

Institutional Arrangements for Food and Nutrition Security in India: Retrospects and Prospects

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Abstract

The need for achieving food security is felt significantly in the recent years due to enormous pressure from the ever-increasing population in India. Owing to the change in preferences in crop production techniques over a period of time, several new challenges draw attention to food security. Chronic food insecurity still persists as reflected in the low energy intake and high incidences of malnutrition. The overall improvement in nutritional status being very slow, is very chronic for approximately half of the population, particularly among the vulnerable groups of children. India is one of the few countries which have experimented with a broad spectrum of programmes for improving food security. However, despite a significant reduction in the incidence of poverty, chronic food insecurity persists in a large proportion of India's population. The government needs to supplement the provision of food security with a mix of short- and long-term policies. This will require improvements in infrastructure and time-limited targeted policies to improve rural farm and non-farm productivity. Special care should be taken in laying down the guidelines for the policies and programmes so that the money and labour expended result in durable and visible assets benefiting the whole community and ensuring food security for all. Research should be targeted to emphasize on bio fortification to ensure nutritional security in the diet. Prioritize the demand-driven and nutrient-based research programmes. Concerted efforts should be made to ensure involvement of social sciences in research prioritization, and technology development, targeting and dissemination. This paper deals with food and nutritional security status, interventions of government and the other institutions and the roles to be played by policy makers, researchers and extension agents in overcoming food and nutritional challenges in India.

Keywords: Food security, nutrition security, malnutrition, bio fortification, chronic food insecurity and policies.

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Introduction

With a population approaching almost 1.2 billion, India is likely to be the most populous country on this planet by 2030 with 1.6 billion people. It currently accounts for more than 17 per cent of the global population (census 2011). Ensuring food and nutrition security is thus a challenge for India. Article 47 of the Constitution of India states that, "the State shall regard raising the level of nutrition and standard of living of its people and improvement in public health among its primary duties". India's Five-Year Plans enunciated the policies, laid down multi-pronged strategies, outlined multi-sectored

programmes to improve food security and nutritional status of the population, laid the goals to be achieved in a specified time frame, and provided the needed funds to implement the interventions.

Food security is 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 (FAO 2001). Food security was formerly considered essentially in terms of production. It was assumed that adequate food production would ensure adequate availability of food in the market as well as in the household. The concept rests on three pillars: food availability, food access, and food

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absorption. Availability refers to the physical availability of food stocks in desired quantities. This depends on the domestic production, changes in stocks, and imports along with the distribution of food across territories. Access stands for physical and economic reach of population. This ability to acquire the requisite quantum of food depends upon income levels, purchasing power and effective distribution network. It was this pillar of food security which shifted the focus to poverty reduction. Absorption is defined as the ability to biologically utilize the food consumed. This is related to several factors such as nutritional knowledge, safe drinking water, and availability of stable and sanitary physical and environmental conditions. All this allows effective biological absorption of food in a human body (Swaminathan 2009).

Food security status

At the global level, the South Asian region is home to more chronically food insecure people than any other region in the world. The number of hungry persons in South Asia (Bangladesh, India, Nepal, Pakistan and Sri Lanka) rose from 290.4 million in 1992 to 298.5 million in 2003 (FAO, 2004). The National Family Health Survey 2005 – 06, highlights some very disturbing truths about the prevailing situation in the country: 56 per cent of the women are anaemic; 30 per cent of new born babies are of low birth weight (LBW); and 47 per cent of the children are underweight. India ranks 63rd in Global Hunger Index (GHI) 2013 as per International Food Policy Research Institute. India has the highest prevalence of underweight in children under five which is more than 40 per cent (IFPRI 2013). Though, the position of India is marginally improving, it is still categorized under ‘alarming levels’ list of nations across the globe. As per IFPRI data, undernourished population for 2010-12 was 17.5 per cent (21 Crore); Underweight children below 5years were 40.2 per cent and mortality rate of children under 5 years was 6.1 per cent which was dismal by any standards.

