



The Scope and Benefits of Organic Farming in India

(*Akash Verma)

B.Sc. (Hons.) Horticulture, College of Horticulture, MHU, Karnal, 132001

*Corresponding Author's email: akashcoh@mhu.ac.in

Organic farming has emerged as a beacon of sustainable agriculture, and in the diverse landscape of India, it is gaining traction as a viable alternative to conventional farming practices. This article explores the scope and benefits of organic farming in India, shedding light on its potential to transform the agricultural sector and promote environmental and human well-being.

Indian Scenario

Currently, India ranks 33rd in total land under organic cultivation and 88th in agricultural land under organic crops to total farming area. Nearly 4.72 million hectares have been brought under organic certification processes, including 0.6 million ha of cultivated agricultural land and 4.12 million ha for wild harvest collection in forests involving around 6 lakh farmers. India ranks 10th among the top ten countries of the world in terms of cultivable land under organic certification. It is the fifth largest country in having organic wild collection areas and bee pastures. Madhya Pradesh has the highest area under organic farming (1.1 mha or 52%), followed by Maharashtra (0.96 mha or 33.6%) and Orissa (0.67 mha or 9.7%). With the sizable acreage under naturally organic/default organic cultivation, India has tremendous potential to grow crops organically and emerge as a major supplier of organic products in the world's organic market. The demand for organic food is increasing steadily in both developed and developing countries at an annual average growth rate of 20-25 percent, and with the rise in consciousness, it is fetching ground in India and establishing a good export market.

Scope of Organic Farming in India

India stands as a significant global contributor to fruit production, accounting for about 10% of the world's total. Achieving a double-digit GDP growth rate in the country necessitates a robust agricultural growth of 4% or more. The potential for organic farming in India is underscored by the abundance of organic resources within the farming sector, including livestock, crop residue, water, aquatic weeds, forest litter, urban and rural solid wastes, as well as agro-industrial by-products.

Historically, India's agricultural practices, rooted in natural laws, have contributed to sustaining soil fertility over extended periods. The country's inherent advantages, such as diverse agro-climatic regions, self-sustaining agri-systems, a substantial number of progressive farmers, and the availability of cost-effective labor, position it favorably for cultivating a wide range of organic products. Over 65% of India's cultivated area relies on rainfed agriculture, incorporating crop rotation, residues, animal manure, legumes, and biological pest control.

Organic farming is gaining momentum, particularly in low-productivity areas, rainfed zones, hilly terrains, and the northeastern states where fertilizer consumption is minimal. The North Eastern Region (NER) stands out for niche crops like Assam lemon, Joha rice,

medicinal rice, and passion fruits, accounting for a significant portion of the nation's pineapple production. States like Uttaranchal and those in the Northeast have declared themselves "organic-farming states," with Sikkim leading as India's first fully organic state. Sikkim's success has inspired other states, such as Nagaland, where 3000 hectares are under organic farming, and Meghalaya aims to certify 200,000 hectares as organic by 2020. Regions experiencing high rainfall, such as the northeastern states, are particularly conducive to organic farming due to increased biomass production. The promotion of organic farming is especially advocated in rain-fed and hilly areas, where limited resources and smallholder farmers dominate the agricultural landscape. In the hilly terrain of Jammu and Kashmir, known for soil erosion and un-irrigated arable land, the potential for organic farming is substantial. Overall, the varied agro-climatic zones in India provide ample opportunities for widespread adoption of organic farming practices.

