

# The Organic Roadmap to Sustainability in Agriculture: Evidence from Bihar

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## **Abstract:**

**Organic farming is being practiced in 141 countries of the world today. The ill-effects' of chemicals used in agriculture have changed the mindset of some consumers of different countries who are now buying organic with high premium for health. Policy makers are also promoting organic farming for restoration of soil health and generation of rural economy apart from making efforts for creating better environment. It is emphasized that green manure saves 50-100% nitrogen and improves soil physical properties. Simple inoculation with Rhizobium/Azotobacter can increase productivity by 10 to 20 %. In addition, insect pest and disease incidence can decrease with the use of organic sources. Groundwater contamination with fertilizer and pesticides residues are posing threat to soil health and ultimately to human beings may be prevented under organic farming. Therefore, organic farming using manures, legumes, crop residues, off farm organic wastes and bio-pesticide, should be used to produce adequate food grains along with the conservation of the natural resources.**

**Key Words: Environment, Groundwater, Organic Farming, Rural Economy.**

## **INTRODUCTION**

ALTHOUGH THE TERM 'organic farming' is getting popularity in recent times, but it was initiated in 10000 years back when ancient farmers started cultivation depending on natural sources only. There is brief mention of several organic inputs in our ancient literatures like Rigveda, Ramayana, Mahabharata, Kautilya Arthasashthra etc. In fact, organic agriculture has its roots in traditional agricultural practices that evolved in countless villages and farming communities over the millennium. Organic agriculture has grown out of the conscious efforts by inspired people to create the best possible relationship between the earth and human. A major challenge today is certainly its entry into the policy making arena, its entry into anonymous global market and the transformation of organic products into commodities. During the last two decades, there has also been a significant sensitization of the global community towards environmental preservation and assuring of food quality. Ardent promoters of organic farming consider that it can meet both these demands and become the mean for complete development of rural areas. After almost a century of development organic agriculture is now being embraced by the mainstream and shows great promise commercially, socially and environmentally.

Organic farming is not only a specific agricultural production system, it is also a systemic and encompassing approach to sustainable livelihoods in general, where due account is given to relevant factors to influence for sustainable development and vulnerability, be this on physical, economic, or Socio-cultural levels (Eyhorn, 2007). Basically, the purposes of organic farming are for recycling wastes of plant and animal origin in order to return nutrients to the land, thus minimizing the use of non-renewable resources; reduce global warming by lowering emission of greenhouse gases hence temperature rise; enhances biological diversity within the whole system and increase soil biological activity minimizes indiscriminate use of pesticides affects on human and animal health, biodiversity of wildlife etc.& cause of environmental pollution; maintains long – term soil fertility and overcome micronutrient deficiency; reduce energy loss of both animal and machines, and risk of crop failure; promote the healthy use of soil, water, and air, as well as minimize all forms of gaseous pollution that may result from agricultural practices; highly adaptive to

climatic change due to application of traditional skills, farmers knowledge, soil fertility building techniques and a high degree of diversity.

### **Status and Scope of Organic Farming in Bihar:**

Agriculture is the mainstay of economies such as Bihar, underpinning their food security, employment, and rural development. It supports the livelihoods of more than three-fourth of the population. Besides generating employment, it also provides raw material to industries, augments food supply, and assists in poverty alleviation. The contribution of agricultural sector to State's GSVA stands around 20 percent in 2022-23. The share of crop sector in total GSVA was 9.9 percent during 2022-23. Despite the constraints of finite land resource, fragmented land holdings, and erratic rainfall, the production performance of crop and horticulture has been encouraging. In 2022-23, food grain production in Bihar stood at 19736 thousand tonnes. In Bihar, agriculture is not only the source of livelihood but also it generates raw materials for the agro-based industries which has immense potential in the state. Agro-ecological situation of Bihar is quite favorable for production of various field and vegetables crops, fruits, livestock, fish, honey and other commodities. Bihar enjoys monopoly in production of Litchi and Makhana in the country followed by honey and aromatic and medicinal plants.

