KNOWLEDGE PARTNERSHIP PROGRAMME

Scoping Study:

Review on food and nutrition security: India's domestic story and scope to build global partnerships

By

N C Saxena

Sheila Vir

Harsh Mander

March, 2014

Addressing Food and Nutrition Security in India[1]

NC Saxena

Contents

[1] Based on inputs from Harsh Mander and Sheila Vir

Executive Summary

This paper outlines India's achievements in the area of food and nutrition security, and explores what lessons India has to offer to other South countries, and the institutions through which such knowledge sharing may be accomplished.

High economic growth in India in the last three decades has been accompanied with increased agricultural production with sufficient buffer stocks of foodgrains in government godowns. Between 1950 and 2012 India's foodgrain production has gone up by five times, whereas its population increased during this period by roughly three and a half times. This has helped India in reducing poverty, ending famines and mass starvation, stabilising foodgrain prices by massive distribution of subsidised grain through a public distribution system (known as PDS), and starting an ambitious school meals and young child feeding programme. According to the NSSO data the percentage of households who are not able to afford two square meals a day for its members has come down from 17.3% in rural India in 1983 to only 1.9% in 2009-10. In urban areas it is even less, only 0.4% in 2009-10 as against 12.1% in 1983 (Deaton and Dreze 2008; Economic Times[2]).

Thus India has made significant achievement in ensuring food security to its population, though its success on the nutritional front is more modest. Focus on multi-dimensional nutrition started only in the last ten years, after the National Family health Survey _III showed that not only was the percentage of malnourished children abnormally high at 46%, it declined only by one percentage point in the period 1998-2006. Till 2006, nutrition was confused with access to food, its other dimensions, such as balanced diet, micro-nutrients, healthy environment, and cultural practices of rearing up of children, were overlooked.

However, considering that policy makers' attention on multi-dimensional aspects of nutritional security is only eight years old, India has shown satisfactory progress on reducing malnutrition too. The HUNGaMA survey of 2011 in 100 poorest districts indicates that the prevalence of underweight in children under 5 years decreased from an estimated 53 per cent in 2002-4 (based on DLHS-2 data) to 42 per cent in 2010-11 i.e. AARR (average annual rate of reduction) of 2.9 per cent in the seven years period from 2003-2011. Recent data from the states of Chhattisgarh and Maharashtra indicate a very significant improvement in the nutrition situation. In Chhattisgarh state, the AARR of 4.22% was observed for underweight children and 5.64% for stunting. In Maharashtra, stunting rate declined from 39 per cent in 2005 in under two years children to 23 per cent in 2012 (Unicef 2013). Thus other developing countries can learn a great deal from various micro- and macro-level success achieved by India even on the nutritional front.

Partnerships promoting South-South knowledge sharing - For improving food production, collaboration between India and other developing countries could be in the adaptation of agricultural technologies, promotion of family-based agriculture with security of tenure, watershed development, establishment of institutional mechanisms for seed and fertiliser production, agricultural extension, marketing and financial systems, establishing and running centralised and decentralised systems of state procurement, minimum support price assurances to farmers, and buffer stock management. Other governments can also learn how India has extended rural credit through its commercial banks, *Kisan* Credit Cards, interest subvention schemes and also through agricultural insurance schemes. India's more recent efforts offer models for IT-enabled systems of agriculture extension, real-time farmer information and farmer education systems. These all carry potential learning for low income countries as well as emerging economies.

For improving access to food by the disadvantaged, India has experience in subsidized food distribution followed by a recent legislation on food security as well as on Right to Employment for

[2] http://articles.economictimes.indiatimes.com/2013-03-19/news/37844251_1_welfare-schemes-mid-day-meal-scheme-foodgrains

the poor, universal mid-day meals programme for school going children, and supplementary nutrition to the infants through 1.4 million village centres, called Anganwadis. A successful right to work legislation must rely on active participation at all levels of government, particularly local governments that form the backbone of employment opportunities, so while far from perfect, low-income countries can learn from India's attempts at employment guarantees. Legal rights create a normative framework of what people should rightfully expect from their governments, enhancing expectations, and through it democratic pressures for change. The rights-based approach is particularly suited to nascent democracies that wish to strengthen the protection of its peoples under law.

As regards nutritional security, developing countries can learn a great deal from the following interventions which have shown positive results in India:

i. Infant and Young Child Feeding (IYCF) Practices
ii. Community based undernutrition reduction initiatives by many states
iii. Prevention and management of Severe Acute Malnutrition (SAM)
iv. Food fortification & universal salt iodization

The challenge for low income countries (LICs) is scaling up coverage of direct food and nutrition actions in a cost-effective manner with proper implementation of a well-designed programme. In the LICs, much less is known on how to implement the direct food and nutrition interventions at scale, how to replicate or adapt, how to deliver in a cost-effective manner, what strategies to actively discourage, how to sustain, and how to minimise costs, etc. Low income countries, in general, require strong advocacy for creating an enabling political and resource environment, a proper system for ensuring effective delivery of services, support for producing suitable technical expertise in public health nutrition and assistance for essential programme related supplies. In addition, political commitment needs to be backed by appropriate support for establishing legislation framework for successful implementation of policies and programmes.

Scaling up therefore requires programme expertise for the development of suitable policies, implementation guidelines and programme designs along with technical support in defining goals, targets, timelines and deliverables. India, with the financial support of international development agencies, could take a leading role to support LICs. India has made significant progress in terms of advocacy, policy formulation, strategy formulation, programme planning, establishing of delivery mechanisms for each of the selected nutrition specific interventions. Additionally, India has demonstrated expertise in system development, execution of a comprehensive communication strategy, training and capacity building of programme managers and workers, community mobilization as well as monitoring and evaluation. India has experience, expertise and capacity to work with LICs in conducting training, developing the required institutional capacity and competence for the execution of programme implementation tasks.

India is also in a position to offer technical and managerial support for conducting country-wide dietary and nutrition surveys. Additionally, technical support could also be provided for generating data base and analysing findings for appropriate programme planning.

Predominant institution through which government-to-government knowledge sharing from India to other South countries occurs is through the Indian Technical and Cooperation Programme (ITEC). Something close to 10,000 foreign nationals are trained in various subjects each year in India under this programme, which spans many subjects including those connected with food security. The programme is fully funded by the Government of India and has grown since its inception, at this date, working with its sister programme the Special Commonwealth African Assistance Programme (SCAAP), it reaches 161 countries in Asia, Africa, Eastern Europe, South America, the Caribbean, as well as Pacific countries and islands.

In addition, developing countries may also like to take advantage of the initiatives of DARE/ ICAR (Department of Agricultural Research and Education/ Indian Council of Agricultural Research) towards knowledge cooperation in SAARC and G20 countries.

Lastly, Corporate Social Responsibility has become increasingly important in India as well as in other developing countries. There is large room for growth in engaging private enterprises to play a larger role in knowledge sharing and laying the grounds for inter-government cooperation.

1. Introduction

This paper outlines India's achievements in the area of food and nutrition security, and explores what lessons India has to offer to other South countries, and the institutions through which such knowledge sharing may be accomplished.

FAO (2013) defines food and nutrition security as:

Food security: A situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life.

Nutrition security: A situation that exists when secure access to an appropriately nutritious diet is coupled with a sanitary environment, adequate health services and care, in order to ensure a healthy and active life for all household members. Nutrition security differs from food security in that it also considers the aspects of adequate caring practices, health and hygiene in addition to dietary adequacy.

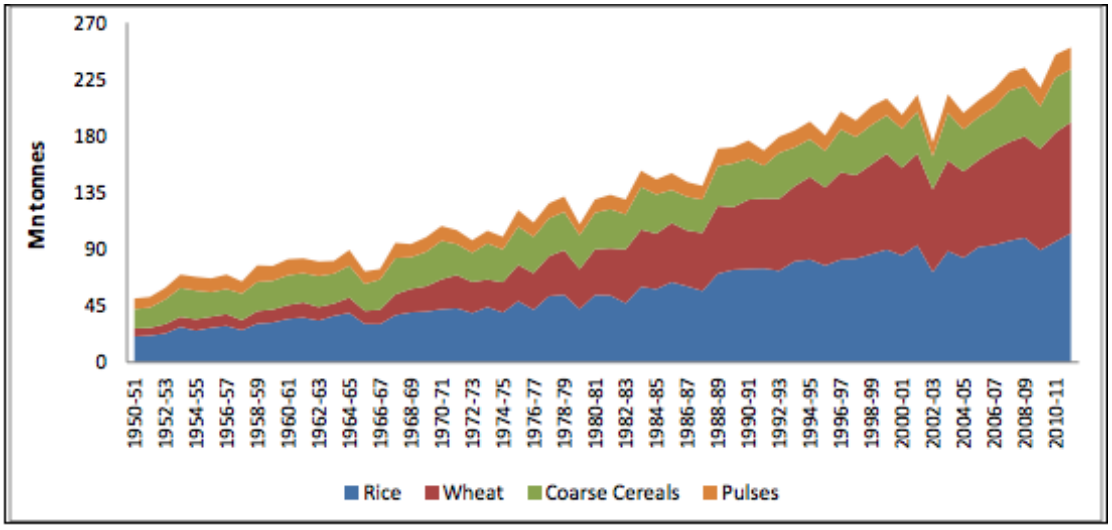
These three pillars of food and nutrition security - production, accessibility by all, and ability to live a healthy and active life – together with factors influencing success will be considered below.

2. Food production

India's success in adopting high yielding "Green Revolution" technologies from the late-sixties onwards was primarily due to the fact that India in the 1950s abolished landlordism and promoted personal cultivation by small and medium farmers, providing them with secure tenure through land reforms. Increased food production from the 1970s onwards ended India's dependence on food imports, and gradually India was able to build up a comfortable buffer stock by providing remunerative price to farmers through a programme called Minimum Support Price (MSP) for cereal crops. The multi-pronged strategy embraced several instruments such as generation and adoption of technology, better availability of inputs, institutional credit, subsidy on farm inputs, improved infrastructure, expansion of irrigation, competitive markets, remunerative prices for farmers/producers, public procurement, system of buffer stocks with government, and open market sales if needed.

This strategy has helped India in several ways. Food production including vegetables, fruits, livestock products and fish increased from 188 million tonnes (MT) during 1970-71 to 342 MT during 1990-91 showing an 82 per cent increase over two decades. In the next two decades, food production increased to close to 600 MT - marking a 75 per cent increase. In these two periods, the population of the country increased by 53 and 47 per cent, respectively. This has resulted in an increase in per capita production of total food from less than 350 kg per person per annum during the early 1970s to more than 500 kg in recent years (Chand and Jumrani 2013).

Figure 1: Foodgrain production in India 1950-2011



Source: Ministry of Agriculture, 2013

Today India is first in the world in the production of milk, and second in wheat, paddy, sugarcane, groundnut, vegetables, and fruit. In the last two decades India has done very well in the non-crop sector such as horticulture, dairy, and fisheries, whereas its performance in pulses, coarse cereals, and oilseeds has been modest.

In the last two decades, 1990s and 00s, yields have increased by 50 per cent, although during the 10th Plan period of 2002-07 agricultural output slowed, with only 2.1 per cent as average annual growth of the agricultural and allied sectors in the Gross Domestic Product (GDP). This fortunately improved to 3.6 per cent during the 11th Plan period of 2007-12 (Economic Survey, 2012). High production in recent years and remunerative MSPs, along with various other steps taken by the government, has seen the procurement of wheat and rice steadily rising and reaching record levels (see Table 4). This also enabled Government of India (GOI) to pass a Food Security legislation promising highly subsidized foodgrains to almost three-fourth of its population, which is discussed in section 3.2. Both production and procurement of foodgrains is better widespread throughout the country, rather than be confined only to the north-west India. Besides Punjab and Haryana, the contribution from states such as Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh in production and procurement of wheat increased because of higher yields now than in the previous years. Similarly production and procurement of rice in Bihar, Chhattisgarh, Uttar Pradesh and West Bengal showed significant increase over the previous years.

