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pandey, Aviral

A. N. Sinha Institute of Social Studies, Patna 800001, India.

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Food security in India and States: key challenges and policy option

Aviral Pandey¹

Condition of food security in India is gloomy and is similar to African countries. Both the supply side and demand side factors have their roles in the present condition of food security and undernourishment in India. This study supports that if agriculture production grows; increasing food prices has less bearing on low food security. Problem of food security in India is very much related to low demand. If demand of people can be improved, food security can be achieved. Disaggregated trend of food security shows that problem of food insecurity is high in poor states. Considering disaggregated level of food security, government has passed Food Security Bill in India. Our analysis points out that food security cannot be achieved in India without improving the level of overall agriculture production. Improving agricultural production is essential for ensuring long term food security and promoting poverty reduction. State level condition of storage capacity of food grains also points out that how a state like Bihar with low storage facility will manage to implement this Bill. Without identifying role of market, success of Food Security Bill and reduction of poverty is distant dream.

Keywords; Agriculture production, food security, India, poor states, poverty.

¹ Assistant Professor, Agriculture Economics, Division of Economics, A. N. Sinha Institute of Social Studies, Patna 800001, India. Tel.: 8987100796, Email: aviral.ansiss@gmail.com. Please cite as: Pandey A (2015). Food security in India and States: Key challenges and policy option. Journal of Agricultural Economics and Rural Development, 2(1): 012-021.

INTRODUCTION

India has a long history of hunger and food insecurity during the British rule. Condition of food insecurity was very much related to exploitation of farmers and common people by the colonial government in India during the British rule. However, British supporter economists held that food unavailability was responsible for food insecurity in India. Sen (1976) in his famous work challenged the orthodox perspective on food insecurity, reviving the claim that there was no shortage of food and that the famine was caused by inflation. This significantly indicated that food insecurity is not only supply side problem but also demand side problem. After 66 years of independence, India is still suffering from the problem of death of people due to starvation and malnutrition. Death of common people due to starvation and Hungama Report (Hungama 2011) on malnutrition has attracted attention on the issue of food security and undernourishment in India. Keeping demand side at priority, recently Parliament of India has passed the Food Security Bill. The Bill promises to people that every person belonging to priority households is entitled to receive five kilograms of food grains per person per months at subsidized prices. Here is an attempt to explain the condition of food security in India and challenges of Food Security Bill. This work is divided into five sections. First section describes theoretical perspectives of food security issues. Second section discusses condition of food security in world. Third section discusses condition of food security in India and states, and Fourth part discusses Food Security Bill and its limitations. Finally part five gives conclusion and policy suggestions.

Section I Food Security Issues: A Conceptual Review

Food security is defined as access to nutritionally adequate, safe, and personally acceptable foods and the ability to acquire them in a socially acceptable way at all states of lifespan (Parnell and Smith, 2008; Cook and Frank, 2008). Food insecurity occurs when people do not have enough food to satisfy hunger, have an insufficient and limited diet, are anxious about having enough food or need to resort to makeshift coping strategies such as begging, scavenging, or relying on emergency assistance programmes (Cook and Frank, 2008). Food security is closely related to limited household resources, low disposable income and poor socioeconomic status (Cook and Frank, 2008; Press, 2004; Rush and Rusk, 2009). It has become interestingly clear that food security is strongly interlinked with other issues, such as food prices global environment change,

water, energy and agriculture growth (Gustafson, 2013; Hanumankar, 2014; Henningsson et al, 2004). The concept of the food, water, and energy nexus is extremely relevant to Asia as the region has to feed two-thirds of the world's population (4.14 billion people) and accounts for 59% of the planet's water consumption. Ensuring food security and providing access to safe drinking water and modern energy for all remains a key challenge for Asia's sustainable development (Rasul, 2015). The challenge is especially great serious in the South Asian countries- Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka- where more than 40% of the world's poor live and some 51% of the population is food-energy deficient (Ahmed et al., 2007). This challenge is especially different in the Indian states like Punjab (food prosperous state of India). Studies has suggested interventions include crop diversification, precision agriculture, including water saving technologies, and developing crop varieties with improved water-use efficiency is essential to maintain sustainable food security in state like Punjab (Khus, 2015).

