

## **Agricultural Production Trends in India: An Overview**

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### **ABSTRACT**

India's agricultural sector is rich world second largest rice and wheat producing country and the export of rice produce in large and diverse. Indian agriculture has one –fifth trade worldwide also the largest producer, consumer and importer of pulses such as pigeon peas, chick peas, mung beans and lentils. However in India today, as in many other mounting countries with a rich agricultural tradition of their own, the words 'improved agriculture' and 'progressive agriculture' have become synonymous with the spread of HYVs grown with ever-increasing doses of chemical fertilizers and pesticides. Wherever the new crop varieties have spread, time-honoured crop rotations, inter-cropping patterns and other important features of traditional agriculture have been harshly uprooted. At the back of this trend, and the official policies which support it, is the belief that traditional agriculture is 'backward' and incapable of meeting the need of increasing population.

### **1. INTRODUCTION**

Indian Agriculture has the backbone of Indian economy as of its high share in employment and livelihood formation. India is the second largest producer of food in the world: more than 200 million tons of food grains, 150 million tones of fruits and vegetables, 91 million tonnes of milk, 1.6 million tonnes of poultry meat, 417 million livestock, and 6.05 million tonnes of fish and fish products. The Indian agriculture has made great strides over the years. The food grain production has increased more than fourfold - from 51 million tonnes in 1950-51 to 212 million tonnes during 2003-04 growing at an annual average rate of more than 2.4 percent per annum. 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 an important sector of the Indian economy, accounting for 14% of the nation's GDP, about 11% of its exports, about half of the population still relies on agriculture as its principal source of income and it is a source of raw material for a large number of industries. Accelerating the growth of agriculture production is therefore necessary not only to achieve an overall GDP target of 8 per cent during the 12th Plan and meet the rising demand for food, but also to increase incomes of those dependent on agriculture to ensure inclusiveness. The share of agriculture in the Gross Domestic Product (GDP) has registered a steady decline yet this sector provides direct employment to more than fifty percent of total workforce in the country and a large proportion of the population depends upon agro-based industries and trade of agriculture products. It is also an important source of raw material and demand for many industrial products, particularly fertilizers pesticides, agricultural implements and a variety of consumer goods contribute significantly to the exports. However, the growth of agriculture over a period of time remained lower than the growth in non-agriculture sectors.

## **GENERAL CAUSES OF EXTREME DEMANDS OF POPULATION ON LAND**

The heavy pressure of population on land is caused by the limited growth of employment opportunities in the non-agricultural sector for rural people and rapid growth of rural population. In 2001, about three-quarters of the rural working population were employed in the agriculture sector. The increasing population is largely responsible for subdivision, fragmentation of land holdings that results into low productivity of land.

## **COMMUNITY ENVIRONMENT**

The social environment in terms of illiteracy, superstitious attitude and unresponsive behavior towards the new technology is also a major limiting factor to the improvement in the agricultural productivity. Further, the human factor engaged in the agriculture sector is most unsatisfactory due to poor health and hygiene conditions.

## **LAND DEGRADATION**

The natural resource degradation in rural areas has occurred due to two major problems one is the increasing population pressure that has resulted into decline in forest cover and second is the erosion and loss of top-soil which is very difficult to reverse. The increased land degradation is mainly due to the increased use of chemical fertilizers, and low quality of canal water. This has resulted into loss of nutrients in the land and fall in the productivity levels.

## **LACK OF GENERAL INFRASTRUCTURAL FACILITIES**

The economic rural infrastructural facilities are inadequate in terms of availability of road, transportation facilities, electricity and power. The Government's expenditure on total rural development has declined tremendously. There is a marked slowdown in capital formation in the agriculture sector.

## **INADEQUATE AGRICULTURAL CAPITAL FORMATION:**

Agriculture sector cannot make substantial contribution to the economic development of the country. The capital formation in the agriculture sector particularly the public capital formation in the agriculture sector is declining. The investment in agriculture as a proportion of GDP has fallen from 1.92 per cent in 1990 to 1.31 per cent in 2003. The depressed capital formation has resulted into low agriculture productivity.