Of late, especially during the post-2000 period, hybrid maize for poultry and industrial use and Bt cotton have shown great strides in production, leading to sizeable exports of cotton, which made India the second largest exporter of cotton in 2007–2008. Pulses have also grown steadily, 17.09 million tonnes in 2012 from 14.57 million tonnes in 2008-2009, yet the growth has been inconsistent and slow, the predominant agricultural products are still cereal crops.

2.1 Ongoing challenges and gaps

2.1.1 Changing consumption patterns

As economic growth picks up, it is common to observe a change in dietary patterns wherein higher income groups substitute cereals with high-value food. Growing prosperity leads to an increased access to fruits, vegetables, meats and dairies, and a diversification of diets. However non-cereal food production lags behind its demand. Consumption of cereals has declined over

the years: per capita monthly consumption of cereals went down from nearly 15 kg in 1983 to 11.7 kg in 2007–2008 in rural areas, while in urban areas it declined from 11.3 kg to 9.7 kg (Government of India 2010). On the other hand, per capita consumption of fruits and vegetables has increased rapidly over the past two decades. In 2011/12 production of fruits and vegetables was 2.7 and 2.6 times that of the output level two decades ago[3], i.e. in 1991/92. This expansion was much higher than that for cereals, where the output level in 2011/12 was 1.5 times that of 1991-92. A similar and more marked difference may be seen in the most recent past decade (2001/02 to 2011/12) where output of fruits and vegetables has increased by 80 and 69 per cent respectively over 2001/02, while output of cereals has grown by 17 per cent in the same period. However, there is considerable wastage and spoilage in fresh produce as also sharp variation in prices during the season.

The rate of increase in the prices of fruit and vegetables have been higher than that for cereals especially in recent years, and is a major contributor to the sharp increase in the inflation level for primary food. Inflation in primary food has been greater than that of manufactured products and appears to be a driving force behind the higher inflationary pressure.

High food prices are often blamed for raising hunger without reckoning indirect effect of prices on production. Empirical evidence shows that inverse relationship between food prices and hunger cannot be generalised and recent spikes in food prices have not caused any adverse effect on the prevalence of hunger – they have rather improved access to food through positive effect on food production. A substantial and consistent rise in food prices in the last ten years might have created a strong incentive for the producers to raise their output and put food production on a new growth trajectory.

The proportionately higher increase in the prices of horticultural produce and other perishable farm items suggest that (a) there is excess demand in the domestic market and (b) their higher output levels will indeed be absorbed by domestic consumption demand. This clearly justifies energetic efforts to encourage the continued expansion of horticulture, animal husbandry and fisheries, in order to service increasing domestic demand. The data shows that for fruit and vegetables, the price at the first point of sale in large mandis as a proportion to the final retail price, is in the range of 25 to 40 per cent. This proportion may be lower, if smaller mandis were to be considered. The inference is that (a) the benefits of demand expansion is not passing adequately to the farmer and (b) the benefits of higher production and productivity is not passing adequately to the consumer. All the evidence suggests that this is on account of the large deficiencies in the logistics system in between the farm to the final consumer. The push to build up storage capacity through cold chains has not been successful in vegetables and is limited for fruits. The private sector has a greater role to play in terms of investments in value chains and strengthening the firm–farm linkages critical for scaling up processing and retailing operations.

[3] Report of the committee on encouraging investments in supply chains including provision for cold storages for more efficient distribution of farm produce, Development Policy Division, Planning Commission, New Delhi May 2012

Table 1: Changes in consumption pattern in all of India: 1987-88 to 2009-10.

	Rural (percent share of consumption)					Urban (percent share of consumption)				
Food item	1987–88	1993–94	1999–2000[a]	2004–05	2009–10	1987–88	1993–94	1999–2000	2004–05	2009–10
Cereals	26.3	24.2	22.2	18.0	15.6	15.0	14.0	12.4	10.1	9.1
Grains	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1
Cereal substitutes	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Pulses and products	4.0	3.8	3.8	3.1	3.7	3.4	3.0	2.8	2.1	2.7
Milk and products	8.6	9.5	8.8	8.5	8.6	9.5	9.8	8.7	7.9	7.8
Edible oil	5.0	4.4	3.7	4.6	3.7	5.3	4.4	3.1	3.5	2.6
Egg, fish, and meat	3.3	3.3	3.3	3.3	3.5	3.6	3.4	3.1	2.7	2.7
Vegetables	5.2	6.0	6.2	6.1	6.2	5.3	5.5	5.1	4.5	4.3
Fruits and nuts	1.6	1.7	1.7	1.9	1.6	2.5	2.7	2.4	2.2	2.1
Sugar	2.9	3.1	2.4	2.4	2.4	2.4	2.4	1.6	1.5	1.5
Salt and spices	2.9	22.7	3.0	2.5	2.4	2.3	2.0	2.2	1.7	1.5
Beverages and the like	3.9	4.2	4.2	4.5	5.6	6.8	7.2	6.4	6.2	6.3
Food total	64.0	63.2	59.4	55.0	53.6	56.4	54.7	48.1	42.5	40.7
Nonfood total	36.0	36.8	40.6	45.0	46.4	43.6	45.3	51.9	57.5	59.3
Total expenditure	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: NSSO, 2011

Several private players, both domestic and multinational, are venturing into agriculture and developing models of better firm–farm linkages. The private sector has already emerged as a significant player in the seed market and there is opportunity for its greater presence in other input services related to high-value agriculture. The private sector can take the lead in investments in value chains, be it by farmers or corporate players. The role of the multilateral and bilateral agencies can be supporting many of the public sector initiatives and also private ventures through better technology, innovative models of program management, and knowledge partnerships.

While the production basket is diversifying toward high-value commodities, large post-harvest losses (20% to 30% for fruits and vegetables) and poor value addition arising from fragmented value chains continue to pose challenges (ADB 2010). Most of the existing marketing systems for high-value commodities, particularly fruits and vegetables, are quite fragmented and the supply chains are not adequate for handling perishable commodities. Although the Indian agricultural system is undergoing structural transformation, it still requires large investments and strategic allocation of resources to accelerate the process. Here, the role of organized processing and retailing is crucial as these sectors generate demand for quality produce and it is in the interest of the players to strengthen firm–farm linkages. A World Bank study on the value chains of mangoes, lychees, and potatoes in Bihar shows that a significant amount of the consumer price is lost in transport and wastage; for mangoes, the farmers receive 34%, for lychees 42%, and for potatoes only 16% of the consumer price (World Bank 2007).

Thus the issue of food security is not only about availability of foodgrains but the composition of the overall food basket as observed from changing consumption patterns. A dietary transformation is under way in the country and demand for high-value, vitamin- and protein-rich foods, such as fruits, vegetables, milk, eggs, meat, and fish is increasing. The other kind of investment that is required in developing modern supply chains and logistics services, such as cold chains, reefer vans, and warehouses, specialized to handle high-value commodities, can come from the private sector. Some big private companies that have ventured in agricultural retailing and processing are investing heavily in strengthening the supply chains.

Future growth in agriculture is likely to come increasingly from high-value agriculture but this is less likely to happen in a business-as-usual scenario. Currently the markets for high-value commodities are quite fragmented and small and the existing supply chains are inadequate to handle perishable products. Despite a huge network for delivering key agricultural inputs and services (e.g., seed, fertilizer, farm management advice, etc.), the outreach is not adequate and the quality of the services is poor. Cutting across all the programs is a severe delivery deficit and a lack of accountability. Building synergies between the various stakeholders to overcome these problems is necessary. Looking into the role of the various stakeholders, the public sector can enhance investments by rationalizing subsidies as these have much lower rates of return than investments in, say, agriculture R&D, rural roads, irrigation, and cold chains. But ironically, today, quite a bit of the public resources going to agriculture are in the form of subsidies (Fan, Gulati, and Thorat 2008). The private sector can take an obvious lead in investments in the value chain; the investment can be as small as a farmer's investment in setting up a tubewell to as big as a corporate player's investment in logistic services. The role of multilateral and bilateral agencies can come in supporting many of the public sector initiatives as well as private ventures. But for this to happen, the government policy has to be friendly to private sector participation through better incentives and institutional (rules-of-the-game) changes. A multi-stakeholder system can ensure better accountability and address issues related to poor governance and transparency, which have a positive impact on the functioning of the programme and, hence, the outreach. Gender (female) participation particularly needs to be recognized explicitly in this entire chain, especially the importance of empowering women through education and asset ownership.

2.1.2 Stress on groundwater

The increasing stress on available water resources, particularly groundwater, which is a major source of irrigation in India, is quite evident. Satellite maps released by the National Aeronautics and Space Administration (NASA) showed that north-western India's aquifers fell by a foot a year from 2002 to 2008 (The Economist, 10 Sept. 2009). There is a huge pressure on groundwater resources in India and this is felt even more during periods of drought; hence, large investments are needed in "groundwater banking" (Shah et al. 2009). It is interesting to observe that Gujarat has invested in more than 100,000 check dams through the involvement of nongovernment organizations since 2000, and has been instrumental in recharging water tables. This has given rich dividends to Gujarat, which has registered the highest rates of growth in agriculture (above 9% per annum) among all states of India since 2000. Free and low-priced power compounds the problem and this needs to be replaced by pricing of power per usage and separation of feeder lines, as done in Gujarat (Shah and Verma 2008). Subsidies should be given to small farmers through "smart cards."

It is quite evident that paddy cultivation in low rainfall areas of Punjab and Haryana may not be sustainable and it will be imperative to shift the production base to the water abundant regions, such as eastern Uttar Pradesh, Bihar, West Bengal, Assam, Orissa, and Chhattisgarh However, to shift the Green Revolution to the eastern region, investments will be needed to build the required infrastructure and irrigation systems, and the current government initiative should rightly focus on this. The question is whether it will be the public sector alone that is going to bring in the required resources or could there be opportunities for partnerships with the private sector and multilateral agencies.

Micro-irrigation systems that include drips and sprinklers are being increasingly adopted in India, owing to their water saving and efficient use of technology. The micro-irrigation scheme has been in place since 2005–2006. Since its inception, an area of 1.8 million hectares of land across 18 states has been brought under micro-irrigation. This scheme has been recently upgraded to a national mission on micro-irrigation with an outlay of Rs80.3 billion in the context of climate change. Of the total outlay, the Department of Agriculture and Cooperation will contribute Rs34.1 billion, comprising a 40% subsidy for general farmers and 50% for small and marginal farmers.

For foodgrains, private players have played an important role in the seed sector. Corporations, such as the Hariyali Kisaan Bazaar of DCM Shriram Consolidated Limited are engaged in the multiplication of seeds in collaboration with farmers. The technological innovation has made an impact on the seed replacement rate (SRR), which has improved in the case of staples.

2.2 Use of IT for Agricultural Extension Services

Agricultural Extension Services provide services to farmers to help improve their yields, to teach new techniques and introduce new technologies, as well to provide information and education. This has been recently augmented by technological improvements, such as utilizing phone networks to SMS farmers information, call centres to provide aid, and IT systems to create databases. India can provide expertise on computerization of wholesale markets and SMS systems in contacting farmers.

A key way of reaching farmers has been utilising farmer's collectives to spread information, as well as Kisan Call Centres that provide support for farmers; these have been improved through new technology, greater involvement of state governments, effective supervision and dissemination of information regarding schemes and programmes (Government of India, 2012). Extension services have been part of the success of horticultural production, as well as the continued growth of food grains and pulses, propagating technology and providing timely information in support of other schemes and programmes. Over 21.5 million farmers have benefited so far since the inception of the Extensions Reform Scheme, through various extension activities. For example, 11.5 million farmers were involved in Farmer Meetings (*Kisan Melas* or *Kisan Goshties*), 4.9 million through training programmes at different levels, 2.3 million through technology and expertise demonstrations, and 1.5 million farmers benefitted through so-called 'Exposure Visits'. On top of this, over 41,000 farm schools have been set up (Government of India, 2012).