Section II **Food Security in World**

Country level food security can be seen using two indicators: Global Hunger Index, Global Food Security Index. Table 1 shows the list of countries according to Global Hunger Index and Table 2 shows list of regions according to level of poverty. It shows that most of African countries have high level of hunger and poverty. Among all countries, Haiti, Eritrea and Burundi have higher level of hunger. Similarly, India also has high level of hunger and high poverty.

Table 3 shows list of countries according to Global Food Security Index (GFSI). In this Table countries have been classified in four categories: High, Medium, Lower Medium and Lower. Ranges for different categories are given in Table. The Table shows that almost all developed countries are included in the first category except Russia. Russia is included in Middle level of food security index value group of countries. Unfortunately, India is included in Lower Middle level of food security index value Group of countries and it stands at 70 in list of 107 countries. According to GFSI, India is included with African countries. Other, disaggregated level data also reveals the fact that the condition of India is worse in terms of affordability and food absorption (quality and safety) in comparison to availability (used in constructing GFSI). Overall, report on global food security reflects following important trends: Developing countries made the greatest food security gains in the past year, with the biggest increases in Ethiopia, Botswana and the

Dominican Republic. Falling national incomes has hurt food security in some developed countries over the past year. Those countries where diet diversification is high and larger population have access to safe water and level of poverty is low are also highly food secure. The countries where agriculture production is highly volatile per capita availability of food supply is less and are low food secure. Some emerging markets appear well positioned to respond to urbanisation and the implications for food security. Political stability and democratic reform are strongly tied to food security. Overall, both indexes and level of poverty point out that besides improvement in economic growth in recent decades, African countries are still in worst condition in comparison to other parts of the world. It shows that poverty and food insecurity are interrelated to each other. This relationship is more visible in economy like India. India is placed better in food security index than in hunger index. It reflects the concept of hunger is different from the concept of food security index. GFSI covers more dimensions but the hunger index covers mostly nutrition part, so improvement should be done in a comprehensive manner which not only improves the food security but also malnutrition.

Table 1. List of Countries According to Global Hunger Index 2012

Range	Category	Country
13-May	Low	Azerbaijan, China, Malaysia, Paraguay, Trinidad & Tobago, Gabon, Mauritius, El Salvador, Kyrgyz Republic, South Africa, Turkmenistan, Uzbekistan, Panama, Guyana, Peru, Ecuador, Honduras, Thailand, Suriname, Ghana, Nicaragua, Armenia, Dominican Republic, Swaziland, Mauritania, Vietnam, Congo, Rep., Mongolia, Lesotho, Indonesia, Philippines, Bolivia, Guatemala.
13.1-21	Medium	Namibia, Botswana, Senegal, Sri Lanka, Benin Gambia The, Nigeria, Tajikistan, Uganda, Mali, Guinea, Malawi, Burkina Faso, Zimbabwe, Cameroon, Cote d'Ivoire, Guinea-Bissau, Liberia, North Korea, Togo, Kenya, Tanzania, Cambodia Lao PDR, Pakistan, Rwanda, Nepal.
21.1-29	High	Sudan, Djibouti, Niger, Madagascar, India, Mozambique, Zambia, Bangladesh, Angola, Yemen Rep., Sierra Leone, Comoros, Central African Rep., Timor-Leste, Chad, Ethiopia.
More than 29.1	Highest	Haiti, Eritrea, Burundi.

Source: Global Hunger Index (2012)

Table 2. Poverty Headcount Ratio, at \$1.25 a Day, Across Regions of World (2010)

Regions	Percentage
East Asia & Pacific	12.50
Europe & Central Asia	0.70
Latin America & Caribbean	5.50
Middle East & North Africa	2.40
South Asia	31.00
Sub-Saharan Africa	48.50

