

## **Performance of Foodgrains Production in India:Decadewise Trend Analysis**

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### **I. INTRODUCTION**

Food is the first and foremost basic necessity of every human being. Food security refers to the availability of sufficient food grains at a reasonable price so that each and every individual in a country can access food grains as per his/ her requirements. According to United States Agency for International Development (USAID), a country attains food security, when all the people at all times have both physical and economic access to sufficient food to meet their dietary needs for a productive and healthy life. As per various definitions, food security has four dimensions namely food availability, food accessibility, food affordability (utilization) and food stability. Of these four dimensions of food security problem, food availability is more important fundamental issue at present.

In a developed economy, a problem called 'farm problem' emerges. While in an under-developed economy the type of problem called 'food problem' frequently appears mainly because of the low productivity of agriculture, poor distribution system and existence of backward sloping supply curve in agriculture. The total agricultural production, on the average, is low in a backward economy because of various causes. It is not only low but also quite fluctuating because of vagaries in nature. So there is every chance of the food output at times failing to meet the requirements of the economy and thus leading to the emergence of food problem. Sometime, the total supply in the country may be sufficient to meet all the needs of the population but poor means of transportation may hinder proper distribution of foodgrains in the country.

Today everybody talk about food insecurity in world. During the last 25 years many chronically food deficit countries of the Asian region have been able to raise food output above the rate of growth of population. This has been achieved primarily through increased productivity per unit of land and of time. A recent study by the International Food Policy Research Institute, however, indicates that the prospect for reducing malnutrition during the next 25 years among children is bleak. According to the most likely 2020 vision scenario, the proportion of malnourished children will decline from 34 per cent to 20 per cent by 2020. But because of the population growth, the actual number will decline only slightly. Thus there is no time to relax on the food production front.

At present the Indian economy is facing many challenges in the farm sector. One of the major problems is food insecurity. In India food insecurity is not a new problem. It has been persisting historically in terms of all above said four dimensions. This problem has been continuing even before the advent of British Imperialism in India. However, step-motherly attitude of the British government is one of the principal reasons for the present growing insecurity with respect to availability of food grains in India for its sizeable section of the society. Besides the human factor, natural factors also have been a hurdle in food security in India. Famines, floods and other natural calamities have been a recurring phenomenon causing a fall in food grains production which leads to food insecurity. Even during the present period of high economic growth and achievement of self sufficiency, with respect to food grains production it is not encouraging; rather it is need of an hour to make the attention of the government. Still a sizeable section of the Indian society is deprived of adequate quantity of food grains at a reasonable price. According to Planning Commission of India nearly 35.46 per cent (estimated as on March 2010) of the total population are living below the poverty line and reeling under absolute poverty. This explains the grim situation of food insecurity in India. With this background, the present article aims to analyse the decade-wise trend and growth of foodgrains production in India.

### **II. MATERIALS AND METHODS**

The present study is a descriptive and analytical research purely based on the secondary data. The necessary secondary data for 66 years from 1950-51 to 2015-16 have been collected from the various survey reports published over the years by Ministry of Agriculture and Cooperation, Ministry of Statistics and Programme Implementation (MOPSI)-Central Statistical Organisation, Centre for Monitoring Indian Economy, Handbook of Indian Economy published by RBI, various issues of Economic Survey and Websites. The present

study had made an attempt to analyse the decade-wise trend and growth of foodgrains production in India by applying linear regression model and Semi-log Model.

### III. RESULTS AND DISCUSSION

#### Foodgrains Production in India

The role of agriculture in India's economic development continues to be of great importance, as a producer of food, as an employer of about two-thirds of the labour force, and as a source of purchasing power for much of the non-agricultural consumer goods and services in the economy. Thus, rapid growth of agriculture is essential for sustainable growth and development of the economy. Within agriculture, foodgrain production is by far the major activity, covering about 80 per cent of the cropped area in India and providing the main staple source of food. Foodgrains provide almost all the calories and proteins consumed by the poor and provide the rural poor with the bulk of their employment and income. Further, with a population of 121 crores, India's foodgrain supply needs to balance the demand which will have important implications for the global balances. Government policy in India has always given substantial importance to foodgrain production. Such support, particularly since the beginning of the green revolution in the mid-1960s, has contributed to remarkable growth in this sector despite many constraints. Yet with a growing population, rising incomes, and the substantial latent demand of the poor for foodgrains, the country will require to increase the production. India, which faced food deficits till mid-1970s, became self-sufficient or marginally surplus thereafter; but even with this performance in food production, rapid economic growth and reduction of poverty level have not been achieved. The implications of the achievement of these goals on the food demand the interlinkages between the growth in foodgrain production to be considered, particularly in the rural areas.