## **INSTITUTIONAL CAUSES DEFECTIVE LAND TENURE SYSTEM**

The exploitative character of land tenure system in the form of Zamindari system has reduced the capacity, incentive and motivation of the cultivators to improve productivity. The exploitative practices in terms of excessive rent, insecurity of land tenure and no land ownership rights causes cultivators to share large portion of output with land owners. This has resulted in lack of resources and interest of farmers to introduce technological improvements and thus increase productivity.

## **UNECONOMIC LAND HOLDINGS**

The average land-holding in India is not only small in size but split into pieces and scattered due to sub-division and fragmentation of land. The average land-holding is just 2.30hectares according to the latest agriculture census in India. This has resulted into the uneconomic land holding making investments in improved technology and inputs unviable .This has caused reduction in land productivity.

## **INADEQUATE CREDIT AND MARKETING FACILITIES**

There has been a drastic reduction of institutional credit for agriculture. It is evident from the fact that the percentage share of agricultural credit, in the total credit of all scheduled commercial banks since the early 1990s has fallen compared to the levels, reached in the 1980s. Banks and financial institution are reluctant to provide financial assistance at fair rate of interest to farmers. Since 2003, however, there is an increase in absolute amount of credit to agriculture sector of all banks. However, the most disturbing trend of institutional financing in the recent years is the increase in the share of indirect financing by these institutions. The share of direct financing of farmers has declined tremendously. Thus, a large section of farmers has to depend upon non-institutional credit system (like moneylenders, and traders) that charge exorbitant rate of interest. The investment for improved seeds, irrigation facilities and other improved technological requirements to increase land productivity is adversely affected due to paucity of funds.

## **TECHNICAL CAUSES IN TECHNOLOGICAL BACKWARDNESS**

Most of farmers use traditional agriculture methods mainly due to paucity of finance. The use of high-yield variety seeds and fertilizers is very limited. Since the early 1990s there has been the weakening of scientific research and extension services by the government. By all accounts, the agricultural universities, which had played a critical role in the development and dissemination of better quality seeds, other inputs and improvement in agricultural practices, have been starved of funds with adverse consequences. Government has withdrawn from provisioning of HYV seeds developed in laboratory to the farms. Farmers have to pay exorbitant prices to the private suppliers for the low quality seed variety which has adverse consequences on the agricultural productivity.

## **INCREASING INPUT COST**

The increase in the input cost due to reduction in subsidies for fertilizers and better seeds and increase in cost of power are responsible for the deceleration in the agriculture growth in the recent years.

## **INADEQUATE IRRIGATION FACILITIES**

The vast proportion of cultivable land in India is rain-fed. Further, the infrastructure for irrigation is highly underdeveloped due to defective management as revealed by the fact that only 52.4 percent of the land was irrigated in the year 2003. A good monsoon results in a robust growth for the economy as a whole, while a poor monsoon leads to a sluggish growth. As rainfall is often insufficient, uncertain and irregular, it leads to low productivity. Further, the Government's expenditure on irrigation coverage and flood control has witnessed a declining trend during the

reform period. The constant and regular supply of water is required to use chemical fertilizers and other technological resources to boost up production.

## **2. OBJECTIVES**

- To analysis the trend in agricultural production in India.
- To study discuss the of problem and of agricultural production and technology.
- To study of the direction of agricultural productivity trends in five year plan.

## **3. METHODOLOGY**

The Present Study is based on secondary sources. Secondary data is collected from various Government of India Reports, RBI reports, Ministry of Agriculture reports, books, articles, and Economic Survey of India. In this background, the present study is to analyze the trends and pattern of agriculture growth and Production in India.

## **MEASURES TO IMPROVE PRODUCTIVITY**

Government has initiated various measures to overcome the problem of low agriculture productivity but the following measures are required to strengthen the agriculture development:

## **EFFECTIVE IMPLEMENTATION OF LAND REFORMS**

The land reforms in terms of Zamindari abolition, ceiling and redistribution of land tenurial relations, consolidation of small and scattered holdings, minimum wages of landless labor etc needs to be effectively implemented. This will help to provide incentives and motivation to farmers to improve productivity and investment in agriculture sector. It will also have social implication by providing due share in the output. The strong political will and better administrative skills are required to operationalize these reforms at the grass root level.

