Coffee is grown in more than 70 countries of the world.
- Due to Caffeine, it gives stimulating effects.
- The origin of Coffee Plan is credited to Ethiopia and cultivation of the Coffee expanded from the Arab world to other parts of the world.
- The botanical name of the genus is *Coffea* family Rubiacae.
- Most popular species, commercially cultivated are Coffea robusta and C. arabica.
- The plant is an evergreen shrub. The flowers bloom simultaneously and are followed by oval berries of about 1.5 cm. The berries are Green when immature, ripen to yellow and get crimson before they get black on drying. Berries ripen in seven to nine months. Coffee is **generally propagated** by vegetative methods just to maintain the new strains. Cuttings, grafting, and budding are the usual methods of vegetative propagation. However, Coffee **can be grown by seeds as well.** The traditional method of planting coffee is to put 20 seeds in each hole at the beginning of the rainy season, out of which half are eliminated naturally.

Production of Coffee Worldwide

Total world production is approximately 77.5 Lakh Metric tons. Brazil is world's number 1 Coffee producer, followed by Vietnam and Colombia. The following graphics shows world's 10 largest Coffee producers:



The graphic shows that India is world's 7th largest coffee producer. Brazil accounts for one third of the coffee production in the world. Share of India in the world Coffee production is around 3.3%.

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Some Varieties of Coffee & Coffee Drinks:

Coffea liberica:

- Coffea liberica is a species that originated in Liberia. The plant grows up to 9 meters and produces larger cherries. Its variety Baraco is a major crop in Philippines.

Robusta Coffee

- Robusta Coffee or *Coffea canephora* is mostly grown in Africa and Brazil but also grown in South Asia and South East Asia. On the account of this coffee only, Vietnam has become one of the largest produvers and exporter of coffee in the world. Though, it is considered inferior to Coffea arabica, it requires lesser care. It has twice amount of caffeine than Arabica.

Coffea Arabica:

- Coffea arabica is indigenous to Ethiopia and Arab world. It is also known as Coffee Shrub of Arabia and is believed to be the first variety of Coffee to be cultivated. It naturally contains little caffeine.

Coffea charrieriana

- *Coffea charrieriana* is a coffee that is free of caffeine. It is found in Cameroon.

Mocha Coffee:

- Mocha Coffee or Cafe mocha is derived from Coffea Arabica. **This name derived from the Mocha town of Yemen.** Yemen was the largest producer and exporter of Mocha Coffee in some 15th and 16th century.

Cappuccino

- Cappuccino is a popular Italian Coffee Drink. It is a coffee drink topped with frothed milk.

Espresso:

- Espresso is a concentrated coffee beverage, which is brewed by forcing hot water under pressure through fine coffee. Due to pressure, it results in higher concentrations of dissolved solids and foam and gives the drink all the flavors of the coffee. Espresso is base for other drinks such as cappuccino, macchiato, mochas, and americanos.

Coffee Substitute: Roasted barley tea

- Roasted barley tea is a coffee substitute without caffeine and is popular in Japan, China and Korea.

Coffee Production in India

India produces both *Coffea arabica* and *Coffea robusta*. As per the provisional figures of 2010-11, Coffee is planted in India in around 399801 hectares. Out of this area, 52% is under Coffea robusta and 48% is under Coffea arabica. So in India almost both varieties are grown in equal areas.

✓ In India Coffee is grown Mostly in south India and also in Orissa and some parts of North East India.

✓ In India, **Karnataka is the leading Coffee producer with 56.9% of total area under production and 71% of total Production.**

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The following table shows the area and production of Coffee in various states.

