



Research Paper

Organic Farming in North Eastern Hill Region of India: The Way Forward

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Abstract: In organic farming improvement of agro-ecosystem is the prime importance to sustain and improve the soil health to make the soil capable of supplying all the essential nutrients to the crop for increase the productivity. Agriculture in North Eastern Hilly Region of India is organic by default. The farmers of the North Eastern Hill Region depend on agriculture for their livelihood. Most of the farmers of this hilly region are practicing organic farming with indigenous knowledge system since time immemorial. The production technology following the improved method of crop cultivation like compost preparation, use of bio-fertilizers and bio-pesticides, crop rotation with leguminous crop etc. should be popularized in this region for successful organic farming in the North Eastern Hilly Region of India. So, various research and extension activities are required to introduction and promotion of various low cost technology of organic inputs production in the farmers' level so that organic farming may be converted to self-reliance practice and become suitable and attracted for both resource-poor and resource-rich farmers

by taking the market strategy suitable for local farmers in the village level itself. This paper attempts to highlights the present status of organic farming in North Eastern Hilly Region of India and to cite some recommendation for the success of organic farming in this area for the livelihood and the economic upliftment of the Region.

Keywords: organic farming, agro-ecosystem, agriculture, farmer, bio-fertilizers

Introduction:

The concept behind the organic farming is to go back to the arms of nature and take up organic farming to restore the loss which was obtained by the haphazard conventional farming to achieve the goal of food sufficiency. The maximum areas of North Eastern Hilly Region in India along with other hilly states are following the organic farming which is achieved by wisdom. Organic farming is getting popularity worldwide. It has beneficial effects to the environment as well as for the human health where the farmers are expected more money and profit by justifying higher prices of organic produce

(Bordoloi, 2014). Conventional farming refers to a production system which employs a full range of tillage practices, synthetic fertilizers and pesticides and characterized by a high degree of crop specialization but organic farming is not dependent on the above factor and characterized by a diversity of crops (Guthman 2004, Reddy *et al.*, 2010, Bordoloi, 2021 a). Organic farming provides environmental benefits which relates to soil properties and other major components of environment, capturing more water, less prone to soil erosion by adopting crop rotation and other techniques and helps in replacing the mineral fertilizers and pesticides by organic products, enhances the soil biological activity and efficiency by microbial substrate use (Bordoloi, 2021 b, Swami-Sanjay, 2020). In North Eastern India a huge amount of bio-waste is generated every year which could be recycled annually for meeting the nutrient requirement of the crop. Those bio-waste can be utilized successfully to improve the organic carbon content of the soil, can improve other available nutrients required by the crop for proper growth and development, improves the moisture retention capacity and buffering capacity of the soil along with many other desirable attributes of soil quality when it is applied directly or it can be use for production of organic manure with high nutrient content in a short period of 50-80 days using earthworms and cellulose decomposing microorganisms either alone or in combination (Kumar *et. al.* 2020, Rajkhowa *et. al.*, 2013, Bordoloi, 2021c). Some improved methods of bio-waste conversion to nutrient rich organic manure were presented by many Researchers which is suitable for North Eastern Hill Region. In a recent study Rajkhowa *et al.* (2019) was presented a method of bioconversion of agricultural waste in the terrace lands of hills by digging pits in

hilly regions of North East India. This paper attempts to highlights the present status of organic farming in North Eastern Hilly Region of India and to cite some recommendation for the success of organic farming in this area for the livelihood and the economic upliftment of the Region.

ORGANIC FARMING IN NORTH EASTERN HILLY REGION OF INDIA

The Agriculture in North Eastern Hilly Region of India is organic by default. The Farmers of North Eastern Hill Region depend on agriculture for their livelihood. Most of the farmers of this hilly region are practicing organic farming with indigenous knowledge system since time immemorial. In terms of organic agricultural land India ranks 8th and India ranks 1st in terms of total numbers of organic farmer among the world (Anonymous, 2020). Sikkim is declared as first organic state of entire world in the year 2016.

Organic Farming has dual advantages as it has positive effects on the environment and it tries to make the farmer self-sufficient in terms of agro-inputs (Prasad *et. al.*, 2009, Bordoloi, 2021a). The use of chemical fertilizers, pesticides etc. are very limited in maximum parts of North Eastern Region. Due to the remoteness of this region the impact of green revolution of India has escaped this region as evidenced by lack of modernization of agriculture like poor adoption of improved technologies, low consumption of fertilizers, lack of irrigation, use of high yielding varieties of seed, heavy machinery etc. Moreover the farmers of this region are afraid and not willing to use the chemical fertilizer and pesticides to their crop field by realizing the adverse effect on soil and human health (Bordoloi *et. al.*, 2020, Sanjay-Swami, 2019).

Although economy of North Eastern India is based on agriculture but due to the occurrence of heavy rainfall the high soil

acidity is experiencing in this region which affects the crop productivity (Bordoloi, 2020; Bordoloi, 2021d, Sanjay-Swami *et. al.*, 2020 and Lyngdoh *et. al.*, 2020).