The main extension activities of the central autonomous Indian Council for Agricultural Research (ICAR) are achieved through the 40 Agriculture Technology Information Centres (ATICs) and 569 district-level Krishi Vigyan Kendras (KVKs), or farm science centers. In 2000, the Indian Tobacco Company (ITC) launched an initiative called e-Choupal. The project is a private commercial initiative in agricultural extension. The e-Choupal initiative, which consists of 6,500 kiosks, serves four million farmers in 40,000 villages in 10 states (ITC 2010a). Essentially, an e-Choupal is a kiosk located in a village and equipped with computers with Internet access. To manage the e Choupal, ITC identifies and trains a local farmer (Sanchalak), who bears the operative costs. The e Choupal provides farmers with an alternative marketing channel, information on local district weather, agricultural best practices, feedback on quality of crops, and input sales with accompanying field-specific testing such as soil tests (Annamalai and Rao 2003[4]; Bowonder, Gupta, and Singh 2007[5]). However, the main purpose for which the kiosks were started was to procure crops, including soy in Madhya Pradesh, wheat in Uttar Pradesh, coffee in Karnataka, and seafood in Andhra Pradesh (Annamalal and Rao 2003). The e-Choupal initiative has had a supposedly positive effect on the incomes of participating farmers, as the system has brought efficiency to the supply chain by removing intermediaries and reducing transaction costs (Bowonder, Gupta, and Singh 2007; Karnani 2007[6]). The e-Choupal initiative highlights the impact that price information provided by village Internet kiosks,

[4] Annamalai, K., and S. Rao. 2003. What works: ITC's e-Choupal and profitable rural transformation: Web-based information and procurement tools for Indian farmers. Digital Dividend "What Works" Case Study Series. Washington, D.C.: World Resources Institute

[5] Bowonder, B., V. Gupta, and A. Singh. 2007. Developing a rural market e-hub: The case study of e-Choupal experience of ITC. <http://planningcommission.nic.in/reports/sereport/ser/stdy_ict/4_e-choupal%20.pdf>. Accessed July 30, 2010

[6] Karnani, A. 2007. Fortune at the bottom of the pyramid: A mirage. How the private sector can help alleviate poverty. California Management Review 49(4): 90–111.

coupled with supporting services, can have on farmer decisions and ultimately profits—information and services that are currently not provided in the public-sector extension system.

2.3 Lessons for other countries

The integration of IT technology with traditional farming practices offers much potential in improving rural livelihoods and increasing agricultural knowledge. While IT extension is still at a relatively nascent stage even in India, their trials and tribulations up to this point can give plenty of examples and best practices for other agriculturally dependent countries to adopt. The particular use of phone technology such as SMSs and farmer call centres has become far more doable and attractive option due to the exponential increase in mobile phones in developing countries.

India has many success stories in soil and water management through civil society and peoples' participation, where decision-making and management of water systems has been devolved to the community level. In canal irrigation too, the shift to participatory irrigation management (PIM) is to enhance the role and responsibility of local communities in managing canals at the tertiary level, bring in greater community ownership of the infrastructure and make the state more accountable. The role of the state is still paramount but with the community being included on specific and (state) defined terms. Water users' associations (WUAs) are therefore introduced in various forms in different states of India and they are not only meant to be governed and controlled by the people who pay for services, receive benefits and manage the infrastructure, but also provide an institutional structure that delivers the services that a public authority would with participation and decentralisation as concurrent elements (Narayanan and Kamath 2012).

3. Access by all to food to combat hunger

Growth and higher production alone may not be able to ensure food security for the poor and vulnerable. Although there has been a drastic decline in self-reported hunger in India as reported in the Executive Summary, the information regarding the adequacy or inadequacy of food for consumption, elicited through a single probing question, may not always be free from subjectivity. Very often, particularly in rural India, the head of the family, usually a man, who is the main respondent in the survey, would not be sufficiently aware of the quantity and content of meal left for his wife and other female members of the house. Often men, as bread-winners would hate to admit that they cannot provide even two square meals to their dependents (Kundu 2006: 120). Issues of pride, self-image and dignity are involved here, which leads to a deep sense of shame and reluctance on the part of the head of the households to publicly admit their inability to provide for their respective families. This may result in under-reporting on the number of meals family members are able to afford. For these reasons the NSSO data on decline in hunger over the years would probably give only a broad idea about the perceptions of the people on adequacy of food (GOI 1993:54).

Measuring hunger by calorie consumption - Hunger has many faces: loss of energy, apathy, increased susceptibility to disease, shortfalls in nutritional status, disability, and premature death. No single indicator can provide a complete picture, and that a variety of different indicators should be used in analysing different aspects of the problem. One needs to measure dietary diversity, rather than just the consumption of food staples. Some aspects of hunger, such as the stability of food consumption between seasons and between years, are generally not captured by the existing data. FAO (2013) uses consumption of a minimum of 1820 kcalories as an indicator to see how the situation has changed over the years in India, according to which the number of hungry people in India as perentage of total population has declined from 26.8% in 1990–1992 to 17.2% in 2011–2013.

Table 2: Number in millions and percentage of hungry people in India

Year	1990–1992	2000–2002	2005–2007	2011–2013
Total number	227.3	240.7	233.1	213.8
Share in population	26.8	23.1	20.8	17.2

(FAO 2013)

Declining cereal consumption - Over the 18-year period ending 2011-12, cereals have registered the largest decline in share of the total expenditure – from 24% to 12% in rural India and from 14% to 7% in urban India. As already argued in section 2.1.1, between different forms of food there is a clear shift in favour of more expensive non-cereal food, such as fruits and vegetables, dairy and poultry products, etc. This is also true of the bottom deciles of India's population. Although the top 20% in rural India spent in 2011-12 almost double the amount on food when compared with the bottom 20%, there was not much difference between the two classes in terms of proportion of cereal vs non-cereal, both classes spending more than 70% on non-cereal food items (NSSO 2013). One may argue that this could indicate shift to more sedentary lifestyle needing less calories.

Table 3: Changes in per capita cereal consumption (kg per month) in since 1993-94 for different MPCE classes: all-India, rural

year	monthly per capita cereal consumption (kg) in population percentile class									
	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
1993-94	10.52	12.03	12.63	13.19	13.33	13.72	14.07	14.41	14.59	15.39
1999-00	10.45	11.64	12.27	12.56	12.89	13.03	13.36	13.45	13.67	13.96
2004-05	10.39	11.33	11.70	11.98	12.16	12.37	12.61	12.77	12.72	13.14
2009-10	10.17	10.63	11.06	11.12	11.48	11.42	11.72	11.75	12.05	12.07
2011-12	10.42	10.80	11.03	11.14	11.19	11.46	11.50	11.58	11.48	11.71

NSS 68th Round, Report No. 555

However the affluent class is still consuming more cereal than the poor. The decile-wise data (Table 3) shows that the hard working poor consume much less cereal (the cheapest form of food) than the non-poor. It also shows a declining trend in the annual per capita consumption of cereals, for all classes of people.

Thus as India moved to greater prosperity in the last twenty years the cereal consumption of the rural rich went down, but there was no increase for the poor. At any given point of time the cereal intake of the bottom 10 percent in rural India continues to be about 20 percent less than the cereal intake of the top decile of the population, despite better access of the latter group to fruits, vegetables and meat products. Their sedentary life style too should be taken into account while assessing the difference between the two groups. For the upper segment of population the decline may be attributed to a diversification in food consumption, easy access to supply of other high value agricultural commodities, changed tastes and preferences, and consumption of more expensive non-foodgrain products. Higher economic growth and per capita incomes thus contribute to reduction in per capita demand for cereals for the rich.

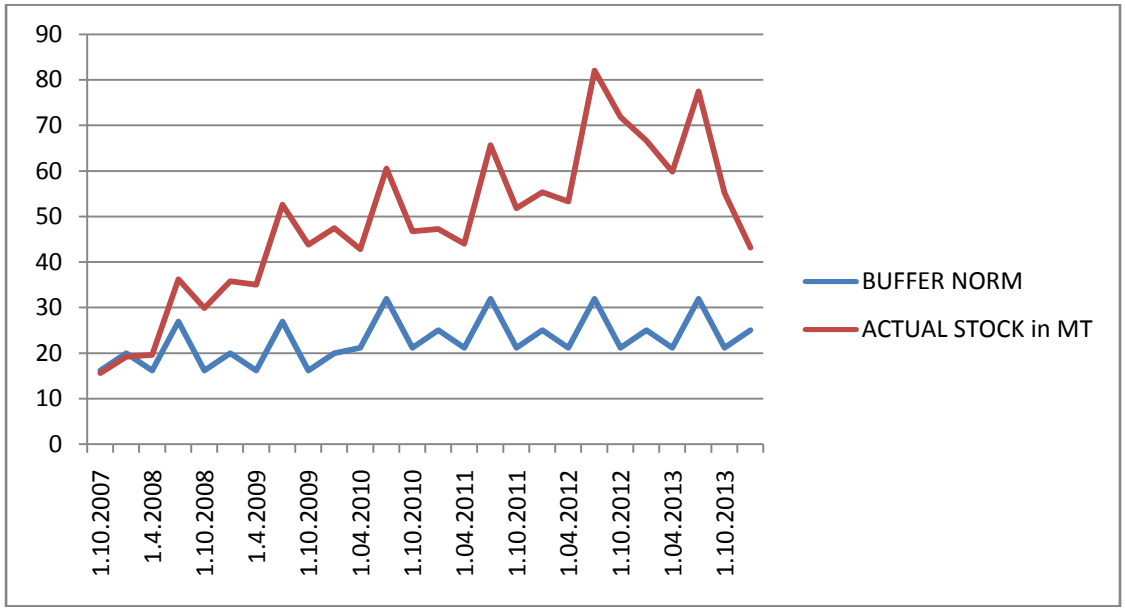
However for those who are around or below the poverty line, stagnant (or declining) cereal consumption has to be understood as a distress phenomenon, as with marginal increase in their incomes over time they are forced to control their expenses on food to meet other pressing demands that were not considered important in the past. For instance, as more schools open, the poor too wish to send their children to schools, where expenses are incurred on clothes, books, etc. despite the school fees being met by government. These expenses would thus become a new item on the household budget, and food expenditure may be curtailed to make room for it. Fighting sickness leads to another chunk of essential expenses, for which

opportunities did not exist in the past, as there were no doctors in the vicinity. Finally, the rural labouring masses have to spend on transport in order to earn their livelihoods. The food budget of the poor has been squeezed out because the cost of meeting the minimum non-food requirements has increased (Sen 2005). Food is still needed but not demanded to meet their bodies' full requirement because of lack of incomes and other pressing compulsions on expenditure.

Thus, it is not possible for households around the poverty line to purchase their full requirement of food within their current food budget. This explains the rationale for providing subsidised food to them through several governmental interventions, described below.

Social safetynet programmes and employment-generating programmes will thus play an important role in keeping food prices stable and in improving accessibility of food to the poor and disadvantaged. The main price stabilisation system is through the MSP guarantees to build up buffer stock, the logic is that during good harvest when prices fall, the government steps in and buys; and during bad harvest when prices tend to rise, it releases a part of what it had purchased in the past. The FCI mainly stocks rice and wheat, which accounts for almost three-fourth of total production of foodgrains. It had 43 MT of stock on the 1st January 2014 as against a norm of 25 MT for January. The stock has been falling consistently since a high of 82 MT in July 2012, the fall is due to better offtake of subsidized foodgrain through fair price shops and market releases.

Figure 2: Government buffer stock of foodgrains since 2007 as against norms



As the price at which foodgrain is released through fair price shops has not been increased in the last fifteen years, subsidy has been rising rapidly. Changes in production, procurement & offtake of foodgrains over the years are shown in Table 4.