## **GREATER USAGE OF MODERN TECHNOLOGY**

The components of modern technology in terms of improved seeds, fertilizers and pesticides have to be made available easily to the farmers at fair prices. Farmers are required to be given training about the usage of these components especially fertilizers and chemical pesticides. The services of constant expertise, guidance and counseling about seeds sowing, time of sowing etc needs to be developed. In fact a second green revolution is required to distribute these technological inputs including improved variety of seeds to the cultivators.

## **IMPROVED CREDIT SERVICES**

The timely and sufficient financial assistance is the precondition to improve usage of better technology. Government had launched various schemes and institutions to improve agricultural credit such as establishment of cooperative banks, rural branches of nationalized banks, grameen banks etc. However, there is a lack of coordination under the multi-agency credit system. Further, there is an absence of appropriate motivation and knowledge especially amongst commercial banks to provide agriculture credit in the rural areas. In fact, the rural credit system should be developed as comprehensive financial cum service constancy organization that provides financial and farm-related help to the farmers.

## **RESTRUCTURING CROPPING PATTERN**

The scientific research has mainly focused upon two major crops viz, wheat and rice. The breakthrough in terms of improved varieties of seeds has to be explored for other crops.

## **DEVELOPMENT OF IRRIGATION FACILITIES**

The main obstacle in the exploitation and use of modern technology is the water shortage. The inter-linking of river projects needs to be implemented speedily to reduce the ill-effects of floods and droughts. The greater use of dry and commercial cropping that requires lesser use of water should be encouraged. The surface-irrigation and water-pumping arrangements should be increased.

## **DEVELOPMENT OF RESEARCH INSTITUTES**

The research labs and agricultural universities have to be established, upgraded and sustained. The problems such as lack of resources, equipments and experts in these institutes need to be addressed immediately. The weakening of link between laboratory research and application on farm has to be minimized

## **BETTERMENT OF WAREHOUSING AND DISTRIBUTION SERVICES**

The warehousing facilities are so under-developed that it renders the stored goods unsuitable for consumption. It is paradoxical that the country suffers from deficient food supplies in many regions and the food grains are rotten in warehouses. The modern warehousing facilities, transportation system and marketing methods needs to be developed to increase the availability of food to the masses. This would provide incentives to marketable surplus among farmers and go a long way to improve productivity. The public- private alliance may be encouraged to increase investment in warehousing services.

## **POPULATION CONTROL**

The continuous growth in the population especially in the rural areas is the major cause of uneconomic land-holding which limits the usage of modern technology. Thus the family planning and population control remain national priority.

## **INTRODUCTION OF CO-OPERATIVE FARMING AND MARKETING**

The co-operatives in India are suffering due to strict Government controls and legislations. The co-operative should be given greater operational freedom and allowed to enlarge their activities including banking and marketing of agro products. Before 1980, the northern part of India led in agricultural productivity since it was the center of irrigation expansion and Green Revolution technology-led growth. In the 1990s, spending on irrigation, water management and scientific research was cut and extension services declined. There were limited advances in traditional food crops and agricultural productivity growth stalled. The North still has the highest mean revenue share, but production growth has now shifted from the North to rainfed areas in the South and West. As shown in Figure 15, from 1980 to 2008, agricultural output growth in the South and West

was driven by diversification from grains and pulses to high-value crops, particularly vegetables, spices and livestock, resulting in the highest TFP gain.

The basic model is characterized by two equations

- 1 a production functions;
- 2 a capital accumulation equation

The Neoclassical Aggregate Production Function

$$Y(t) = F(A(t), K(t), L(t))$$

where  $K(t)$  is physical capital,  $L(t)$  is labor and  $A(t)$  is a exogenous technology shift (TFP) Technology is free; it is publicly available as a non-excludable, non-rival good.

Begin with our Cobb-Douglas production function expression for output per worker as a function of the capital-labor ratio--with the capital-per-worker form of the production function, Romer(1992) assumed that physical capital might have external effects, which means that invention of one physical capital by one firm might lead to benefit to other firms. Then physical capital might have constant returns to scale.