Source: World Bank Official Website Retrieve on 31st August 2014

Table 3. List of Countries According to Global Food Security Index 2013

Range	Category	Country
90-70	High	United States, Norway, France, Austria, Netherlands, Switzerland, Belgium, Canada, New Zealand, Denmark, Germany, Ireland, Finland, Sweden, Australia, Singapore, Israel, Japan, Spain, United Kingdom, Portugal, Italy, Czech Republic, South Korea, Greece, Chile.
69-50	Medium	Hungary, Brazil, Mexico, Saudi Arabia, Uruguay, Romania, Malaysia, Argentina, Costa Rica, Slovakia, Turkey, South Africa, Russia, Venezuela, China, Botswana, Panama, Thailand, Belarus, Tunisia, Ukraine, Serbia, Peru, Bulgaria, Colombia, Paraguay, Jordan, Dominican Republic, Egypt, Ecuador, Kazakhstan.
49-50	Lower Medium	Sri Lanka, Vietnam, Honduras, El Salvador, Philippines, Bolivia, Indonesia, Ghana, Algeria, Guatemala, India, Azerbaijan, Nicaragua, Uzbekistan, Myanmar, Pakistan, Cote d'Ivoire, Uganda, Cameroon, Syria, Kenya, Bangladesh, Senegal, Tajikistan, Nepal, Benin, Nigeria, Guinea, Angola, Cambodia, Ethiopia, Niger.
Less than 30	Low	Mozambique, Yemen, Tanzania, Madagascar, Rwanda, Sierra Leone, Malawi, Zambia, Haiti, Mali, Burundi, Sudan, Togo, Chad, Congo (Dem. Rep.).

Source: Global Food Security Report (2013)

Section III

Food security in India and States

Present condition of food security reflected through GFSI and GHI shows that India is standing with the list of African countries in terms of all indicators used to measure food security or hunger. One measure indicator of food insecurity is level of undernourishment and indicators of undernourishment are given in Table 4. This shows that more than 40 percent children under five years are stunted and underweight in India, however, level of undernourishment has reduced during 1990-2006. There are several explanations for decreasing undernourishment in India. Interestingly, our analysis (Table 5, Table 6 and Table 7) shows that prevalence of undernourishment is negatively related with food prices volatility and food production variability (rising food production). Thus it summarizes that if agriculture production grows, increasing food prices has limited bearing on low food security in India (Besides, delivery mechanism, such as PDS, Mid Day meal, etc. has also played their role in reducing malnourishment level in India). Problem of food security is very much related to low demand. If demand of people can be improved, food security can be achieved in India. State level condition of food security gives more interesting scenario of food security in India. To find out food security condition at state level in India, a food security index has been constructed for the year 2010-11.

Table 4. Indicators of Undernourishment in India Since 1990 to 2006

Indicators	1990	1997	1999	2006
Percentage of children under 5 years of age who are stunted	66.2	48.5	51.0	47.9
Percentage of children under 5 years of age affected by wasting	21.3	19.3	19.8	20.0
Percentage of children under 5 years of age who are underweight	59.5	41.1	44.4	43.5

Source: FAOSTAT

Table 5. Correlation Coefficient between Undernourishment, Food Supply and Food Prices In India since 1990-2006

Variable	Prevalence of undernourishment	Domestic food price level index volatility	Per capita food production variability
Prevalence of Undernourishment	1		
Domestic Food Price Level Index Volatility	-0.56**	1	
Per Capita Food Production Variability	-0.59*	0.66*	1

*Note: * and ** denotes 1 percent and 5 percent level of significance
Source: Author's Calculations using FAOSTAT data*

Table 6. Role of Food Price Volatility in Prevalence of Undernourishment in India

Prevalence of Undernourishment	Coefficient	Prob.
Constant	22.6	0
Domestic Food Price Level Index Volatility	-0.11	0.02
R^2		0.32
Adj. R^2		0.27
F		0.02

Source: Author's Calculations using FAOSTAT data

Table 7. Role of Food Production Availability in Prevalence of Undernourishment in India

Prevalence of undernourishment	Coefficient	Prob.
Constant	22.18	0.00
Per Capita Food Production Variability	-0.41	0.02
R^2		0.35
Adj. R^2		0.30
F		0.02

It is given that food security covers three important issues affordability, availability, and food absorption. In developing Food Security Index (FSI) variables related to each issue has been taken. Data was not available for all states and union territories, so FSI has been constructed for seventeen states only. Three category (Affordability, Availability, and Food Absorption) scores are calculated from the weighted mean of underlying indicators and scaled from 0-100, where 100=most favourable. The overall score for the FSI (from 0-100) is calculated from a simple weighted average of the category and indicator scores. Details of variables used in different categories are given below.

