
Food Grains Production Growth Rates and Availability of Per-capita Food Grains in India – A Macro Level Study

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Abstract

The present study was undertaken to analyze the trends in area, production and productivity of major food grain crops for the period 1995–96 to 2015–16 obtaining data from the Directorate of Economics and Statistics, Ministry of Agriculture, Government of India, New Delhi. Food grains are cultivated in India in an area of 123.22 million hectares with a production of 251.57 million tonnes. The results of the study revealed that the food grains production in the country has increased at a rate of 2.0 annual compound growth rate. The availability of food grain gradually increasing trends and the crops of Rice, Wheat, Cereals and Pulses are also in positive dimensions. But the shares of these crops not even in all the decade points even in the present 2021 the crops of Paddy and Wheat both together more than 90.0 percent of share and the remaining less than is cereals production have been noted from the study. On the other hand the overall growth rate and compound annual growth rates are at significant level for these two crops. On the other hand population growth rate to be stabilized from 2031 to up to 2051 the population growth rate is to be less than 1 percent in India as such the food security is more effectively worked out by end 2051 the study is to be assume self-reliance by end of 2051. In the food grains point of view self-sufficient, as said by our PM Modi Samruddi Bharath.

Keyword: Population Growth, overall growth rate, compound annual growth, projected growth rates Introduction

As we know that agriculture sector alone producing the food for all, Agriculture contributes 4.3 per cent of global GDP but provides employment to 26.4 per cent of the world workforce. “When we look at developing countries, we find the share of agriculture in the economy is half or one-fourth of what its share is in employment,” Agriculture sector is playing a crucial role in the economic growth of a country particularly in developing economies. The counter share of GDP is in between 4.0 per cent to 25.0 per cent and more than the half of the employment by the agriculture sector and more than 60.0 per cent of population directly or indirectly depends on the agriculture sector for their livelihood⁶.

The agricultural sector plays a pivotal role in the contribution to the GDP of the country since independence. In 1950-51 the GDP share of Agricultural sector was about 59.0 percent at present agriculture share in the GDP is about 17.0 percent. In the employment point of view agriculture sector as the main livelihood for the millions of the people in rural India, more than half of the total population getting the employment by the agricultural sector. On the other hand, agriculture sector has been feeding food for not only for the 140 crores of population but exporting to the rest of world⁷. Agriculture is providing a major portion of the basic human needs by giving food and non-food needs. By the harvesting the crops of food and non-food crops agriculture is sustained. The cropping pattern in agriculture broadly divided into two folds like Food crops like Paddy, Wheat, Coarse Grains, and Pulses, and the Non-food crops like Oilseeds, Cotton, and Sugarcane, Establishing crops like Tea and Coffee, and Plant crops like organic products, vegetables, blossoms, flowers, cashews, and coconut. Moreover, some related allied products like milk and dairy items, poultry items, and fisheries are also considered as the cultivation area of agriculture¹².

At global level population growing trends are at alarming level, particularly third world nations. As the over growing of the population immediate effect on the food security as an issue and it is the burning issue in the third world countries (Mishra *et al.* 2015). Agriculture plays a, important segment for the food security not only at global level but also in Indian economy. Indian agricultural sector has experienced marvellous change over the years in all the major states. In getting to self-sufficiency in food grain production farming community and the research and development communities on agriculture have been working restlessly. Especially from 1960 and 1980s onwards. After the agricultural reforms in the form of green revolution, and rainbow revolution and operation flood etc. all these are stepping towards the food security for the down trading people of India. As per the data released by the India stat 2016 indian food production radical growth rate as more than 5 times increased the food production from 50.8 MT to 280 MT as such India got the food security in all the dimensions at macro level. But the micro level so many issues raising day by day as the laps of distribution, store of the grains, procurement prices and issue prices and along with the minimum supporting prices. The coordination among these aspects not adoptable level as the result considerable level of population have been suffering with the food security

