

# Agricultural Production, Marketing and Food Security in India: A Peep into Progress

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*Providing food for all has continued in the forefront of agricultural and development policy in India. The country mainly focussed on improving domestic availability through increasing food production in India, and Green Revolution was started with this objective. With the research and development policy efforts, the country has achieved self-sufficiency in food grain production but still depends on imports for pulses and edible oils. Although, it has reduced the prevalence of undernourishment and malnutrition in the country, however, a large number of people still suffer from these ills. On the distribution side the country has taken many policy and institutional initiatives to improve supply chain related issues in order to provide affordable access to nutritious food to its population.*

## 1. Introduction

Ensuring food security is continuing to be a daunting task for many countries with the growing challenges of climate change, shrinking resources and global economic environment. The world produces enough food to feed everyone, but the distribution of food is not ensured properly leading to food starvation for many in different countries. Food security for everyone is a basic need and ensuring it is the primary responsibility of all governments. Currently about 792.5 million people are estimated to be undernourished all over the globe (FAO, 2016), although reduced from 1010.7 million people undernourished in 1991. Nearly one-fourth of people are undernourished in sub-Saharan Africa, while Asia (the world's most populous region) is home to the majority of hungry people (Sharma et al., 2016). India is home to about 25 per cent of the world's undernourished population.

Providing food to each and every person is the most important issue for the Indian government, where more than 15 per cent of its total population is still undernourished and nearly 40 per cent of its children have suffered from malnourishment over the last many decades (FAO, 2016). Food availability is a necessary condition for food security. India is more or less self-sufficient in cereals but deficit in pulses and oilseeds as well as in livestock products. There have been changes in consumption patterns over the years; with increase in income, the pattern is diversifying leading to increase in demand for fruits, vegetables, dairy, meat, poultry, and fisheries (Nair and Eapen, 2012; Kumar and Joshi, 2016).

After the Green Revolution, India succeeded in the laudable task of becoming a food self-sufficient nation, at least at the macro level. It produces sufficient food to feed its population, but is unable to provide access to food to a

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large chunk, especially women and children. The country's hunger and malnutrition levels are still high. It is estimated that nearly 5–15 per cent of the fruits and vegetables, and 3–10 per cent of the food grains that are produced are lost due to inefficient supply chain management and do not reach the consumer markets (Jha et al., 2015).

Markets for agricultural and food commodities have always exhibited volatility on account of production fluctuations mainly due to weather aberrations, volatility in international markets, seasonality in production, increased demand with increase in consumer income, etc. The asymmetric nature of extreme volatility in food and agricultural prices, with upward price spikes much larger than downward price declines, affects the affordability of poor and even farmers who are net buyers. Small and marginal farmers tend to sell their agricultural produce immediately after harvest at lower than prevailing market prices for the want of money, and purchase food in the lean season at higher prices. Recent price peaks have served to attract new attention to this phenomenon of food market volatility and to demonstrate the importance of developing appropriate and effective responses to a situation that can have dire social consequences.

Food price volatility raises serious concerns particularly in India as the poor spend a large share of their income on food, and agriculture is the main source of income for many poor people. Persistent situation can result in sharp declines in the incomes of poor, potentially pushing them into poverty, and pose serious threats to their food security. The policy challenge in this scenario is to identify combinations of policies that can ensure livelihood security as well as food security of vulnerable sections of the population. Moreover, the large amount of post-harvest losses of agricultural commodities not only reduces availability of food to the people but also pushes commodity prices up, leading to poor access and affordability of food for the vulnerable. With this background the paper addresses the issues of food security in India with the following objectives: (i) To analyze the growth in production and availability of food in India; (ii) Examine the changes in consumption of food items; (iii) To study the trend and progress in food security, and (iv) To understand the progress in agricultural marketing to improve food security in the country.

Section one of the paper examines the availability of food, while section two deals with food availability and demand estimation at the national level. Section three discusses price behaviour over time, while section four

examines post-harvest loss at the national level. The final section comprises the conclusions from the study.

## **2. Data and Methodology**

The paper is mainly based on secondary data sourced from publications and websites of the Directorate of Economics and Statistics, Ministry of Agriculture and Farmers' Welfare, National Sample Survey Organisation, Ministry of Statistics and Programme Implementation, International Food Policy Research Institute, Food and Agricultural Organisation of United Nations, etc.

## **3. Trend in production and availability of food commodities**

Food security at the national level mainly depends on domestic production-led higher availability at affordable prices to meet the increasing demand. Sufficient availability of food commodities can be made available either through domestic supply or imports. The growth in production of food commodities and the per capita availability is presented and discussed in this section.