In India, the agriculture sector produces various foodcrops (rice, wheat, cereals, pulses), commercial crops, oilseeds and sugarcane since the time immemorial. Among these, foodgrains are most important in India. Foodgrain is defined as the starchy grain of cereal grasses, which are used for food. The most common food grains of India are Rice, Wheat, Coarse Cereal (which include maize or makka, sorghum, barley, ragi & other small millet's) and pulses. The total foodgrains production, the percentage share of foodgrains production to agricultural production, index and annual growth rate of foodgrains production in India during the decades between 1950-51 and 2015-16 are presented in the table 1.

**Table 1**  
**Foodgrains Production in India**

Year	Agricultural Production (inMTs)	Foodgrains Production (in MTs)	Percentage Share of Foodgrains to Agriculture Production	Index of Foodgrains Production	Annual Growth Rate
<b>Period-I</b>					
1950-51	119.65	50.83	42.5	100	--
1951-52	126.86	51.99	41.0	102	2.2
1952-53	123.84	59.20	47.8	116	12.2
1953-54	127.77	69.82	54.6	137	15.2
1954-55	141.74	68.03	48.0	134	-2.6
1955-56	142.99	66.85	46.8	132	-1.8
1956-57	156.31	69.86	44.7	137	4.3
1957-58	152.35	64.31	42.2	127	-8.6
1958-59	169.91	77.14	45.4	152	16.6
1959-60	170.71	76.67	44.9	151	-0.6
<b>Average</b>	<b>143.21</b>	<b>65.47</b>	<b>45.8</b>	<b>129</b>	<b>13.7</b>
<b>Period-II</b>					
1960-61	210.17	82.02	39.0	100	6.5
1961-62	207.39	82.71	39.9	101	0.8
1962-63	192.52	80.15	41.6	98	-3.2
1963-64	206.09	80.64	39.1	98	0.6
1964-65	233.86	89.36	38.2	109	9.8
1965-66	213.66	72.35	33.9	88	-23.5
1966-67	185.69	74.23	40.0	91	2.5
1967-68	212.59	95.05	44.7	116	21.9
1968-69	235.19	94.01	40.0	115	-1.1
1969-70	254.94	99.50	39.0	121	5.5
<b>Average</b>	<b>215.21</b>	<b>85.00</b>	<b>39.5</b>	<b>104</b>	<b>2.0</b>
<b>Period-III</b>					
1970-71	784.96	108.42	13.8	100	8.2
1971-72	745.98	105.17	14.1	97	-3.1
1972-73	788.31	97.03	12.3	89	-8.4
1973-74	827.71	104.67	12.6	97	7.3
1974-75	848.13	99.83	11.8	92	-4.8

1975-76	855.43	121.03	14.1	112	17.5
1976-77	900.27	111.17	12.3	103	-8.9
1977-78	1009.06	126.41	12.5	117	12.1
1978-79	984.89	131.90	13.4	122	4.2
1979-80	957.16	109.70	11.5	101	-20.2
<b>Average</b>	<b>870.19</b>	<b>111.53</b>	<b>12.8</b>	<b>103</b>	<b>0.4</b>