Due to the high price of organic inputs, lack of appropriate market for getting higher prices, export market, certification process etc. the organic farming is limited to the resource rich farmers who are doing organic farming for profit maximization (Sanghi, 2007). But the farmers from various parts of the country they are doing the organic farming as like ecological farming where the farmers are not depends on external inputs and getting low profit. Although there are various limiting factor in organic farming in North Eastern Hilly Region of India in terms of profit maximization there are lots of scope and opportunities are there to promote organic farming in North Eastern Hilly Region of India. Organic farming relies on organic manures, crop rotation and biological pest control which promotes and enhances biodiversity, biological cycles and biological activity of the soil (Sanjay-Swami *et. al.*, 2020b). There is a possibility for nutritious organic manure production by following improved method which may be almost enough for nutrient requirement of the crop grown in North Eastern Hilly Region of India by the organic waste material available in the region itself. According to Bujarbaruah (2004) the region has a potential of producing about 47 million tons of organic manure including 37 million tons from animal excreta and 9 million tons from crop residues, which may be sufficient for maintain the organic matter content of the soil for crop cultivation. North Eastern India is the home for some of the famous crop of India like Assam lemon, Joha rice, passion fruits, pineapple, orange, zinger, turmeric etc. along with various medicinal plants (Munda *et. al.*, 2007). Though the organic movement has regarded with

some scepticism (Trewavas, 2001 and Trewavas, 2004) it has strong marketing appeal (Cornish, 2002) and it is one of the fastest growing agribusiness sectors in the world. The organically cultivated products are more preferred by the consumers as because of the knowledge of adverse effect of chemical pesticides and fertilizers to the health of Mankind. Moreover it is believed that the organically grown commodities are more nutritious than the commodities produce under conventional system. The increased demand for organic agricultural products for high value commodities both for fresh and processed products in the domestic and global markets is the boon for adopting the organic farming for income generation and it is pointing towards potential prosperity of the Region. Industrialization in organic farming is also the opportunity for the Farmers of North Eastern Hilly Region for profit maximization and economic upliftment of the region. By adopting organic farming food security can be improved by diversifying on-farm crop and livestock operations (Parrott *et. al.*, 2006 and Wani *et. al.*, 2013).

RECOMMENDATION FOR FUTURE DEVELOPMENT OF ORGANIC FARMING IN NEH REGION

The privilege of organic farming which is achieved by wisdom in the hill agro-ecosystem of North Eastern parts of India is the blessings for the humankind as well as for the environment of the Region. For making North East India as a organic hub some recommendation are required for successful achievement in organic agriculture sector for improvement the farmers income as well as socio economic development of entire North Eastern India. Some strategies are recommended by considering the challenges faced by the North Eastern India for getting success in the field of organic farming for doubling

farmers' income as well as for the development of the Nation.

➤ Majority of the farmers of the North Eastern Hilly Region of India is following traditional agricultural practices for crop and livestock production. It may be due to unawareness about the recent technological development. So, there is an urgent need to cover all the farmers to give the awareness about the recent technological development for successful implementation of the organic farming by the Scientist and Extension Specialist.

➤ For making the North Eastern Hill Region of India as an organic hub in near future the proper and urgent Research and Extension Strategies are required. Extension network for dissemination of knowledge and technologies and monitoring their adoption should be strengthened. The improved and location specific technologies are required.

➤ The integrated farming system approach with watershed development with plantation crop and field crop along with animal and fishery component should be introduced in remote places. Adoption of low cost plastic tunnels, low cost plastic rain shelters and low cost greenhouse for year round production of high value low volume vegetable crops for high value commercial crops and off seasonal vegetable production for getting high income. The new and improved high yielding varieties should be introduced in the entire areas of the region.

➤ Due to over dominance of single crop and due to geo-physical and climatic condition soil erosion, nutrient leaching and soil exhaustion are occurring in this region. Moreover, lack of irrigation facility is also the constrain for successfully growing the organic crop in various part of this region. There is a need for adoption of intercropping and mixed cropping, introduction of leguminous crops to the cropping system, cover cropping, mulching etc. for getting

maximum productivity by cope up with the prevailing situation exist in the region. Construction of water harvesting structure like Jalkund should be introduced for water management in organic farming.

➤ In North East India the infestation of weeds, insect pest and diseases are somewhat high which is a constrain for adopting organic farming successfully. Strategies should be adopted to mitigate the problem of pest and disease infestation.

➤ For meeting the nutrient requirements the improved and quick composting method should be introduced. The vermi-composting, bio-fertilizers, green manuring and concentrated organic manures like neem cake should be used for proper soil nutrition management for organic crop cultivation. In-situ biomass management in shifting cultivation instead of biomass burning for improving soil carbon is advisable. The improved varieties requiring less nutrient should be incorporated. In organic farming some products are required specially the bio-fertilizers, bio-pesticides etc. which should make available in proper time and proper place by the government side.

➤ Post harvest management technology should be introduced for proper handling of organic produce. Government policies should be there for construction of more food processing units and industries which gives a scope for the farmers for getting higher prices for their produce and it will encourages the farmers to go for organic farming. Adoption of cool transport chain, pre-cooling units, packing houses, short and long term cold storage facilities should be incorporated in every villages for minimizing the post-harvest losses.

➤ Government policies for organic farming should be location specific and should be suitable for a particular area. Financial and technological support should be there to promote the organic farming commercially. There should be proper

agency and proper support for organic certification.

Conclusion:

The farmers of the North Eastern Hilly Region of India are practicing organic farming by following natural farming by their traditional agricultural practices. The production technology required in organic farming for improve crop cultivation like compost preparation, use of bio-fertilizers and bio-pesticides, crop rotation with leguminous crop, mulching etc. should be popularized in this region for successful organic farming. The farmers are not aware about the complete package and practices of organic farming. So, various research and extension activities are required to introduction and promotion of various low cost technology of organic inputs production in the farmers' level so that organic farming may be converted to self-reliance practice and suitable and attracted for both resource-poor and resource-rich farmers by taking the market strategy suitable for local farmers in the village level itself. There is an urgent need for farmers' friendly government policy and strategies, location specific research and extension services, awareness about the proper nourishment of crop and pest and disease management, implementation of easy organic land certification process, development of proper marketing channels, etc. for making the organic farming successful in North Eastern Hilly Region of India and then it will soon be strengthen in organic farming and be able to make a proper place in global agricultural market.

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