Benefits of Organic Farming

- **Organic consumes less energy and reduces GHG emissions:** Organic management shows a positive impact on soil-based greenhouse gas emissions. On average the climate protection performance of organic results in 1082 kg CO₂ eq per hectare and year, due to lower GHG emissions and increased carbon sequestration in soils
- **Lower emissions due to prohibition of synthetic fertilizers use:** Organic farming's prohibition of synthetic fertilizers leads to a significant reduction in greenhouse gas (GHG) emissions, as production, transportation, and use of these fertilizers contribute to emissions. By avoiding synthetic fertilizers, organic agriculture reduces GHG emissions by approximately 20% of the global annual agricultural total. Organic practices focus on closing nutrient cycles naturally, minimizing nitrogen losses, and optimizing nutrient levels.
- **Lower nitrous oxide emissions from soil:** Synthetic fertilizer use in agriculture contributes to nitrous oxide emissions, a significant greenhouse gas. Studies reveal a 40% reduction in nitrous oxide emissions per hectare in organic systems, showcasing the effectiveness of minimizing nitrogen application rates to mitigate this potent greenhouse gas. Manure management contributes to 15% of agricultural greenhouse gas emissions. Organic agriculture often employs improved techniques like manure composting, reducing nitrous oxide by 50% and methane emissions by 70%. To further mitigate emissions, efforts focus on limiting anaerobic methane generation, using closed storage, and promoting sustainable biogas production that relies on waste and residues, avoiding large-scale cultivation of energy crops like maize.
- **Organic sequesters and stores more carbon:** Organic farming practices combat declining organic matter in EU arable soils due to land management and climate changes. Techniques such as using organic fertilizers, crop rotations, reduced tillage, and cover crops significantly enhance soil quality and carbon sequestration. Globally, organic management exhibits 3.5±1.1 tonnes more carbon per hectare than conventional practices, with annual sequestration rates up to 0.5±0.2 tonnes. In Europe, reduced tillage under organic farming boosts surface layer organic carbon content by over 20%, as observed in Switzerland, with a 25% increase in topsoil organic carbon through reduced tillage. Besides climate mitigation, enriched humus content improves water infiltration, reduces erosion, and enhances plant health, showcasing the multifaceted benefits of organic practices.
- **Organic supports ecosystem functions:** Organic farming is crucial in preserving biodiversity, enhancing ecosystem processes, and promoting sustainable agriculture. Positive impacts include increased crop pollination for higher fruit yield, reduced misshapen fruit loss, and enhanced natural pest control. The emphasis on soil health in

organic practices results in improved soil structure, preventing soil erosion and aiding flood protection. Organic soils exhibit 137% higher water infiltration rates, reducing erosion from heavy precipitation by -22% and -26%. Additionally, organic farming minimizes nitrogen leaching, with a 30% increase in nitrogen mineralization during drought conditions. By avoiding pesticides and limiting veterinary drug use, organic farming significantly safeguards ground and surface water.

Constraints

- **Low amount of nutrients and high C: N ratio of different organic residues:** Organic nutrient sources, such as farmyard manure and compost, provide insufficient nutrients for crop needs, creating a substantial gap between potential and utilization. Slow nutrient release in low temperatures complicates synchronization with crop uptake. While residues like paddy straw can supplement nutrient needs, their high C:N ratio causes nutrient immobilization. Meeting 100% of crop nutrient requirements solely from organic sources is impractical in full-scale organic farming on cultivable land.
- **Low yield of crops:** With the use of organic sources of nutrients, the yield of the crop is very low, especially during the initial stages; although it may stabilize later, complete dependence on pure organic farming will not be sustainable in the long run.
- **Market and Infrastructural problems and lack of target (institutional) groups:** Organic agriculture faces significant challenges in market development, particularly in domestic markets, due to remote locations and limited product variety. Supply chain actors lack interest, hindering consumer demand and procurement by institutions. High consumer prices further limit interest. Inadequate processing, packing, and storage infrastructure to meet organic standards exacerbates the issue. The absence of target groups like upscale hotels and restaurants willing to pay premiums compounds the challenge, while common consumers struggle with affordability, resulting in low domestic consumption.
- **High input costs:** Local or farm renewable organic resources like neem cakes, groundnut cakes, cow dung, earthworms, etc, are becoming costlier day by day than conventional or industrially produced chemical fertilizers & pesticides. Chemical fertilizers are easier to purchase, given the farmer has purchasing power.
- **Lack of awareness:** There is a lack of awareness and knowledge about modern methods or techniques of composting, vermicomposting etc., among the farmers from the preparation as well as application point of view, and thus both quality and efficacy are poor at the end.
- **Certifying oriented problems:** Before producing marketable products, an organic farm has to have a transition period of 1 to 3 years, depending upon the certifying agency's requirements. During this period, the farmers have to grow the crops as per standards set for organic farming and thus produce about 3/4th of the normal yield. Yet, they have to market the produce in the general market. Small and marginal farmers can hardly afford to do so. Moreover, the farmers won't opt for certification because of the costs involved and the extensive documentation required by certifiers.

Conclusion

In conclusion, the trajectory of organic farming in India unfolds as a beacon of hope for a transformative and sustainable agricultural future. The expansion of organic practices promises increased yields and improved soil health and aligns with global movements toward environmentally conscious and ethical farming. The potential benefits, spanning from reduced environmental impact to enhanced food quality, underscore the need for a collaborative effort. Farmers, policymakers, and consumers play pivotal roles in nurturing the

growth of organic farming. By investing in education, infrastructure, and policy support, India can usher in a new era of agriculture that prioritizes health, sustainability, and resilience in the face of evolving challenges. The success of organic farming holds the key to a future where the land, its stewards, and the consumers thrive in harmony with nature.

References

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