Affordability

Food consumption as a share of rural and urban household expenditure (in percentage)

Proportion of population under the poverty line (in percentage)

Gross State domestic product (SDP) per head (in rupees)

Availability

Per Capita Food Grain Availability (in Kg per person). Infrastructure needed for food security: It is simple composite index of following variables. Existence of adequate crop storage facilities (in Kg per capita).

Road infrastructure (in km per 100 sq km of area). Volatility of agricultural production (standard deviation of agriculture production over the years).

Food Absorption

Percentage of population with access to potable water

Data are drawn from website of agriculture department, Planning Commission, Government of India, Central Statistics Organisation India, NSS Survey Reports, Planning Commission Report on Poverty, Report of Ministry of Road Transport and Highways, Government of India and Census 2011. The weight assigned to each category and indicator can be changed to reflect different assumptions about their relative importance. Global Food Security Index developed by Food and Agriculture Organisation (FAO) gives equal and more weights to affordability and availability than food absorption. In calculating the food security index same weight criteria has been used in this study. The weights are 40, 44 and 16 for all three categories. In calculating affordability, availability and food absorption index same weights has been given to related variables. Indicator scores are normalised and then aggregated across categories to enable a comparison of broader concepts across states. Normalisation rebases the raw indicator data to a common unit so that it can be aggregated. The indicators where a higher value indicates a more favourable environment for food security—such as State Domestic Product (SDP) per head or average food supply has been normalised on the basis of: $x = (x - \text{Min}(x)) / (\text{Max}(x) - \text{Min}(x))$ Where $\text{Min}(x)$ and $\text{Max}(x)$ respectively show the lowest and highest values in the 17 states for any given indicator. The normalised value is then transformed from 0-1 value to 0-100 score to make it directly comparable with other indicators. This in effect means that the country with the highest raw data value will score 100, while the lowest will score 0. For the indicators where a high value indicates an unfavourable environment for food security such as volatility of agricultural production the normalisation function takes the form of: $x = (\text{Max}(x) - x) / (\text{Max}(x) - \text{Min}(x))$

Table 8 shows rank wise list of states according to their Affordability, Availability and food

absorption. In terms of Affordability Kerala, Haryana, Punjab and Maharashtra are comparatively better than states like Bihar, Assam, Jharkhand, Odisha, Uttar Pradesh and Chhattisgarh. In terms of Availability Punjab, Assam, Uttar Pradesh and West Bengal are comparatively better than states like Jharkhand, Gujarat, Tamil Nadu, Andhra Pradesh, Chhattisgarh, and Maharashtra. In terms of food absorption Tamil Nadu, Andhra Pradesh, Gujarat, Haryana, Maharashtra and Karnataka are comparatively better than states like Assam, Bihar, Jharkhand, and Chhattisgarh. In terms of affordability and availability Punjab, Kerala are good performing states and Jharkhand is adverse performing state. Rank wise list of states according to FSI is given in Table 9 and Table 10 shows list of states according to poverty level. Comparison of both Tables shows that people of Punjab, Kerala, Haryana, Maharashtra, Tamil Nadu, Karnataka, and Andhra Pradesh are comparatively more food secure and have low poverty than other part of India. The condition of food insecurity is high in Bihar, Jharkhand, Chhattisgarh, Odisha and Assam where poverty ratio is also very high. This indicates that poverty and food insecurity are inseparable.

Table 8. Rank Wise List of States According Affordability, Availability and Food Absorption

State	Affordability	State	Availability	State	Food Absorption
Kerala	92	Punjab	51	Tamil Nadu	100
Haryana	79	Assam	42	Andhra Pradesh	87
Punjab	78	Uttar Pradesh	41	Gujarat	86
Maharashtra	76	West Bengal	40	Haryana	85
Tamil Nadu	68	Bihar	39	Maharashtra	84
Karnataka	63	Kerala	39	Karnataka	82
Gujarat	59	Haryana	31	Punjab	62
Andhra Pradesh	59	Odisha	24	Rajasthan	48
Madhya Pradesh	48	Rajasthan	22	Kerala	33
Rajasthan	47	Karnataka	20	Uttar Pradesh	30
West Bengal	40	Madhya Pradesh	18	West Bengal	28
Chhattisgarh	37	Maharashtra	16	Madhya Pradesh	25
Uttar Pradesh	33	Chhattisgarh	15	Chhattisgarh	22
Odisha	29	Andhra Pradesh	14	Odisha	12
Jharkhand	20	Tamil Nadu	13	Jharkhand	11
Assam	13	Gujarat	10	Assam	8
Bihar	0	Jharkhand	5	Bihar	0