**MAIN MODEL**

If physical capital has constant returns to scale and production depends only on physical capital, then:

$$Y = aK$$

$$K = sY = saK$$

$$K \dot{Y} = sa K \dot{Y} \Rightarrow \Delta K = sa \Delta K \Rightarrow sa = 1$$

The model has two simple and powerful implications: 1) GDP and capital growth rate is constant. This means that economy continues to grow in the long run. Therefore growth is unbounded. 2) If savings rate increases or marginal product of physical capital (a) increases, then the economy grows faster and unbounded.

**AVERAGE ANNUAL CHANGES IN COMMODITIES SHARE OF OUTPUT GROWTH IN INDIA, 1980-2008**

COUNTRY	GRAINS PERCENTAGE	PULSES PERCENTAGE	HORTICULTURE & SPICES PERCENTAGE	OILSEEDS PERCENTAGE	SPECIALTY CROPS PERCENTAGE	LIVESTOCK PRODUCTS PERCENTAGE
India	-1.83	-4.03	2.45	-0.12	-0.41	1.18
North	0.32	-8.50	-1.06	-5.18	-2.11	1.38
West	-4.66	-3.90	6.18	-1.02	-2.56	0.46
Central	-4.05	-3.12	1.51	8.20	-5.18	-1.41
East	-0.57	-11.57	2.64	-8.88	-3.13	0.07
Northeast	-0.91	-2.43	1.59	4.50	-2.70	-1.74
South	-4.78	-11.8	2.77	-4.04	-0.76	1.81

**Source:** Central Statistics Office, Ministry of Statistics and Programme Implementation, Govt. of India.

**TABLE NO 1**

India remained the fastest growing large economy in the world during 2016-17, despite a slowdown due to unprecedented challenges faced by the domestic and the world economies. The Indian economy, which achieved a real Gross Domestic Product (GDP) growth of 8.0 per cent during 2015-16, is estimated to experience a decline to 7.1 per cent during 2016-17, according to

provisional estimates (PE)1 . Further, the growth of real Gross Value Added (GVA) at basic prices, which stood at 7.9 per cent during 2015-16, is estimated to decelerate to 6.6 per cent during 2016-17.

**SECTOR-WISE GROWTH RATE (%) OF GVA AT BASIC PRICE AT CONSTANT (2011-12) PRICES**

YEAR	AGRICULTURE	INDUSTRY	SERVICES
2012-13	1.5	3.3	8.3
2013-14	5.6	3.8	7.7
2014-15	-0.2	7.5	9.7
2015-16	0.7	8.8	9.7
2016-17	4.9	5.6	7.7

**Source:** Central Statistics Office, Ministry of Statistics and Programme Implementation, Govt. of India.

**TABLE NO 2**

**SECTOR WISE CONTRIBUTION OF GDP IN INDIA**

YEAR	AGRICULTURE & ALLIED		AGRICULTURE		INDUSTRY		MINING & QUARRYING		MANUFACTURE		SERVICE	
2000-01	23.02	22.26	19.43	18.71	26.00	27.25	2.29	2.96	15.31	15.46	50.98	50.49
2001-02	22.92	22.39	19.34	18.90	25.08	26.54	2.21	2.86	14.64	15.01	51.99	51.07
2002-03	20.70	20.13	17.26	16.72	26.17	27.39	2.69	2.98	14.87	15.44	53.13	52.48
2003-04	20.74	20.33	17.49	17.16	26.01	27.22	2.44	2.84	14.90	15.21	53.25	52.44
2004-05	19.03	19.03	16.04	16.04	27.93	27.93	2.86	2.86	15.25	15.25	53.05	53.05
2005-06	18.81	18.27	15.83	15.46	28.13	27.99	2.79	2.65	15.39	15.34	53.06	53.74
2006-07	18.29	17.37	15.30	14.69	28.84	28.65	2.70	2.60	16.06	16.00	52.87	53.98
2007-08	18.26	16.81	15.63	14.29	29.03	28.74	2.72	2.46	15.99	16.14	52.71	54.45
2008-09	17.78	15.77	15.21	13.36	28.29	28.13	2.64	2.36	15.43	15.78	53.93	56.11
2009-10	17.74	14.64	15.20	12.35	27.76	28.27	2.61	2.30	15.10	16.17	54.50	57.09
2010-11	18.21	14.59	15.78	12.42	27.16	27.92	2.83	2.25	14.80	16.17	54.64	57.48
2011-12	17.86	14.37	15.50	12.26	27.22	28.22	2.65	2.11	14.73	16.28	54.91	57.42
2012-13	17.52	13.95	15.10	11.85	26.21	27.27	2.37	1.98	14.07	15.76	56.27	58.79
2013-14	18.20	13.94	15.79	11.87	24.77	26.13	2.13	1.86	12.89	14.94	57.03	59.93