Area Under Coffee Cultivation in India (hectares)						
State	Arabica	%	Robusta	%	Total Area	Total Area %
Karnataka	110023	27.5	117317	29.4	227340	56.9
Kerala	3711	0.9	81085	20.3	84796	21.2
Tamil Nadu	25708	6.4	5636	1.4	50786	7.8
North East India	4035	1	1382	0.3	5417	1.4
Others (Orissa etc.)	50518	12.6	268	0.1	50786	12.7
	193995	48.4	205688	51.5	419125	100
Production of Coffee in India (Metric Tons)						
State	Arabica	%	Robusta	%	Total Production	Total Area
Karnataka	73400	25.3	132300	45.7	205700	**71**
Kerala	1375	0.5	57875	20	59250	**20.5**
Tamil Nadu	14650	5.1	4700	1.6	193350	**6.7**
North East India	75	0	40	0	115	**0**
Others (Orissa etc.)	5100	1.8	85	0	5185	**6.7**
	94600	32.7	195000	67.3	289600	**100**

The above data makes it clear that:

- Karnataka leads Coffee Production in India with 71% share in production.
- The production of Robusta Coffee (67.3%) is approximately double of production of Arabica Coffee (32.7%).
- Almost all coffee grown in Kerala is Robusta. Kerala accounts for 20% of Robusta Coffee while 0.5% of Arabica Coffee.
- In Tamil Nadu, the production of Arabica Coffee is more than that of Robusta.
- In other parts of India such as Andhra Pradesh and Orissa, almost only Arabica Coffee is grown.

Please also note the following points:

- In Karnataka Chikmagalur, Kodagu & Hassan districts are largest producers of Coffee.
- In Kerala, Wyanad, Travancore & Nelliampathies are largest growing districts of Coffee.
- In Tamil Nadu , Pulneys, Nilgiris, Salem & Coimbatore are largest coffee grwing areas.
- **In India Coffee productivity is 826 Kilogram per hectare.**

Coffee Board of India

Coffee Board of India is an autonomous body, functioning under the Ministry of Commerce and Industry, Government of India. It was set up under an Act of the Parliament of India in the year 1942. It focuses on research, development, extension, quality upgradation, market information, and the domestic and external promotion of Coffees of India.

A comparison of Robusta Coffee and Arabica Coffee

Factors	Arabica	Robusta
Soil	Both need Deep, rich in Organic matter , well drained and slightly acidic soil with pH around 6.0 -6.5	
Slopes	Gentle to Moderate Slopes	Gentle Slopes and plains
Elevation	1000-1500 meter	500-1000 meter
Temperatire	15°C to 25°C, Cool & Temperate	20° C to 30° C, hot and humid
Relative Humidity	70-80%	80-90%
Annual Rainfall	1600-2500 MM	1000-2000 MM

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Some varieties of Indian Coffee

Kents:

- Kents is the earliest variety of Arabica, selected by an English planter of the same name during the 1920s. This variety remained popular with the planting community till the 1940s, because it was less susceptible to rust. Today, it is grown in a few areas but it is still known for its exceptional cup quality.

S.795:

- This is by far the most popular Arabica selection released during the 1940s with high yields, bold beans, superior quality and relative tolerance to leaf rust. This selection was developed using 'Kents' Arabica, known for its high quality. Even today, the S.795 is a favourite with the planters and is a widely cultivated Arabica variety. S.795 has a balanced cup with subtle flavour notes of Mocca.

Cauvery:

- **Popularly known as Catimor,** Cauvery is a descendant of a cross between 'Caturra' and 'Hybrido-de-Timor'. Caturra is a natural mutant of the famous Bourbon variety. Thus, Cauvery inherited the high yielding and superior quality attributes of Caturra and the resistance of 'Hybrido-de-Timor'.

Selection 9

- Selection 9 is a derivative of a cross between an Ethiopian Arabica collection, 'Tafarikela', and 'Hybrido-de-Timor'. Sln.9 has inherited all the superior cup quality traits of Tafarikela. This variety has won the Fine Cup Award for best Arabica at the 'Flavour of India - Cupping Competition 2002' organised by Coffee Board of India.

