



CROPPING PATTERN IN INDIA



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ABSTRACT:

Agriculture was the predominant sector of Indian economy at the time of Independence from colonial rule in 1947. The share of agriculture in total gross domestic product at that time was above 55 per cent, and about 70 per cent of workforce was engaged in agriculture sector. Since the urban industrial and tertiary sectors were very small, and absorbed only 26 per cent of labour force, vast majority of Indian population, about 83 per cent, lived in rural areas (Census 1951). Though agriculture was the predominant sector at that time but its productivity was very low and output growth during 1901 to 1946 was less than half of the population growth. As a consequence of this, per capita income of rural population was awfully low. With the beginning of era of planned development in 1950-51 it was recognized that agricultural development is the key for rural economic development, improvement in living standard and living conditions of country's populace, and eradication of widespread poverty and malnutrition prevalent in the country. Performance of agriculture sector was also considered crucial for overall development of vast majority of people of India and for attaining several economy wide goals. It was thus imperative to follow the policy and development strategy which favoured quick and high growth rate of agriculture. Another notable feature of India's agricultural economy is its diversity. Both, agriculture growth and productivity have shown tremendous variation across regions and states of the country.

KEYWORDS: Economic, Population, Agriculture, Crop

INTRODUCTION:

CROP PRODUCTION

During 2011-12, there was record production of food grains at 259.34 million tonnes, of which 131.28 million tonnes was during Kharif season and 128.05 million tonnes during the Rabi season of the total food grains production, production of cereals was 242.23 million tonnes and pulses 17.09 million tonnes. As per 2nd advance estimates for 2012-13, total food grains production is estimated at 250.14 million tonnes (124.68 million tonnes during Kharif and 125.47 million tonnes during Rabi seasons). the 6.59 million tonnes (about 5.02 per cent) decline in kharif production has been on account of late onset of monsoon and deficient rainfall in several states affecting Kharif production in Andhra Pradesh, Bihar, Gujarat, Haryana, Karnataka, Maharashtra, Rajasthan, Tamil Nadu and West Bengal. The production of rice (both Kharif and Rabi) is estimated at 101.8 million Tonnes, pulses at 17.58 million Tonnes, oilseeds at 29.46 million tonnes, sugarcane at 334.54 million tonnes and cotton at 33.80 million bales (of 170 kg. each). Though, production of

rice, sugarcane and cotton during kharif 2012-13 has been lower than that of the last year, these are better than the average production during the last five years. Production of coarse cereals has been severely affected by the deficient monsoon in Gujarat, Haryana, Karnataka, Maharashtra and Rajasthan, with the result that the overall production of Coarse Cereals has been lower by 3.95 million tonnes as compared to kharif 2011-12. Production of jute is estimated at 10.56 million bales (of 180 kg each) which are marginally lower than that of last year (10.74 million bales). Production of the major crops since 2007-08 till 2012-13 given in below table.

**Table-1 Production of major crops during the recent years
(million tones / bales)**

Crop	Season	2007-08	2008-09	2009-10	2010-11	2011-12 Final Estimates	2012-13 2 nd Adv Estimates
Rice	Kharif	82.66	84.91	75.92	80.65	92.75	90.69
	Rabi	14.03	14.27	13.18	15.33	12.56	11.11
	Total	96.69	99.18	89.10	95.98	105.31	101.80
Wheat	Rabi	78.57	80.68	80.80	86.87	94.88	92.30
Coarse Cereals	Kharif	31.89	28.54	23.83	33.08	32.46	28.51
	Rabi	8.86	11.49	9.72	10.32	9.58	9.96
	Total	40.75	40.03	33.55	43.40	42.04	38.47
Total Cereals	Kharif	114.55	113.45	99.75	113.73	125.21	119.19
	Rabi	101.46	106.45	103.70	112.52	117.02	113.37
	Total	216.01	219.90	203.45	226.25	242.23	232.56
Pulses	Kharif	6.40	4.69	4.20	7.12	6.06	5.48
	Rabi	8.36	9.88	10.46	11.12	11.03	12.09
	Total	14.76	14.57	14.66	18.24	17.09	17.57
Food grains	Kharif	120.96	118.14	103.95	120.85	131.27	124.68
	Rabi	109.82	116.33	114.15	123.64	128.05	125.47
	Total	230.78	234.47	218.10	244.49	259.32	250.15
Oilseeds	Kharif	20.71	17.81	15.73	21.92	20.69	19.45
	Rabi	9.04	9.91	9.15	10.56	9.11	10.01
	Total	29.75	27.72	24.88	32.48	29.80	29.46
Sugarcane		348.19	285.03	292.30	342.38	361.04	334.54
Cotton		25.88	22.28	24.02	33.00	35.20	33.80
Jute and Mesta		11.21	10.37	11.82	10.62	11.40	11.13
(million bales of 170 kg each), (million bales of 180 kg each)							

