
Sustainable Development and Food Security—A Review

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Abstract

Sustainable development is the development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It promotes the idea that social, environmental, and economic progress is all attainable within the limits of our earth's natural resources. On the other hand, food security exists when all people at all times have access to sufficient, safe and nutritious food to meet the dietary needs and food preference for an active and healthy life. (FAO, 2010). Sustainable food security means enough food for everyone at present plus the ability to provide enough food in future as well (Swaminathan,2001). Food has been a critical issue at the global level as concerns over significant challenges in securing sustained access to food have been mounting. In this paper, an attempt is made to highlight some major issues relating to sustainable food security in the Indian context.

Keywords: Sustainable Development, Food Security, Degradation of Natural Resources, Climate Change

Sustainable development implies economic growth together with the protection of environmental quality, each reinforcing the other. It emphasizes on a stable relationship between human activities and the natural world, which does not diminish the prospects for future generations to enjoy a quality of life at least as good as our own. Food security includes at a minimum ready availability of nutritionally adequate and safe foods and an assured ability to acquire acceptable food in socially acceptable ways. These challenges include the degradation of natural resources and climate change, which are expected to substantially increase risks to agricultural production and people's vulnerability to food insecurity in the coming years; at the same time, food production will need to increase by at least 70 percent by 2050 in order to meet the demands of growing populations (FAO, 2010).

Swaminathan (2001) considered biological absorption of food in the body to recognize food security along with availability and access. Availability is a function of production while access is conditioned by purchasing power and biological absorption is determined by the availability of safe drinking water, primary health care and environmental hygiene. Thus non- food factors are as important for food security as food factors.

Ramakrishnan (2007) emphasized on sustainable agriculture for the well being of the society. The issue of sustainability in respect of agricultural activities was well taken into consideration by two traditional agricultural countries like India and China so as to ensure food security for its large population. The linking of cultural diversity with biological diversity as the basis for sustainable management of natural resources is an emerging need to ensure human well being and security.

Sharma (2009) is in favour of inclusive growth and considers it as an efficient mechanism for ensuring social well being. However, it demands sustainable agriculture, generation of

employment opportunities, poverty alleviation, development of health and education and women empowerment.

The pre-requisite of food security is food availability. However, crop diversification may be an important measure to ensure food availability and thereby food security. A multi-disciplinary approach is needed covering diet diversification including micronutrients, women's empowerment, education, health, safe drinking water, sanitation and hygiene. (Dev and Sharma, 2010). Safe and clean environment is a precondition of peaceful human life but human development efforts often move towards opposite directions. It is important to ensure sustainable development in order to protect the environment. In the Indian context more concerned steps should be taken in this regard though several environment-friendly policies were adopted both in national and transnational levels in different time periods. (Bora and Sarma, 2011)

According to Darana and Danuta (2012) the Brazilian official concept of food security is anchored in its Organic Law of Food and Nutritional Security (LOSAN), which emphasizes that food and nutritional security is the realization of everyone's right to regular and permanent access to quality food in sufficient quantity, without compromising the access to other essential needs, based on health-promoting food practices that respect the cultural diversity and that are environmentally, culturally, economically and socially sustainable. South Africa's macro-policy framework treats food security as a multi-dimensional challenge, acknowledging the definition developed from the World Food Summit of 1996. This concept states that food security 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.

Critically, the food security policies of these three countries represent diverse approaches to reconciling agricultural production, environmental integrity and rural poverty as well as to the contribution these make to sustainability and equity. Social, economic and environmental sustainability along with equity remain concerns for the Brazilian food security policy agenda, with increasing attention to production models based on family farming and agro-ecological practices. South Africa's current policy on the other hand, directs equity and social-economic sustainability efforts through support to household production, while focusing less on environmental issues. India's policy, in further contrast, concentrates on the right of access to food as an attempt to promote equity and social sustainability, while its connections with environmentally innovative food production models and with support to marginalized food producers have been less explicit.

Shetty, Ayyappan & Swaminathan (2013) states that climate change will negatively affect agriculture and threaten sustainable food security. Sustainability can be ensured by proper land and water management and adopting eco-friendly technologies and methods of production.

As per the Brundtland Commission Report, 1987 sustainable development signifies development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Throughout the evolution of the concept of sustainable development there was consensus on the fact that it does not focus solely on environmental issues. The three interdependent and mutually reinforcing pillars of sustainable development are economic development, social development, and environmental protection. Since the Brundtland Report, the concept of sustainable development has developed beyond the initial intergenerational framework to focus more on the goal of socially inclusive and environmentally sustainable economic growth.

Concept of Food Security

Food security exists when all people at all times have access to sufficient, safe and nutritious food to meet the dietary needs and food preference for an active and healthy life. (FAO). Food security may be short term or sustainable. In the case of short term food security we consider food security of the present population only. On the other hand sustainable food security implies food security of the present as well as the future generation. Sustainable food security means enough food for everyone at present plus the ability to provide enough food in future as well.

The conditions for sustainable food security includes:

- Availability of food is required which comes from domestic production and import from foreign countries.
- Access or entitlement to food may come either through the market system or through the social security system of the government.
- Food absorption is necessary for food security. It is not sufficient to take food only to satisfy the hunger. The food taken is to be absorbed in the digestive system and provides nutrition to the body. Pure and safe drinking water, hygienic environment, primary health care system and provision of primary education are important in this regard.