Production of food grains in India increased by more than five-fold from 50.8 million tonne during 1950–51 to 265 million tonnes during 2013–14. Although, the diversity in production of different food grains has decreased, as wheat and rice together accounted for about 50 per cent of the total food grains production during 1950–51, which has increased to about 76 per cent presently. With tremendous growth in production of wheat and rice, the country has not only achieved self-sufficiency but also has net surplus for export. In case of pulses (the major source of protein for the vegetarian population of the country) and oilseeds, the growth in production was sub-optimal leading to higher dependence on import. Production of milk has also increased significantly in the country from 17 million tonnes during 1950–51 to 146.3 million tonne presently (Table 1).

With the fast increase in production of wheat and rice, the per capita availability of food commodities has increased significantly in India (Appendix 1). Although, self-sufficiency is not the satisfactory condition for providing food security to the population; if a country has enough foreign exchange earnings, importing food commodities can help improve food availability and food security. However, the countries with not enough export earnings, where livelihood of majority of households depends on agriculture and food production, and the number of people living below the poverty line is quite significant, some degree

**Table 1: Production of Selected Commodities in India (in million tonne)**

Year	Rice	Wheat	Cereals	Pulses	Food grains	Oilseeds	Milk
1950–51	20.58	6.46	42.42	8.41	50.82	5.16	17.0
1960–61	34.58	11.00	69.32	12.70	82.02	6.98	20.0
1968–69	39.76	18.65	83.59	10.42	94.01	6.85	21.2
1970–71	42.22	23.83	96.60	11.82	108.42	9.63	
1973–74	44.05	21.78	94.66	10.01	104.67	9.39	23.2
1980–81	53.63	36.31	118.96	10.63	129.59	9.37	31.6
1990–91	74.29	55.14	162.13	14.26	176.39	18.61	53.9
2000–01	84.98	69.68	185.74	11.08	196.81	18.44	80.6
2010–11	95.97	86.87	226.24	18.24	244.48	32.48	121.8
2011–12	105.30	94.88	242.20	17.09	259.29	29.80	127.9
2012–13	105.24	93.51	238.79	18.34	257.13	30.94	132.4
2013–14	106.65	95.85	245.79	19.25	265.05	32.75	137.7
2014–15	105.48	86.53	234.87	17.15	252.02	27.51	146.3

Source: Directorate of Economics and Statistics, Ministry of Agriculture and Farmers Welfare

of self-reliance in food production may be a necessary condition for food security (Acharya, 2003, 2009).

#### 4. Trend in Consumption of Food Items

For assessing the adequacy of food and nutrition among the population, the trends in the per capita calorie, protein and fat intake are often used. The mean per capita per day intake of calorie, protein and fat for rural and urban population are presented in Table 2 pertaining to the period starting from 1983–84 to 2011–12 sourced from different survey rounds of National Sample Survey Organisation (NSSO).

The pattern of calorie and protein intake for rural and urban households shows a dissimilar trend during the period 1983–84 to 2011–12, while per capita calorie intake declined from a level of 2240 kcal per day in 1983–84 to 2047 kcal per day in 2004–05 for the rural population, although improved recently to 2165 kcal per day in 2011–12. The per capita protein intake for the rural population declined from 63.5 gm to 58.5 gm per day. In case of urban population, the per capita calorie intake, however, increased marginally from 2070 kcal per day during 1983–84 to 2140 kcal per day during 2011–12, whereas per capita

protein intake declined marginally from 58.1 gm per day to 57.4 gm per day in the corresponding period. However, the per capita fat intake has increased gradually over time for both rural and urban populations.

Expenditure on food items by rural population in India was 64 per cent of the total household expenditure in 1987–88, which has reduced to 48.6 per cent in 2011–12. Urban people were spending 56.4 per cent of their total household expenditure on food, which has reduced to 38.6 per cent during the same period (Table 3). The diversification in the food intake has increased in rural as well as urban India, as the proportion of total expenditure on cereals and pulses has reduced from about half during 1987–88 to less than one-third of food expenditure during 2011–12 in rural India and about one-third to one-fourth in urban India. The share of milk & products and eggs, fish and meat in total food expenditure has increased in rural as well as in urban areas over the years. Thus, the consumption is moving away from food grains and changing towards horticultural products like fruits and vegetables, food items of animal origin like milk, eggs, meat, fish, etc., and processed products (Shalendra et al., 2013).