Table 4: Production, Procurement & Offtake of Foodgrains (in mT)

	1997-98	2002-03	2007-08	2012-13
Food Subsidy in billion Rupees	79	240	313	720
Production of foodgrains	192	175	231	255
Procurement of foodgrains	23.6	40.3	39.6	55.5
Distribution through FPS	17	20.1	33.5	51
Disposal though welfare schemes	2.1	11.4	3.9	4.4

3.1 PDS

With a network of more than 5 lakh Fair Price Shops (FPS) claiming to distribute annually commodities worth more than Rs 50,000 crore to about 16 crore families[7], the PDS in India is perhaps the largest distribution network of its type in the world. PDS is operated under the joint responsibility of the central and state governments, with the former responsible for procurement, storage, transportation (upto the district headquarters) and bulk allocation of foodgrains.

The state governments are responsible for distributing these foodgrains to consumers through a network of Fair Price Shops. This responsibility includes identification of families below poverty line (BPL), issue of BPL cards, and supervision and monitoring of the functioning of the Fair Price Shops. States are also responsible for movement of foodgrains from the district headquarters to the PDS shop, which requires storage at the sub-district level. As food was always a non-plan subject, such an infrastructure is often weak in the poorer states.

PDS was universal, but was substituted in 1997 by the Targeted PDS (TPDS), specifically aimed at BPL people in all parts of the country. However the entitlement was increased gradually from 10 kgs of foodgrains per month per household to 35 kg by 2003-04. The additional allocations were made at APL (above poverty line) rates to the non-poor subject to availability of foodgrains in the central pool and the constraints of food subsidy. The central issue price (CIP) for wheat and rice has remained unchanged since April 2000.

Table 5: BPL/APL central issue price (Rs/kg)[8]

Category	Date	Wheat	Rice (common)
BPL	1.6.1997	2.5	3.5
-do-	1.4.2000	4.15	5.65
APL	1.6.1997	4.5	5.5
-do-	1.4.2000	6.1	7.95

Antyodaya - In order to make TPDS more focused and targeted towards the poorest, the "Antyodaya Anna Yojana" (AAY) was launched in December, 2000 for one crore poorest of the poor families providing them foodgrains at a highly subsidized rate of Rs 2 per kg. for wheat and Rs 3 per kg for rice. The States/UTs are required to bear the distribution cost, including margin to dealers[9] and retailers as well as the transportation cost. The scale of issue that was initially 25 kg per family per month has been increased to 35 kg with effect from 1st April, 2002. The AAY Scheme has been expanded in stages and by 2005 covered 2.5 crore households.

All is not well with the Public Distribution System in India. Weaknesses in the distribution system include ration cards being mortgaged to ration shop owners, large errors of exclusion of BPL families and inclusion of APL families, prevalence of ghost BPL cards, with weaknesses in the delivery mechanism leading to large scale leakages and diversion of subsidised grains to markets and unintended beneficiaries. As per the 2004-05 NSS round, households in the bottom quintile obtained only 17% of their foodgrains consumption from PDS for the country as a whole. The percentage varied from 2% for Bihar, 6% for UP to 50% for Tamil Nadu and 68% for Karnataka.

Fortunately many states have tried to improve the PDS in the last ten years. It had always worked quite well in Tamil Nadu, Kerala, Himachal Pradesh and Andhra Pradesh, but now states like Chhattisgarh, Orissa and Rajasthan (Khera 2011) have undertaken state-level PDS reforms

[7] Many of them get kerosene only

[8] Information in Tables and Figures, wherever source is not indicated, is based on the Monthly bulletins issued by the Department of Food, GoI from time to time.

[9] In actual practice, very few states give margin to the dealers, thus forcing them to corrupt practices.

by extending coverage, improving delivery and increasing transparency. Due to these efforts leakage of rice and wheat implied by NSSO estimated consumption and amounts released for PDS have come down from 55% in 2004-05 to 43% in 2007-08 to 30% in 2011-12 (Himanshu and Sen 2011; NSSO 2013).

Amongst the poorer states, best results are seen in Chhattisgarh (see box) because of replacement of private dealers by panchayats, increased commissions, coverage of more than 80 per cent families under the scheme as opposed to only 40 per cent who are officially recognised as BPL by GOI, and regular monitoring and grievance redressal mechanism that leads to swift action if foodgrain does not reach the people.

Other states have followed in Chhattisgarh's footsteps, with similar results. An interesting example is Orissa, especially the 'KBK region' (undivided Kalahandi, Bolangir and Koraput districts), which used to be known mainly for starvation deaths. Today, the KBK region has near-universal PDS, which seems to work quite well. A recent study found that PDS cardholders in Koraput get 97 per cent of their rice entitlements under the system (Outlook March 22, 2014). Much remains to be done to extend these gains across the country, especially in states like UP that show little willingness to reform themselves.

Public Distribution System in Chhattisgarh

A survey of PDS in two districts of Chhattisgarh revealed that 88 per cent of the respondents were satisfied with the functioning of their ration shops and were getting their foodgrains regularly at the correct prices. Government has shifted the management of ration shops from private dealers to community-based organisations such as gram panchayats, self-help groups (SHGs) and cooperatives. To reduce leakages, the government decided to dispense with private players and directly deliver foodgrains to ration shops in government trucks painted yellow. Transition from a targeted to a "quasi-universal" PDS, one that covers approximately 80 per cent of the state's rural population not only helped in improving the functioning of the PDS by giving a majority of the people in villages a stake in their local ration shop, but also reduced exclusion errors that occurred due to the faulty targeting system used by the central government. The other steps are: increasing the commission paid to ration shopowners from Rs 8 to Rs 30 per quintal of rice, procuring more foodgrains from farmers in the state to encourage them to raise outputs, making electronic weighing scales mandatory in all ration shops, and conducting verification drives to identify and cancel bogus ration cards (Puri 2012).

3.2 Food Security Act, 2013

In September, 2013 GOI enacted a new National Food Security Act. The main beneficiaries of the Act and their entitlements are summarised in Table 6.

Table 6: Provisions for Nutritional Security and Entitlements in the Act to Special Groups

Target Group	Entitlement
Holders of Antyodaya cards	35 kg per household as before, wheat/rice/coarse grain and millets at Rs 2/3/1 per kg
75% of rural & 50% urban population minus those covered above	5 kg per unit of wheat/rice/coarse grain and millets at Rs 2/3/1 per kg
Pregnant woman/ lactating mother	Meal, free of charge, during pregnancy and six months after child birth, Maternity benefit of Rs 1000 per month for a period of six months
Children (6 months-6 yrs)	Age appropriate meal, free of charge, through the local anganwadi
Children suffering from malnutrition	Meals through the local anganwadi, free of charge
Children (6 years-14 yrs)	One mid-day meal, free of charge, every working day, in all schools run by local bodies, Government and Government aided schools, up to class VIII

Although the Act seeks to cover 67% of the total population (75% rural and 50% urban), in actual practice the coverage would be much more, as GOI has promised to the richer states which had almost universal coverage that their quota (which would have come down to about half of what they get now, if the Food Security law was strictly followed) would not be reduced, thus increasing the overall coverage to about 75% of the total. Their state-wise number has been determined by GOI but identification of eligible households is left to state governments.

Amma Canteens in Chennai (Tamil Nadu)

The clientele among the 200 recently opened community kitchens in Chennai, Amma Canteens, are head-loaders, factory workers, wage labourers, domestic workers, security guards, auto-rickshaw drivers, construction workers, street vendors and children. These canteens supply people with *idlis* with *sambar* at one rupee each, as well as 350 grams of *sambar* rice or *pongal* at Rs 5. These costs are subsidised by the Municipal Corporation at 86 paise per *idli* and Rs 5 for *sambar*, while the state government supplies the rice at one rupee a kilo. Private eateries would have a fulfilling meal cost around Rs 40-50, while at the canteen an adult male could fill up for Rs 10, and women or children for Rs 5 (Mander, 2013).

Offering cheap, wholesome and hygienic meals, Amma Canteens help secure nutrition and free up earnings for migrants and the homeless, who would otherwise have nowhere to cook food; as they are forced to buy food every day, they have the option to avoid unhygienic food of poor nutrition purchased from the streets, as these meals often take up half to two-thirds of their daily earnings. The Amma canteens reach about 100,000 people daily, and in contrast to other services aimed at the poor, they maintain a level of cleanliness and quality that makes it attractive to students and workers in the IT sector and white collar offices, an estimated tenth of all clients, with staff wearing aprons, hairnets and plastic gloves serving in well-ventilated and clean environs (Mander, 2013).

The workers in the Amma canteens come from slum-based self-help groups, predominantly female, and help promote independence and remunerative wages.

The success of Chennai's community kitchens, opening up a thousand more in the near future, will hopefully incentivise other governments to follow their model and be able to feed the urban poor with more success than is currently seen. Tamil Nadu's example of community feeding centres can help developing countries set up similar food kitchens that combine government bodies and civil society.

3.3 Ongoing challenges & good practices

3.3.1 Increasing food subsidy

Food subsidy in the short run would certainly go up from 85,000 to Rs 1,25,000 crore in a full year. The impact of subsidy on fiscal deficit can be contained by reducing non-merit subsidies on fertilisers, cooking gas, and higher education. As government stocks will come down closer to the buffer norm, storage costs would come down. But greater reduction in subsidy would be achieved by abolishing the dual pricing system, which is difficult to implement, and sell government stocks to the fair price shop dealer at the market price, as described in the next section.

Fiscal deficit is high in India because the tax-GDP ratio is only 15 per cent, far below other middle-income countries like Brazil (34.2), South Africa (31.2), Turkey (32.5), Russia (32.3), or even low income countries like Ghana (22.4) and Kenya (18.3). To contain the deficit one needs to improve tax collection and not cut down on development expenditure for the poor.

3.3.2 Reducing leakages through technology

It may however be added that large-scale substitution of PDS by direct cash transfers (DCT) is not feasible, as foodgrains purchased from the farmers through MSP mechanism need an outlet for distribution. Introducing DCT nationally would mean that GOI would have to end the state procurement regime. That is neither politically feasible, nor can it be in the realm of consideration by any government in India, given that more than half of the population is still dependent on agriculture. At best, DCT could be tried on a pilot basis in a few poor localities of metropolitan cities, as is being done in Delhi.

DBT (Direct Benefit Transfer) is however different. Under this programme, the entitlement holders would still buy their food rations from Fair Price Shops (FPS) as they do now, with the difference that they would submit their biometric details to the FPS owner through a point-of-sale device that is connected either through a GSM network or through other means to an integrated stock management system.

Government would abolish the dual pricing system and sell stocks to the fair price shop dealer at the market price, say Rs 20 for wheat. The consumer would go to him with only two rupees in cash as before and with her/his UID card to buy a kg of wheat but the rest 18 Rs would get transferred from government to the shopkeeper through the card. This will vastly reduce leakages and subsidy as well as improve the dealer's attitude towards the buyer. As of now the dealer avoids the consumer as his main interest is in selling the grain in the open market. Once he is given grain at the market price he would be forced to welcome the card holder and persuade her/him to come to his shop at the earliest so that the transfer of subsidy could take place.

This would not only ensure that the right person gets their rations, but would also free entitlement holders to buy their rations from any FPS and not be tied to a single vendor. In other words, it would ensure 'entitlement portability' that will allow PDS entitlements to be accessed anywhere in the country and greatly help the poor migrant workers, who are unable to access their entitlements now. This would revolutionise the PDS by providing genuine choices to entitlement holders. It would also cut down significantly on corruption.

Government of India has decided to substitute dual pricing in kerosene and fertilisers by DBT, and after learning from experience, it would be launched for PDS too.