**Source:** Central Statistics Office, Ministry of Statistics and Programme Implementation, Govt. of India.

**TABLE NO 3**

**SHARE OF AGRICULTURE & ALLIED SECTORS IN TOTAL GROSS VALUE ADDED (GVA)**

ITEMS	YEAR			
	2012-13	2013-14	2014-15	2015-16
GVA of Agriculture and Allied Sectors	1680797	1902452	1995251	2093081
Percent to total GVA	18.2	18.3	17.4	17.0

**Source:** Central Statistics Office, Ministry of Statistics and Programme Implementation, Govt. of India.

**TABLE NO 4**

**AREA, PRODUCTION AND YIELD OF MAJOR CROPS**

CROPS	AREA (LAKH HECTARE)			PRODUCTION (MILLION TONNES)			YIELD(KG/HECTARE)		
	2013-14	2014-15	2015-16	2013-14	2014-15	2015-16	2013-14	2014-15	2015-16
<b>Rice</b>	441.36	441.10	433.88	106.65	105.48	104.32	2416	2391	2404
<b>Wheat</b>	304.73	314.65	302.27	95.85	86.52	93.50	3145	2750	3093
<b>Coarse Cereals</b>	252.19	251.70	237.75	43.29	42.86	37.93	1717	1703	1596
<b>Pulses</b>	252.12	235.54	252.59	19.25	17.15	16.47	764	728	652
<b>Foodgrains</b>	1250.41	1243.00	1226.50	265.04	252.02	252.22	2120	2028	2056
<b>Oilseeds</b>	280.50	255.96	261.34	32.74	27.51	25.30	1168	1075	968
<b>Sugarcane</b>	49.93	50.66	49.53	352.14	362.33	352.16	70522	71512	71095
<b>Cotton</b>	119.60	128.19	118.72	35.90	34.80	30.15	510	462	432
<b>Jute&amp; Mesta</b>	8.38	8.09	7.85	11.69	11.12	10.47	2512	2473	2399

**Source:** Directorate of Economics & Statistics, Department of Agriculture, Cooperation & Farmers Welfare

**TABLE NO 5**

Production Scenario 2015-16 1.9 Notwithstanding the setback in kharif crops 2015-16 due to bad monsoon and Rabi crops due to warm winter, total foodgrain production in the country increased marginally in 2015-16. As per 4th Advance Estimates for 2015-16, total production of rice is estimated at 104.32 million tonnes which is lower by 1.17 million tonnes than the production of 105.48 million tonnes during the preceding year. Production of wheat, estimated at 93.50 million tonnes, is higher by 6.97 million tonnes than the production of 86.53 million tonnes achieved during 2014-15. Total production of Coarse Cereals estimated at 37.94 million tonnes is lower by 4.38 million tonnes than their production during 2014-15.

**KHARIF PRODUCTION IN 2015-16 AND 2016-17**

CROP	2015-16 (4 <sup>TH</sup> ADVANCE ESTIMATE)	2016-17(1 <sup>ST</sup> ADVANCE ESTIMATE)	ABSOLUTE DIFFERENCE	PERCENTAGE INCREASE /DECREASE
Food grains	124.01	135.03	11.02	8.89
Oilseeds	16.59	23.36	6.77	40.81
Sugarcane	352.16	305.25	46.91	-13.32
Cotton	30.15	32.12	1.97	6.53

**Source:** Directorate of Economics & Statistics, Department of Agriculture, Cooperation & Farmers Welfare

**TABLE NO 6**

As per the First Advance Estimates, total production of Kharif Foodgrains during 2016-17 is estimated at record 135.03 million tonnes which is higher by 11.02 million tones as compared to last year's Kharif foodgrains production of 124.01 million tonnes. Total production of Kharif rice is estimated at record level of 93.88 million tonnes which is higher by 2.57 million tonnes more



than the last year’s production of 91.31 million tonnes. Total production of coarse cereals in the country has increased to 32.45 million tonnes as compared to 27.17 million tonnes during 2015-16 (4th Advance Estimates). The production of kharif pulses estimated at 2.54 million tonnes more than the last five years’ average production.