**Table 2: Average per capita Consumption of Calorie, Protein and Fats in India (per capita/day)**

Year	Round	Calories (kcal)		Protein (gm)		Fats (gm)	
		Rural	Urban	Rural	Urban	Rural	Urban
1983–84	38	2,240	2,070	63.5	58.1	27.1	37.1
1987–88	43	2,233	2,095	63.2	58.6	28.3	39.3
1993–94	50	2,153	2,073	60.3	57.7	31.1	41.9
1999–2000	55	2,148	2,155	59.1	58.4	36.0	49.6
2004–05	60	2,047	2,020	55.8	55.4	35.4	47.4
2009–10	66	2,147	2,123	59.3	58.8	43.1	53.0
2011–12	68	2,165	2,140	58.5	57.4	43.7	54.2

Source: Various survey rounds, NSSO, Gol.

**Table 3: Trends in Composition of Consumer Expenditure since 1987–88**

Item group	Rural						Urban					
	1987–88	1993–94	1999–2000	2004–05	2009–10	2011–12	1987–88	1993–94	1999–2000	2004–05	2009–10	2011–12
Cereal	26.3	24.2	22.2	18.0	15.6	12.0	15.0	14.0	12.4	10.1	9.1	7.3
Pulses & products	4.0	3.8	3.8	3.1	3.7	3.1	3.4	3.0	2.8	2.1	2.7	2.1
Milk & products	8.6	9.5	8.8	8.5	8.6	9.1	9.5	9.8	8.7	7.9	7.8	7.8
Edible oil	5.0	4.4	3.7	4.6	3.7	3.8	5.3	4.4	3.1	3.5	2.6	2.7
Egg fish & meat	3.3	3.3	3.3	3.3	3.5	3.6	3.6	3.4	3.1	2.7	2.7	2.8
Vegetables	5.2	6.0	6.2	6.1	6.2	4.8	5.3	5.5	5.1	4.5	4.3	3.4
Fruits & nuts	1.6	1.7	1.7	1.9	1.6	1.9	2.5	2.7	2.4	2.2	2.1	2.3
Suger	2.9	3.1	2.4	2.4	2.4	1.8	2.4	2.4	1.6	1.5	1.5	1.2
Salt & spices	2.9	2.7	3.0	2.5	2.4	2.4	2.3	2.0	2.2	1.7	1.5	1.7
Beverages, etc.	3.9	4.2	4.2	4.5	5.6	5.8	6.8	7.2	6.4	6.2	6.3	7.1
<b>Food Total</b>	64.0	63.2	59.4	55.0	53.6	48.6	56.4	54.7	48.1	42.5	40.7	38.6
<b>Non-food Total</b>	36.0	36.8	40.6	45.0	46.4	51.4	43.6	45.3	51.9	57.5	59.3	61.5
<b>Total expenditure</b>	100	100	100	100	100	100	100	100	100	100	100	100

Source: NSSO, M/O Statistics & Programme Implementation, Key Indicators of Household Consumer Expenditure in India, various issues.

## 5. Trend and progress in food security

As per the Global Hunger Index (GHI), computed by International Food Policy Research Institute, considering under nutrition, child malnutrition and child mortality, India

is ranked 97 in the list of 118 countries. Although, GHI of India has improved from 46.1 during 1991–93 to 28.5 during 2014–16, total number of people not getting adequate food is still high (IFPRI, 2016). The country is home to a quarter of the total undernourished population all over the globe.