Rubber Industry of India

- Rubber is an elastic hydrocarbon polymer that is derived from latex of some plants. The collection of the latex is called tapping. Rubber tree or Para Rubber tree is *Hevea brasiliensis* which is from family Euphorbiaceae and is the most important source of Natural rubber. It originates from Amazon forests, though it derives its name from Pará, one of the states of Brazil.

Production in World:

- **Thailand is world's largest producer of Natural Rubber.**
- **Thailand is followed by Indonesia and Malaysia. Together, Thailand, Indonesia and Malaysia account for more than 70% of world's Natural Rubber production.**
- **India is world's fourth largest Rubber producer.**
- **Following table shows the top 10 producers of Rubber in the world:**

Rank	Country	Production
1	Thailand	3166910
2	Indonesia	2921872
3	Malaysia	1072400
4	India	819000
5	Viet Nam	659600
6	China	547861
7	Philippines	411044
8	Côte d'Ivoire	188532
9	Nigeria	143000
10	Sri Lanka	129240
Values Metric Tons. Source FAO		

Rubber Production in India:

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Commercial cultivation of natural rubber was introduced in India by the British, although the experimental efforts to grow rubber on a commercial scale in India were initiated as early as 1873 at the Botanical Gardens, Calcutta. The first commercial Hevea plantations in India were established at Thattekadu in 1902. The importance of rubber production in India from strategic and security reasons had been realized by the government during the Second World War period. The rubber growers in India were encouraged to produce the maximum rubber required for the use during war. After the war, there were growing demands from the growers for setting up a permanent organisation to look after the interests of the industry. Thereupon the government set up an ad-hoc committee in 1945 to study the situation and to make appropriate recommendation. On the recommendation of this ad-hoc committee, the government passed the Rubber (Production and Marketing) Act, 1947, on 18th April 1947, and the "Indian Rubber Board" was constituted forthwith. The Rubber Production and Marketing (Amendment) Act, 1954, amended the name of the Board as "The Rubber Board".

Rubber Board of India:

The Rubber Board is a statutory body constituted by the Government of India, under the Rubber Act 1947, for the overall development of the rubber industry in the country. It is located in Kottayam. Website: rubberboard.org.in

Rubber production: How Brazil lost dominance:

Until the turn of the twentieth century Brazil plus countries that share the Amazon basin (i.e. Bolivia, Venezuela and Peru), were the only exporters of natural rubber.

Brazil sold almost 90% of the total rubber commercialized in the world. The reason was that the rubber plants were grown only in the Amazon region of Brazil. The Brazilian rubber industry developed a high-wage cost structure as the result of labor scarcity and lack of competition in the early years of rubber production. Since there were no credit markets to finance the trips of the workers of other parts of Brazil to the Amazon, workers paid their trips with loans from their future employers. Much like indenture servitude during colonial times in the United States, these loans were paid back to the employers with work once the laborers were established in the Amazon basin.

Costs of producing rubber was increased because tappers in the field had to be shipped in from outside the region at great expense. This made Brazilian production very expensive compared to the future plantations in Asia. Brazil dominated the natural rubber market until the first decade of the twentieth century. The Brazilian rubber market was crushed by the rapid development of the more efficient rubber plantations of Southeast Asia.

This was not so easy as the Rubber seeds could not survive the long Atlantic journey from Brazil. In 876, an English planter, Henry Wickham, had collected 70,000 seeds and shipped them to England. This has been a controversial issue and the Brazilians call it Rubber Theft.

- In India, Kerala accounts for 80 per cent of country's total output.
- In production of natural rubber, India comes after Thailand, Indonesia and Malaysia and in consumption also it ranks fourth after China, USA and Japan.
- The coverage of under rubber crop in Kerala in 2008-09 was 5.17 lakh hectares, which was higher by 5430 hectares over the previous year.
- The state produced **783,000 tonnes** of rubber during the year, marking an increase of 4.03 per cent.
- Rubber Productivity of Kerala has increased from 1,190 Kg per hectare in 1998-99 to 1,514 Kg per hectare in 2008-09.
- RSS-4 & RSS-3 are important varieties of rubber in India.

