

A Critical Timeline Analysis of India's Quest for Food Security

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Abstract

In the first two decades after independence large quantities of food grains were imported to meet shortfall in domestic production. The extent of food vulnerability came to sharp focus during the severe drought of 1965 and 1966 since then spurred by agricultural innovation and generous farm subsidies, India now grows so much food that it has a bigger grain stockpile than any country except China. In this paper we revisit the success story of food self sufficiency in India by examining the economic strategy adopted by us. We travel through time from the Green Revolution which greatly augmented production- to effective procurement, distribution and sophisticated storage system to finally arrive at the enactment of the National Food Security Bill in our quest for a hunger free India.

Violent hunger, starvation and death resulting in catastrophe, tragedy and disaster; often called 'Famine' has been recorded in various early civilizations, the earliest such evidence being in Egypt during 1199 BC and 1064 BC¹. The origin of the word 'Famine' seems to be in Old French, dated late Middle English, with the possible translation 'hunger'. Dearth, shortage, shortfall, deficit and paucity are the synonyms of famine. "They that die by famine die by inches"².

1. Timeline of World Famines

The World history has faithfully documented many of the intense tragedies resulting in large numbers of deaths due to hunger (Table 1). During the period of 1,000 year from 11th to 20th Century (AD), a number of major famine were recorded in the World including India suffering from famine in six centuries, starting from 14th Century and further occurring continuously from 16th to 20th Century. A list of some of the major famines in world history is given in Table 1.

Keywords

*Famines, Green revolution,
Production, Procurement,
Distribution*

Table 1: A List of Major Famines in World History¹

The number of deaths has been to the extent of 10 million during 1769–70, about one third of the population of the then Bengal Kingdom; comparable to over 10 million

deaths in World War– II as of the war. Such famine has been continuing to hunt many of the countries even to-date (Table 2).

Table 2: Effect of Famine during 20th Century³

Sl. No.	Year	Country	No. of Deaths
1	1932-1933	Ukraine	5-6 million
2	1943	Bengal	2-3 million
3	1959-1961	China	15 million
4	1984-1985	Ethiopia	Close to 8 million famine victims during 1984, and over 1 million died ⁴
5	1998	Sudan	70,000

1.1. Timeline of Major Famines in India

In the Pre-Independence Era spanning from 1765, there have been a number of major famines in India both in the princely states (regions administered by Indian rulers) and British India. The 18th Century can be named as 'Hunger Century' in the history of famine in India affecting a total of 32 million varying from 10-11 million

people in each of the three great famines, affecting 5.0 to 5.5 per cent of the total population of the country (the estimated population of India during 18th Century as 200 million). The intensity of the effect of the famine to a large extent declined, though steadily, with the exception of 5.0 to 5.5 million people during the Southern India Famine of 1876-78 and Indian Famine of 1896-97 (Table 3).

Table 3: Chronological list of great famines in India between 1765 and 1947⁵

Year	Name of famine (if any)	Indian kingdoms/Princely states	Mortality
1769–70	Great Bengal Famine	Bihar, Northern and Central Bengal	10 million (about one-third of the then population of Bengal)
1783–84	Chalisa famine	Delhi, Western Oudh, Eastern Punjab region, Rajputana, and Kashmir	11 million, large areas were depopulated
1791–92	<i>Doji bara</i> famine or Skull famine	Hyderabad, Southern Maratha country, Deccan, Gujarat, and Marwar	11 million, one of the most severe famines known. People died in such numbers that they could not be cremated or buried
1837–38	Agra famine	Central <i>Doab</i> and trans-Jumna districts of the North-Western Provinces (later Agra Province), including Delhi and Hissar	800,000
1860–61	Upper Doab famine	Eastern Rajputana including Upper Doab of Agra; Delhi and Hissar divisions of the Punjab	2 million
1865–67	Orissa famine	Orissa and Bihar; Bellary and Ganjam districts of Madras	1 million
1868–70	Rajputana famine	Rajputana including Ajmer, Western Agra, Eastern Punjab	1.5 million
1873–74	Bihar famine	Bihar	No mortalities, an extensive relief effort was organized
1876–78	Southern India famine	Mysore and Hyderabad	5.5 million, estimates vary from 6.1 to 10.3 million.
1888–89	-	Ganjam, Orissa and North Bihar	1.50 million in Ganjam
1896–97	Indian famine	Northern and eastern Rajputana, parts of Central India and Hyderabad	5 million
1899–1900	Indian famine	Hyderabad, Rajputana, Central India, Baroda, Kathiawar, Cutch	1 million
1905–06		Bundelkhand	235,062
1943–44	Bengal famine	Bengal	1.5 million, 3.5 million including deaths from epidemics