In Bihar use of chemical fertilizer 201 kg/ha in 2020-21 to 207 kg/ha in 2022-23 is higher than national average (141.2 kg/ha in 2022-23) but farmers use imbalanced quantity of nitrogen (N), Phosphate (P<sub>2</sub>O) and Potash (K), resulting poor response of crops to this nutrients. Poor response to chemical fertilizer might be due to deficiency of micro-nutrients, particularly zinc, manganese and sulphur in the soil and thus affect the environment. Recognizing the adverse effects of excessive use of fertilizers, the state government is now promoting organic farming which would help retain the nutritive content in the soil and also produce food which is free of health hazards. The state government is making vermi-compost and bio-fertilizers available to farmers at affordable rates to minimize the dependency on chemical fertilizers. Demand for organically grown crops both in domestic niche markets and in export markets is another region behind it. Bihar is strong in production of certain high quality crops, vegetables, fruits and spices which are suitable for organic production system. Department of Agriculture, Bihar has taken initiatives to promote organic farming on a large scale.

Government of Bihar has taken up several programmes to encourage organic farming, with the objectives of promoting sustainable production, improving soil organic carbon for sustenance of soil quality, and promoting export of quality organic produce. Giving boost to organic farming in Bihar, Sohdi village in Nalanda district found a place on the global map through the global positioning system (GPS) for sowing potato over an area of 160 acres by using organic fertilizers only. The state government has decided to promote organic farming in at least one village of the 38 districts, as it felt that there is adequate farmyard manure, vermin-compost, and crops residue for use under organic farming. To encourage organic farming on a large scale with the view to declare the state as an Organic State, Department of Agriculture has prepared a five year Agriculture Road map-III (2017-22) for promotion of organic farming in the state with main objective of developing one village in each of the 38 districts was selected as organic grams or bio-village. Bio-village is a unit to improve physical, chemical and biological status of soil through locally available organic inputs and production of crops through scientific methods by farmers at village level. The concept helps to lower cost of production, increase fertility and check degradation of soil. The major goal of the programme is developing Bihar as a hub of organic farming. An amount of Rs. 1.54 lakhs crore has been provided under scheme for promotion of organic farming and develop the organic corridor scheme for areas along both banks of the Ganga and also along the highways, aims to ensure organic farming in 1.57 lakhs acres of land in 2016-17: 20000 acres in 2017-18, 25000 acres in 2018-19, 35000 acres in 2019-20, 45000 acres in 2020-21 and 50000 acres in 2021-22. For promotion of organic farming, farmers have been identified in villages along the river Ganges in the districts of Patna, Nalanda, Bhagalpur, Vaishali, Samastipur, Begusarai, Lakhisarai, Khagaria and Munger. The farmers among the listed district would get input subsidy in advance in the form of improved seeds, organic fertilizers, organic pesticides and a sum of Rs6000 per hectare of land (max. 2.5 hc). Agriculture and Processed Food Products Exports Development Authority (APEDA) has been entrusted as the certifying agency for organic produce. Bihar State Seed and Organic Certification Agency (BSSOCA) is involved in the certification process of organic produce and is undertaking programmes to educate farmers on organic farming practices.

This is aligning with the 2030 agenda for Sustainable Development Goals (SDGs). The State Government is implementing the Fourth Agriculture Roadmap (2023-28) to boost crop productivity, reduce production costs and improve the farmer's livelihood by investing in irrigation, infrastructure and technology. The Agriculture Roadmap - iv (2023-28) underscores the necessity of capacity building and extension services to educate farmers on balance fertilizer use and enhance their access to affordable fertilizer especially the biofertilizers and green manure. In 2022-23, Rs 3965.67 lakh was allocated under the Jaivik Corridor scheme to establish a cluster of organic farms along the Ganga river's bank.