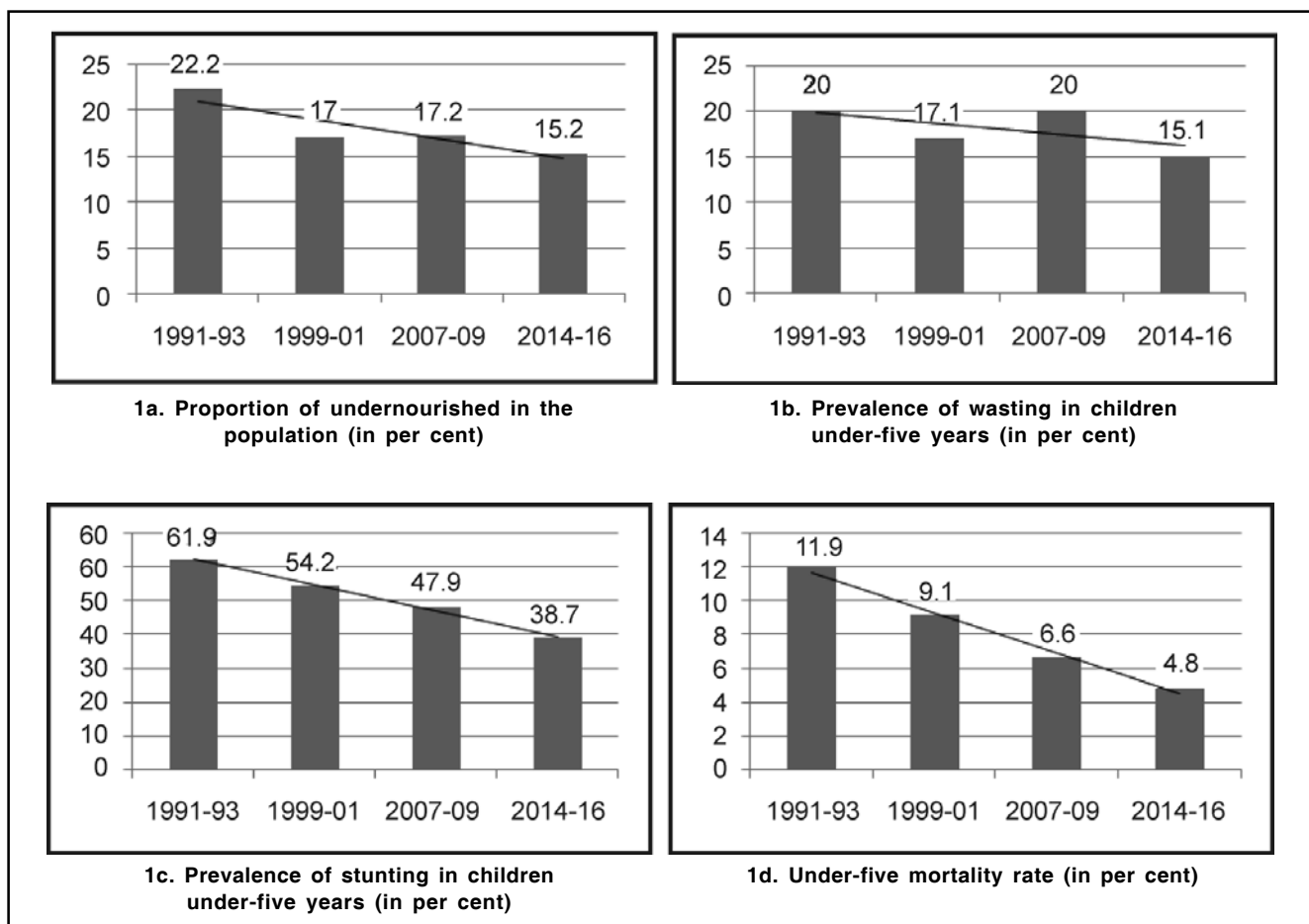


Figure 1: Trends and Progress in Food Security

Source: IFPRI Global Hunger Index, 2016

The progress on food security indicators shows that the prevalence of undernourishment has decreased from 22.2 per cent during 1991–93 to 15.2 per cent during 2014–16 (Figure 1a). Child malnutrition indicators also point to good progress over the period as child wasting has decreased from 20 per cent to 15 per cent, and child stunting has dropped significantly from 62 per cent to 38.7 per cent during the corresponding period (Figure 1b and 1c). Significant achievement has also been made in reducing child mortality from 11.9 per cent to 4.8 per cent during the same period (Figure 1d).

### 5.1. Undernourishment and economic growth

On the importance of economic growth in reduction of hunger, FAO report on ‘State of Food Insecurity in the World 2012’ stated that economic growth is ‘necessary but not sufficient’ for reductions in hunger and malnutrition. The relevance of economic growth is weakly supported by Figure 2.

The importance of economic growth in reduction of undernourishment is worked out through fitting regression equation, seemingly the simplest possible for testing the hypothesis that reductions in undernourishment are driven by economic growth:

$$H = a + b \text{ GDPpc} + e \quad \dots\dots\dots(1)$$

where,

*H* denotes the prevalence of undernourishment (hunger) as a percentage of the population of country over the period 1990–2014,

GDPpc denotes the real GDP per capita of country in 2011 PPP over the same period,

*a* and *b* are estimated parameters and

*e* is an error term

The results of the analysis are presented in Table 4.

