

# Research & Reviews: Journal of Agriculture and Allied Sciences

## Food security: A world wide challenge

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### Editorial

Received date: 07/04/2015

Accepted date: 12/04/2015

Published date: 20/04/2015

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The production of food grains in world increased considerably since 1960s due to increase in arable area, large-scale cultivation of high yielding semi-dwarf varieties and increased applications of irrigation, fertilizers and pesticides. Food security has to be understood as a distress phenomenon, as with marginal increase in their incomes over time they are forced to cut down on their food consumption to meet other pressing demands of health and education that were not considered important in the past (Mukherjee, 2004). High economic growth rates have failed to improve food security in whole world leaving the state facing a crisis in its rural economy. If food security is a complex objective, pursued with others (shelter, safety, health, self-esteem), in a world where individual households face diverse, complex and different livelihood opportunities, what role can policy possibly play? Can governments ever know enough to act?

The global food system today is beset by serious challenges and risks: production and prices have become more volatile; hunger and poverty levels remain high, particularly among farming communities; and unsustainable practices exacerbate environmental challenges (Khera, 2009). By 2050, the world's population will have risen to 9 billion. Feeding this population will require substantial changes to ensure the production, distribution and consumption of sufficient nutritious and sustainably produced food. The gradual increase in environmental degradation through intensive cropping systems is further compounding the problem. There is now a great concern about decline in soil fertility, change in water table depth, rising salinity, resistance of harmful organisms to many pesticides and degradation of quality of irrigation water world wide (Chopra, 2009). Ensuring food security ought to be an issue of great importance for a country like India where more than one-third of the population is estimated to be absolutely poor and one-half of all children malnourished in one way or another (Framing Hunger report, 2013). India became food secure in the last three decades, at gross level, because of increase in food production. The food security of India and other countries in South Asia is, however, now at risk due to increase in population. By 2050, India's population is expected to grow to 1.6 billion people from the current level of 1.1 billion. This implies a greater demand for food. The cereal requirement of India by 2020 will be between 257 and 296 million tons (Mt) depending on income growth. The demand for rice and wheat is expected to increase to 122 and 103 Mt, respectively, by 2020 assuming a medium income growth. This will have to be produced from the same or even shrinking land resource. Thus, by 2020 the average yields of rice and wheat need to be increased by about 60%. Similar is the scenario for many other crops. Although, there is a pressure to increase production, lately, there has been a significant slow down of the growth rate in the cultivated area, production and yield (Brahmanand *et al.*, 2013).

Food availability is a necessary condition for food security. Throughout the world, most of the country more or less self-sufficient in cereals but deficit in pulses and oilseeds. Due to changes in consumption patterns, demand for fruits, vegetables, dairy, meat, poultry, and fisheries has been increasing (Mahendra *et al.*, 2010). There is need to increase crop diversification and improve allied activities. It may be noted that the slowdown in agriculture growth could be attributed to structural factors on the supply side, such as public investment, credit, technology, land and water management, etc., rather than globalization and trade reforms per se. Access to food can be increased through employment due to growth in labour intensive sectors and/or through social protection programmes. The malnutrition problem is much broader than that of access to food. The South Asian Enigma (levels of malnutrition in Asia are higher than in Africa) is well known. India has malnutrition levels almost the levels

double those of many countries in Africa. This problem needs a multi-disciplinary approach covering diet diversification including micronutrients, women's empowerment, education, health, safe drinking water, sanitation, and hygiene. India has government programmes such as TPDS including AAY, nutrition programmes like mid-day meals, and ICDS to improve food and nutrition security. NREGS and self employment programmes can also increase access to food and nutrition. Social protection programmes in India helped in improving incomes and providing protection from shocks for the population, particularly the poor. However, there are a number of gaps and inefficiencies in social protection programmes. Under national food security law, the government wants to provide rice and wheat to the poorest of poor at Rs. 3 per kilogram. This is too narrow an approach for implementation of the Right to Food. The Right to Food campaign specifies several other things to be included, apart from universal PDS, under the Food Entitlements Act. According to Food and Agriculture Organization (FAO), food security exists when all people, at all times, have physical and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life. Food security has three components, viz., availability, access, and absorption (nutrition). The three are interconnected. Many studies have shown that improvement in nutrition is important, even for increase in productivity of workers. Thus, food security has intrinsic (for its own sake) as well as instrumental (for increasing productivity) value.

Climate change is a major threat to rural livelihoods and to food security in the developing world—i.e., to society. While the poor in general are the most vulnerable to climate change, the vulnerability of people and their agricultural systems is very complex due to interacting direct and indirect climate-related stresses. Year to year variability in climate already contributes to rural poverty where exposure is high and adaptive capacity is low. Climate change is already being felt in terms of gradual increases in temperature, increased variability in annual rainfall regimes and a greater prevalence of extreme events such as drought and floods. Rural communities must adapt to these changes if any development progress is to continue and if further impoverishment is to be avoided. Fundamental changes in agricultural systems are needed for rural communities in less developed countries to adequately adapt to climate change. Climate change poses new and serious challenges for farmers and other resource users, for policy makers and those who invest in rural and agricultural development and poverty alleviation—and for science. The changes in agricultural systems and their management that are needed to enable the rural poor, resource managers and policy-makers to adapt to these stresses and challenges will not come about in sufficient time unless the best of science based solutions are developed and the best of delivery mechanisms are put in place. The international agricultural research community together with the worldwide global environmental change research community possesses the combined strengths and capabilities required to meet such needs. The global environmental change community and its partners bring to bear the latest and best of scientific understanding and methods regarding climate change, biodiversity, Earth system functioning and associated institutional and other socioeconomic issues.

