



Role of Extension in Promoting Organic and Natural Farming

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INTRODUCTION

Agriculture is essential for feeding the world and providing livelihoods. High-yielding varieties, chemical fertilizers, pesticides and irrigation technologies largely contributed to the increase of agricultural productivity during the Green Revolution, but over-reliance on these inputs has led to problems of environmental and socio-economic degradation successively, including soil degradation, biodiversity loss, ground water pollution and increase in input costs of production. Hence organic and natural farming are gaining importance as appropriate means to achieve ecology friendly, soil friendly, biodiversity friendly, and least dependence on synthetic inputs. Their adoption, however, has been limited by lack of awareness, technical know-how, certification issues, and uncertainty in the market. To this end, agricultural extension acts as a catalyst by raising awareness, enhancing the capacity of farmers, bridging them with technology, and encouraging the implementation of sustainable agriculture.

Concept of Organic and Natural Farming Organic Farming

Organic agriculture is a whole system of management and practices that is based on promoting and enhancing ecosystem health, including biodiversity, biological cycles, and soil biological activity. It stresses the application of organic manure, biofertilizers, crop rotation, green manure, biological management of pests, and other ecological processes and prohibits the use of chemical fertilizers, pesticides and genetically modified organisms.

Major Principles of Organic Farming

The major principles of organic agriculture include health, ecology, fairness and care. This is based on between the principles of ensuring soil, plant, animal, human and environmental health and protecting and enhancing biodiversity and ecological balance, and being just and using resources responsibly for ensuring sustainability over time.

Benefits of Organic Farming

The environmental and agricultural benefits of organic farming may be mentioned as increased soil fertility and good structure, amplified biodiversity, decreased environmental

pollution and the production of food that is more safe and healthy. It contributes to the sustainable evolution of farming systems, through natural resource preservation and ecological stability maintenance, for future generations.



Natural Farming

Natural farming is a farming system based on forestry principles and utilizing natural local material which is worked on a farm not disturbed from whichever layer is present. It reduces reliance on external inputs and promotes farm ecosystem earth.

Core Components of Natural Farming

Beejamrit, Jeevamrit, mulching, Waaphasa, and mixed/intercropping systems are the essential part of natural farming. These practices promote seed health, stimulate soil microbial activity, conserve moisture, maintain soil aeration, and increase crop diversity for sustainable production.



Benefits of Natural Farming

Natural farming contributes to lower production costs by reducing the reliance on external inputs and increasing soil biological activity and soil health in general. It strengthens farmer resilience to climate variability, decreases reliance on bought inputs, and supports long-term ecosystem

sustainability by conserving natural resources and ecological processes.

Importance of Agricultural Extension in Sustainable Agriculture

Agricultural extension is a non-formal education system and service that increases farmers knowledge and skill, leading to improvement in decision making and adoption

of better technologies and management practices. In natural and organic farming systems, extension has a vital function in supporting learning, problem solving, innovation diffusion and institutional development, as it assists farmers in making the transition from conventional to sustainable agricultural systems.

Role of Extension in Promoting Organic and Natural Farming

1. Creating Awareness and Sensitization

Awareness of advantages of organic and natural products is a vital role of agricultural extension. Farmers are taught about the environmental consequences of overuse of chemicals, how to manage soil health, produce food safely, and farm sustainably, as well as the economic benefits of doing so over the long term. Through publicity campaigns, village level meetings, exhibitions, farmer fairs and mass media support of extension work keep farmers enthusiasm to take up sustainable agricultural practices.

2. Capacity Building and Skill Development

Organic and natural farming are knowledge-intensive productive processes, hence knowledge generation and dissemination are crucial areas of agricultural extension. Extension agencies also build farmers' capacity in composting, vermicomposting, use of biofertilizers, biological pest management, preparation of Jeevamrit and Beejamrit, crop diversification through training programmes, workshops, farmers field schools, exposure visits and on-farm demonstrations. This work increases confidence among farmers, builds their technical know-how, and helps to mitigate the risks of piloting sustainable agriculture techniques.

3. Technology Transfer and Knowledge Dissemination

Extension is the important connecting link between the scientific research organizations and the farming community by way of providing information on organic nutrient management, biological pest control, climate

resilient agriculture and integrated farming systems. Contemporary extension methodologies encourage two-way communication, fostering a dialogue between scientific knowledge and farmers' indigenous knowledge, thus facilitating the articulation and dissemination of multi-local, sustainable farming technologies.