Nutrition security status

Nutrition Security implies ‘Physical, economic and social access to balanced diet, clean drinking water, safe environment, and health care’. India has among the highest incidence of under-nutrition in the world. Almost 50 per cent of children under 5 were under weight and stunted. Over 30 per cent of adults were also undernourished (UNICEF, 2010). Besides deficiency of calories and protein, deficiency of micronutrients (vitamins and minerals) was rampant (NNNB 2006). Micro Nutrient deficiency is referred to as the hidden hunger since often times it is not an obvious killer or crippler, but extracts heavy human and economic cost. India is home to 25 percent of the world’s hungry population. An estimated 43 per cent of children under the age of five years are malnourished (WFP 2012).

Improvement in food consumption is a necessary but not a sufficient condition for overcoming the problem of malnutrition in India. Apart from inadequate food consumption, the other important causes of malnutrition are high incidence of gastrointestinal and respiratory infections and behavioural factors such as faulty child feeding and weaning practices, all of which contribute to the low absorption of nutrients from the food consumed. The overall improvement in nutritional status has also been very slow. There is chronic undernourishment in about half of the population, particularly among the vulnerable groups of children, women and elderly from the lower half of the expenditure class.

There are even differences of nutritional status in inter states of India. The state-level mismatch between food intake and nutritional status could be attributed to the differences in education, health, availability of safe drinking water, environmental sanitation and personal hygiene which intervene between the food intake and nutritional status. Micro nutrient deficiency is equally common among

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the population, more so in the vulnerable groups such as women and children. These two groups are more prone to certain deficiencies than the adult male population. Iodine deficiency is common among the populations living in the sub-Himalayan region and other hill regions of the country. Vitamin-A deficiency, which leads to preventable blindness in the children, is more common among the children from the rural households.

An iron deficiency was widely prevalent among the pregnant women. About half of the pregnant women suffer from iron deficiency and consequent anemia; 35 per cent suffer from mild anemia, 15 per cent from moderate and 2 per cent from severe anemia (NFHS 2005).

Low dietary intake is the major factor responsible for under nutrition. Vegetables intake which is essential to provide the needed micronutrients continued to be low. Pulses critical to meet protein needs in populations subsisting on vegetarian diets, are expensive and consumption had come down. Pulse production in the last two decades, has remained stubbornly low. The urgent need for a technological breakthrough to increase the yield potential of pulses is widely acknowledged. Potable water supply and sanitation are critical for prevention of infections. Health care for early detection and effective management of infections can reduce under nutrition due to infections.

Initiatives to improve food and nutritional status of India

India is one of the few countries which have experimented with a broad spectrum of programmes for improving food security. It has already made substantial progress in terms of overcoming transient food insecurity by giving priority to self-sufficiency in food grains and through procurement and public distribution of food grains, employment programmes, etc.

Earlier programmes:

- 1. Mid Day Meal Programme:** In 1925, a Mid Day Meal Programme was introduced for disadvantaged children in Madras Municipal Corporation to improve the nutritional status of school-age children nationwide. In the post-independence period, today the scheme is being implemented in most states. It would also have impact on school attendance and enrolment.
- 2. Food Corporation of India (1965):** It involves in effective price support for the farmers, distribution of food grains throughout the country for Public Distribution System and maintaining buffer stocks of food grains to ensure national food security.
- 3. Special Nutrition Programme (1970-71):** It provides supplementary feeding to the extent of about 300 calories and 10 gm. of proteins to pre-school children and about 500 calories and 20 gm. of protein to expectant and nursing mothers for 300 days a year. At present SNP is operated, as a part of the Minimum Needs Programme.
- 4. Balwadi Nutrition Programme (1970-71):** It is for the benefit of children, consists of 300 calories and 10 gm. of protein per child per day for 270 days a year.
- 5. Integrated Child Development Services (1975):** Today, ICDS Scheme represents one of the world's largest and most unique programmes for early childhood development. The package of services is supplementary nutrition, immunization, health check-up, referral services, pre-school non-formal education and nutrition & health education. Government of India partners with the international agencies like United Nations International Children' Emergency Fund (UNICEF), Cooperative for Assistance and Relief Everywhere (CARE), World Food Programme (WFP) to supplement interventions under the ICDS.