2. Production and Management of Food in India

Pioneering work by agriculture scientists and the efforts of the farmers helped to achieve a breakthrough in agriculture sector in the 1960s, popularly known as the 'Green Revolution'. High agricultural production and productivity achieved in subsequent years has been the main reason for attaining food security to a large extent⁶. Agriculture is the mainstay of the Indian economy. Agriculture and allied sector contribute nearly 17.8 and 17.1 per cent of the Gross Domestic Product (GDP of India) during 2007-08 and 2008-09 respectively. The

agricultural output, however, depends on monsoon as nearly 55.7 per cent of area sown is dependent on rainfall⁷. Production, procurement, distribution and maintenance of buffer stock are the key activities of India's food production and management system.

2.1. Production: In order to augment the production and productivity in agriculture, a number of schemes were launched by the Government of India pertaining to Natural Resources Management, Micromanagement of Agriculture, Agricultural Mechanization, Plant Protection, Horticulture Mission, Production of Seeds and Planting

Material, Revamping of Co-operative Credit Structure, National Food Security Mission, Integrated Nutrient Management, Technology Mission on Oilseeds, Pulses and Maize, Support to State Extension Programmes, Agricultural Marketing, Small Farmers' Agribusiness Consortium and Rashtriya Krishi Vikas Yojana. Similar strategic programmes were undertaken in the field of animal husbandry and fishery to increase their contribution in India's food basket.

Starting with a total food grain production of 50.0 million tonne during 1950s, India achieved a four-fold increase in food grain production to 199.44 million tonne during 1996-97, which further increased to an all time high of 227.32 million tonne during 2007-08. The food grain production was 218.10 million tonne during 2009-10 (Table 4).

2.2. Procurement: The management of the food economy in India includes procurement of major food items especially food grains, their storage, movement and delivery and overall to keep a close watch to ensure that there is adequate availability of food items at reasonable prices. The basic objectives of food grain procurement by the Government of India are as follows⁹:

- ♦ To ensure that farmers get remunerative prices for their produce and do not have to resort to distress sale,
- ♦ To service the TPDS (Targeted Public Distribution System) and other welfare schemes of the Government so that subsidized food grains are supplied to the poor and needy, and
- ♦ To build up buffer stocks of foodgrains to ensure foodgrains security

There has been quantum jump in the procurement of food grains over the years. During 1997-98, 24.88 million

tonne of rice and wheat were procured besides other coarse grains; which increased to 37.64 million tonne during 2000-01, continued at the same level till 2007-08 and increased sharply to 56.86 million tonne during 2009-10 (Table 5).