Source: Author's Calculation

Table 9. Rank Wise List of States According to Food Security Index (FSI)

State	FSI	State	FSI
Punjab	63	Uttar Pradesh	37
Kerala	59	Rajasthan	36
Haryana	58	Madhya Pradesh	31
Maharashtra	50	Assam	26
Tamil Nadu	48	Odisha	24
Karnataka	46	Chhattisgarh	24
Andhra Pradesh	42	Bihar	18
Gujarat	40	Jharkhand	12
West Bengal	39		

Source: Author's Calculation

Rest states are in middle condition. Considering socioeconomic status, Government of India has initiated several programmes, such as public distribution system, national food for work programme, national rural employment guarantee programme, mid day meal scheme, integrated child development programme covering different aspects, such as accessibility, vulnerability and utilization of food. Possible explanation for this present diversified food security condition in states of India is that the impact of these programmes is not equal in all states of India and has unequal benefits. For instance, food for work and public distribution system programmes improve food security level in developed states compared with backward states (Mahadevan and Suardi 2012). Institutional shortcomings restriction for vulnerable households and land fragmentation and environmental degradation are responsible for contemporary food insecurity paradox in India (Pritchard, 2013). These interactions have created vicious cycle of food insecurity in poor states.

Section IV Food Security Bill 2013 and its Implementation

The level of food security is very low and level of hunger is very high in India. Besides faster and more democratic political system India is still unable to provide two times food to its population. The outcomes of hunger and food insecurity can be understood viewing statistics of malnutrition level. Considering the level of hunger, food insecurity and level of undernourishment, importance of Food Security Bill 2013 cannot be ignored. Whatever level of growth is being achieved by India, it cannot be justifiable unless death of common man due to starvation is stopped. After the Bill passed several limitations has been discussed by academicians. The Bill aims to provide heavily subsidized food to two-thirds of India's 1.2 billion people. Seventy five per cent of rural and 50 percent of the urban population entitled to five kg food grains per month at Rs.3, Rs.2, and Rs 1 per kg for rice, wheat and coarse grains, respectively. The Bill proposes meal entitlement to specific groups, including pregnant women and lactating mothers; children between the ages of six months and 14 years; malnourished children; disaster-affected persons; and destitute, homeless and starving persons. The measure envisages food grain entitlement for up to 75 percent of the rural population and up to 50 percent of the urban population. Of these, at least 46 percent of the rural population and 28 percent of the urban population will be designated as priority households. The rest will be designated as general households. In case of non-supply of food grains, states would have to pay a food security

allowance to the beneficiaries. There are several critics of this Bill. This work deals with two important critiques that this act ignores supply side limitation of India and bottlenecks of distribution system and second, it does not identify role of market.

Table 10. Poverty across States of India

Range of Poverty (In Percentage)	States
0-10	Andhra Pradesh, Delhi, Goa, Himachal Pradesh, Kerala, Punjab, Sikkim, Puducherry, Andaman & Nicobar, Daman, Lakshadweep
10-20	Gujarat, Haryana, Jammu & Kashmir, Maharashtra, Meghalaya, Nagaland, Rajasthan, Tamil Nadu, Tripura, Uttarakhand, West Bengal
20- 30	Chandigarh, Mizoram, Uttar Pradesh, Karnataka
30-40	Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Dadra & Nagar Havelli, Jharkhand, Madhya Pradesh, Manipur, Odisha,

Source: Press Note on Poverty Estimates 2011-12 (2013), Government of India, Planning Commission.