Source: RBI Database of Indian Economy, Department of Economics and Statistics

**Table 1 (continued)**  
**Foodgrains Production in India**

Year	Agricultural Production (inMTs)	Foodgrains Production (in MTs)	Percentage Share of Foodgrains Agriculture Production	Index of Foodgrains Production	Annual Growth Rate
<b>Period-IV</b>					
1980-81	997.11	129.59	13.0	100	15.3
1981-82	1061.01	133.30	12.6	103	2.8
1982-83	1034.96	129.52	12.5	100	-2.9
1983-84	1040.27	152.37	14.6	118	15.0
1984-85	1180.61	145.54	12.3	112	-4.7
1985-86	1132.39	150.44	13.3	116	3.3
1986-87	1173.46	143.42	12.2	111	-4.9
1987-88	1160.28	140.35	12.1	108	-2.2
1988-89	1323.9	169.92	12.8	131	17.4
1989-90	1235.94	171.04	13.8	132	0.7
<b>Average</b>	<b>1133.99</b>	<b>146.55</b>	<b>12.9</b>	<b>113</b>	<b>4.0</b>
<b>Period-V</b>					
1990-91	1345.75	176.39	13.1	100	3.0
1991-92	1395.75	168.38	12.1	95	-4.8
1992-93	1321.54	179.48	13.6	102	6.2
1993-94	1428.07	184.26	12.9	104	2.6
1994-95	1442.92	191.50	13.3	109	3.8
1995-96	1484.86	180.42	12.2	102	-6.1
1996-97	1512.49	199.43	13.2	113	9.5
1997-98	1580.43	193.12	12.2	109	-3.3
1998-99	1660.08	203.61	12.3	115	5.2
1999-00	1681.29	209.80	12.5	119	3.0
<b>Average</b>	<b>1485.32</b>	<b>188.64</b>	<b>12.7</b>	<b>107</b>	<b>1.9</b>
<b>Period-VI</b>					
2000-01	1681.26	196.81	11.7	100	-6.6
2001-02	1704.96	212.85	12.5	108	7.5
2002-03	1618.66	174.78	10.8	89	-21.8
2003-04	1646.84	213.19	12.9	108	18.0
2004-05	1669.39	198.36	11.9	101	-7.5
2005-06	1770.58	208.60	11.8	106	4.9
2006-07	1892.53	217.28	11.5	110	4.0
2007-08	1895.28	230.78	12.2	117	5.8
2008-09	1815.51	234.47	12.9	119	1.6
2009-10	1852.6	218.11	11.8	111	-7.5
<b>Average</b>	<b>1754.76</b>	<b>210.52</b>	<b>11.9</b>	<b>107</b>	<b>-0.2</b>

Source: RBI Database of Indian Economy, Department of Economics and Statistics

**Table 1 (continued) Foodgrains Production in India**

Year	Agricultural Production (inMTs)	Foodgrains Production (in MTs)	Percentage Share of Foodgrains Agriculture Production	Index of Foodgrains Production	Annual Growth Rate
<b>Period-VII</b>					
2010-11	1932.58	244.49	12.7	100	10.8
2011-12	2106.94	259.29	12.3	106	5.7
2012-13	2128.35	257.13	12.1	105	-0.8
2013-14	2210.8	265.04	12.0	108	3.0
2014-15	2211.98	252.02	11.4	103	-5.2
2015-16	2251.44	252.22	11.2	103	0.1
<b>Average</b>	<b>2140.35</b>	<b>255.03</b>	<b>11.94</b>	<b>104</b>	<b>2.26</b>

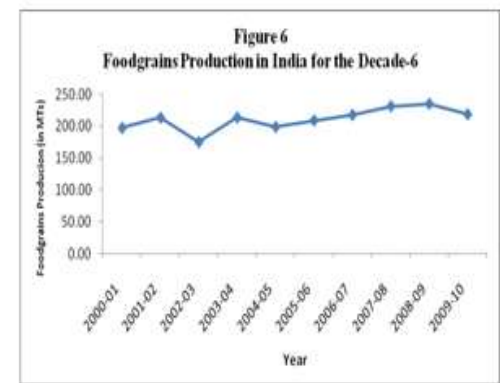
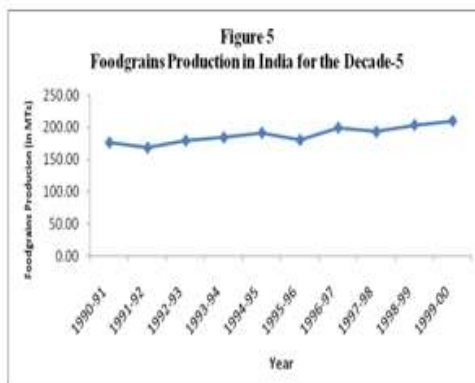
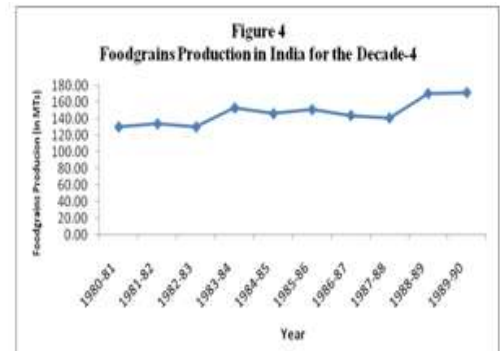
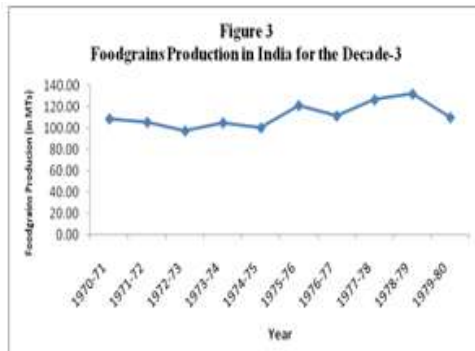
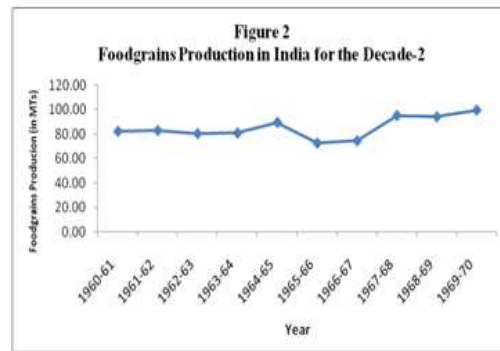
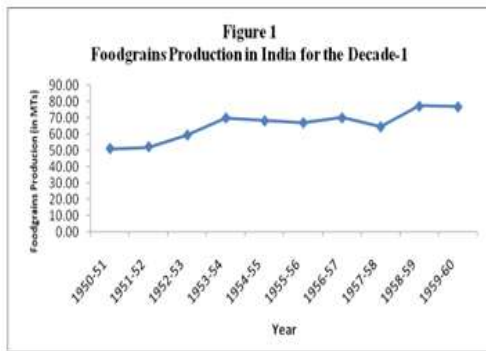
Source: RBI Database of Indian Economy, Department of Economics and Statistics