As many states in India have now demonstrated, technology is a necessary but not a sufficient condition for reforming the PDS. Bringing in a robust system of greater inclusion of marginalised communities, putting in place an appropriate financial architecture, ensuring greater transparency and accountability and, above all, having the political will to see through the reforms are the most critical elements of reform. In other words, technology should not be seen as a substitute for governance.

3.4 School meals

One of India's greatest successes in public interventions in the social sector, the Mid-Day Meal Scheme provides daily meals for millions of children, leading to greater school attendance figures, as well as improved nutrition for the children. It has been able to feed more than 120 million children every day for more than 10 years, and the popular programme's relative success has been recently documented in economic research, clearly showing the positive impact on enrolment, attendance, retention and nutrition (Khera, 2013). The success has also been in its scale and regularity, consistently feeding millions of children on a daily basis. Apart from its success in bringing children to school and keeping them there, the nutritional successes are marked, with a study by Afridi (2010) finding positive nutritional effects among children in Madhya Pradesh; when comparing nutrient intake on a school day with a non-school day, she found that 'nutrient intake of programme participants increased substantially by 49 per cent to 100 per cent,' while deficiency in protein intake was reduced by 100 percent and iron deficiency by 10 per cent. This was achieved for a very small cost of Rs 5 for every child every day.

Furthermore, it is popular with parents, making it easier to convince their children to go to school, and it is also a source of employment for tens of thousands of destitute women (Khera, 2013).

The scheme is by no means perfect, and the recent tragedy in Bihar, where 23 children died from eating food through the MDMS, has highlighted some of the long-standing issues in implementation (Khera, 2013). Foremost of those concerns have been food quality, hygiene and accountability, as well as lack of proper infrastructure and sufficient staff, caste issues, and issues regarding the nutritive quality of food; state governments have made efforts in dealing with these issues, although progress has been slow (Khera, 2013).

3.4.1 Supplementary nutrition through ICDS

The Integrated Child Development Services (ICDS), launched in 1975, has had the aim to provide multiple services to pregnant and nursing mothers, as well as children under six, particularly to provide supplementary nutrition, provide health and nutrition advice and act as a link to immunisation and health check-ups, as well as providing non-formal pre-school education. ICDS has been successful in ostensibly covering all development blocks in India, implemented through the network of about 1.4 million 'anganwadi' centres, yet despite this, the supplementary nutrition component of ICDS has not been as successful as the Mid-day Meals programme of the schools, and is sadly plagued by corruption and leakages.

A recent evaluation of ICDS in Gorakhpur (UP) by the National Human Rights Commission (http://nhrc.nic.in/Reports/misc/SKTiwari_Gorakhpur.pdf) showed that despite Supreme Court orders to provide hot cooked meals, all centres supplied only packaged ready-to-eat food, containing only 100 calories, as against a norm of 500 calories, and 63 per cent of food and funds were misappropriated. The food being unpalatable, half of it ends up as cattle feed. The ready-to-eat food is produced in poor hygiene conditions. Some of the ingredients shown on the bags containing the finished product were not found in stock at the time of visit and the stock of maize was only enough to meet 25% of the daily requirement.

In 2004, the Focus On Children Under Six (FOCUS) survey examined the status of ICDS in six states: Tamil Nadu, Maharashtra, Himachal Pradesh, Chhattisgarh, Rajasthan and Uttar Pradesh. The first three were found to have reasonably active and effective anganwadis. The last three, however, were described as "dormant states", where the programme was yet to take off. But even as the slumber in UP continues, some of the other dormant states are waking up. Rajasthan, and especially Chhattisgarh, have made serious efforts to revamp ICDS, with significant results. For instance, pre-school education activities, highly valued by parents but rarely seen at the time of the FOCUS survey, can now be seen in many anganwadis. Health services such as child immunisation also seem to be in much better shape today, with a little help from the Accredited Social Health Activists (ASHAs)—village women who have been trained as frontline health workers.

There are relatively good anganwadis in Orissa as well, a state not exactly known for exemplary governance. According to a recent survey[10], there were clear signs of real efforts to create a friendly environment at the anganwadi, both for the child and for the anganwadi worker. In most of the sample villages, anganwadis were relatively well-equipped—some even had mini-toilets especially designed for small children. Many anganwadi workers were active and well-trained, and not just for routine work at the anganwadi but also for home visits. Children had uniforms, signifying that the anganwadi is not just a parking lot for children but a centre of learning. Simple pre-school education activities such as games, songs and counting were found at several anganwadis.

ICDS still has a very long way to go. But at least there are now good reasons to feel hopeful about the programme. Indeed, more and more anganwadis in north India are beginning to

[10] Outlook, 22 March 2014

achieve standards that were thought to be possible only in a few states like Tamil Nadu and Himachal Pradesh. Few programmes are more important for the future of the country and of Indian children.

3.5 Wage employment guarantee through law

The Mahatma Gandhi National Rural Employment Guarantee Act passed in 2005 guarantees employment in rural areas for 100 days. A government programme without precedent, it is the largest ever human-employment programme that has created more work for poor people than any other programme since independence; about one-fourth of all rural households participate in the programme every year. Various activities being carried out under the MNREGA include water conservation and harvesting, irrigation provisioning and improvement, renovation of water bodies, land development, flood control and drought proofing. These have resulted in improvements in water percolation and rise in groundwater, improvement in soil quality and reduction in vulnerability in certain areas.

Under the renewed MGNREGA, there is an emphasis since 2012 on sustainable asset creation, with various schemes such as the Integrated Watershed Management being integrated with the MNREGA to rejuvenate rural economy as well as ecology.

The MGNREGA is believed by some analysts to have increased agricultural wages. Real farm wages increased by 3.7 per cent p.a. during the 1990s, declining by 1.8 per cent p.a. from 2000 to 2007, before increasing at a rate of 6.8 per cent p.a. from 2007-08 onwards. Developing countries can utilise India's framework on the MGNREGA, its rights-based approach and employment guarantee, to create employment opportunities in areas with high unemployment or lack of work.

3.6 Lessons for other countries

For countries that need to distribute food to its population, India has had many years of experience in the PDS, and can provide examples of best practices from states such as Chhattisgarh and Tamil Nadu, as well as examples of technological moves described in section 3.3.2 to check corruption and improve transparency. Tamil Nadu's example of community feeding centres can help developing countries set up similar food kitchens that combine government bodies and civil society.

In addition, there is also a great potential with the mid-day meals programme for the school children. The programme can promote proper hygiene habits (such as washing hands before meals), which has been underutilized in India, as well as provide an opportunity to break through caste barriers, where children will eat among themselves regardless of background (Khera, 2013). Feeding programme for the infants, adolescent girls, and pregnant women through the ICDS however works well only in some places because of lack of political will, though the number of ICDS centres have gone up by three times in the last decade.

Developing countries can utilise India's framework on the MGNREGA, its rights-based approach and employment guarantee, to create employment opportunities in areas with high unemployment or lack of work. The focus on manual labour should be foregone for more specified jobs, particularly in improving agricultural land and specific infrastructure projects.

4. Nutritional security

In contrast to 22 per cent of India's population who are declared as poor, a larger proportion of people suffer from not only inadequate food consumption but also lower intake of essential proteins, vitamins and micronutrients so essential for healthy development of the human mind and body. Subclinical deficiencies of micronutrients such as iron, calcium, vitamin A, folic acid, iodine and zinc remain a major public health problem in India. However even consumption of balanced food may not lead to sound health because of high incidence of infections due to poor

quality of water, lack of toilets, and limited access to medical services. Hidden hunger (due to lack of micronutrients) and under-nutrition (health related) thus continues to afflict a larger proportion of Indian population than just those who are below the poverty line. This gets reflected in being underweight for one's age, too short for one's age (stunting), and dangerously thin for one's height (wasting).

4.1 BMI

A widely used measure of nutritional status is a combination of weight and height measurements known as the Body Mass Index (BMI). Low body weight, associated with low intakes, is an indication that people could not reach their growth potential and hence is essentially a sign of continued hunger and nutritional distress. This is defined as weight in kilogrammes divided by height in metre squared. A BMI of below 18.5 for adults indicates chronic energy deficiency (CED), which would be due to an intake of calories and other nutrients less than the requirement for a period of several months or years.

According to the XI Plan, volume 2 (Planning Commission 2008), in 1998–99 as much as 36 per cent of the adult population of India had a body mass index (BMI) below 18.5; eight years later (2005–06) that share had barely fallen to 33 per cent of the population, despite a decade of robust economic growth. These figures are based on the NFHS data, which is collected from all the states. Changes in BMI are also monitored by the National Nutrition Monitoring Bureau (NNMB, shown in Table 10), but it covers only ten[11] states.

Table 7: Nutrition status of Indian adults, 1975-9 to 2004-5 (Body Mass Index)

	Proportion (per cent) of adults with BMI below 18.5					per cent decline
	1975-79	1988-90	1996-97	2000-01	2004-05	(1975-9 to 2004-5)
Men	56	49	46	37	33	41
Women	52	49	48	39	36	31

(Deaton and Dreze 2008)

A third of adolescent girls' between 11-18 years are also undernourished. Early marriage and early child bearing as well as poor education further worsens the situation. As per the DLHS3 survey, 43 per cent of the currently married women in the age group of 20-24 years are reported to have been married before attaining the age of 18 years.

The implications of women's malnutrition for human development are multiple and cumulative. Women's malnutrition tends to increase the risk of maternal mortality. Maternal short stature and iron deficiency anaemia, which increase the risk of death of the mother at delivery, account for at least 20 per cent of maternal mortality. Additionally, maternal malnutrition impinges significantly on such important but interconnected aspects as intrauterine growth retardation, child malnutrition and the rising emergence of chronic diseases, among others.

4.2 Undernourished children

Just as for adults, for children too, the anthropometric indicators of nutritional status in India are not satisfactory. According to the National Family Health Survey, the proportion of underweight children remained virtually unchanged between 1998-99 and 2005-06 (from 47 per cent to 46 per cent for the age group of 0-3 years). These are appalling figures, placing India among the most undernourished countries in the world. The overall levels of child under-nutrition in India (including not only severe but also moderate under-nourishment) are shown in Table 8.

[11] Andhra Pradesh, Karnataka, Kerala, Tamil Nadu, Maharashtra, Madhya Pradesh, Orissa, Uttar Pradesh, Gujarat, and West Bengal

Table 8: Trends in Child Nutrition: NFHS Data

	Proportion (percentage) of children under the age of three years who are undernourished		
	1992-3	1998-9	2005-6
Weight-for-age			
Below 2 SD[12]	52	42.7	40.4
Below 3 SD	20	17.6	15.8
Height-for-age			
Below 2 SD	n/a	51.0	44.9
Below 3 SD	n/a	27.7	22.0
Weight-for-height			
Below 2 SD	n/a	19.7	22.9
Below 3 SD	n/a	6.7	7.9

Numerous studies have shown that the impact of malnutrition is most severe on the young infant, as it affects the development of the child's brain and the future cognitive skills, and therefore highest priority needs to given to monitor and improve nutrition status of the young children. In India infants begin life with a disadvantage due to poor intrauterine growth. At birth one-third of Indian infants are underweight and 20% are stunted. Combining the nutritional deficits already suffered at birth with those that develop within the first two years of life will account for the most crucial under-nutrition in India. What happens, or does not happen, in the crucial 1,000 day "window of opportunity" (pregnancy plus first two years of a child's life) will affect the future potential and capability of our manpower. Under-nutrition in children is estimated to reduce nation's economic advancement by at least 8% due to direct productivity losses, poor cognition, and reduced schooling. Malnutrition is also an underlying cause in about a third of preventable deaths in children under five years of age. Deficiencies of essential vitamins and minerals, though not visible, are widespread in the country and have adverse effects on the child survival, growth and brain development. Foetal growth restriction, attributed to a great extent to maternal under-nutrition, is a cause of more than a quarter of all neonatal deaths. The long term consequences of chronic under-nutrition are far more reaching since the adverse impact is not only irreversible but intergenerational.