2.3. Distribution: There are a number of mechanisms/ schemes evolved for distribution of food grains specially rice and wheat across the country. The important schemes are Targeted Public Distribution System (TPDS) including the population both Below Poverty Line (BPL) and Above Poverty Line (APL); *Antyodaya Anna Yojana* (AAY) a scheme meant for providing food grains at a highly subsidized rate to the poorest of poor; and a number of welfare schemes including Mid-day Meal Scheme for the benefit of the students in primary school, Wheat-based Nutrition Programme for providing nutritious/ energy food to the children below 6 years of age and expectant/ lactating mother, supply of food grains to hostels/ welfare institutions to help shelterless/ homeless poor, supply of food grains for scheduled caste/ scheduled tribes/ other backward class hostels, *Annapurna Scheme* for Senior Citizen of 65 years of age not covered under National Old Age Pension Scheme, National Programme for Adolescent Girls (NPAG) and Emergency Feeding Programme in selected state for old, infirm and destitute persons. The details of distribution of food grains during the period of 2005-06 to 2010-11 indicates steady decline in the offtake of food grains under different schemes from 42.3 million tonne during 2005-06 to 25.2 million tonne during April-September, 2010-11 (Table 6).

2.4. Buffer Stock: As a result of intense procurement drive the buffer stock of wheat and rice together increased from 18.11 million tonne in April 1998 to 47.12 million tonne in January 2011, an increase by 160.19% over a period of 13 years (Table 7).

Table 4: Production of Food grains

Table 5: Procurement of Foodgrains

(Million tonne)

Sl.No.	Crops	1997-98	2000-01	2004-05	2007-08	2009-10
1	2	3 ⁹	4 ⁹	5 ⁹	6 ⁹	7 ¹⁰
1	Rice	15.59	21.28	21.79	25.95	31.46
2	Wheat	9.29	16.36	17.00	11.13	25.40
	Total	24.88	37.64	38.79	37.08	56.86

Table 6: Status of Distribution of Foodgrains (Rice and Wheat)¹⁰

Crops	(Million tonne)						
	2005-06	2006-07	2007-08	2008-09	2009-10	2009-10	2010-11
	April-September						
TPDS*	31.1	31.4	33.3	34.6	42.4	21.6	21.9
BPL	15.7	14.2	15.1	15.6	16.5	8.3	8.7
APL	8.0	8.5	8.7	9.5	16.1	8.4	8.2
AAY	7.4	8.7	9.5	9.5	9.8	4.9	5.0
Other schemes							
Welfare Scheme	10.1	5.4	4.1	3.7	5.2	1.8	3.0
Open/Tender Sales/ Export	1.1	0.0	0.0	1.2	2.1	0.0	0.3
Total	42.3	36.8	37.4	39.5	49.7	23.4	25.2

*TPDS: Targeted Public Distribution System

BPL: Below Poverty Line

APL: Above Poverty Line

AAY: Antyodaya Anna Yojana (a scheme meant for providing food grains at a highly subsidized rate to the poorest of poor, approx 5 million families)

Table 7: Status of Actual Buffer Stock during 1998- 2011¹⁰

Year	(Million tonne)		
	Wheat	Rice	Total
1998	5.07	13.04	18.11
1999	9.65	12.18	21.83
2000	13.18	15.71	28.89
2001	21.50	23.19	44.69
2002	26.03	24.91	50.94
2003	15.64	17.15	32.79
2004	6.93	13.07	20.00
2005	4.07	13.34	17.41
2006	2.01	13.68	15.69
2007	4.70	13.17	17.87
2008	5.80	13.83	19.63
2009	13.43	21.60	35.03
2010	16.13	26.71	42.84
2011	21.54	25.58	47.12

N.B.: The figures relate to April of the corresponding years from 1998 to 2010 and January for 2011

3. Changes in Food Security Scenario

3.1. *Poverty Status:* As per Census Report, 2001, about 72 percent of the population of the country lives in rural areas and the agricultural sector providing employment to about 60 per cent of the country's total labour force¹¹. Livelihood and food security issues are critical in India in view of heavy dependence of the majority of the population on the agricultural sector for employment and as a source of income and spend a considerable proportion of their total income on food.

A recent FAO study shows that about 225 million people (23 per cent of the total population) are undernourished, and about 260 million people (24 per cent of the total

population) are below the poverty line¹¹. The number of people below the poverty line has reduced significantly between 1993-1994 and 1999-2000 (Table 8).