The Ministry of Women and Child Development and Ministry of Health had adopted the New WHO (World Health Organisation) Child Growth Standard in India on 15th of August, 2008 for monitoring the growth of children through ICDS. There has been significant progress in the implementation of ICDS Scheme during X five year Plan and during XI Plan in terms of increase in number of operational projects, Anganwadi Centres and coverage of beneficiaries.

6. **Wheat based Supplementary Nutrition Programme (1986):** It consists of supply of free wheat and supportive costs for other ingredients, cooking, transport etc.
7. **National Programme for Nutritional Support to Primary Education (1995):** Launched with a view to enhancing enrollment, retention, attendance and simultaneously improving nutritional levels among children.

Current programmes:

1. **National food security mission (2007):** Aim is to increase the production of rice by 10 million tons, wheat by 8 million tons and pulses by 2 million tons to the end of eleventh plan. The Mission is being continued during 12th Five Year Plan (2012-17) with new targets of additional production of food grains of 25 million tons of food grains comprising of 10 million tons rice, 8 million tons of wheat, 4 million tons of pulses and 3 million tons of coarse cereals by the end of 12th Five Year Plan. Various interventions proposed in NFSM is demonstration of improved package of practices at farmers' fields to create awareness about the improved practices and action plans proposed for additional area coverage of crops.

2. **National food security bill (2013):** It is an initiative for ensuring food and nutritional security to the people. It gives right to the people to receive adequate quantity of food grains at affordable prices. The Bill has special focus on nutritional support to poorest of the poor, women and children. In case of non-supply of foodgrains now people will get Food Security Allowance. The bill provides for grievance redressal mechanism and penalty for non compliance by public servant or authority.

3. Food fortification programmes

- Iodised salt for reaching out iodine to the poorest of the poor
- Iron fortified Iodised salt
- Iron fortified wheat flour (Atta) and rice
- Fortification of Cereal Products with Folic Acid to combat vitamin B12

DBT network project on bio fortification of rice, wheat and maize is currently being implemented by ICAR Institutions and state agriculture universities and National Institute of Nutrition.

4. Transgenic technologies

Golden Rice rich in pro-vitamin A; high- iron rice (high ferritin gene from mangrove); are examples of transgenic technologies.

Pulses Development Programmes in India: Changing Patterns

As pulses play a major role in nutritional security, several policy initiatives, projects and programmes with respect to pulses were undertaken in India viz.

- All India Coordinated Pulses Improvement Project (AICPIP)
- National Pulses Development Programme (NPDP)
- Technology Mission on Pulses (TMOP)

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- Centrally Sponsored Integrated Scheme of Oilseeds, Pulses, Oil palm and Maize (ISOPOM), etc.

These policies and programmes hardly led to improvement in pulse production of India. In order to raise pulses production, the existing pulses related programmes were replaced by (National food Security Mission 2007) NFSM-pulses.

Role of institutions in breeding for nutrition:

There are many institutes in India breeding for nutrition in the diet. The major ones are Indian Agricultural Research Institute, Indian Institute of Pulses Research, Directorate of Mushroom research etc. The interventions of pioneer institute i.e Indian Agricultural Research Institute in nutritional security is explained here

Indian Agricultural Research Institute: IARI developed many improved crop varieties and techniques for securing nutritional security in the diet. Examples are:

i) Varieties:

- **Rice:** Golden rice is a genetically modified crop developed for its nutritional value i.e. provitamin A; **Golden Swarna** has high beta carotene content.
- **Wheat:** HI 8627 (Malavkirti) variety is rich in vitamin A; HI 8663 (Poshan) variety is more nutritious and suitable for dalia, suji and pasta making; HD 2967 has high protein (12.7%); HD 3043 has higher zinc, copper, manganese and high protein content (12.76%).
- **Maize:** Single cross maize hybrids, Quality Protein Maize help in reducing protein malnutrition
- **Vegetables:**
 - a) Chick pea, Pusa 5023 has high protein content
 - b) Vitamin A enriched carrots, pumpkins, spinach
 - c) Vitamin C enriched bitter gourd, tomato, mustard