There is one other factor that has been recently highlighted as a major contributing factor to differences in child nutritional status between India and Sub- Saharan Africa. This is that 53% of the Indian population defecates in the open, a significantly higher proportion than in Sub-Saharan Africa. Combined with the far higher population density in India this represents a double threat. A recent analysis has demonstrated a quantitatively important gradient between child height and sanitation that can statistically explain "much or all of the excess stunting in India" (Chambers and Medeazza 2013).

Poor child feeding practices is a primary cause of undernutrition. Children below 24 months cannot eat themselves, they need to be fed. Poor feeding practices is often due to lack of information on optimum feeding or/and inadequate time available with caregivers for child feeding. Inappropriate feeding practices during illness and convalescence worsen the situation. Available data reveals that not even 3 per cent children are fed additional amount of food during and after an episode of diarrhoea. The situation worsens with each episode of infection. Frequent infections sets up a vicious cycle of poor appetite, ill-health, poor nutrient absorption and malnutrition. This implies that food consumption that meets the nutritional requirements needs to be seen in conjunction with non-food factors that enable a person to appropriately

[12] Standard deviation

metabolise and utilise food. The latter pertains to enabling factors such as appropriate hygiene practices, safe water, adequate sanitation facilities including use of latrines and routine immunisation.

4.3 Good Practices in addressing undernutrition in India

Today ICDS is the leading system for implementation of the selected nutrition interventions. The system of ICDS with almost 1.4 million 'Anganwadi centers' – first community or village outpost for nutrition, health and early child development-- is estimated to be reaching 80 million children 6 months to 6 years and 18.2 million pregnant and lactating mothers. Recognizing that ICDS has the potential for delivering on nutrition outcomes, if invested and managed well, ICDS Mission has also been launched recently by the Ministry of Women and Child Development. At the same time, the role of the health sector, through the National Health Mission, is being increasingly recognised for reaching under two more effectively and rolling out existing policies pertaining to increasing coverage of selected direct nutrition interventions referred above.

Increasing awareness about multiple causes behind malnutrition has led to an improvement in the rate of reduction of undernutrition, in many states. The HUNGaMA survey of 2011 in 100 poorest districts indicates that the prevalence of underweight in children under 5 years decreased from an estimated 53 per cent in 2002-4 (based on DLHS-2 data) to 42 per cent in 2010-11 i.e. AARR (average annual rate of reduction) of 2.9 per cent in the seven years period from 2003-2011. Recent data from the states of Chhattisgarh and Maharashtra indicate a very significant improvement in the nutrition situation. In Chhattisgarh state, the AARR of 4.22% was observed for underweight children and 5.64% for stunting. In Maharashtra, stunting rate declined from 39 per cent in 2005 in under two years children to 23 per cent in 2012 (Unicef 2013).

According to another report (AI 2013), as of February 2008, on average, 49 percent of children under the ICDS programme suffered from various degrees of malnutrition ranging from mild to severe. This improved to 37 percent by March 2012. As of February 2008, Gujarat had amongst the highest rates of malnourished children amongst ICDS beneficiaries at 62 percent. This decreased by 28 percentage points to 34 percent by March 2012. Similarly, in Maharashtra, malnutrition rates decreased from 43 percent to 19 percent during the same period.

Thus other developing countries can learn a great deal from various micro- and macro-level success achieved by India even on the nutritional front. Some of the successful policy initiatives and innovative community based experiences for reducing under-nutrition are described below.

4.3.1 Infant and Young Child Feeding (IYCF) Practices

The promotion of IYCF in the country initially focused only on promotion of breastfeeding with slogan "Breast is Best" with emphasis on advantages of breastfeeding and discouraging use of diluted formula milk or use of unhygienic practice of bottle feeding. Marketing of commercial milk formula was banned by law. Involvement of national level NGO such the Breastfeeding Promotion Network (BPNI) and professional bodies such as the Indian Academic of Paediatrics (IAP) acted as catalysts to draw and sustain attention to the crucial role of exclusive breastfeeding (EBF) in improving child survival, building immunity and cognitive development. The fact that caregivers/mothers required not only knowledge but appropriate skills in sustaining EBF was soon recognised. The training curriculum was modified to improving the skills of mothers to breastfeed. Opportunities of antenatal and postnatal contacts with mothers were encouraged to be given special attention besides group counselling.

Efforts were directed to actively discourage feeding of water to exclusively breastfed children even in the peak of summer. Additionally, practical suggestions were also included in counselling sessions to instil confidence in mothers regarding sufficiency of breastmilk

produced and to discourage use of milk other than breast milk for feeding. The problem of working mothers to EBF is also recognised and is addressed through encouraging implementation of policy on paid maternity leave to post-natal mothers and by encouraging provision of crèches for infants in work places. Recent Annual Health Survey (AHS) undertaken in eight states of India indicate a substantial improvement in breastfeeding practices.

4.3.2 Success stories in child feeding innovations in the states

Many initiatives have been launched for improving the nutrition situation, such as Tamil Nadu Integrated Nutrition Project (TINP I and II), Positive Deviance (PD) Project of West Bengal, Dular project of Bihar and the Integrated Nutrition Health Project (INHP) of CARE and Maternal Child Health Nutrition (MCHN) in UP state. In the past five years, a number of comprehensive nutrition improvement activities have been intensified at the state level under the State Nutrition Mission mode such as in Maharashtra, MP and Gujarat.

Chhattisgarh - Positive impact on malnutrition has been observed in a number of state level initiatives. For example, the Mitanin initiative in Chhattisgarh state where the calorie density of child feeding has been successfully promoted by introducing the simple practice of addition of extra tea spoon of oil or fat in the semi-solid feed mixture of a child. The positive impact reported on family level practices is attributed to frequent contacts of community worker /community volunteer or a woman from Self -Help group with caregivers for interpersonal or group dialogue and counselling .This was feasible due to a low ratio of community mobilisers to population.

The unique feature of Chhattisgarh state is that it is spearheaded by the state health department and not the ICDS. Moreover, this is the only nutrition initiative where a linkage with the Public Distribution System (PDS) has been established. As per the revised programme design, an active effort is made to inform community of the entitlement of the food basket which includes pulses, oil, double fortified salt besides rice. Food basket has also been expanded to include pulses and oils at a subsidised rate. The computerised PDS has resulted in over 90 per cent households using the PDS food.

Maharashtra - Inter-personal and group counselling combined with promotion of home level production of local traditional energy and nutrient rich sweet “laddu” (comprising 20 g peanut powder, 20 grams milk powder, 30 g ground sugar) and amylase rich cereal gruel mix (process of drying and pounding sprouting cereals) by Maharashtra Mission or Nutri-mix production by CINI has proved useful. The Mother-Child Protection (MCP) card, developed jointly by NRHM and ICDS, have standard technical messages and MCPs are being used for counselling cum monitoring .The MCP card has been adapted by a number of state governments and is reported to have been rolled out in most of the ICDS centres throughout India.

In the Maharashtra Mission project, frequent interpersonal and group discussions with mothers on nutrition care during pregnancy and care of children under twos has been intensified. Weighing of pregnant mothers and promoting adequate weight gain is promoted. Higher attention to care of undernourished children is emphasised through detection and special care of severely underweight children by providing special five to six feeds at the ICDS centre. Additionally, a strong link with the health system has been ensured for timely health services and supply of micronutrient supplement. Production of home based amylase rich foods using home level germination technique and preparation of energy-nutrient dense preparations using simple home level recipes are encouraged for meeting the nutrient gap.

Both these projects reveal the significant benefit of establishing a system for effective supervision and timely support to frontline workers. In Maharashtra, state district/regional project coordinators have been appointed for coordinating activities of health and ICDS as well as to provide continuous training and guidance to frontline workers. Similar supervision support is noted in the Mitanin initiative and this has been achieved by appointment of an independent supervisors cadre.

In both the states of Chhattisgarh and Maharashtra success factor is attributed to a high political commitment. As a result , some special inputs and invest are in place for scaling up of direct nutrition interventions such as intensive counselling and family level follow up.

Gujarat - Gujarat is one of the most urbanised states of India with a per capita GDP twice that of the national average. Nevertheless, considerable challenges remain in social development, such as immunisation coverage (45%) and percentage of children underweight (46% in 2005-06). The Government of Gujarat (GoG), with support from UNICEF, initiated a synchronisation process between the ICDS scheme and the health sector in 2006. This involved reorganising geographical jurisdictions of Health and ICDS boundaries and collaboratively providing health and nutrition services through the introduction of an initiative called Mamta Abhiyan[13] (MA). Mamta Abhiyan simply aims to provide a set of convergent essential Health and Nutrition services on a common day to children, out of school adolescent girls, pregnant women and lactating mothers.

Mamta Day is the most critical component of the MA initiative. It occurs every month in each village at existing Anganwadi Centres, Sub Centres, Primary Health Centres or Community Health Centres by Health and ICDS functionaries (one Mamta Day is scheduled for an average population of 1,000). Services are provided to all children below five years of age, ante-natal and post natal cases and adolescent girls. There has been an increase since 2006 in attendance of under-threes' at growth monitoring and promotion sessions 5 from 25% in 2006 to 65% in 2009; equating to 1.5 million children attending per month (UNICEF, 2011).

Community based nutrition programmes also reveal that programmes led by health sector or with the active involvement of health sector is effective. This can be attributed to better response to demands of the community for preventive health services such as routine immunisation, diarrhoea management, antenatal care services, micronutrient supplement coverage etc. Commitment of both health and ICDS sectors and their convergence is facilitated by fixing roles and responsibilities of each sector towards achieving the goal of undernutrition.

4.3.3 Management of Severe Acute Malnutrition (SAM)

In India, one child out of ten is estimated to be suffering from SAM. Intensive advocacy by WHO and UNICEF with the Ministry of Health and Family Welfare, which is accountable for meeting the MDG of rapid reduction of high under-five mortality rate, has resulted in a high interest in management of SAM. For referral of such cases, norms for establishment of Nutrition Rehabilitation Centres (NRCs) and a protocol for the treatment of SAM cases has also been recommended in an institutional set up.

Today, India has over 800 NRCs. The states of Madhya Pradesh and Jharkhand have taken the lead in the establishment of NRCs in the country. Early evaluation has, however, identified a number of constraints such as mothers being reluctant to stay at NRCs for 10-15 days at a stretch despite being compensated for lost wages, poor follow up of cases discharged from NRCs, and poor attendance in referral clinics. The discharge criteria are noted to have some practical constraints. The relapse rate is also reported to be high. This is attributed to inadequate care and feeding of the discharged cases of children at community/family level being far from optimum. The challenge is to reduce the relapse of discharged cases from NRCs by building the capacity of mothers and other caregivers regarding appropriate feeding and caring practices at home level. It is also evident that 80 per cent SAM children in India, like in many other developing countries, have no medical complications and can be managed at family level.

[13] Literal meaning – Campaign to provide care with tender love

4.3.4 Food Fortification: Universal Salt Iodisation (USI)

For addressing the problem of micronutrient deficiencies, fortification of staple foods such as wheat flour, rice, oils, and dairy products is on an increase. India has experience in salt, cereal and oil fortification. Industrially produced fortified flour (often with iron and folic acid) is available in open market and has been supplied through the Public Distribution System (PDS). Trials have also been conducted in Gujarat and Madhya Pradesh for fortification of flour milled by local small millers or chakki in village situations. Fortification of rice with micronutrients is being experimented at a small scale in rice eating states of Karnataka, Orissa and Andhra Pradesh. Production and supply of oil fortified with vitamin A and vitamin D through the PDS is being tried to Gujarat and Tamil Nadu. Use of multiple micronutrients or sprinklers has been experimented through efficacy trials.