Earlier Studies and Research Gap

A majority of studies have been conducted on food grain production and its contributing factors. Khatkar *et al.* (2016) showed that the area under wheat cultivation has accelerated significantly in comparison to other cereals and millets during 2000–01 to 2010–11. Dhingra (2015) analyzed yield of principal crops in India and found that the compound annual growth rate of food grains is 2.0 but in cases of rice and wheat which are the major constituents of food grains it is 1.97 and 1.35 respectively whereas for maize it is slightly better and is to the order of 3.00. In case of cereals CAGR is 2.34 and for pulses it is 2.44 during the same period. Ahmed *et al.* (2015) also reported that production of major cereals in India increased with positive growth rates and it was due to adoption of high yielding varieties. Kumar and Mittal (2006) analyzed agricultural productivity trends in India. The findings revealed that paddy and wheat, the major staple food crops, have performed well in productivity gains. A study by Larson *et al.* (2004) showed that increase in crop yields and crop acreages have contributed positively to the increased production for most crops. These studies are not connected the production of food-grains and per capita availability of availability of food grains. And at the same time these observation are only on the limited time and data. The present study made an attempt on food grains production, availability of food grains per head per annum and per day too. On the other hand, the overall growth rates of food grains and population growth rates also revealed by this study.

Methodology:

The present study is purely based on the secondary source of data, the data has been gathered from various sources of Hand book of RBI, World population Institution and the India stat. come. The data classified into decade wise for the production of food grains and also population production also consider. Finally, connectivity of population and the food production has been estimated in the form of per head per annum and per day availability of food grains at macro level of India.

Objectives:

The study has been carried out following objectives,

- 1 To find out the distribution of various food grains production during the period of 1951 to 2051 as 100 years.
2. To analyses the per-capita availability of food grains per annum and per day during the points of the study.

To fulfil these objective the study has been adopted the 3 simple percentage and overall and compound growth rates for the entire decades of the study.

Table – 1 gives the information about the distribution of total cereals and its growth rates of India for the 10 decades from 1951 to 2051, from 2021 to 2051 as the projected estimations. In the beginning of 1951, the total cereals production is 42.4 MT and it was distributed as 48.0, 36.0, and 7.0 percent of Rice, coarse cereals and wheat respectively. by the 2020-21 as the decade point of study the total Cereals output is 285.3 MT and the shares of about 44.0 percent of rice as the highest

followed by Wheat and Coarse Cereals are 38.0 and 18.0 percent respectively. the projected shares of rice is almost stagnation with 43.0 percent in study points of 2021 -30, 2031 – 40, and 2041-2050, and Wheat is at significant share with about 39.0 percent in the same points of the study, the Coarse and Cereals production share is almost similar about 10.0 percent. Off the total cereals rice is occupied the first place in all the decades.

The Wheat percentages are gradually progressive trend from 1950 to 2020-21 and after that it constituent with 39.0 percent share of production. Coming to coarse and cereals share is gradually reducing trend has been observed from

Table – 1
Details of Food-grains production and Growth Rates
During 1951 - 2051 of India

Decade Year	Rice	% of TC	DGR	Wheat	% of TC	DGR	Coarse Cereals	% of TC	DGR	Total Cereals	% of TC	DGR
1950-51	20.6	48.58		6.5	15.33		15.4	36.32		42.4	100.0	
1960-61	34.6	49.93	40.5	11	15.87	41.3	23.7	34.20	35.2	69.3	100.0	38.8
1970-71	42.2	43.69	18.1	23.8	24.64	53.8	30.6	31.68	22.3	96.6	100.0	28.2
1980-81	53.6	45.04	21.3	36.3	30.50	34.4	29	24.37	-5.3	119	100.0	18.8
1990-91	74.3	45.84	27.8	55.1	33.99	34.1	32.7	20.17	11.3	162.1	100.0	26.6
2000-01	85	45.77	12.6	69.7	37.53	20.9	31.1	16.75	-5.2	185.7	100.0	12.7
2010-11	96	42.42	11.5	86.9	38.40	19.8	43.4	19.18	28.4	226.3	100.0	17.9
2020-21	124.4	43.60	22.8	109.6	38.42	20.7	51.3	17.98	15.4	285.3	100.0	20.7
2030-31	140	43.46	11.2	125.2	38.87	12.5	56.7	17.60	9.5	322.1	100.0	11.4
2040-41	157.6	43.34	11.2	143	39.33	12.5	62.6	17.22	9.5	363.6	100.0	11.4
2050-51	177.4	43.22	11.2	163.4	39.81	12.5	69.2	16.86	9.5	410.5	100.0	11.4
1951-2051	156.8	42.60	861.0 8.61	158.8	43.14	2514.0 25.0	53.8	14.62	449.0 4.5	368.1	100.0	968.0 9.6