**PRE AND POST NHM SCENARIO: AREA, PRODUCTION AND PRODUCTIVITY**

CROP	AREA				PRODUCTION				PRODUCTIVITY		
	2004-05	2014-15	2015-16(3 <sup>rd</sup> Adv.estimates)	Annual Growth Rate % (2015-16 over 2014-15)	2004-05	2014-15	2015-16 (3 <sup>rd</sup> Adv.estimates)	Annual Growth Rate % (2015-16 over 2014-15)	2004-05	2014-15	2015-16(3 <sup>rd</sup> Adv.estimates)
<b>Fruits</b>	5049	6110	6405	6405	50867	86602	91443	5.59	10.07	14.2	14.3
<b>Vegetables</b>	6744	9542	9575	9575	101246	169478	166608	(-)1.69	14.99	17.8	17.4
<b>Flower</b>											
<b>Loose</b>	118	249	243	(-)2.53	659	1659	1545	(-)6.86	5.65	8.6	6.4
<b>Spices</b>	3150	3317	3264	-1.61	4001	6108	6350	3.97	1.36	1.8	1.9
<b>Medicinal &amp; Aromatic Plant</b>	131	659	617	(-)6.33	159	1000	1156	15.64	1.18	1.5	1.9
<b>Plantation</b>	3147	3534	3683	4.23	9835	15575	15477	(-)0.63	4.22	4.4	4.2
<b>Others</b>	106				172		782				
<b>Total</b>	18445	23410	23787	1.16	166939	280986	283360	0.84	9.1	12	11.9

**Source:** Directorate of Economics & Statistics, Department of Agriculture, Cooperation & Farmers Welfare

**TABLE NO 7**

Area, Production & Productivity of Horticulture Crops 5.13 The comparative details of area, production and productivity of various horticulture crops during 2015-16 with reference to 2004-05 viz. pre and post NHM scenario are given in the following Table with a production of about 283.4 million MT, horticulture production has witnessed an increase of about 34.3% during the period 2007-08 to 2015-16. The significant feature is that there has been improvement of productivity of horticulture crops, which increased by about 13.8% during this period. The wide and varied nature of horticulture sector covering fruits, vegetables, root and tuber crops, flowers, aromatic and medicinal crops, spices and plantation crops facilitates better returns per unit of area besides opportunities for diversification in agriculture.

**AREA, PRODUCTION AND PRODUCTIVITY OF HORTICULTURE CROPS**

<b>YEAR</b>	<b>AREA</b>	<b>PRODUCTION</b>	<b>PRODUCTIVITY</b>
2007-08	20.2	211.0	10.4
2008-09	20.5	214.4	10.5
2009-10	20.8	223.2	10.7
2010-11	21.8	240.4	11.0
2011-12	23.2	257.3	11.1
2012-13	23.7	268.8	11.3
2013-14	24.2	277.4	11.5
2014-15	23.4	280.99	12.01
2015-16	23.7	283.36	11.91

**Source:** Directorate of Economics & Statistics, Department of Agriculture, Cooperation & Farmers Welfare

**TABLE NO 8**

Area, production and productivity of horticulture crops during past 9 years are given in Table production of 166.6 million tonnes with average productivity of 17.4 tonnes/ha. In fact vegetables constitute about 59% of horticulture production. During the period (2007-08 to 2015-16), area and production of vegetables increased by 22% and 29% respectively, Comparative details are depicted in the

**4. CONCLUSION**

Indian cultivation continues has to be large source of employment and rural livelihood. In the year 2006-07 around 52 percent of the country’s workforce is directly engaged in agriculture and allied activity which is down from 70 percent in early 90’s and 57 percent in 2001. Besides direct employment this sector provides employment in ago-based industries like edible oils, cotton, sugarcane etc. Promote large employment opportunities are also generated in activities that handle agriculture products like storage, transportation, rural banking and agriculture export.

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