It is heartening to note that the percentage of addition to rural poverty which was by 5.2 per cent during 1993-94 over 1987-88, reduced during 1999-2000 over 1993-94 by 20.9 per cent. Similarly, the addition of urban poor by 1.3 per cent 1993-94 over 1997-98, declined by 11.8 per cent during 1999-2000 over 1993-94. In both the cases the poverty ratio has declined during 1999-2000 over 1993-94 by 4.6 per cent and 27.3 per cent respectively in rural India, and 15.2 per cent and 27.2 per cent respectively in urban India, the decline in overall poverty ratio by 7.5 per cent and -27.5 percent respectively during the period (Table 8).

Table 8: Changes in poverty status in India¹²

Year	Rural number	Poverty ratio	Urban number	Poverty ratio	Total number	Poverty ratio
	(million)	(%)	(million)	(%)	(million)	(%)
1987-88	232	39.1	75	38.2	307	38.9
1993-94	244	37.3	76	32.4	320	36.0
1999-2000	193	27.1	67	23.6	260	26.1
Percentage change						
1993-94 over 1987-88	5.2	-4.6	1.3	-15.2	4.2	-7.5
1999-2000 over 1993-94	-20.9	-27.3	-11.8	-27.2	-18.8	-27.5

3.2. *Prevalence of Undernourished People:* It is not just the quantitative changes in the number of poor as discussed earlier, there has been significant change in the per capita dietary energy supply from 2370 kcal/ day during triennium ending (TE) 1992 to 2430 kcal/ day during

TE 1999. While the proportion of under nourished to total population has declined from 25 to 23 per cent during the two triennium periods, there has been increase in the number of undernourished population by 10.7 million (Table 9).

Table 9: Population, per capita dietary energy supply and prevalence of undernourished people in India¹²

Period	Total population (million)	Per capita dietary energy supply (kcal/day)	Number of undernourished (million)	Undernourished as a proportion of total population (%)
TE 1992	861.3	2 370	214.6	25
TE 1999	976.3	2 430	225.3	23

3.3. *Food Availability:* The Table 10 indicates that there has been increase in food production over the years. The Food Production Index Per Capita, considering 1989-91 as the base year, increased steadily over the years to 102.7 during TE 1994, and 107.5 during TE 2000. The extrapolated value based on the log linear trend for the period of 1985-1994 has been estimated to be 112.7. In the similar pattern, the Food Supply Per Capita has gone up by 256.2 kcal/day from 2251.3 kcal/day to 2507.5 kcal/day. With the increase in food production over the years, there has been steady decline in Food Imports Per Capita from US\$ 1.7 to US\$ 0.6 during the period resulting in reduction in percentage of Food Imports of

Total Merchandise Export from 11.6 per cent to 1.3 per cent during the period. There is serious concern in view of declining rate of per capita food production index by 4.6 and per capita food supply (kcal/day) by 4.0 during the same period.

The declining trend of per capita food production index as well as per capita food supply can further be explained based on the annual rate of growth of area, production and productivity of food grains and other non-food grains during the period of 1990-91 to 2000-01 over 1980-81 to 1989-90. The Table 11 reveals that there has been reduction in area under food grains.

Table 10: Food production, food supply, food imports and food prices in India¹²

Period	Food production index per capita (base 1989-91 =100)	Food supply per capita (kcal/day)	Food imports per capita (US\$ per annum)	Food imports as a percentage of total merchandise exports (%)	Food prices relative to all commodity prices ^a
TE 1988	92.9	2 251.3	1.7	11.6	0.98
TE 1994	102.7	2 360.7	1.2	4.5	1.01
TE 2000	107.5	2 408.0	2.8	7.4	1.07
TE 2000(E)	112.7	2 507.5	0.6	1.3	1.05
Percentage change					
TE 1988 and TE 1994	10.5	4.9	-30.9	-61.2	2.8
TE 1994 and TE 2000	4.7	2.0	138.5	65.3	6.6
TE	-4.6	-4.0	359.8	474.3	2.7