In 1984, Iodization of edible salt for edible purposes was made mandatory by law. For meeting the increase in demand of iodised salt, a unique public-private sector partnership was agreed in India. A ban on sale of non-iodised salt for edible purpose was implemented by the central and state governments. A well planned communication strategy was launched at consumption level to create demand for iodized salt that also sustained the interest of the producers and wholesalers. An analysis of iodized salt consumption pattern was undertaken to understand the gap in reaching the goal of universal consumption of iodized salt. The findings revealed an inequity in consumption with reference to wealth index—84.7 per cent population in high wealth index consumed adequately iodized salt compared to only 30.4 per low wealth index. This problem of inequity is being addressed currently through marketing of lower cost subsidized iodized salt through the Public Distribution System (PDS) network. About 15 states have included iodized salt in the food package of PDS.

Iodization of salt offers a number of lessons in food fortification in the country. The key learning ranges from effective intensive advocacy for seeking political commitment to developing guidelines for production, building country capacity for quality production and the marketing of iodized salt, and preventing unreasonable escalation in price of the fortified food items. These lessons are critical for rolling out production of double fortified salt (DFS or salt fortified with both iodine and iron).

4.3.5 Supreme Court intervention

In 2001, the Right to Food campaign filed a Supreme Court case that resulted in a landmark decision demanding government action to protect the right to food. The decision makes specific reference to Article 21 of the Indian Constitution that concerns the right to life and personal liberty. State negligence in the response to drought-affected areas and the inadequacy of the Public Distribution System were the main foci of the initial petitions. Following this decision, several interim Supreme Court hearings have been held and many orders issued. These include orders focusing on the government's eight food-related schemes, including ICDS. The Supreme Court decision institutionalized the process of universalizing ICDS as a critical part of ensuring food security for infants and children and realizing the Children's Right to Food agenda.

On 28 November 2001, the Supreme Court directed State Governments and Union Territories to fully implement ICDS, ensuring that each AWC provide specific calorie and protein requirements for children aged 0-6 years, adolescent girls, pregnant and lactating mothers and malnourished children, together with an ICDS disbursement centre in every settlement. This led government to increase the number of anganwadi centres from 5.7 lakhs in 2001 to about 14 lakhs now. Two Commissioners (Harsh Mander and Dr NC Saxena) were appointed by the Government of India since 2002 to monitor and assess the implementation of the orders, and to ensure accountability.

5. South-South Learning

We have discussed above the key factors behind India's progress on all aspects of food and nutritional security. There are several learnings for other developing countries from India's long experience. We discuss these separately, for food production, making it available to the poor, and nutritional security.

5.1 Lessons for low income countries (LICs) in food production

Other developing countries can learn from India's successes in agriculture that have enabled India to adapt new agricultural technologies and practices, especially in the context of small farms and family-based agriculture, and applicable to diverse agro-ecological locations through watershed development and small-scale irrigation. India has also established institutional mechanisms – such as of seed and fertiliser production, agricultural extension, marketing and financial systems and credit – that enable the adoption of improved technologies. India's more recent efforts offer models for IT-enabled systems of agriculture extension, real-time farmer information and farmer education systems. These all carry potential learning for low income countries as well as emerging economies.

India's success in increasing food production is also due to heavy investment in irrigation, roads, electricity and human capital. Thus, investments in infrastructure must be fulfilled before any major production revolution, although initial subsidies in credit, fertiliser, and irrigation helped farmers adopt the new technologies. India has also institutionalized centralised and decentralised systems of state procurement of the two main food crops – paddy and wheat - and declares minimum support price assurances to farmers right at the time of sowing, so as to assure farmers of handsome returns on their investment and efforts.

Rural credit has significant impact on improving agricultural production as well as reducing risks and distress of farmers. There has been a significant increase in the share of formal financial institutions (commercial banks, regional rural banks and cooperatives) in the total credit availed. The government has extended rural credit through its commercial banks, *Kisan* Credit Cards, interest subvention schemes and also through agricultural insurance schemes. Crop loans up to Rs. 300,000 are provided effectively at 4 per cent p.a. with an interest subvention of 4 per cent for timely repayment of loans. Resultantly, rural credit target for 2011-12 has been overachieved by 107 per cent of the target.

5.2 Lessons for LICs in ensuring access to food by the poor

As the poor lack purchasing power to buy food at the market price, India has worked on two fronts to ensure food availability to them. First, India runs a host of poverty alleviation programmes to enhance their incomes. Special mention may be made of the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) discussed in section 3.5 that guarantees employment in rural areas for 100 days at the statutory wages fixed by GOI. Additional employment created by government has also increased wages on private farms, thus helping the poor. Second, government runs a vast network of fair price shops that sell subsidized grain and other essential items such as sugar and kerosene to the poor. The right of the people to highly subsidized grain has now been given a legal backing through Food Security law. These issues have already been discussed in sections 3.1 and 3.2. A successful right to work legislation must rely on active participation at all levels of government, particularly local governments that form the backbone of employment opportunities, so while far from perfect, low-income countries can learn from India's attempts at employment guarantees.

Developing countries can also utilise India's expertise in providing meals at government schools. The Mid-Day Meal Scheme's impressive scope and long duration, as well as its positive effects on school attendance, is worth modelling after in countries where school attendance is poor and nutrition is low.

India can offer its approach to social protection by including the duties of state food provisioning within a basic package of social protection. Legal rights create a normative framework of what people should rightfully expect from their governments, enhancing expectations, and through it democratic pressures for change. The rights-based approach is particularly suited to nascent democracies that wish to strengthen the protection of its peoples under law. India's programmes for social protection which include large programmes for food provisioning through subsidised grain and direct feeding programmes, as well as rights-based approach to laws could become complementary or alternate frameworks for developing countries that suffer similar challenges as India, and can learn from India's journey and experience, and its surrounding debates. Purely legislatively the rights-based approach has a lot of potential, particularly stemming from the UN declaration of human rights creating a standardised idea of what a human right entails, as well as insisting on a moral centre for a state to build its ideals on.

5.3 Lessons for LICs in nutrition

India is not a member of the SUN movement. However, India has experience in implementing most of the direct nutrition interventions. There is a need to intensify support to LIC countries for creating an enabling environment to generate higher interest, investment, commitment towards ensuring the planned outcomes are achieved at a much higher AARR. In India, in the last five years, the AARR for underweight has been reported to have improved to 2.9 in 100 districts surveyed. In Mitanin initiative in Chhattisgarh state which combined direct nutrition interventions with the indirect food security measures through PDS, a high AARR has been reported, as discussed in section 4.3. India has a number of pilot projects with good results. Lessons learned are valuable for planning nutrition improvement programs in LICs.

As already discussed in para 4.3 regards, developing countries can learn a great deal as regards nutritional security from the following interventions which have shown positive results in India:

i. Infant and Young Child Feeding (IYCF) Practices
ii. Community based undernutrition reduction initiatives by many states
iii. Prevention and Management of Severe Acute Malnutrition (SAM)
iv. Food Fortification. Universal Salt Iodization

The challenge for LICs is scaling up coverage of direct nutrition actions in a cost-effective manner with proper implementation of a well-designed programme. In the LICs, much less is known on how to implement the direct nutrition interventions at scale, how to replicate or adapt how to deliver in a cost-effective manner, what strategies to actively discourage, how to sustain, how to minimise costs etc. Low income countries, in general, require strong advocacy for creating an enabling political and resource environment, a proper system for ensuring effective delivery of services, support for producing suitable technical expertise in public health nutrition and assistance for essential programme related supplies. In addition, political commitment needs to be backed by appropriate support for establishing legislation framework for successful implementation of policies and programmes.

Scaling up therefore requires programme expertise for the development of suitable policies, implementation guidelines and programme designs along with technical support in defining goals, targets, timelines and deliverables. India, with the financial support of international development agencies, could take a leading role to support LICs. India has made significant progress in terms of advocacy, policy formulation, strategy formulation, programme planning, establishing of delivery mechanisms for each of the selected nutrition specific interventions. Additionally, India has demonstrated expertise in system development, execution of a comprehensive communication strategy, training and capacity building of programme managers and workers, community mobilization as well as monitoring and evaluation. Inter-personal as well as group counselling skills and social mobilisation are essential components of nutrition programme design. India has experience, expertise and capacity to work with LICs in

conducting training, developing the required institutional capacity and competence for the execution of programme implementation tasks.

Besides rolling out policies and programmes, India is also in a position to offer technical and managerial support for conducting country-wide dietary and nutrition surveys. Additionally, technical support could also be provided for generating data base and analysing findings for appropriate programme planning. India's experience in conducting ethnographic studies for planning behavioural change communication (BCC) program and support in the production of information-education materials would be of great value to LICs for strategic planning and implementation. Additionally, India could offer support in building technical expertise by establishing teaching centres of public health nutrition or linking with existing distance education or organising short courses in public health nutrition.

The opportunities for learning by other LICs and the salient findings of our study for each of the three aspects discussed above are summarised below in Table 9.

Table 9: A Conceptual Framework of Food and Nutrition Security in India: Opportunities for learning

	Availability (physical access) Production + import – export + buffer stocks	**Accessibility (economic access)** Income levels + purchasing power + social safety nets	**Absorption (nutritional outcomes)** Diet + health and sanitation + cultural practices + status of women
Enabling factors	• Incentives (Security of land tenure, input subsidies and remunerative output pricing, trade policies) • Institutions (Land, labour, credit, foodgrain management, agricultural marketing) • Investments (Irrigation, roads, power, supply chains)	• Employment opportunities (Rural nonfarm activities, urban semi-skilled/ unskilled) • Social safety nets (PDS, Food Security Act, direct food transfers at schools and Anganwadis)	• Nutritional intake (Calorie, proteins, micro nutrients) • Health and sanitation initiatives • Awareness about child rearing • Empowering the role of gender in the household
Stakeholders (opportunities of partnership)	• Centrally sponsored schemes; Central Foodgrain management • Private sector provision of Seed; modern value chains; back-end operations (like IT based extension, etc.) • Civil society extension services; clustering farmers in groups (BAIF, Pradan) • Multilateral/Bilateral agencies/Philanthropic Foundations	• Public sector Rural employment: NREGA PDS, other food-based programmes (MDM, SN) • Private sector Modern retailing and processing • Civil society • Multilateral/ Bilateral/ Agencies/ Philanthropic Foundations	• Public sector (ICDS, NRHM, Sanitation, etc.) • Private sector (Fortified food for the poor) • Civil society (Akshya Patra, Micronutrient Initiative etc.) • Multilateral/Bilateral agencies/ Philanthropic Foundations (World Bank, WFP, Care, etc.)

5.4 Institutional partnership for collaboration

Predominant institution through which government-to-government knowledge sharing from India to other South countries occurs is through the Indian Technical and Cooperation Programme (ITEC). Something close to 10,000 foreign nationals are trained in various subjects each year in India under this programme, which spans many subjects including those connected with food security.

Instituted in 1964 as a branch of the Ministry of External Affairs, the ITEC Programme's initial vision was for a bilateral programme of assistance, 'based on ideals and aspirations shared between developing countries, to work towards a solid economic foundation'. In more recent years, the technical and economic cooperation that the programme tried to foster became more multi-lateral, utilising regional and inter-regional cooperative programmes, as well as through regional and multi-regional organisations such as the Association of South-East-Asian Nations (ASEAN), the Mekong-Ganga Cooperation (MGC), the African Union (AU), the Afro-Asian Rural Development Organisation (AARDO), the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) and the World Trade Organisation (WTO). The programme is fully funded by the Government of India and has grown since its inception, at this date, working with its sister programme the Special Commonwealth African Assistance Programme (SCAAP), it reaches 161 countries in Asia, Africa, Eastern Europe, South America, the Caribbean, as well as Pacific countries and islands.

Specifically for agricultural and rural training, both the ITEC programme and SCAAP provide water resource development and irrigation water management at M.Tech and P.G. diploma level at the Indian Institute of Technology's Department of Water Resources Development and Management in New Delhi, Sustainable Agricultural Strategies for Rural Development and other rural development schemes with four to six week courses at the National Institute of Rural Development in Punjab, as well as a five week Training Programme on Fertilizer Quality Control at the Central Fertilizer Quality Control and Training Institute in Faridabad.