Table 11. Demand Projections Based on Households Consumption Approach (In million tons)

Year	Rice	Wheat	cereals	Cereals	Pulses	Food grains
2013	94.33	75.39	28.15	197.9	12.89	210.8
2014	95.49	76.32	28.5	200.3	13.04	213.4
2015	96.64	77.24	28.84	202.7	13.2	215.9
2016	97.78	78.15	29.18	205.1	13.36	218.5

Source: Kumar et al (2009)

Table 12. Supply Projections Based on Multiple Regression Method (In million tons)

Year	Rice	Wheat	Coarse cereals	Cereals	Pulses	Food grains
2013	99.17	87.84	41.39	228.4	17.67	246.07
2014	100.38	89.57	42.2	232.15	18.12	250.28
2015	101.6	91.3	43.01	235.91	18.58	254.48
2016	102.81	93.02	43.82	239.66	19.03	258.69

Source: Kumar et al (2009)

Table 13. Demand Supply Gap of Food Grains Based on Projected Supply and Demand (In million tons)

Year	Rice	Wheat	Coarse cereals	Cereals	Pulses	Food grains
2013	4.84	12.45	13.24	30.5	4.78	35.27
2014	4.89	13.25	13.7	31.85	5.08	36.88
2015	4.96	14.06	14.17	33.21	5.38	38.58
2016	5.03	14.87	14.64	34.56	5.67	40.19

Source: Author's Calculation Using table 11 and 12

Puzzle of Demand and Supply of Food in India

Success of Food Security Bill lies in the supply of food in India. Table 11 and 12 show demand and supply of cereals and Table 13 shows gap between them. It shows that India will have excess supply of cereals and there will be no supply side problem. Unfortunately, this demand does not cover food security issue in depth and ignore the prevalence of undernourishment in India. In calculating the demand for food grain, most researchers have used present pattern of

consumption. Most of them have ignored the fact that at this level of consumption there are still several people who are not getting sufficient food according to their physical work. FAO gives country level data about the average intensity of food deprivation in countries. Data shows that India has 125 kilo calories per day per person average deficiency in 2012. Here, in calculating food needed for achieving food security in India, level of extra demand has been calculated using formula given below. This analysis is based on five assumptions: 1. It has been assumed that the average intensity of food deprivation given in 2012 will be same till 2016. 2. Demand combination for rice, wheat and coarse cereals given in 2013 (3.35:2.68:1.00) will be same till 2016. 3. One gram of rice, wheat and coarse cereals provide 3.45 Kilo calorie per gram (taking average of calorie intake from one gram rice, wheat and coarse cereals) (See ICMR Report 2009). 4. Persons who are not able to get proper food and suffering from food shortage are poor and mostly use cereals in their food basket, so food deprivation of the undernourished people will be reduced using consumption of cereals. 5. Total number of days in a year is 365.

Based on these assumptions, extra demand of cereals is calculated using following formula-

Excess Need of Cereals_t (in gms) = Intensity of food deprivation (125 kilo calories per day) / 3.45 (in K.Cal) X Total Population_t X 365

Corrected Demand = Demand projected using Households Consumption Approach + Excess need of Cereals

Where,

Excess Need of Cereals_t - Excess need of cereals in year t,

Total Population_t - Projected population in year t
Corrected Demand - Total demand of cereals in year t.

Table 14 shows the corrected demand for 2013 to 2016. Table 15 shows the gap between projected supply of cereals and corrected demand of cereals. Table shows that India will have surplus coarse cereals and wheat in future to insure food security to its population. But India will have deficit of rice. Analysis shows that condition of food insecurity is really serious in India. In this condition relevance of Food Security Bill cannot be ignored. But the demand and supply analysis shows that food security cannot be achieved in India without improving the level of overall agriculture production especially rice production. Agricultural growth will not only

improve the level of overall production of agriculture but its linkages with other sector will enhance the overall level of economic growth and thus, poverty and buying capacity of common people (Diao et al., 2006).

Table 14. Corrected Demand Projections (In million tons)

Year	Rice	Wheat	Coarse Cereals
2013	102.23	81.71	30.51
2014	103.51	82.74	30.89
2015	104.79	83.76	31.27
2016	106.06	84.77	31.65

Source: Author's Calculation

Table 15. Corrected Demand Supply Gap of Food Grains Based on Projected Supply and Corrected Demand (In million tons)

Year	Rice	Wheat	Coarse Cereals
2013	-3.06	6.13	10.88
2014	-3.13	6.83	11.31
2015	-3.19	7.54	11.74
2016	-3.25	8.25	12.17