^aWeighted wholesale price index of primary food articles and food products deflated by the wholesale price index of all commodities.

during both the reference periods. The rate of growth of total food grain production declined from 2.85 during the period of 1980-81 to 1989-90 to 1.66 during the period of 1990-91 to 2000-01. Similarly, the rate of growth of productivity of food grains declined from 2.74 to 1.34

respectively during the same period. Considering the area under all the crops together, there is only very marginal increase in the growth rate of area with reduction in area under food grains but increase in area under cash crop like cotton. The growth rate of overall production of all the crops together has declined from 3.19 to 1.73 due to decrease in the annual rate of growth in productivity from 2.56 to 1.02 during the reference period.

Table 11: Annual rates of growth for selected crops in India¹²

Crop	1980-81 to 1989-90			1990-91 to 2000-01		
	Area	Production	Yield	Area	Production	Yield
Rice	0.41	3.62	3.19	0.63	1.79	1.16
Wheat	0.47	3.57	3.10	1.21	3.04	1.81
Coarse cereals	-1.34	0.40	1.62	-1.84	0.06	1.65
Pulses	-0.09	1.52	1.61	-1.02	-0.58	0.27
Food grains	-0.23	2.85	2.74	-0.20	1.66	1.34
Non-food grains	1.12	3.77	2.31	0.84	1.86	0.59
Oilseeds	2.81	5.20	2.43	0.44	0.66	0.61
Sugar cane	1.44	2.70	1.24	1.72	2.62	0.89
Cotton	-1.25	2.80	4.10	2.21	0.92	-1.26
All crops	0.10	3.19	2.56	0.08	1.73	1.02

4. Changes in Poverty and Inequality

In the report entitled "Beyond the Midpoint: Achieving the Millennium Development Goals"¹³, an analysis has been made depicting the changes in growth, poverty and inequality over a time span of 12 years from 1995 to 2007 in respect of 29 countries covering parts of South Asia, East Asia, Africa and West Asia. As far as the position of India is concerned, the country stands above the average annual GDP growth rate of 5.0 per cent as

well as the household consumption rate of 5.0 per cent. India's record of reducing the poverty rate (36% in 1994 and 28 % in 2005) has been laudable being much below the average poverty rate of 45 per cent during late 1990s and 35 per cent during mid 2000s (Table 12).

Table 12: Growth, Poverty and Inequality during 1995 to 2007¹³

	Average Annual GDP Growth 1995-2007 ¹⁴	Household Consumption Growth 1995-2007 ¹⁵	Poverty Rate (Late 90s) ¹⁶	Poverty Rate (Mid 00s) ¹⁶	% Poverty Reduction (late 90s to mid 00s) ¹⁶	Gini (mid 90s) ¹⁷	Gini (mid 00s) ¹⁷	% change Gini
India	6.9%	5.6%	36% (1994)	28% (2005)	22%	N/A	0.368 (2005)	N/A
Average	5.0%	5.0%	45%	35%	22%	0.398	0.400	1%
Rank of India out of 29 countries	4	9	6	8	11	N/A	11	N/A

5. Innovativeness in Reducing Food Insecurity

There have been a number of initiatives taken up by the country to address the issues related to growth with social justice, more especially directing the efforts for solving the problems of food security. Some of the strategic initiatives are as follows:

5.1. Building a Formidable Food Grain Buffer

Stock: As per the Government's estimates, the current 53 million tonne buffer stock of food grains will go up to 72 million tonne once the food security programme fully rolls out by 2014¹⁴.

5.2. World's Largest Food Distribution System: A

large network of public distribution has been established for distribution of the essential commodities including wheat, rice, sugar and kerosene through a network of 5.0 million Fair Price Shop (FPS) across the country.

5.3. World's Largest School Feeding Programme:

The Mid Day Meal Scheme was launched on 15.08.1995 and presently covering about 120 million primary and upper primary school children.