Sources Directorate of Economics and Statistics, Ministry of Agriculture:

GROWTH PERFORMANCE OF AGRICULTURE

India accounts for only about 2.4 % of the world's geographical area and 4% of its water resources, but has to support about 17% of the world's human population and 15% of the livestock. Agriculture is a critical sector of the Indian economy. Though its contribution to the overall Gross Domestic Product (GDP) of the country has fallen from about 30 percent in 1990-91 to less than 15 percent in 2011-12, about 11% of its exports, a trend that is expected in the development process of any economy, agriculture yet forms the backbone of development. An average Indian still spends almost half of his/her total expenditure on food, while roughly half of India's work force is still engaged in agriculture for its livelihood. Being both a source of livelihood and food security for a vast majority of low income, poor and vulnerable sections of society, its

performance assumes greater significance in view of the proposed National Food Security Bill and the ongoing Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) scheme. The experience from BRICS countries indicates that a one percentage growth in agriculture is at least two to three times more effective in reducing poverty than the same growth emanating from non-agriculture sectors. Given that India is still home to the largest number of poor and malnourished people in the world, a higher priority to agriculture will achieve the goals of reducing poverty and malnutrition as well as of inclusive growth. Since agriculture forms the resource base for a number of agro-based industries and agro-services, it would be more meaningful to view agriculture not as farming alone but as a holistic value chain, which includes farming, wholesaling, warehousing (including logistics), processing, and retailing. Further, it may be noted that in the last two Five Year Plans, it is clearly mentioned that for the economy to grow at 9 per cent, it is important that agriculture should grow at least by 4 per cent per annum.

Achieving an 8-9 percent rate of growth in overall GDP may not deliver much in terms of poverty reduction unless agricultural growth accelerates. At the same time 'growth with inclusiveness' can be achieved only when agriculture growth accelerates and is also widely shared amongst people and regions of the country.

All these factors point to just one thing that agriculture has to be kept at the centre of any reform agenda or planning process, in order to make a significant dent on poverty and malnutrition, and to ensure long-term food security for the people.

OVERALL GROWTH

The growth performance of the agriculture sector has been fluctuating across the plan periods. It witnessed a growth rate of 4.8 per cent during the Eighth plan period (1992–97). However, the agrarian situation saw a downturn towards the beginning of the Ninth plan period (1997–2002) and the Tenth plan period (2002–07), when the agricultural growth rate came down to 2.5 percent and 2.4 percent respectively. This crippling growth rate of 2.4 percent in agriculture as against a robust annual average overall growth rate of 7.6 per cent for the economy during the tenth plan period was clearly a cause for concern. The trend rate of growth during the period 1992-93 to 2010-11 is 2.8 percent while the average annual rate of growth in agriculture and allied sectors-GDP during the same period is 3.2 percent.

CROPPING PATTERN IN INDIA:

In India, area allocation among various crops has shown a measure of structural rigidity that reflects the traditional character of Indian agriculture wherein food grains have remained the predominant crop accounting for two thirds to three fourths of the gross cropped area since the early 1950's. This also reflects the impact of the prevalent demand structure. However, within the food grains sector, substantial changes have taken place.

Policy makers in India have been stressing the need for crop diversification to higher value crops as major strategy of agricultural development. This is because, with a rise in per capita income whereas the demand for food grains is likely to grow at a slow rate, that for oilseeds, fibres, sugarcane, livestock and horticulture products is projected to grow at a much faster rate. The planners feel that such diversification not only offers opportunities for rising farm incomes significantly, these are also likely to put less pressure on natural resources.

Most of the food grains crops that account for a major share of total cultivated area, in particular coarse cereals and to some extent pulses have remained low yield low value crops for a very long time. The introduction of new seed fertiliser technology during the mid-sixties resulted in substantially raising the yield levels of some of the major food grains crops like wheat and rice. This combined with a positive price climate resulted in increasing area allocation to these crops. The new technology was able to impact on the yield levels of non-food grain crops like oilseeds, fibre crops, sugarcane and fruit and vegetables after some time lag thereby resulting in significant cropping pattern changes over time.