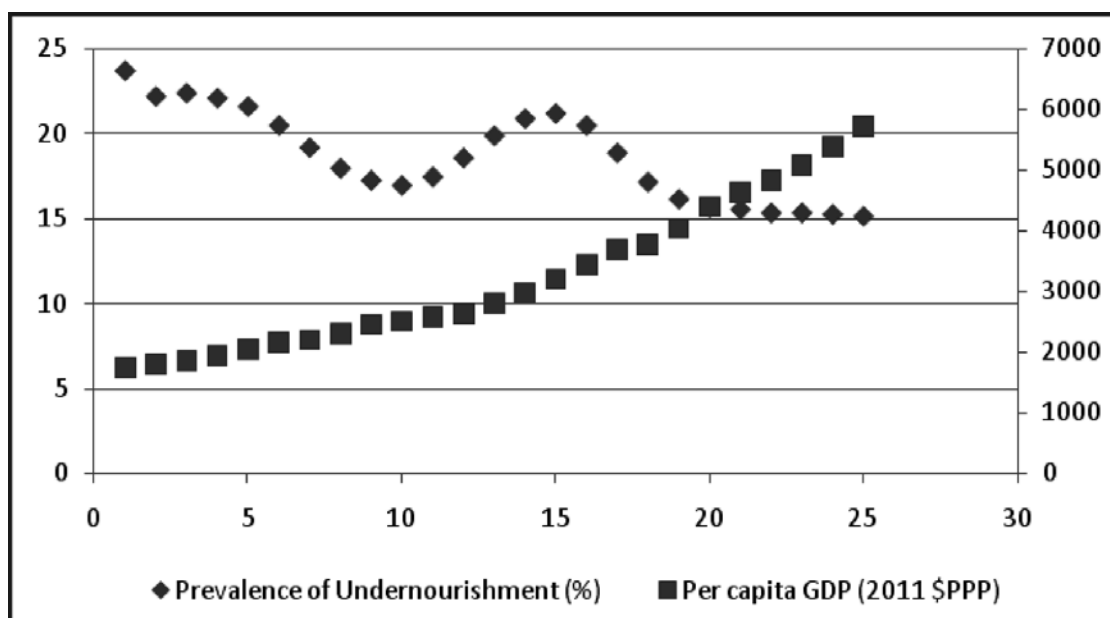


Figure 2: Undernourishment and Economic Growth in India

According to these results, undernourishment declines with the increase in economic growth per capita, but very marginally. The relationship is statistically significant. Thus, reduction in undernourishment and

economic growth per capita are weakly associated. Economic growth is not sufficient for reduction in undernourishment (Warr, 2014).

Table 4: The Weak Relationship between Undernourishment and Economic Growth

Variables	Coefficients	p-value
Real GDP per capita (2011 \$PPP)	-0.00191***	1.09E-18
Constant	25.53318***	8.38E-07
N	25	
R <sup>2</sup>	0.659	
adj. R <sup>2</sup>	0.644	
F-stat	44.469	8.38E-07

Note: \*indicates \*\*\*P < 0.01. The regressions for 'Developing countries' and 'Asia-Pacific' exclude China on the grounds that its GDP data may be unreliable.

Source: Author's calculations using data from FAO 'Food Security Indicators', 2016 and World Bank, 'World Development Indicators'.

In India, the food basket has become more diversified with a significantly higher share of milk and other high nutritive food items. Dietary shift towards high-value food commodities has a profound impact on agricultural production, marketing, processing and retailing sector. However, despite increasing demand for high-value commodities, the importance of cereals and pulses will

continue towards attaining food and nutritional security in the country, as food grains account for more than three-fourth share in the total calorie and protein intake.

### 5.2. Post-harvest Losses for Food Commodities

A recent study conducted by ICAR-Central Institute of Post-Harvest Engineering and Technology, Ludhiana (Jha et al.,

2015) estimated the various stages, from harvesting to the food reaching the hands of the consumers. The results of the report revealed that harvest and post-harvest losses in cereals were to the tune of 4.65 per cent to 6 per cent of total production, i.e., 6.02 million tonne of paddy (calculated at 2016–17 production level) produced is lost in the post-production and marketing activities (Table 5). Similarly, 4.76 million tonne of wheat produced during 2016–17 will be lost post-production. The harvest and post-harvest losses of major cereals produced estimated at about 12.78 million tonne in the country, which could have saved a large chunk of people from undernourishment if stored and properly distributed.

The harvest and post-harvest losses were estimated at 6.36 per cent to 8.4 per cent of total production in case of major pulses and 3.24 to 9.96 per cent in case of major

oilseeds, at present the production level amounts to 1.38 million tonne of pulses and 2.44 million tonne of oilseeds. Since the country depends greatly on imports to fulfil the growing domestic requirement of pulses and edible oils, the reduction in harvest and post-harvest losses of these commodities not only will help reduce protein malnutrition in the country but also save a lot of foreign exchange.

Providing adequate technique and infrastructure for harvest and post-harvest handling of farm produce is much needed. The losses at the supply chain can be minimized through integrating supply chain activities and stakeholders, providing appropriate infrastructure and policy support. Under the changing demand and supply scenario, the location of markets, marketing practices, handling methods and policies needs to be relooked.