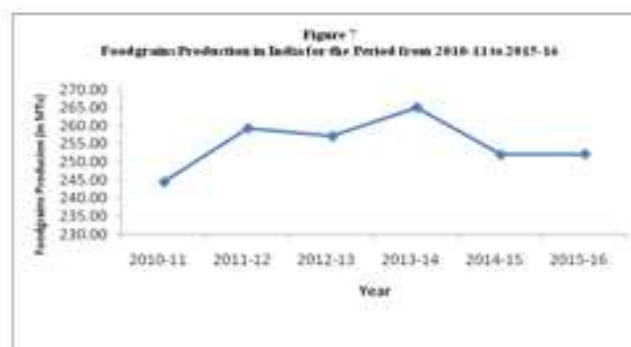
Table 1 reveals that the averages of both the agricultural production and foodgrains production during the first sub period of the study period (1950-51 to 1959-60) was 143.21 million tonnes and 65.47 million tonnes respectively. It has been continuously increased over the study periods and it has gone up to 2140.35 million tonnes of agricultural production and 255.03 million tonnes of foodgrains production during the current period.

But the average percentage share of foodgrains production to total agricultural production was higher in the first period with an account of 45.8 per cent. Thereafter it has been declined to 39.5 per cent from the second period to 12.8 per cent in the third period. During the fourth period it has raised to 12.9 per cent then it has gone down to 12.7 per cent in the fifth period, 12 per cent in the sixth period and 11.9 per cent during the current period.

Between the seven periods of the study period, the average index of foodgrains production was found to be greater (129) in the first period than the other periods. The index of foodgrains production was 113 in the fourth period, 107 in the sixth period, 106 in the fifth period, 104 in the second and the seventh periods. The index of foodgrains production was lower (103) during the third period of the study period in India.

As compared to the foodgrains production in India during the seven periods of the study period, the highest average annual growth rate (13.7 per cent) was observed during the first period (1950-51 to 1959-60) followed by 4 per cent in the fourth period, 2.3 per cent in the seventh period, 2 per cent in the second period, 1.9 per cent in the fifth period, 0.4 per cent in the third period and -0.2 per cent during the sixth period from 2000-01 to 2009-10. This is mainly because of the erratic monsoon, scarcity in irrigation and conversion of lands for non-agricultural practices as a result of climate change in India. The decade-wise trends in foodgrains production in India from 1950-51 to 2015-16 are illustrated in the figures 1, 2, 3, 4, 5, 6 and 7 given below.





### Trend Analysis of Foodgrains Production

To analyse the trend and growth patterns of foodgrains production in India, straight line equations both in linear and log-linear models have been fitted for the foodgrains production for the seven periods of this study. The slope coefficients of the trend lines have been compared for the periods for foodgrains production considered in this study. The independent variable is time factor that is year and dependent variable is production of foodgrains. To fit the straight line the model of the following type has been used.

$$P = a + bt$$

Where, P = Foodgrains Production in Million Tonnes,

t = Time trend variable taking values 1,2,3,..

'a' is the intercept term and 'b' is the regression coefficient showing the annual growth or decline in the foodgrains production in India during the periods under study. The results of trend equations obtained for foodgrains production in India during the decades of the study period from 1950-51 to 2015-16 is presented in table 2.