India's productivity of rice (3590 kg/ha) is lower than China (6686 kg/ha), Bangladesh (4219 kg) and Myanmar (4081 kg). Whereas India's productivity of wheat (1661kg) is lower than China (4838 kg) in 2011. India's per hectare production of pulses is the lowest when compared to its six neighbours - Bangladesh, Bhutan, China, Myanmar, Nepal and Sri Lanka. Besides all our efforts to enhance agricultural productivity through a huge network of institutions, we are still lagging behind due to numerous problems that are inherent in our system. At present, our aim should be to enhance the agricultural productivity without causing much damage to the natural resources and production environment. (*Source: Statement of Minister of State for Agriculture and Food Processing Industries, Government of India, March, 2013*)

Causes of food crisis

- Due to increase in the price of oil, search is on for alternative sources of energy. Developed countries are now turning to the use of bio-fuel in place of fossil fuel. Bio-fuel is produced from agricultural produce like oil seeds, food grains etc. To produce bio-fuel many countries are reducing the production of food crops and increasing the production of commercial crops to be used in the production of bio fuels.

- Increased use of land for non-agricultural purposes. Agricultural land is increasingly used in building roads, houses, factories etc.
- Environmental pollution and climate change. Climate change is projected to reduce timely sown irrigated wheat production by about 6% by 2020. In the case of late sown wheat, the projected levels are alarmingly high, to the extent of 18%. Similarly, a 4% fall in the yield of irrigated rice crop and a 6% fall in rain-fed rice are foreseen by 2020 due to climate changes. (ICAR).
- Climate change may affect agricultural crops in four ways (Hulme, 1996). First, changes in temperature and precipitation will alter the distribution of agro-ecological zone. An increase of potential evapo-transpiration is likely to intensify drought stress, especially in the semi-arid tropics and subtropics. Second, carbon dioxide effects are expected to have a positive impact due to greater water use efficiency and higher rate of photosynthesis. Third, water availability (or runoff) is another critical factor in determining the impact of climate change. Fourth, agricultural losses can result from climatic variability and the increased frequency of extreme events such as droughts and floods or changes in precipitation and temperature variance.
- Sustainable food security is affected by persistent land degradation, land fragmentation, labour problem, over exploitation of natural resources etc. A holistic approach is required by considering technological, biophysical, socio-economic, political and environmental factors. Food security and environmental sustainability can be attained by improved land and water management, adopting eco-friendly technologies and initiating good agricultural practices in different agro-ecosystems.
- Indian Agricultural Research Institute (IARI) estimated that with every one degree Celsius rise in temperature, around 4 to 5 million tons of India's wheat production will be lost.
- After the establishment of WTO, free trade in agricultural products has been introduced. For this production of food grains is considered unprofitable in many developing countries. Farmers are producing less of food crops and more of cash crops thereby reducing the supply of food grains in the market. Again intellectual property rights are now applicable to plants and farmers have to depend on multinational corporations for getting HYV seeds. Again in many cases multinational corporations are introducing genetically modified seeds which are harmful to the environment of the developing countries. For this reason also agricultural development of developing countries is hampered.

Food policy of the Government of India

India's food policy has two components viz., sale of food grains at subsidized rates through the public distribution system (PDS) and fixation of minimum support price (MSP) of food grains and procurement of food grains to build stocks through the levy system. In the PDS, food grains are

sold to below the poverty line families at lower prices and to above the poverty line families at higher prices. In order to sell food grains through the public distribution system the Government purchases food grains from the market. Sometimes purchases are made directly from the producers and sometimes they are purchased from the traders through the levy system. The levy system requires that traders can sell food grains in the market only after they have sold the levied amount to the government. However, the functioning of the food policy is also not very much encouraging because of its several weaknesses. The public procurement system is proved faulty. Even if the government announces a minimum support price, government agencies cannot purchase the entire quantity offered for sale at this price. Only rice, wheat and sugar are sold through PDS. But only these three commodities are not sufficient for subsistence. Sometimes the government curtails subsidies in order to reduce fiscal deficit. Moreover, the list of BPL families is also not appropriate. In fact, for food security the supply or availability of food is not sufficient. Purchasing power to buy food should also be created. Moreover for the absorption of food, the primary requirement is safe drinking water, primary health facilities, healthy environment and spread of education.

Suggestion and Conclusion

Sustainable food security is a global challenge. However, appropriate actions at the right time may be helpful in ensuring food security in the long run. In the Indian context, various measures were taken by the government from time to time. However, more concerned steps should be taken on certain specific areas. Control of population explosion is one of the important issues in this regard. Arrangement should be made for the conservation of land under cultivation. Lost fertility of land has to be restored. Water security has to be maintained. There should be availability of water not only for the present generation but also for the future generation. Bio-diversity has to be maintained. Instead of producing one or two crops round the year, different crops may be produced on the same plot of land. Environment should be protected from pollution. Investment in social sector such as health, education, nutrition, social security measures, etc. has to be increased. Moreover, the right to food should be recognized as a fundamental right. To ensure food security, non-government organizations (NGOs) should act as pressure groups exerting pressure on central and state governments to ensure food security for all citizens.

Food insecurity leads to social and political instability, thereby retards economic development. Hence in the interest of economic development urgent measures should be taken to solve the food crisis and for ensuring sustainable food security. Agricultural productivity must be increased. The government should significantly increase its investment in agricultural research, education, and rural infrastructure. Climate change and its effects need special attention in designing the agricultural policy so as to ensure sustainable food security.

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