### **Major issues for agriculture, rural livelihoods and food security in the context of climate change**

Agriculture is sensitive to changes in climatic conditions, with outcomes affecting food security, livelihoods and economic prosperity. Climate change is a threat that, in the shorter term, will significantly affect the rural poor who are the most vulnerable given their limited resources and high exposure to risk (Tim and Braun, 2013). This ultimately threat to food security pattern of the nation. The poor in the tropics are of particular concern because some impacts of climate change—e.g., water availability, droughts, and floods—are expected to be highly negative in the tropics and sub-tropics. Improved knowledge of such vulnerability is needed in order to design appropriate response and mitigation strategies. Although the international community has invested substantially in both climate-change impact studies and adaptation programs, less-developed countries have not yet been able to successfully incorporate adaptation into their development strategies. Lacking are effective strategies to manage climate risk locally and on relatively immediate time scales. Strategies need to be devised from a holistic and integrated perspective so as to not further compromise the capacity of the Earth system to support approximately two billion more humans by mid-century (Mukherjee, 2014). For example, poorly targeted and planned large irrigation schemes intended to respond to decreased rainfall in a given area could disrupt regional hydrological and biogeochemical cycles, leading to negative local and global repercussions. Also lacking are effective strategies to manage longer-term climate change, and which is driving much of the important and ongoing major policy developments worldwide (e.g., UNFCCC, G8-Glennegles follow-up, international and national policy formulation on climate change and carbon trading schemes, GEF investments). This may reflect crop production pattern of the nation. Climate change is occurring amidst global economic, demographic and social change, resulting at times in unexpectedly uneven outcomes on rural livelihoods. Minor changes in climate and climate variability may push some areas and households to food insecurity (Mukherjee, 2014). People are and will be facing new threats beyond their experience or capacity to cope. In addition to local effects, agricultural losses in developing countries will translate into macroeconomic impacts that will exacerbate problems of food access for the urban poor. Negative effects of climate change could push up food prices, seriously affecting all poor consumers. This becomes important threat in term of food availability particularly lower income group. Even gradual negative changes in today's most intensive agricultural production areas in the developing world—such as the Indo-Gangetic plains, the Brazilian savannahs and the Yellow River Basin—will play a pivotal role in both regional and global food security. Climate induced problems will also be exacerbated by changes in consumption patterns (e.g., rising meat consumption and “supermarketization”), urbanisation and land use conversion.

### **Vision of food security plan**

The vision would primarily be articulated to address four important aspects of development namely production pattern,

marketing, environment and human for better productivity, environmental sustainability and employability.

These can be categorised as:

- To generate a common development perspective of the state and nation as a whole, that reflects the thinking of diverse farming practices.
- To work out inspiring goal for overall development of the broad agriculture sector.

To facilitate evolving of more realistic, objective oriented and executable Five Year and Annual Plans.

- To provide specific directions for enhancement of food production, through sustainable manner and restoration of ecological balance.
- Creation of sustained employment opportunity with good agricultural practices for the rural people, including the landless.
- To improve our understanding of how agricultural adaptation and mitigation options at operational and policy levels affect ecosystems and the Earth system in order to address.

## **REFERENCES**

1. Brahmanand, P.S., Kumar, A., Ghosh, S., Chowdhury, S.R., Singandhupe, R.B., Singh, R., Nanda, P., Chakraborty, H., Srivastava, S.K. and Behera, M.S. Challenges to food security in India. *Current Science*. 2013; 104 (7): 841-845.
2. Chopra, S. "Holding the State Accountable for Hunger", *Economic and Political Weekly*, August 15, Vol.44, No.33. 2009.
3. Framing Hunger – Response to The State of Food Security in the World 2012 (June 2013) (<http://www.ase.tufts.edu/gdae/pubs/rp/framinghunger.pdf>).
4. Khera, R. "Right to Food Act: Beyond Cheap Promises". *Economic and Political Weekly*, July 18, Vo.42, No.29. 2009.
5. Mahendra, S., Alakh, D and Sharma, N. 2010. Food Security in India: Performance, Challenges and Policies Oxfam India working papers series September 2010 OIWPS – VII page 2-6. 2010.
6. Mukherjee, D. 2004. Kadia sureksha ke bartaman chunautia (in Hindi). *Surebhi Sandesh*, p. 40. 2004.
7. Mukherjee, D. 2013. Organic agriculture. In *ADVANCES IN AGRO-TECHNOLOGY: A TEXT BOOK* (eds. Rodriguez, H., Ramanjaneyulu, R., Sarkar, N.C. and Maity, R). Compilation of international research work. Pustaka Publishing House, Kolkata, India. 2013; 43-81.
8. Mukherjee, D. Climate change and its impact on Indian agriculture. In *PLANT DISEASE MANAGEMENT AND MICROBES* (eds. Nehra, S.). Aavishkar Publishers, Jaipur, India. 2014; 193-206.
9. Tim, W. and Braun, J.V. Climate change impacts on global food security. *Science*, 134 – 508-15 ( doi 10.1126/science.1239402). 2013.