Please note that : In case of Rubber, the Production, Consumption has been almost equal in India.

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Brand Indian Natural Rubber (INR)

The effort of branding of Indian natural rubber by the Rubber Board has paid off recently. Exports of rubber under the **Rubber Board-owned brand "Indian Natural Rubber (INR)"** is **making an impact on the international market** with 20 per cent of the total exports between April and November 2011 coming under the category.

» The Rubber Board had registered the brand 'Indian Natural Rubber', under Intellectual Property Rights Act as Certification Trade Mark and covered under Copyrights Act.

About 21,000 tonnes of natural rubber was exported between April and November. Of this about 5,000 tonnes have been exported under the brand name in an exercise that was launched in February this year. Last year, shipments were less than 5,000 tonnes.

The Rubber Board certifies the quality of the consignments and this is an added incentive for the importer, who is assured of the quality of the delivered produce. Already 12 companies, including rubber marketing co-operative societies have signed MoU with the Rubber Board for using the logo.

What is India's position in Natural Rubber (NR)?

» **India,** which continues to occupy **the first position in productivity and the fourth in production among the rubber producing countries** in the world, is a major player in the global NR market. It is **the second largest consumer of NR** too.

» NR has been more or less a controlled commodity in India for nearly five decades since Independence. India had a self-supporting rubber market, in the sense that it had the infrastructure to consume the rubber produced indigenously. **It is worthy to note that India and China are the only countries which can consume their whole domestic production.**

Why the need for Branding of NR?

» In this age of **globalized markets**, the situation has changed drastically for India. The protection that was enjoyed by the Indian market vanished and export and import became the order of the day. In the present market situation, anybody can import rubber paying the duty specified by the Government. As a result, domestic prices of all marketable forms of NR remain closely related to those in the global market, at times even violating the demand-supply equations. This situation warrants export of NR to overcome the challenges raised by globalisation and to maintain a stable and healthy domestic market. **India has to promote export either to offset the adverse effects of imports when the domestic price is ruling above the global price, or to fetch a better price for our commodity when the domestic prices are low.**

» India's presence in the global rubber market is of recent origin. India's total NR export comes to barely one per cent of the total global demand. However, as we have a sizeable NR industry, India remains a potential destination for global players in the sector.

» **The Rubber Board being the sole Government agency to deal with matters of NR**, has naturally undertaken a number of schemes to encourage NR export from India. All of them were successful in

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introducing the Indian NR to the global market. The most recent measure taken by the Board in this regard is **branding**.

What is Branding?

- Branding is a **modern management technique to improve the domestic as well as international acceptability of a commodity.**
- In the case of NR, it is an assurance of quality and a promise by the exporter, with the endorsement of the Board.
- **If the quality of a commodity is assured and certified by a competent authority, it will definitely improve its image among its consumers.**
- The brand **will fetch a premium price** for the rubber exported which, in turn, will definitely benefit the one million primary producers of India.

What is 'Indian Natural Rubber'?

- 'Indian Natural Rubber' is the **brand name owned and permitted by the Rubber Board** and registered under Intellectual Property Rights Act as certification Trade Mark and covered under Copy Rights Act.
- **It will enhance the marketing efficiency of the Indian NR.**
- The brand is promoted with a view to differentiating the Indian NR on its consistent quality parameters in line with the international standards.

INR logo

- The Board's initiative for branding started with the launching of a logo, 'Indian Natural Rubber', with the objective of enhancing the marketability of the Indian rubber in the global market. The logo is the seal of trust along with quality assurance from the Board. The quality certification by the Board entitles the exporters to use the INR logo which is expected to enhance the confidence of the consumer and thereby fetch a premium price for the Indian rubber.

It is a point to be noted that India is the first among the NR producing countries in the world to take such an initiative to promote NR export.

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