Source: derived from RBI Hand Book Statistics 2024

the data. The projected percentages are at constant 43.0, 39.0, 17.0 percent of production shares of the cereals production in India.

Coming to the growth rates, during the period of 100 years 70 years are actual result and the rest of 30 years as the projected facts. The overall growth rate is 968. 0 and 9.6 percent annual compound growth rate. In this direction Wheat 2514.0 and 25.0, Rice is 961.0 and 8.6, coarse and cereals 449.0 and 4.5 percent of OGR and CAGR respectively. on the other hand projected growth rates are at constant level as 11.4, 12.5, 11.2 and 9.5 percentages after 2021 to upto 2051 of upcoming 3 decades of the study.

Table – 2 provides the information about the productions shares of pulses and total cereals of the total food grains during the 100 years of the study. In India in 1951 the total food grain production is 58.8 MT and it was shared by

Table – 2

Details of Pulses & Food-grains production and Growth Rates

During 1951 - 2051 of India

Decade Year	Pulses	% of TC	DGR	Total Cereals	% of TFG	DGR	Total Foodgrains	DC	DGR
1950-51	8.4	16.54	-	42.4	83.46	-	50.8	100.0	-
1960-61	12.7	15.49	33.8	69.3	84.51	38.8	82	100.0	38
1970-71	11.8	10.89	-7.4	96.6	89.11	28.2	108.4	100.0	24.3
1980-81	10.6	8.18	-11.2	119	91.82	18.8	129.6	100.0	16.3
1990-91	14.3	8.11	25.5	162.1	91.89	26.6	176.4	100.0	26.5
2000-01	11.1	5.64	-28.8	185.7	94.36	12.7	196.8	100.0	10.4
2010-11	18.2	7.44	39.3	226.3	92.56	17.9	244.5	100.0	19.5
2020-21	25.5	8.21	28.4	285.3	91.79	20.7	310.7	100.0	21.3
2030-31	28	8.01	9.1	322.1	91.09	11.4	349.7	100.0	11.2
2040-41	30.8	7.83	9.1	363.6	92.13	11.4	393.6	100.0	11.2
2050-51	33.9	7.65	9.1	410.5	92.35	11.4	443.1	100.0	11.2
1951-2051	25.5	6.50	367.0 3.7	368.1	100.0	968.0 9.6	392.2	100.0	872 8.7

Source: derived from RBI Hand Book Statistics 2024

the Pulses and total cereals as 8.4 and 83.6 percent respectively by end of 2020 -21 the pulses share was dropped as 8.1 percent and the cereals production share gained as 92.0 percent and the projected growth rates are of cereals is almost equal with about 92 percent and the overall food grain growth rates are 11.2 percent. During the 100 years 872 percent of overall growth rate of food grains and it is 8.7 percent as the annual growth rate. The total cereals growth is about 968 and 9.6 as the OGR and CAGR accordingly. When we look into pulses 367.0 and 3.7 percent as OGR and CAGR respectively.