Source: Author's Calculation

How Present Public Distribution System is Viable in achieving Food Security in India

Success of Food Security Bill depend on existing public distribution system (PDS) in India. Studies (Swaminarhan, 2000. and Report on The State of Food Insecurity in Rural India. 2002) reflect that our PDS is not in a condition to implement Food Security Bill in India. Keeping in view that poverty percentage is very high and benefits of growth cannot reach quickly in the hands of poor, the role of PDS in India cannot be ignored. Table 16 shows the net availability, procurement and public distribution of food grains in India since 1991. Overall Trend shows that due to increase in production and population, role of public distribution system has been increasing in India and coverage of PDS has been increased. Five patterns can be observed in this table: First, Net production of food grains has been increasing in India. The growth in net production has been higher in the post 2001 era but the food grain production has been more unstable in post 2001 era than pre 2001 era. Second, Net imports has been higher after 2001. Third, Percentage of procurement of net food grain production has been increasing in post 2001 era. Fourth, the role of public distribution in total availability of foograin has also been increasing in post 2001 era.

State wise condition of storage capacity is given in figure 1. This shows that the facility of food grain storage is not very satisfactory in all states except Punjab, Uttar Pradesh, Maharashtra, Andhra Pradesh, and Haryana. Condition is more alarming in Arunachal Pradesh, Bihar, Goa,

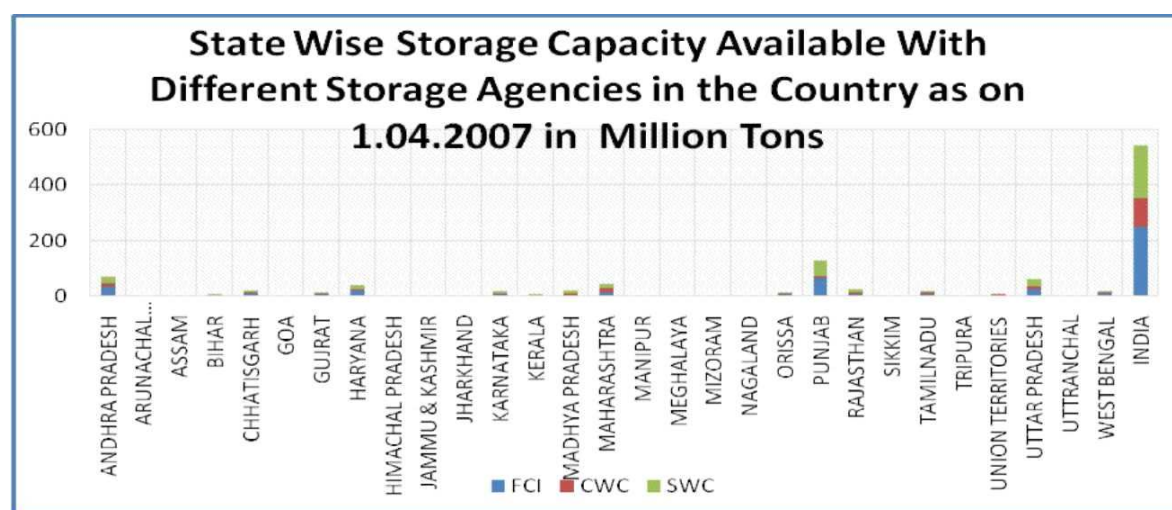
Himachal Pradesh, and Jammu and Kashmir, Jharkhand, Manipur, Mizoram, Nagaland and Sikkim. In terms of food security, Bihar stands at the second lowest.

Table 16. Net Availability, Procurement and Public Distribution of Food grains (in million tons)