**Table 5: Harvest and Post-harvest losses of Food Commodities in India**

Commodities	Production (mt)*	% Loss**	Loss Quantity (mt)
<b>Cereals</b>			
Paddy	108.86	5.53	6.02
Wheat	96.64	4.93	4.76
Maize	26.15	4.65	1.22
Bajra	9.42	5.23	0.49
Sorghum	4.75	5.99	0.28
<b>Pulses</b>			
Pigeon pea	4.23	6.36	0.27
Chickpea	9.12	8.41	0.77
Black gram	2.89	7.07	0.20
Green gram	2.13	6.60	0.14
<b>Oilseeds</b>			
Mustard	7.192	5.54	0.40
Soybean	14.125	9.96	1.41
Safflower	0.059	3.24	0.00
Sunflower	2.41	5.26	0.13
Groundnut	8.472	6.03	0.51

Note: \*2<sup>nd</sup> advance estimates for 2016–17, Department of Economics and Statistics, Ministry of Agriculture and Farmers' Welfare, GOI,\*\*

Source: Jha *et.al.*, 2015.

### 5.3. Agricultural Prices and Food Security

Market price of food and agricultural commodities is one of the critical factors in assuring food safety. Agricultural sector of India is exposed to sudden disturbances, mainly after globalization and liberalization of trade, caused by domestic demand–supply conditions as well as by volatility in international prices and exchange rate. Extreme price volatility or high food inflation poses threat to food security. The impact of higher food prices on food and nutrition security is more prominent on those who can least afford

it. Rising cost of food coupled with other natural and economic crises can greatly impact food security by pushing most vulnerable households into poverty and impacting ability to access adequate food (Gustafson, 2013). The efficiency of the price system begins to break down when price movements are increasingly uncertain and subject to extreme swings over an extended period of time. Improvement in functioning of agricultural markets is the key to insulate vulnerable population from extreme price surge or high volatility.

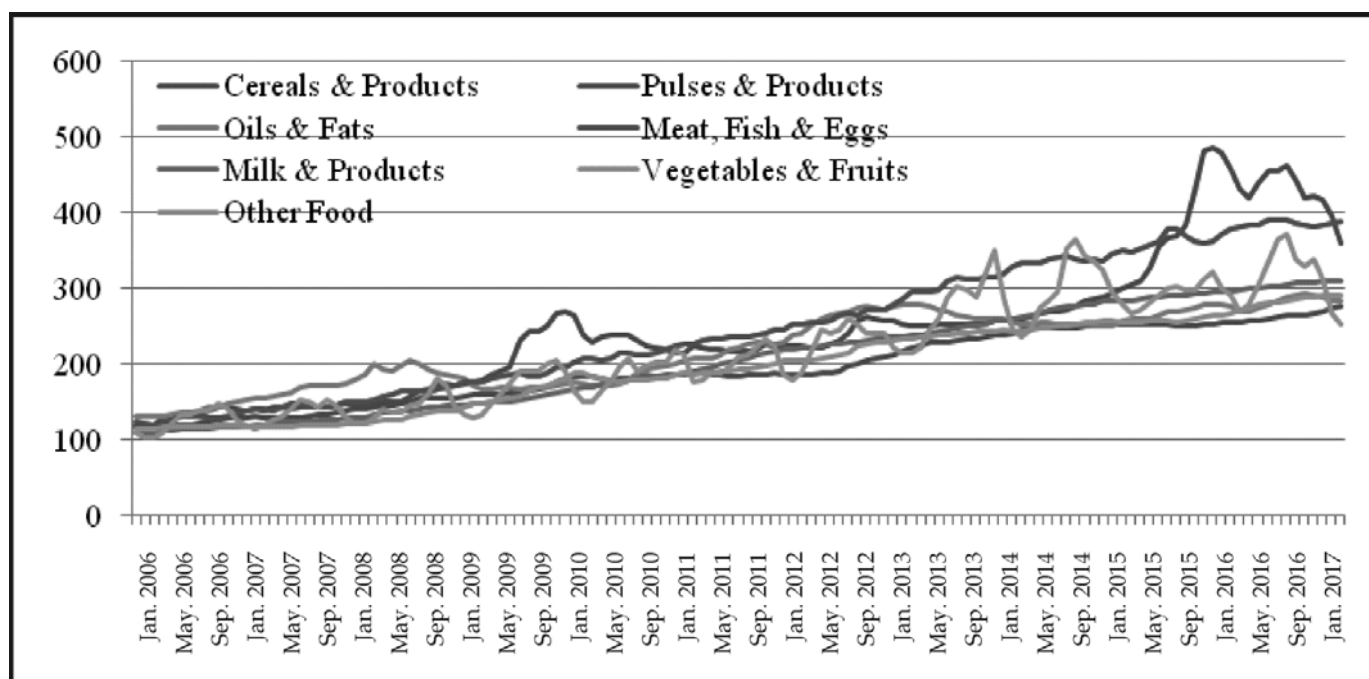


Figure 3: Consumer Price Index for Industrial Workers (Food sub-groups) 2001=100

The monthly consumer price index for industrial workers for different food sub-groups is presented in Figure 3. It is clear from the Figure that the price index for all the food articles started rising sharply and price rise has remained alarmingly high in case of protein foods. Prices of pulses and vegetables remain highly volatile.