### **Schemes & Programmes of the Department of Agriculture, GOB for Organic Farming:**

To give a boost to the efforts of state government for organic farming and to bring all stakeholder, including exporters, certification agencies, experts from international and national organizations on one platform, an International Conference is being organised in the month of June 2011 at Patna. This would be jointly organized by Department of Agriculture, Govt. of Bihar in association with ICAR-RCER, Patna and Institute of Horticulture Technology, New Delhi. Certification of organic crops produced in Nalanda has started through 'Ecocert'. Similarly, in Muzaffarpur, the National Agriculture Cooperative Marketing Federation (NAFED) is doing certification for "litchi". For the first time in India, Bihar farmers would be receiving 50% subsidy for production of vermicompost, a bio-fertilizer so as to popularize organic farming in the state.

ATMA as well as NGOs too have been roped in for creating awareness among farmers about organic farming. They are involved in forming groups and clusters of farmers engaged in organic farming and marketing of their produce through an effective marketing agency. It is expected that some unique organically produced commodities like jute, litchi, cosmetic raw materials viz. herbal and aromatic plants and makhana from Bihar will soon be ready for export to different world markets. The scope for other promising crops from Bihar include, Zardalu, a improved Mango variety from Bhagalpur and Shahi litchi varieties from Muzaffarpur which can safely be chosen for organic farming. Similarly, Nalanda district has been considered for organic potato production. A massive programme for encouraging the use of green manure particularly *Sesbania (Dhaincha)* has been initiated from *kharif* 2011. *Sesbania* seed was distributed to all interested farmers who have irrigation facility at 100% subsidy for a minimum of ½ acre and maximum of 5 acres; selected farmers of seed village, bio-village, and those using hybrid paddies as well as SRI technique are given priority. Extensive training programmes and mass media publicity were organised along with seed distribution and extensive follow up done to ensure success of the programme.

The Bihar State Organic Mission is being implemented in 12 districts (Patna, Buxar, Bhojpur, Nalanda, Vaishali, Saran, Samastipur, Begusarai, Lakhisarai, Khagaria, Bhagalpur and Munger) with a total approved sum of Rs. 15,588.58 lakh for the period 2019-20 to 2021-22 under the Agriculture Road Map-III mission. The main objectives of the scheme is to promote organic farming in the state, protect the environment, soil and water resources from pollution and make farming sustainable. It also aims at increasing the value of produce to ensure better incomes for farmers. Under the Adoption and Certification Programme of organic seeds, the farmers will be provided certification for adoption of organic seeds.

### **Vision of State:**

There is large untapped potential for development of Agriculture. There is large yield gap across the crop and sector. An agriculture road map is implemented since 2008. Food and nutritional security along with the increase in farmers income is the corner stone of agriculture road map. Organic farming is one of the major interventions proposed in Agriculture Road Map -III. Bihar is considered destination for second green revolution in the country. Plan Expenditure on agriculture has increased 40 times in last five years. State government has constituted a cabinet committee on agriculture. It is now on the fore front of the development agenda. With the natural resources of fertile soil, plenty of water and hard working farmers the state is poised for leap frog development of agriculture in the state.

The state government has launched organic Bihar project. State government has allocated a sum of of Rs. 1.54 lacs crore for next five years. It tends to promote Vermi-Compost on a large scale. It has been made demand based and farmers are promoted to set up units for Vermi-Compost production. Commercial production of Vermi-compost is also encouraged. Bio gas with or without human excreta is promoted. Bio fertilizers are promoted. Green manuring particularly with *sesbania* has been taken up on a large scale.

Dhaincha (*Sesbania sesban*) could yield 25-30 t/ha green biomass within 55 days and able to supply 90-120 kg of nitrogen, 12-15 kg of phosphorus and 8-10 kg of potash to the succeeding crop of rice during July. This attempt would help in maintaining the soil health besides increasing the productivity of rice. The practices of integrated nutrient management and integrated pest management is promoted with additional support to farmers for bio and organic inputs. One village in every district has been identified as organic village. It has yielded laudable success. The success can be replicated on a large scale.

Now it is high time to expand area under different fruits and vegetable crops as well as traditional cereal crops to reap the benefits of organic farming in the state. It is expected that some unique organically produced commodities like jute, litchi, cosmetic raw materials viz. herbal and aromatic plants and *makhana* from Bihar will soon be ready for export to different world markets.

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