Year 1	Net Production of Food Grain 2	Net imports 3	Net Availability of Food Grains 4	Procurement 5	Public distribution 6	Col 3 as percentage of Col 4 7	Col 5 as percentage of Col 2 8	Col 6 as percentage of Col 4 9
1991	154.3	(-)0.1	158.6	19.6	20.8		12.7	13.1
1992	147.3	(-)0.4	148.5	17.9	18.8	(-)0.3	12.2	12.7
1993	157.5	3.1	149.8	28.1	16.4	2.1	17.9	10.9
1994	161.2	1.1	154.8	26	14	0.7	16.1	9.1
1995	167.6	(-)2.6	166.7	22.6	15.3	(-)1.6	13.5	9
1996	157.9	(-)3.1	163.3	19.8	18.3	(-)1.9	12.5	11.2
1997	174.5	(-)0.1	176.2	23.6	17.8		13.5	10.1
1998	168.2	(-)2.5	159.6	26.3	18.6	(-)1.6	15.6	11.1
1999	178.2	(-)1.3	169.4	30.8	17.7	(-)0.8	17.3	9.9
2000	183.6	(-)1.4	168.3	35.6	13	(-)0.8	19.4	7.7
2001	172.2	(-)2.9	156.9	42.6	13.2	(-)1.8	24.7	8.4
2002	186.2	(-)6.7	189.5	40.3	18.2	(-)3.5	21.7	9.6
2003	152.9	(-)5.5	170.6	34.5	23.2	(-)2.8	22.6	13.2
2004	186.5	(-)6.5	183.3	41.1	28.3	(-)3.5	22	15.5
2005	173.6	(-)6.0	170	41.5	31	(-)3.5	23.9	18.2
2006	182.5	(-)2.3	181.9	37	31.8	(-)1.3	20.3	17.5
2007	190.1	(-)4.7	183.7	35.8	32.8	(-)2.6	18.8	17.8
2008	210.2	(-)9.7	183.5	54.2	34.7	(-)5.3	25.8	18.9
2009	205.2	(-)4.1	189.5	60.5	41.3	(-)2.2	29.5	21.8
2010	190.8	(-)2.2	189.2	56.1	43.7	(-)1.2	29.4	23.1
2011	214.2	(-)2.9	203.1	64.5	47.9	(-)1.4	30.1	23.6

Source: Economic Survey of India, 2012-13(2013)

Figure 1. State Wise Storage Capacity Available with Different Storage Agencies in the Country (As on 1.04.2007 in million tons)



Source: Ministry of Consumer Affairs, Food and Public Distribution, Govt. of India Website.

The coverage of Food Security Bill in states like Bihar is also very high. State level condition raise serious question in front of policymakers that how a state like Bihar will manage to implement this Bill where storage capacity is not proper. Level of malnutrition and hunger in India seriously raise debates about the fact that for a country like India market system cannot reduce level of hunger and malnourishment. However, data also shows that there is huge gap between demand for food and supply of food through PDS. It means markets still plays a major role in food distribution in India. Success of Food Security Bill significantly depends on present PDS network that is a major critique of this Bill. And this cannot be possible without improving storage capacity is different states and removing the bottleneck in PDS and identifying the role of market in food distribution in India.

Section V

IN CONCLUSION AND POLICY SUGGESTION

In this work an attempt has been made to explain the condition of food security and challenges of Food Security Bill in India. Besides faster and more democratic political system, India is still unable to provide two times food to all population. Present condition of food security reflected through GFSI and GHI shows that India is standing with the list of African countries in terms of all indicators used to measure food security or hunger. Our analysis confirms that if agriculture production grows, increasing food prices has no bearing on low food security. Problem of food security in India is very much related to low demand. If demand of people can be improved, food security can be achieved. It shows that with increasing agriculture production food security can be achieved via improving the overall level of Income of households in India. Special attention is needed on states like Bihar, Assam, Jharkhand, Odisha, Uttar Pradesh and Chhattisgarh to achieve food security in India. These states are also one of the backward states of India. Considering level of hunger, food insecurity and level of undernourishment, importance of Food Security Bill cannot be ignored.

However, this work points out two major limitation of this Bill; ignorance of supply side limitations (related with agriculture production and PDS) and the role of market. Agriculture growth will not only improve the level of overall production of agriculture but also its linkages with other sector will enhance overall economic growth and will reduce poverty and increase buying capacity of common people. State level condition of storage capacity of food grains raises serious question in front of policymakers that how a state like Bihar will manage to

implement this Bill where storage capacity is not proper. Without improving networks of food storage system in states like Bihar, food security in India will not be achieved. Market still plays a major role in food distribution in India. While Food Security Bill does not cover role of market in food security process. As a solution to these challenges the food policy needs to be reformed and importance should be given to technological advancements, ultimately resulting in enhanced food production besides agricultural research and development as well as funding and infrastructural development (Singh, 2014).

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