- d) Calcium and iron enriched spinach
- e) Protein enriched beans and garden peas
- f) Carrot, Pusa Vasuda rich in total carotenoids, lycopene, TSS and minerals; other carrot variety Pusa Rudhira is a rich source of total carotenoids

- g) Radish, Pusa Jamuni is anthocyanin rich radish variety; Other radish variety Pusa Gulabi contains high carotenoids and anthocyanins

- h) Beta carotene rich orange cauliflower
- i) High lycopene tomato breeding selections: Sel 1,2,3,4,5,6.

- **Mustard:** Pusa Mustard 30 (LES-43) is a low erucic acid mustard variety; Pusa Karishma is the first single zero (<2% erucic acid) variety of Indian mustard

ii) Value addition of cereals and pulses

- **Pearl pop snack:** The product is rich in protein, crude fibre, antioxidants, iron and zinc. It also helps significant reduction in phytic acid content.
- **Pusa Nutri Cookies:** Protein enriched product (7.89% protein). It is fortified with soy flour to increase protein content. Good source of iron and calcium.
- **Roasted soya nuts:** It is protein rich product and rich in antioxidants
- **Protein rich crackers:** It is healthier alternative to commercial biscuits as it is made with chickpea and QPM (Quality Protein Maize). Super foods like aonla and beetroot have been incorporated to provide antioxidants and flavonoids besides fibre.

iii) Other Value added products:

Ripe mango powder to combat vitamin A deficiency; Pusa fruit drinks contains natural oxidants, vitamins and minerals; Antioxidant rich functional food from aonla.

Roles to be played

There is an urgent need of the different role players to address all these issues for securing nutrition secure food in the diet. Mainly policy makers, researchers and extension agents play a crucial role in food and nutritional secure India.

1. Policy support

India adopted the National Food Security Act 2013 that stockpiles food for release into the market to mitigate price spikes. The National Food Security Act covers 75 per cent of India's rural population and 50 per cent of its urban population, highlighting the scope of the challenge and the ambition of the program.

The government needs to supplement the provision of food security with a mix of short- and long-term policies. In the short term, there needs to be a recognition that food insecurity stems from lack of opportunity. There is a need to ensure employment opportunities for at least one able-bodied member of a household. For children, the midday meal scheme should be implemented in lagging states as soon as possible. In the long term, food security will result from the wider tackling of poverty. This will require improvements in infrastructure and time-limited targeted policies to improve rural farm and non-farm productivity.

There is a need for procuring pulses under public distribution system to reduce market risk for farmers and ensure supply for their increased consumption. A protein rich crop like soybean has to be looked in a comparative context. The scope for pulses or other sources of protein has to be looked in a situation where special interests can be taken. There is an urgent need for creating a strong mechanism to focus on nutrition security through improved pulse value chains, and efficient processing sector.

The policies should be in such a way that the Corporate Social Responsibility fund should be used for nutrition programmes of the country.

There is an urgent need to strengthen the existing Public Distribution Network (PDS), Food for Work Programmes, improving agricultural productivity and enhancing rural non-farm employment. Nutrition programmes, particularly for the children, should be expanded on a significant scale. There is a strong requirement to ensure the fullest implementation of minimum wage laws for farm labour. Special care should be taken in laying down the guidelines for the policies and programmes so that the money and labour expended result in durable and visible assets benefiting the whole community and ensuring food security for all.

2. Research support

Earlier, the focus was on breeding for production, now there should be a change in the paradigm of breeding for nutrition. Research should be targeted to emphasize on bio fortification to ensure nutritional security in the diet. Prioritize the demand-driven and nutrient-based research Programmes. The research should target on medicinal plants and also the neglected plants for nutritional security. Concerted efforts should be made to ensure involvement of social sciences in research prioritization, and technology development, targeting and dissemination.