In the total food grains production the pulses are very insignificant and the cereals are at significant as per the data. The pulses decades wise growth rates are 2010-11, 1961, 2020-21 and 1990-91 decades as the point of study have 39.0, 34.0, 28.0 and 26.0 percent as positive growth rates as observed and the decades of 2000-2001, 1980-81 and 1970-71 decades are negative growth rates were observed from the data. The projected growth rate of pulses are as the same. The cereals growth rates are not similar these are ups and downs nature but all the decades are as positive. The total food grain decades wise growth rates are also ups and downs. The production of food grains depends on various factors like area under food grain, weather conditions pricing policies and even external trade policies, if these are changes the production trends also be change.

Table – 3
Decade-wise per capita Availability of Food Grains of India

Decade	PIM	FGIM	PA/PH	PD/PH
1951	36.1	50.8	141	0.386
1961	43.92	82	187	0.512
1971	54.81	108.4	198	0.542
1981	68.33	129.6	190	0.521
1991	84.63	176.4	208	0.570
2001	102.87	196.8	191	0.523
2011	121.01	244.5	202	0.553
2021	140.75	310.7	221	0.605
2031	152.62	349.7	229	0.627
2041	161.93	393.6	243	0.666
2051	167.43	443.1	265	0.726
OGR & CAGR	463.0 0.63	872.0 8.7	188.0 1.9	188.0 1.8

Source: derived from RBI Hand Book Statistics 2024 and World Population Institutions

Table – 3 provides the information of the decade-wise population growth rates and along with the food grains production including the per capita availability of food grains at national level of India. The total population of India is 36.1 cro in 1951 and food grain is 50.8 Million Tons and each 141 kg of food grains available per head per annum and it was estimated that 386 grms per day per head in the initial year of 1951 in India. By end of 2021 the projected population of India is 140.75 cr and food grains production is 310.7 Million tons has been estimated and per-capita annual availability of the grains is 221 Kg and it was estimated as 627 Gr per day per head. During the seven decades population increased around 104 cr and food grains about 260 Million Tons and the per capita 80 Kg per annum and 219 Gr per day per head availability of food grains as remarkable improvement was achieved by the farming community in India. If we go through projection of the population estimated as 167.43 cr by the end of 1951 census year as per World Population Institution and overall population growth is 463.0 percent and the annual compound growth rate is about 0.63 percent for the 100 years of India since 1951 to 2051. The food grains production growth rate is 872 percent and the annual compound growth rate is to be estimated as 8.7 in 100

years of India. The per-capita growth rate of food grains is 188.0 percent and the annual compound growth is about 2.0 percent and the same per day and per head. The data indicates that production of food grains increasing along with population growth rate but the population growth rate is less than food grain product as such the per capita availability is increasing trend around 2.0 percent during the period of study. By end of 2051 population growth rate less than one percent and food grains growth rate is more than 8.0 percent growth rate as such impact the availability of food grains progressive path about 2.0 percent more than the requirement has been projected by the study.

Conclusion:

The study is found out the decade-wise food grains production in India not even the shares of Rice, wheat and Cereals are the major food grains. The overall growth rate of these food grains Rice and Wheat both together a major share. The overall growth rate and compound growth rates are 968.0 and 9.6 percent, Wheat 2514.0 and 25.0, Rice is 961.0 and 8.6, coarse and cereals 449.0 and 4.5 percent respectively. During the 100 years 872 percent of overall growth rate of food grains and it is 8.7 percent as the annual growth rate. The total cereals growth is about 968 and 9.6 as the OGR and CAGR accordingly. When we look into pulses 367.0 and 3.7 percent as OGR and CAGR respectively. During the seven decades population increased around 104 cr and food grains about 260 Million Tons and the per capita 80 Kg per annum and 219 Gr per day per head availability of food grains as remarkable improvement was achieved by the farming community in India. The study concludes that during the 70 years of Independent India food grains production increased by more than 5 times of the food grains Rice and Wheat as the significant shares Pulses are insignificant. Population is increased more than 104 cr as such the availability of per-capita food grains not much increased is only 2.0 of growth rates. However, available food grains is sufficient but the question is, is these are accessible and to the common man.

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