1980-83 TO 1990-93 -THE MATURING OF GREEN REVOLUTION

The cropping pattern changes became more pronounced during 1980-83 to 1990-93 when a notable acceleration took place in the yield levels and growth rates of output of many crops across all states and regions of India as compared with the earlier period, 1962-65 to 1980-83.

At the all-India level, the proportion of area under food grains which had remained almost unchanged during 1962 to 1980-83, registered a sharp decline from 73.0 per cent of total area in 1980-83 to 67.3 per cent of GCA during 1990-93. It is the first time since 1962 that area under food grains declined in absolute terms from 126.97 million hectares during 1980-83 to 124.29 million hectares during 1990-93. The shift away from food grains occurred mainly from area under coarse cereals.

During 1980-83 to 1990-93, the main area shift that took place was from coarse cereals towards oilseeds. At all-India level, the share of area under coarse cereals in gross cropped area declined rapidly from 23.9 per cent during 1980-83 to 18.6 per cent of during 1990-93. On the other hand, crop area under oilseeds increased by about 8 million hectares and the share of oilseeds in GCA increased from 10.4 per cent in 1980-83 to 13.3 per cent in 1990-93.

During 1980-83 to 1990-93, there was a decline in the share of coarse cereals in all regions. In the central and southern regions, the decline in the share of coarse cereals went to an increase in the share of oilseeds. In the north western region, the share under coarse cereals declined but the main gainers were rice, wheat and 'remaining crops'.

POST-REFORM PERIOD 1990-93 TO 2003-06

The process of diversification in cropping pattern from food grains to non-food grains which began during 1980-83 to 1990, continued in 1990-93 to 2003-06 albeit at a slower rate and the share of food grains in gross cropped area declined from 67.3 per cent in 1990-93 to 63.7 per cent by 2003-06.

The economic reforms initiated during the early 1990's were expected to hasten the process of crop diversification from low value food grains to high value non-food grain crops. However, during the post-reform period 1990-93 to 2003-06, the yield growth rates of most of the important crops including wheat and rice, oilseeds, sugarcane decelerated considerably compared with the pre-reform period 1980-83 to 1990-93. Consequently during the post-reform period, the pace of cropping pattern changes towards higher value crops slowed down as compared with the pre-reform period 1980-83 to 1990-93.

During 1990-93 to 2003-06, like during 1980-83 to 1990-93, the shift has occurred mainly from area under coarse cereals and from some other crops like pulses. However, unlike the earlier period 1980-83 to 1990-93, when oil seeds were the main gainers, during 1990-93 to 2003-06, although share of oilseeds has also increased marginally, it is the 'remaining crops' which are the biggest beneficiaries. Some other crops like cotton and sugarcane have also marginally increased their share in area during this period. But the share of pulses has declined.

PERIOD OF RECOVERY 2004-05 TO 2014-15.

A significant recovery of growth was observed in the last few years that have pushed the decadal growth rates above 3 per cent. In nutshell, the growth series clearly establish the sharp deceleration of the agricultural sector in the post-reforms period and an unambiguous turnaround in the last five years, which also happens to be the 11th five year plan period. Agriculture sector growth increased 0.18% to 4.71% in 2014-15.

LAND USE STATISTICS UNDER DIFFERENT CROPS AND THE CROPPING PATTERN

As per the land use statistics, the acreage under different crops and the cropping pattern during the last two decades is given in the following table. While the net sown area has come down from 143 million hectares in 1990-91 to 140 million hectares in 2010-11, the gross cropped area has gone up by 6 million ha, from 186 to 192 million ha during the same period due to increase in the cropping intensity from 130 to 137 per cent.

Table-2 Cropping Pattern in India (Area in Million Hectares)

Year	1990-91	2003-04	2010-11(P)
Total Area Under Crops	185.74	189.67	192.20
Net area sown	143.00	140.71	140.02
Cropping Intensity (percent)	129.89	134.80	137.26
Area under Food Crops	141.03	142.12	141.06
Area under Non-Food Crops	44.71	47.55	51.14
Net Irrigated area	48.02	57.05	63.26
Total/Gross Irrigated Area	63.20	78.04	86.42

Sources: Directorate of Economics and Statistics, Ministry of Agriculture

Cropping pattern Changes in India:

The crop-pattern of any country is due to a number of factors, which can be classified as natural, economic, historic and social. Government policy also affects the changes in cropping pattern. As mentioned earlier the natural factors such as soil, type of climate, extent of rainfall etc. will determine the basic crop-pattern of a region over a period of time. Like natural factors economic factors such as, increase in price of a certain crop consistently for some years relative to other crops can induce the farmers to shift over to that crop. Policies of the Government relating to different crops, exports, taxes etc. can affect the cropping pattern in a significant way.