**Table: 2 Trend and Growth of Foodgrains Production in India**

Period	Decade	Linear Model				Log-Linear Model				Compound Growth Rate
		Regression Co-efficient			R <sup>2</sup>	Regression Co-efficient			R <sup>2</sup>	
		a	b	T		a	b	T		
I	1950-51 to 1959-60	1935.96	0.291	5.075*	0.763	7.539	0.009	4.965*	0.755	0.047
II	1960-61 to 1969-70	1949.31	0.185	1.884	0.307	7.550	0.008	1.726	0.271	0.022
III	1970-71 to 1979-80	1956.66	0.164	2.267*	0.385	7.544	0.009	2.262*	0.384	0.001
IV	1980-81 to 1989-90	1960.73	0.166	3.977*	0.664	7.531	0.013	4.032*	0.670	0.031
V	1990-91 to 1999-00	1955.39	0.210	6.185*	0.805	7.494	0.020	6.119*	0.802	0.019
VI	2000-01 to 2009-10	1979.98	0.119	2.636*	0.465	7.540	0.012	2.537*	0.446	0.011
VII	2010-11 to 2015-16	2000.41	0.049	0.380	0.035	7.572	0.006	0.395	0.038	0.006

Source: Computed by the Researcher\* Significant at 5 per cent level

From the table 2, it is observed that on an average the foodgrains production in India during the first sub period from 1950-51 to 1959-60 has increased by 0.290 million tonnes and it has been decreased to 0.185 million tonnes and 0.164 million tonnes during the second and the third sub periods of the study period respectively. On the other hand, during the fourth and the fifth sub periods, the foodgrains production in India has increased to 0.166 million tonnes and 0.210 million tonnes in that order. But from the sixth sub period (2000-01 to 2009-10) the production of foodgrains has gone down to 0.119 million tonnes and continued to decrease by 0.049 in the seventh sub period between 2010-11 and 2015-16. This shows that the trend of growth of foodgrains production has fluctuations and at present the production of foodgrains have a declining trend from 2000-01 onwards.

The log-linear model shows that the percentage change of foodgrains production in India is 2 per cent, 1.3 per cent, 1.2 per cent, 0.9 per cent, 0.9 per cent, 0.8 per cent and 0.6 per cent during the fifth period (1990-91 to 1999-00), the fourth period (1980-81 to 1989-90), the sixth period (2000-01 to 2009-10), the first period (1950-51 to 1959-60), the third period (1970-71 to 1979-80), the second period (1960-61 to 1969-70) and the seventh period that is current period (2010-11 to 2015-16) respectively.

The calculated 't' values indicates that there is a significant increase in the foodgrains production in India during the sub periods first, third, fourth, fifth and sixth of the study period. On the other hand, during the second and the seventh periods, the foodgrains production did not increased significantly.

The compound growth rate of foodgrains production in India was highest during the first period between 1950-51 and 1959-60 with the witness of 4.7 per cent followed by 3.1 per cent in the fourth period, 2.2 per cent during the second period, 1.9 per cent in the fifth period, 1.1 per cent in the sixth period, 0.6 per cent during the third period and 0.1 per cent in the seventh period.

The reasons behind the above observations are due to adequate rainfall caused by favourable monsoon in India and the efforts taken by the State Government regarding irrigation, canal cleaning, increasing the fertilizer consumption and cancellation of farmer's debt, the foodgrains production was increased during the first, third, fourth, fifth and sixth periods.

#### IV. CONCLUSION

From the results and discussions made in the study, it is clear that the foodgrains production, percentage share of foodgrains production to agricultural production, index of foodgrains production and the average annual growth rate of foodgrains production have found to be greater during the first period of the study period that is 1950-51 to 1959-60 than the other periods. Therefore, we should revamp the ancient production techniques, policies and practices of the foodgrains production along with the modern methods to achieve food security through sustainable production of foodgrains in India.

India has historically been an agricultural country, while its advances in other fields launched the country into competition with other sectors. Since the ancient time, the agriculture sector has witnessed spectacular advances in the production of foodgrains namely rice, wheat, jowar, bajra, ragi, maize, small millets, pulses including tur dal and urad dal and others. Food security is to be achieved through foodgrains production. Food security with home grown foodgrains can alone eradicate widespread rural poverty and malnutrition, since farming is the backbone of the livelihood security system in rural India still now. Building a food security system and containing price rise with imported foodgrains may sometimes be a short term necessity, but will be a long term disaster to our farmers and farming. A well-defined, pro-farmer and pro-resource pro-consumer Food Security Policy by providing an importance to foodgrains production is the need of the hour.

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