In a report on food inflation in India, Bhattacharya (2016) revealed that 'India has witnessed sustained high rate of inflation in both wholesale and retail food prices since 2007 and till the beginning of 2014. Since 2007, the average year-on-year (YOY) inflation rate in WPI food articles and CPI-IW food group have been 9.99 and 10.12 respectively.' The study further reported that high food inflation was on account of lack of competitive agricultural markets and required infrastructure, apart from demand–supply factors.

### 5.4. Agricultural Marketing and Food Security

Food security entails not only producing sufficient food but also sustainable round-the-year access to entire population. Marketing system for food and agricultural commodities and trade policies directly affect the prices received by the farmers for their produce and, thus, influence the profitability of agriculture, also the price paid by the consumers. Profitability of farming sector depends on the productivity and the relative prices of inputs and output. The prices of inputs and output are determined by the market structure and efficiency of the marketing system. The structure and conduct of the market participants decides the performance and efficiency of agricultural marketing system.



Even with satisfactory agricultural growth, rural poverty and food insecurity in the country persist, which led to interventions in agricultural marketing sector intended to improve the performance and efficiency of the agricultural marketing system. Interventions were made to improve the performance of physical and institutional infrastructure focused on integrating the supply chain. In order to further the reforms in agricultural marketing sector, central government drafted Model APMC Act, 2003, as per the comprehensive action plan by Inter-ministerial Task Force and circulated among the states.

The Model APMC Act, 2003, mainly focused on addressing concerns in order to (a) empower farmers, especially small farmers, with knowledge, information and capabilities to undertake market-driven production (b)

provide multiple choice for competitive marketing channels to farmers (c) provide efficient services at a reasonable transaction cost, and (d) attract investment needed for building post-harvest infrastructure. In order to keep pace with the changing production pattern and growing marketable surplus, the government advocates development of adequate number of markets equipped with modern infrastructure, with increased private sector participation and development of other marketing channels like direct marketing and contract farming, etc. The government is actively pursuing states to amend their marketing laws to provide suitable legal framework and policy atmosphere to usher such developments. The reform agenda of the government focuses on seven vital areas for reform vis-à-vis Model APMC Act. State-wise progress, as updated on 25 February 2016, is given below.

Area of Reforms	States adopting the suggested area of marketing reforms
1. Establishment of private market yards/ private markets managed by a person other than a market committee	Andhra Pradesh, Arunachal Pradesh, Assam, Chhattisgarh, Gujarat, Goa, Himachal Pradesh, Karnataka, Maharashtra, Mizoram, Nagaland, Odisha (excluding for paddy/rice), Rajasthan, Sikkim, Telangana, Tripura, Punjab, UT of Chandigarh, Jharkhand, Uttarakhand, West Bengal.
2. Establishment of direct purchase of agricultural produce from agriculturist (direct purchasing from producer)	Andhra Pradesh, Arunachal Pradesh, Assam, Chhattisgarh, Gujarat, Goa, Haryana (for specified crop through establishment of Collection Centres) Himachal Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Mizoram, Nagaland, Rajasthan, Sikkim, Telangana, Tripura, Punjab (only in rule), UT of Chandigarh (only in rule), Jharkhand, Uttarakhand and West Bengal, UP (Only for bulk purchase under executive order issued time to time).
3. To promote and permit e-trading	Andhra Pradesh, Chhattisgarh, Gujarat, Jharkhand, Haryana, HP, Karnataka, Rajasthan, Sikkim, Goa, Madhya Pradesh, Maharashtra (has granted license to Commodity Exchanges registered under FMC), Mizoram, Telangana, Uttarakhand.
4. Establishment of farmers/ consumers market managed by a person other than a market committee (direct sale by the producer)	Arunachal Pradesh, Assam, Chhattisgarh, Gujarat, Goa, Himachal Pradesh, Karnataka, Maharashtra, Mizoram, Nagaland, Rajasthan, Sikkim, Tripura, Jharkhand, Uttarakhand, West Bengal.
5. Contract Farming Sponsor shall register himself with the Marketing Committee or with a prescribed officer in such a manner as may be prescribed	Andhra Pradesh, Arunachal Pradesh, Assam, Chhattisgarh, Goa, Gujarat, Haryana Himachal Pradesh, Jharkhand, Karnataka, Maharashtra, Madhya Pradesh, Mizoram, Nagaland, Odisha, Punjab (separate Act), Rajasthan, Sikkim, Telangana, Tripura, Uttarakhand.
6. Single point levy of market fee	Andhra Pradesh, Rajasthan, Gujarat (for processor, grader, packer, value addition and exporter), Goa, Himachal Pradesh, Chhattisgarh, Karnataka, Madhya Pradesh, Nagaland, Jharkhand, Sikkim, UT of Chandigarh, Punjab, Mizoram, Telangana, Uttar Pradesh and Uttarakhand.
7. Single registration/ license for trade/ transaction in more than one market	Andhra Pradesh, Goa, Gujarat, Haryana, Himachal Pradesh, Karnataka (in rules only), Rajasthan, Chhattisgarh, Madhya Pradesh, Maharashtra, Mizoram, Nagaland, Telangana (in rules only), Sikkim.