For ensuring food security, the research should focus on; to develop promising technologies and management options to raise productivity; to meet growing food demand in a situation of deteriorating production environment at the lowest cost; to develop appropriate technologies; create required infrastructure and to evolve institutional arrangements for production; post-harvest and marketing of high-value and perishable commodities and their value-added products (Vision 2030 of ICAR). There is a need to develop organizational policy and guidelines aimed at enhancing inventions and accelerating innovations in agriculture to harness opportunities by integrating modern and conventional research approaches.

3. Extension support

Extension in our country basically focusing on production aspects of agriculture, its role is very dismal as far as food and nutrition security is concerned. To address these issues, the new role of extension should be to focus on nutrition security in the people. The changing role of extension should be:

- Nutrition literacy and leadership at all levels is needed to understand and act. So creating awareness about the consequences of under nourishment is the first and foremost thing.
- Developing modules on nutritional aspects like what to eat, how much to eat, what should to eat to avoid health problems etc should be covered
- Sensitization of people through Self Help Groups (SHGs)
- Innovative strategies need to be developed and tested not only to improve knowledge and attitudes but practices as well.
- Promoting Dietary Diversification through para-extension workers
- Establishment of nutrition clubs
- Conducting training programmes and demonstrations on nutritional security
- Behavioural modification modules should be developed
- Establishment of model kitchen gardens to address nutrition security
- Empowering women in agriculture: Resources targeted to women and women's groups significantly improve agricultural productivity, women's control of resources or assets, and health and nutrition outcomes. Women's groups, including SHGs can become instrumental in meaningful convergence of health, nutrition, education and other broad-based schemes addressing the deep-rooted causes of under-nutrition. Even the cooking practices of women can be changed through advisory services.
- Public-private-NGO partnership may have a role in improving the outreach.
- Impact studies in extension research should be given high priority to examine the effectiveness of nutritional security programmes of India
- Research is needed to find out socio-cultural, behavioural factors and administrative bottle neck to improve the efficiency.
- Course curriculum on nutritional security should be introduced in schools
- Evolve a lean-and-efficient administration by employing information and communication technology
- Promote innovations and improve human resource capacity by involving all stakeholders in the food-supply chain.
- Strengthen institutional capacity for attaining sustainable food, nutrition, and livelihood security, and also for global competitiveness.
- Act as a catalyst in reclaiming degraded resources for agriculture, and conserve and enhance national wealth of natural resources and biodiversity.
- Improve knowledge management system in agriculture and allied sectors.
- The extension programmes should focus on nutritional security programmes and those experiences need to be replicated to other areas.

Conclusion

Agriculture is fundamental to India's inclusive and sustainable structural economic transformation. It must therefore play a more significant role in promoting nutrition security. The government can maximize the potential of existing architectures across sectors to make them more pro-nutrition oriented and to promote meaningful coherence

and convergence across sectors. Pumping cereals alone to quench hunger will not ensure nutrition and health. The goal should be to ensure a balanced diet adequate in macro- and micronutrients.

The micro-nutrient deficiency can be cost effectively rectified by supplementary nutritional programmes to the children and the expectant and lactating mothers. There is a need to intensify and accelerate efforts to realize the potential of bio fortified crops. Locally produced and procured coarse grains made available through the Targeted Public Distribution System (TPDS) at a subsidized rate may substantially bring down the subsidy cost without any reduction in calories provided. This will also improve targeting as only the neediest are likely to buy these coarse grains. Millets are rich in minerals and micronutrients and hence increased consumption will improve the intake of these vital nutrients by the poor. Now it is a great opportunity for everyone to enlarge the food basket and look at grains which are nutritious.

On the other hand, the area under pulses cultivation is coming down. There is a need for effective procurement policies for pulses along with effective long and medium term trade policies to promote supply and consumption. As the pulse production is low, there is a urgent need with the required investment in research and development and effective extension services to ensure the poor and vulnerable have access to pulses. Protein rich foods like soybean should be encouraged and the value addition should be given higher priority.

Here the task of extension has to be robust. Media support for creating awareness and compliance is important. Accelerating under-nutrition reduction requires realigning agriculture and rural development policy to empower women in agriculture and here the extension plays a big role in mobilization.

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