5.4. Schemes Targeting Vulnerable Group: There are a number of schemes implemented by the Government of India for the benefit of special category vulnerable groups like children below 6 years of age and expectant/ lactating women, special category students, old-age, adolescent girls, and other vulnerable areas.

5.5. Establishment of Village Grain Bank Scheme:

The scheme specially planned to provide safeguard during the period of natural calamities located in various disadvantaged areas like drought prone, hot and cold desert, tribal and inaccessible hilly areas.

5.6. Large Enhancement in Budgetary Support:

The XI Plan (2007-12) saw a sharp increase in the budgetary allocation to the extent of 74.03 per cent in the total priority sector over the budget estimates of the X Plan. The major enhancement made in the sectors include rural development (13.39%), health (8.71%), agriculture (8.55%), social justice (6.35%) and physical infrastructure (9.01%), the details of which is given in Table 13.

Table 13: Comparison of Budgetary Support during X and XI Plan¹⁵

(INR in Billion at 2006-07 prices)

Sl. No.	Sectors	BE#	Tenth Plan		Eleventh Plan
			% of Total	Projected Allocation	% of total
1	Education	624.61	7.68	2742.28	19.29
2	Rural Development, Land resources and Panchayati Raj	870.41	10.70	1903.3	13.39
3	Health, FW and Ayush	457.71	5.62	1239	8.71
4	Agriculture and Irrigation	506.39	6.22	1215.56	8.55
5	Social Justice	363.81	4.47	902.73	6.35
6	Physical Infrastructure	890.21	10.94	1281.6	9.01
7	Scientific Departments	298.23	3.66	665.8	4.68
8	Energy	472.66	5.81	574.09	4.04
	Total Priority Sector	4484.03	55.10	10524.36	74.03
9	Others	3653.75	44.90	3692.75	25.97
	Total	8137.78	100.00	14217.11	100.00

#X Plan BE represents the actual allocation during the five years and not the original X Plan projections.

*Includes APDRP grant component only

5.7. The National Food Security Bill, 2011

The aim of the bill is to provide food and nutritional security, by ensuring access to adequate quantity of quality food at affordable prices, for people to live a life with dignity and for matters connected therewith or incidental thereto¹⁶. The bill has been enacted by the Parliament as the National Food Security Act 2011. The bill has made special provision for every person belonging to priority households, expectants and lactating mothers, children in age group of 6 months to 6 years and 6 - 14 years, homeless and destitute persons, and the families affected due to disaster situations.

6. High Optimism

The UN's forecasters have estimated the World's population to pass through 7 billion marks on October 31, 2011. While the 1 billionth person was born in 1805, it took more than one century to be 2 billion in 1927 and addition of 1 more billion in 1959 within just 32 years. The World crossed 4 billion population 15 years after in 1974, 5 billion after 13 years in 1987 and 6 billion after 12 years in 1999.

Although, there is more than double the amount of people living in the World today than 50 years ago, the food grain production has kept pace with growing demand. Today, there is more food available per capita than 50 years ago (The Times of India, New Delhi, October 31, 2011). The food production which was 847 million tonne to feed 3.2 billion population with per capita availability of food grain as 269 kg/ year during 1960-64; now increased to 2,241 million tonne to feed 7.0 billion population with per capita availability of food grain as 320 kg/ year during 2011¹⁷.

This is in contrary to what Thomas Malthus indicated in theory of population that the population of the World would increase in geometric proportion the food resources available for them would increase only in arithmetic proportion¹⁸. However, unless the population growth is restrained, it will ultimately expand to the limit of elasticity. UN study indicates that India alone would reach 1.593 billion and the World population would reach 9.1 billion by 2050. A summary of the report says, 'future population growth is highly dependent on the path that future fertility takes'¹⁹. There is a need to reemphasize the Millennium Development Goals (MDG), may even be required re-prioritization of the goals.

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