Indian and US leadership agreed in 2010 to use their expertise in agricultural capacity building to provide food security related knowledge to interested third world countries. Pursuant of this principle, India-US- Africa Triangular partnership in agricultural training has been started in 2013. The programme will leverage India's experience, expertise, and resources, as well as share innovations and technologies to address food insecurity, malnutrition, and poverty in the three African countries.

The three-year triangular partnership programme aims to improve agricultural productivity, strengthen agricultural value chains, and support market institutions in Kenya, Liberia, and Malawi. It is supported by the U.S. Government through the United States Agency for International Development (USAID), by the Ministry of External Affairs and the Ministry of Agriculture of India, and implemented by two of India's leading agricultural training institutes - National Institute of Agricultural Extension Management (MANAGE), Hyderabad, and the Chaudhary Charan Singh National Institute of Agricultural Marketing (NIAM), Jaipur.

Africa is an important trading partner for India and Indian investors are eager to invest in agriculture in Africa. According to Department of Science and Technology officials, we have a basket of technologies that span agriculture implements, agri-processes, internet and communication technologies and mobile-based applications, none of which are high-end but well tested and scalable in India. Teams from the ministry have been visiting countries like Rwanda, Senegal and Mozambique to showcase "proven and low-cost" Indian technologies.[14]

India has also been providing support in post-harvest activities. Ministry of Food Processing Industries has decided to establish Food Testing Labs (FTL) and Food Processing Business

[14] http://www.mea.gov.in/articles-in-indian-media.htm?dtl/21739/India+plans+to+boost+Africa+ties+through+education+technology

Incubation Centres (FPBIC) in the member countries of AU. Each FTL will be established at an estimated cost of Rs. 10 crore. These will come up in Zimbabwe, Gambia, The Republic of Congo, Rwanda and Nigeria.

DARE/ ICAR's (Department of Agricultural Research and Education/ Indian Council of Agricultural Research) initiatives towards knowledge cooperation in SAARC and G20 countries also need to be mentioned here. DARE and ICAR coordinate and participate in various activities in the field of agriculture and rural development as identified by SAARC and Technical Committee on Agriculture and Rural Development of SAARC. ICAR undertakes capacity building for SAARC countries in the areas identified by TCARD and SAARC Division of MEA. These include: organise workshops, seminars, and other activities from time to time for participants of SAARC countries on issues of mutual interest; supply and share information on improved technology and good agriculture practices with various SAARC countries; play leading role in guiding TCARD and SAARC Agriculture Centre (SAC), Dhaka; and share expertise with SAARC countries.

They also provide technical support for G20 discussions and meetings in the field of agriculture and food security; price volatility; agriculture market information system; food security; technology delivery system; investment in agriculture; sustainable agriculture production and productivity growth; and developing country perspective on food security.

While India's progress is commendable, there are also gaps that we have identified in the previous sections. Table 10 summarizes some of the existing gaps and obstacles faced in the implementation and execution of the programmes, the likely medium- to long-term solutions, and the scope for partnership in addressing these issues.

Table 10: Existing Gaps, Medium- to Long-Term Solutions, and Potential Partnerships

Gaps and Obstacles	Medium- to Long-Term Solutions	Potential for Partnerships
Availability		
Production shortfalls	Better water management	Government, private sector, civil society organizations, multilateral and bilateral agencies
Productivity gaps	Seed, soil health, pest and disease management, technology and extension	Government, private sector, civil society organizations, multilateral and bilateral agencies
Storage and transportation	Private sector participation, modern technology	Private sector, government
Inadequate value chain integration	Development of cold chains, strengthening of firm–farm linkages	Private sector, multilateral or bilateral agencies
Financial services	Strengthening of access to formal credit, warehouse receipt systems	Private sector, government, civil society organizations
Climate change mitigation	Improved awareness, technological innovations	Government, multilateral and bilateral agencies
Regional vulnerability	Area-specific strategies and investments	Government, multilateral and bilateral agencies
Accessibility		
Operational difficulties in PDS (FCI, FPS, etc.)	Greater decentralization, social audits, abolish dual pricing, direct benefit transfers	Government, civil society organizations, private sector, multilateral and bilateral agencies
Identification of beneficiaries and errors in targeting	Community participation, use of RTI	Government, civil society organizations
Issues of choice and	Multiple options for delivery	Government, civil society

preferences	outcomes, option-based subsidies	organizations
Absorption for nutritional security		
Clean drinking water and sanitation facilities	Enhanced funding and maintenance of assets, better monitoring	Government, private sector, multilateral and bilateral agencies
Clean cooking fuels	Incentive use of clean energy sources	Government, private sector, multilateral and bilateral agencies, civil society organizations
Health services	Improved functioning and coverage	Government, private sector, multilateral and bilateral agencies, civil society organizations
Education	Improved functioning and coverage, awareness raising campaigns	Government, private sector, multilateral and bilateral agencies, civil society organizations
Gender	Incentivized women participation in workforce	Government, private sector, multilateral and bilateral agencies, civil society organizations

FCI = Food Corporation of India, FPS = Fair Price Shop, RTI = Right to Information.

Building synergies between the various stakeholders to improve the efficacy of these interventions is necessary.

5.5 Private enterprise and knowledge sharing

Corporate Social Responsibility has become increasingly important in developing countries. There is large room for growth in engaging private enterprises to play a larger role in knowledge sharing and laying the grounds for government cooperation. The current areas of operation are predominantly aimed at promoting private enterprise and technological uptake, rather than specific government policies and government-led initiatives. Certain knowledge-sharing, particularly on sustainable agriculture, irrigation and water resource management, IT-enabled agricultural extension services and farm mechanisation, coincide with some of the recommendations, but do not go as far in particular recommendations such as initiatives aimed exclusively to small-scale farmers. Existing state institutions for knowledge sharing focus more on technical elements, IT enabled services and market facilitation. They tend to leave out even technical aspects which have a greater equity and sustainability value, because even technology today is being pressed to address the needs of global markets more than of the poorest people around the globe. They leave out even more emphatically 'softer' areas of social rights and aspects of social and food protection.

There is also need, *inter alia*, to produce policy-centred books as knowledge products on each of the identified themes in which India has experience and learning to share with the rest of the world. These books should not be prescriptive but instead descriptive: they should describe the Indian experience objectively with both pitfalls and accomplishments, describe the debates and dilemmas, and identify the lessons not in terms of prescriptions but instead policy options for policy makers in other countries. Also, they should be always mindful of the fact that not all of India's successes, or failures, can be replicated – there are unique cultural, social, economic or political factors which contribute to its results. There is the need to be able to give a range of options and suggest fundamentals for future success – strong civic mobilisation, 'transparency', 'accountability', strong judicial or legislative action, administrative will, etc.

The challenge for LICs is scaling up coverage of direct food and nutrition actions in a cost-effective manner with proper implementation of a well-designed programme. In the LICs, much less is known on how to implement the direct food & nutrition interventions at scale, how to replicate or adapt how to deliver in a cost-effective manner, what strategies to actively

discourage, how to sustain, how to minimise costs etc. Low income countries, in general, require strong advocacy for creating an enabling political and resource environment, a proper system for ensuring effective delivery of services, support for producing suitable technical expertise in public health nutrition and assistance for essential programme related supplies. In addition, political commitment needs to be backed by appropriate support for establishing legislative framework for successful implementation of policies and programmes.

6. References

ADB 2010: Food and Nutrition Security Status in India, Opportunities for Investment Partnerships, T. Nandakumar, Kavery Ganguly, Pravesh Sharma, and Ashok Gulati, Sustainable Development Working Paper Series No. 16, November

Afridi, F., 2010: Child Welfare Programs and Child Nutrition: Evidence from a Mandated School Meal Program in India. Journal of Development Economics, 92

AI 2013: Budget Briefs-Integrated Child Development Services Vol. 5 Issue 6, Accountability Initiative, Delhi

Chambers Robert and Gregor von Medeazza 2013: Sanitation and Stunting in India: Undernutrition's Blind Spot Economic & Political Weekly June 22, vol xlvIiI no 25

Chand, Ramesh and Jaya Jumrani 2013: Food Security and Undernourishment in India: Assessment of Alternative Norms and the Income Effect, *Ind. Jn. of Agri. Econ.Vol.68, No.1, Jan.-March 2013*

Deaton, A. and Drèze, J. (2008). *Nutrition in India: Facts and Interpretations*. Princeton, NJ: Princeton University Press.

Economic Survey (2013): Finance Ministry, GOI. New Delhi

Economic Survey, 2012. Chapter 8: Agriculture and Food Management. Government of India, New Delhi.

Fan, S., Ashok Gulati, and Sukhadeo Thorat. 2008. Investment, subsidies and pro-poor growth in rural India. Agricultural Economics 39:163–170.

FAO 2013: The State of Food Insecurity in the World 2013, Rome

GOI (1993). 'Report of the Expert Group on Estimation of Proportion and Number of Poor'. New Delhi: Perspective Planning Division, Planning Commission.

GOI 1993: 'Report of the Expert Group on Estimation of Proportion and Number of Poor', Perspective Planning Division, Planning Commission, New Delhi.

GOI 2010: Household Consumer Expenditure in India, 2007–2008. National Sample Survey, 64th Round, July 2007–June 2008. Ministry of Statistics and Program Implementation, March 2010. New Delhi

Himanshu and Abhijit Sen (2011): 'Why Not a Universal Food Security Legislation?', Economic & Political Weekly, Vol 46, No 12, pp 38-47

Hungama (2012): 'Fighting Hunger & Malnutrition', at www.theaahm.org/resources/documents/en/

Khera, R., 2013: Mid-Day Meals: Looking Ahead. Journal of Development Studies, vol XLVIII, issue 32.

Khera, Reetika (2011): 'Revival of the Public Distribution System: Evidence and Explanations', Economic & Political Weekly, Vol 46, 44-45

Kumaran, M, (2008). 'Hunger and under-nutrition in post-liberalisation rural India – a review'. Dissertation, Jawaharlal Nehru University, New Delhi.

Kundu, A. (2006). 'Food security system in India: analysing a few conceptual issues in the contemporary policy debate'. In Srivastava, N. and Sharma, P. (eds), *Protecting the Vulnerable Poor in India: The Role of Social Safety Nets*. New Delhi: World Food Programme.

Narayanan, N C and Lalitha Kamath 2012: Rural Water Access: Governance and Contestation in a Semi-Arid Watershed in Udaipur, Rajasthan, Economic & Political Weekly january 28, vol xlvii no 4

NSSO, 2012. *Employment & Unemployment and Household Consumer Expenditure 68th Round*. New Delhi: Government of India.

Puri, Raghav (2012): 'Reforming the Public Distribution System: Lessons from Chhattisgarh', Economic & Political Weekly, February 4, vol xivii no 5

Sen, P. (2005). 'Of calories and things: reflections on nutritional norms, poverty lines and consumption behaviour in India'. *Economic and Political Weekly*, 22 October.

Shah, T., and Shilp Verma. 2008. Co-management of electricity and groundwater: An assessment of Gujarat's Jyotigram Scheme. Economic & Political Weekly: 43(7) 59–66

Shah, T., Avinash Kishore, and Hemant Pullabhotla. 2009. Will the impact of the 2009 drought be different from 2002? Economic & Political Weekly 44 (37): 11–14

UNICEF 2013: Improving Child Nutrition: The achievable imperative for global progress

UNICEF, 2011: Briefing Paper Series: Innovations, Lessons and Good Practices

World Bank 2007: Bihar Agriculture: Building on Emerging Models of "Success". Agriculture and Rural Development Sector Unit. South Asia Region. Discussion Paper Series. Report No. 4. The World Bank Washington D.C.