Table-3 Trends in Cropping Pattern in India (%) Share Crop-wise

Year	1990-91	2003-04	2008-09	2010-11
Total Area Under Crops	185742	189669	195357	192197
Crop-wise Share in Area				
Rice	23.0	22.3	23.1	22.0
Jowar	7.6	5.0	3.9	4.1
Bajra	5.8	5.8	4.5	4.7
Maize	3.2	3.8	4.2	4.3
Ragi	1.2	0.9	0.8	0.7
Wheat	12.9	14.2	14.3	14.9
Barley	0.5	0.4	0.4	0.3
Other Cereals and Millets	1.3	0.6	0.5	0.4
Total Cereals and Millets	55.5	53.0	51.6	51.4
Gram	4.0	3.7	4.1	4.2
Tur	1.9	1.8	1.7	1.8
Other Pulses	7.4	7.3	6.4	6.5
Total Pulses	13.4	12.9	12.2	12.5
Total Foodgrains	68.9	65.9	63.8	63.9
Sugarcane	2.1	2.4	2.5	2.4
Total Condiments & Spices	1.3	1.7	1.6	1.7
Total Fruits & Vegetables	3.6	4.9	5.2	5.4
Other Food Crops	0.1	0.1	0.1	0.1
Total Food Crops	75.9	74.9	73.2	73.4
Groundnut	4.5	3.3	3.2	2.9
Castor Seed	0.5	0.4	0.4	0.4
Sesamum	1.3	1.0	1.0	1.2
Rapeseed & Mustard	2.8	2.7	3.1	2.8

Linseeds	0.5	0.2	0.2	0.2
Coconut	0.8	1.0	1.0	1.0
Other Oilseeds	3.2	5.2	6.4	6.4
Total Oilseeds	13.5	13.8	15.2	14.9
Cotton	4.1	4.2	4.8	5.2
Jute	0.4	0.5	0.4	0.4
Other Fibres	0.2	0.1	0.1	0.1
Total Fibers	4.7	4.8	5.3	5.7
Indigo	0.0	0.0	0.0	0.0
Opium	0.0	0.0	0.0	0.0
Tobacco	0.2	0.2	0.2	0.3
Tea	0.2	0.3	0.3	0.3
Coffee	0.2	0.2	0.2	0.2
Fodder Crops	4.5	4.6	4.4	3.9
Other Non-Food Crops	0.8	1.1	1.2	1.4
Total Non-Food Crops	24.1	25.1	26.8	26.6

Source: Department of Agriculture & Cooperation

Cropping pattern in India is determined mainly by natural factors, yet technological factors have also played an important part. Food crops cover nearly three-fourths of total cropped area in which a large portion is occupied by cereals. Of the total area under food grains 65.9 per cent were under other cereals and 53.0 per cent under pulses in 2003-04.

Rice is the most important food grain crop in India. In 2003-04 rice was grown on 22.3 per cent of total area under food grains shows an increase in area from the earlier periods. In most of the states in India the area under rice increased on account of to the improvement in production of rice owing to special rice production programme and rice technology. When rice constituted more than one third of the total area under food grains the second important food grain crop, wheat, occupies more than one fifth of total area under food grains. Since coarse cereals face competition from superior cereals like rice and wheat in most of the states the area under coarse cereals either stagnated or decreased significantly.

Due to the various programmes launched by government to achieve self-sufficiency in edible oils area under oilseeds increased rapidly in 2008-09 but fell in 2010-11. Area under commercial crops like sugarcane, cotton and jute showed increment in 2003-04.

Cropping pattern is a manifestation of the cropping systems, which is described as the kind, and sequence of crop grown over a period of time under the specified soil conditions. Cropping pattern is a dynamic process and occurs due to changes over space and time with cumulative effects of past and present deviations. Farmers allocated their land among alternative crops in order to maximize their expected returns subject to economic, technical and institutional constraints. The area allocation decisions of the farmers are conditioned not only by the indigenous factors associated with the farm household but also by a group of exogenous variables.