Further, as a part of reforms, the government announced a scheme for setting up of e-National Agriculture Market (e-NAM). Under e-NAM, a common e-market platform is being deployed for online trading across

the states/country. It is expected that e-NAM would address the marketing constraints of fragmentation, lack of transparency in bidding, poor price discovery, information asymmetry between sellers and buyers and provide

farmers with a larger share of the consumer rupee. Total 585 mandis are planned to be integrated with this platform and more than 20 states have expressed interest in linking their *mandis* with this project. So far, 417 markets from 13 states have been integrated with e-NAM against the target of 400 *mandis* by March, 2017, and remaining *mandis* will be integrated by March 2018.

## 6. Programmes to Improve Food Security

Government of India is determined to improve the food security in the country and is making concerted efforts to strengthen production, availability, access and affordability of food commodities through making investments, incentivizing use of key inputs by providing subsidies, enacting social protection programmes, and favourable trade policies to increase supply and stabilize prices (Joshi, 2016).

Efforts towards increasing food production in the country includes Rashtriya Krishi Vikas Yojana (RKVY), National Food Security Mission (NFSM), Bringing Green Revolution in Eastern India (BGREI), National Horticulture Mission (NHM), schemes for irrigation development, etc. To ensure remunerative prices to farmers and for assured procurement of food grains, government announces Minimum Support Prices (MSP) for about 25 commodities before the sowing season starts. These initiatives contributed significantly to increasing food production and making India a food-secure country.

Towards proper distribution of food to vulnerable sections and empowering them, government has launched mega programmes such as mid-day meal scheme for school children, Public Distribution System (PDS) and Mahatma Gandhi National Rural Employment Guarantee Act (MGNERGA). These programmes were implemented to ensure availability, access and affordability of food, apart from increasing production.

## 7. Conclusions

Increasing agricultural production is critical for ensuring India's food security, but this may not be sufficient to meet the increasing demand. The country has achieved a lot towards reducing undernourishment and malnourishment in the country through targeted approach. But still a large section of the population is suffering from undernourishment. The food security programme at present is challenged by multiple factors like limited land and water availability, dwindling natural resources, climate change,

labour shortage, etc. To achieve the goal of food security on sustainable basis, food availability needs to be improved through reductions in harvest and post-harvest losses at farm, retail and consumer levels. Agricultural marketing infrastructure and integrating supply chain for food commodities is highly needed, which is gradually improving. Perfect synchronization of institutions, infrastructure, technologies and policies is needed in order to increase food supply and ensure food availability at affordable prices.

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## Appendix 1

**Table 6: Per capita Food grain, Pulses and Milk Availability in India (gm/capita/day)**

Years	Rice	Wheat	Other Cereals	Cereals	Pulses	Food grains	Edible Oil (kg/capita/yr)	Milk
1951	158.9	65.7	109.6	334.2	60.7	394.9		130
1961	201.1	79.1	119.5	399.7	69.0	468.7	3.2	126
1971	192.6	103.6	121.4	417.6	51.2	468.8	3.5	112
1981	197.8	129.6	89.9	417.3	37.5	454.8	5.1	164
1991	221.7	166.8	80.0	468.5	41.6	510.1	5.4	200
2001	190.5	135.8	56.2	386.2	30.0	416.2	8.8	222
2011	181.5	163.5	65.6	410.6	43.0	453.6	13.8	290
2012	190.2	158.4	60.0	408.6	41.7	450.3	15.8	299
2013	159.6	145.8	52.7	358.1	43.3	401.4	16.8	307
2014	199.0	183.1	62.0	444.1	47.2	491.2		322

Source: Agriculture Statistics at a Glance, Ministry of Agriculture & Farmers' welfare, Gol and Department of Animal Husbandry, Dairying & Fisheries, Ministry of Agriculture & Farmers' welfare, Gol

*"The quest for food security can be the common thread that links the different challenges we face and helps build a sustainable future"*

*– José Graziano da Silva*