4. Demonstration of Organic and Natural Farming Practices

Demonstrations serve as an effective extension activity for creating awareness on organic and natural farming as farmers are more likely to adopt after seeing results. By organizing field line or method demonstration, result demonstration and model organic farm the extension agency convincingly demonstrates the higher productivity, profitability and sustainability of these farming systems to lead to larger adoption by farmers.

5. Promotion of Farmer-to-Farmer Learning

Farmer-to-farmer learning is a very promising extension methodology for organic and natural farming. The extension system promotes the exchange of knowledge between farmers through formations such as farmers groups, FPOs, farmers field schools, community learning platforms etc. Local resource persons are successful farmers who have adopted sustainable practices and are willing to share practical experiences. This approach to learning from peers creates higher levels of trust, better information flow and faster diffusion of organic and natural farming.

6. Strengthening Farmer Organizations

Cooperation is very important in the development of organic and natural agriculture. Agricultural extension facilitates the organization of farmer groups, cooperatives, self-help groups (SHGs) and producer organizations (POs) for capacity building of farmers. These institutions allow for the bulk buying of inputs, certification, value adding, and collective marketing, helping farmers cut costs, increase bargaining power, and access markets better.

7. Facilitating Organic Certification

Certification in organic farming is a big hurdle, and extension is crucial in assisting farmers in managing the process. Extension agents offer advice on certification standards, record keeping, inspection procedures, traceability systems and Participatory Guarantee Systems (PGS). This kind of support decreases the process barriers, improves the compliance and simplifies the way for farmers to organic markets.

8. Market Linkage Development

Market uncertainty is one of the stumbling forces for organic farming adoption. Agricultural extension also assists farmers in creating connections with organic retailers, consumers, farmer markets, e-commerce sites and processing companies. Extension services also provide farmers with access to markets and with the development of value chains allowing farmers to obtain higher prices, increased income and the continuation of organic farming.

9. Promoting Digital Extension Services

The agricultural extension has been transformed because of the digital technologies with an ability to disseminate information more rapidly and more broadly. Mobile advisory services, social media, WhatsApp groups, apps, e-learning platforms, and AI-based advisory systems offer timely guidance to farmers on organic and natural farming. These extension services are digital, and have the potential to increase outreach of extension workers as well as access to knowledge among those they serve making farmers more informed decision makers.

10. Supporting Climate-Resilient Agriculture

Agricultural extension encourages organic and natural farming methods that are climate resilient, including soil carbon sequestration,

water use efficiency, crop diversification, agroforestry and integrated farming systems. These sustainable practices enhance the capacity of farmers to cope with climate variability, increase resource-use efficiency, and mitigate environmental impacts, while making certain that agriculture remains sustainable in the future.

Challenges Faced by Extension in Promoting Organic and Natural Farming

However, agricultural extension service encounters some difficulties to support organic and nature farming such as a farmers inaccessibility to the site-specific technologies, insufficient research back up, lack of trained manpower and financial constraint. There are also producer-related barriers to adoption, including lack of knowledge, fear of yield losses during conversion, risk aversion, and access limitations to organic inputs. In addition, high certification costs, market uncertainties, poor infrastructure and weak value chains are major barriers.

Strategies for Strengthening Extension Support

Capacity building of extension personnel on a regular basis, participatory approaches, and synergy among researchers, extension agencies, NGOs, and farmers will enhance the effectiveness of extension in promoting organic and natural farming. Information and communication technologies can be combined with traditional extension techniques to enhance outreach and delivery of services. In addition, the promotion of public-private partnerships and the formation of strong organic value chains that include production, certification, processing, branding and marketing are necessary to provide application of organic and natural farming practices in a sustainable manner.



Future Prospects

The increasing global need for safe and environmentally sustainable food offers great opportunities for organic and natural agriculture. Enabling Environment Governments around the world are increasingly enabling sustainable agriculture through policy measures, financial support and capacity development. Innovative solutions including artificial intelligence, remote sensing, mobile-based advisory systems, and digital marketplaces have the potential to significantly improve extension effectiveness. Extension systems of the future are expected to be more participatory, demand-driven, technology-enabled, and focused on sustainable development. In this way, by marrying science with local knowledge, organic extension can help create impact through mass adoption of organic and natural farming practices and

contribute to agricultural systems that are resilient.

CONCLUSION

Agricultural extension services are responsible for enabling organic and natural farming through the generation of awareness, development of skills, transfer of technology, support to certification and development of markets. There is an ever-growing need for more effective extension services as sustainable agriculture becomes increasingly vital for the provision of food security, environmental protection, and climate resilience. Enhancing extension with innovation, digital technologies, participatory approaches, and institutional collaboration can further strengthen the diffusion of sustainable farming practices and the development of long-term agricultural production.