India is endowed with diverse climatic, edaphic and socio-economic conditions and this has given rise to many location-specific cropping systems. Peter Robb while searching for the meaning of agriculture through experts in South Asian context writes "Agriculture also relates differently to physical environments. Its role and conditions are different in marginal areas and in the areas with various forms of artificial irrigation. It appears differently in villages, smallholdings and states. It has different imperatives and rhythms according to whether the main crop is wheat or rice, sugarcane or cocoa, pulses or groundnut or cotton and so on hence different practices are associated with the demands of particular crops. But there are also standardizations existing from beliefs and customs, social or gender roles, or indeed in accordance with

broader forces devised from law, terms and trade soon- factors which might extend across different agricultural regimes”.

Major cropping systems followed in India includes paddy based cropping system which is practiced in the region extending from the eastern part to include very large part of north –eastern and south eastern India and also strips along the eastern and western coast. This is predominant in Assam, West Bengal, Orissa, Bihar and Eastern states, Andhra Pradesh, Tamil Nadu, Karnataka, Kerala and the western coast.

Paddy is grown in high rainfall areas or in area where irrigation facilities are available. In southern states namely Andhra Pradesh, Tamil Nadu and Kerala paddy is grown in more than one season. Area under paddy in these three States, taken together, account for nearly one fifth of the paddy area in the country. In Andhra Pradesh pulses, groundnut, jowar, maize and sugarcane are major alternative crops where as in Karnataka alternative crops to paddy are ragi, plantation crops, cotton, groundnut, sorghum and maize. In Kerala plantation crops and tapioca are the main alternatives for paddy. Paddy based cropping system is predominantly subsistence- oriented till the recent past. Today surplus is being generated for trade.

The next and the largest surplus generating system which can be termed, as the major food basket of India is wheat based cropping pattern. Wheat is concentrated on sub-tropical region in northern India.

Another popular cropping system is paddy-wheat based cropping system, which exists in non-traditional paddy growing states of Punjab, Haryana and Uttar Pradesh and less in traditional states like Bihar and West Bengal falling in the Indo- Gangetic plains. The entire area under paddy in Punjab and Haryana and 96 per cent of Uttar Pradesh was under paddy-wheat cropping system.

Sorghum based cropping system is typical of the Deccan plateau and hill region. This can be a typical example of adjusting to climatic variations through diversification across crops and spreading the crops across season. This cropping system is mainly found in Maharastra, Madhya Pradesh, Rajasthan, Andhra Pradesh, Karnataka and Gujarat.

Other cropping systems could be called as convenience based cropping systems and developed by cumulative causation. Constraints are in the form of climate and market. The plantation crop based cropping systems have also been developed under the climatic constraints but optimized with economic incentives to generate high net income flow.

Diversification of agricultural production is emerging as an essential component for stabilizing farm income and augment employment in agriculture. During the Tenth Plan, emphasis was laid on stepping up of export and diversification of agriculture towards export-oriented crops. It is observed that supply of cash crops was more responsive to price changes than the crops largely cultivated for subsistence needs of the farmers.

At the national level during the sixties and seventies area under the food grain crops increased with the expansion of the gross cropped area. After 1970s the rate of growth in the area under food crops decelerated. Now there are clear indications that the cropping pattern is leaning towards non-food crops and consequent commercialization. At the all India level the area under wheat registered a significant increase from 8.92 per cent to 13.68 per cent at the cost of area under coarse cereals. Due to low productivity and lack of price advantages the share of area under pulses experienced decline.

CONCLUSION:

In India, area allocation among various crops has shown a measure of structural rigidity that reflects the traditional character of Indian agriculture wherein food grains have remained the predominant crop accounting for two thirds to three fourths of the gross cropped area since the early 1950s. Most of the food grains crops that account for a major share of total cultivated area, in particular coarse cereals and to some extent pulses have remained low yield low value crops for a very long time. The new technology was able to impact on the yield levels of non-food grain crops like oilseeds, fibre crops, sugarcane and fruit and vegetables after some time lag thereby resulting in significant cropping pattern changes over time. The process of diversification in cropping pattern from food grains to non-food grains which began during 1980-83 to 1990, continued in 1990-93 to 2003-06 albeit at a slower rate and the share of food grains in gross

cropped area declined from 67.3 per cent in 1990-93 to 63.7 per cent by 2003-06. When rice constituted more than one third of the total area under food grains the second important food grain crop, wheat, occupies more than one fifth of total area under food grains.

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