



Role of ICT in Organic Farming and Marketing of Organic Products

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Over the past two decades, the major structural shift in agriculture has been mainly aimed at meeting the demands of the rising population, especially in underdeveloped and developing countries such as India. In this process, in its technical and functional aspects, agriculture became less organic as high in put consumption played a key role in increasing food production. Currently, agriculture is at crossroads with higher production is expected to meet the increasing demand for food commodities and to concentrate on the consumption of natural resources in order to keep the soil green and safe. There is a growing knowledge of the quality of food as well as the degree to which unnecessary and indiscriminate use of chemicals affects the environment. Organic farming, therefore is gaining greater interest worldwide. The numerous reasons for the successful adoption of organic farming in selected areas where they have a competitive advantage can be examined and research for generating innovations that help modern organic farming can be improved. This research may not only lead to improved security of nutrition and the environment, but may also enhance the export prospects of the country.

Recent Government of India Initiatives to Promote Organic Farming

National Centre of Organic Farming

National Centre of Organic Farming by Department of Agriculture, Cooperation and Farmers Welfare, Ministry of Agriculture and Farmers Welfare, Government of India (GOI) is relentlessly working on the development of organic farming among the farming community with its four regional centres. The NCOF is implementing the National Organic Farming Project (NPOF) scheme in the country. Since the 10th Five Year Plan, the National Project on Organic Farming (NPOF) has been a permanent central sector scheme. The National Centre for Organic Farming in Ghaziabad and its eight regional centres in Bangalore, Bhubaneswar, Panchkula, Ghaziabad, Imphal, Jabalpur, Nagpur and Patna are implementing the NPOF. In addition to working towards achieving NPOF goals, NCOFs and RCOFs also play specific roles in the promotion of organic farming.

Objectives

1. Promotion of organic farming in the country through technical capacity building for all stakeholders, including human capital development, transfer of technology, promotion and production of quality organic and biological inputs.
2. Knowledge production and publicity through print and electronic media.
3. To act in accordance with the Fertilizer Control Order Requirement as a nodal quality control laboratory for bio-fertilizer and organic fertiliser research (FCO, 1985).

4. Revision of standards and testing procedures, taking account of scientific and technical developments and putting the remaining organic inputs under the quality management regime.
5. Management of organic input materials, advancement of technology through research support and business development.
6. Promotion of organic farming through the "Participatory Guarantee System" system of low-cost certification.
7. Through the Capital Investment Subsidy Scheme (CISS), the NPOF scheme provides financial assistance for agro-waste compost production units, bio-fertilizer/bio-pesticide production units, the development and implementation of quality control systems, the development of human resources, etc.

Participatory Guarantee System for India (PGS-India)

The Participatory Guarantee System (PGS) is a locally specific quality assurance programme that emphasises the involvement of stakeholders, including producers and customers, and operates outside the third-party certification process. Participatory Guarantee Systems are locally based quality assurance systems in compliance with the IFOAM (International Federation of Organic Agriculture Movements) (2008) concept. They certify producers on the basis of active stakeholder involvement and are based on a base of trust, social networks and exchange of knowledge. PGS is a mechanism in which individuals in similar circumstances (in this case, small holder producers) review, inspect and check each other's production practises and take decisions on organic certification (PGS-Green and PGS-Organic). The PGS framework has a variety of fundamental components that include a participatory approach, a common vision, openness and confidence. A critical and dynamic feature of PGS is participation. Primary stakeholders are involved in the initial design and then in the service of the PGS (producers, customers, retailers, traders and others such as NGOs, Societies/ Gram panchayats/ State/Central Govt. organizations/agencies/farmer etc.) Stakeholders (including producers) are interested in the operation of the PGS in the form of decision-making and important decisions on the operation of the PGS itself.

Role of ICTs in Organic farming

Owing to the indiscriminate use of harmful chemicals in our natural resources, the sustainability of agriculture has become a major challenge in the past few days. In addition to water, nutrients are an essential input for guiding sustainable farming growth. The combined use of various plant nutrient sources i.e., organic and biological enhancements, is essential for the conservation and improvement of soil fertility and the supply of plant nutrients at the optimum level for the required crop productivity. Long-term detrimental effects on soil fertility have been caused by unbalanced use of N:P:K. In addition to supplementing chemical fertilisers, the use of organic manure, crop residue and biodegradable rural and urban waste also improves productivity in the supply of nutrients, contributing to improved physical and biological properties of the soil. Integrating different information systems (networks) involves an hourly approach to organic farming and sustainable farming practises, allowing for a connection between science, technology and development. The distribution of information through information technology should be fast enough in order to achieve full potential from it. Globalization exposes the farming sector to extreme rivalry. In India, only less than 8% of scientific information is transmitted to farmers and there is a very important role for modern electronic/digital information & communication technologies to play in improving this situation. Modern ICT will enable farmers (particularly small and marginal) to obtain timely and relevant information for sustainable livelihoods at the grass root level (ITU, 2016). The internet has become a cost-effective medium of infinite exchange of information, but the question is how effectively we can develop bridge professionals who can

use these advances to support the agricultural/rural community and translate these advances to ensure food security and soil fertility. Long ago, with the establishment of the Agricultural Research Information System by the Indian Council of Agricultural Research (ICAR), the initial steps in information technology began in the agricultural sciences in India. There is very little information available on organic farming, and in particular on the sustainable method, and some of the studies conducted during the period before the use of chemical fertilisers and pesticides are important to today's organic farming. In addition, we must realise that the future progress of organic farming systems will depend, to a large extent, on the generation of new technology suitable for a specific agro-climate situation under the current structural framework. The development of sustainable agricultural systems would involve an interdisciplinary approach to resource conservation study, reduced labour, management of pests, crop rotations, improved crop varieties, etc. For the promotion of organic farming and sustainable agriculture, ICTs may also be used. It is also important to adapt the extension functionaries at different levels to the shift in the philosophy of agriculture, i.e., from energy intensive agriculture to organic agriculture. Scientific literature on organic farming and the essence and status of organic farming-related educational materials includes an inventory, review and assessment of existing reports and professional journals, extension materials and other sources of knowledge as to their importance and applicability to the information and education needs of contemporary organic farmers. A high level of illiteracy will require wide band connectivity for the sharing of audio and visual information in most rural areas of the country. Without this, there would be no useful and appropriate content for information produced and disseminated to the rural population. Fortunately, the second green revolution may be called the agricultural information, technology, computers, nano science revolution, and there are already some obvious signs that rural Asia-Pacific agriculture is in the centre of it (Swaminathan, 2016). This revolution is brought about and sustained by new information and communication technologies (ICTs) by empowering poor farmers with up-to-date knowledge and information (Chatterjee and Nath, 2015). ICT is an umbrella term covering communication devices such as radio, television, mobile phones, hardware and software for computers and networks, satellite systems, and so on. These days with the advent of mobile phones and telecommunication networks usage of mobile phones for any type of information has become regular habit of rural farmers apart from hearing radio and watching TV, which are very strong source of communication in the past decades. Timely, agile and timely information on weather forecasts and calamities, better and spontaneous sustainable agricultural practises, better marketing visibility and pricing, reduction of agricultural risks and increased incomes, better knowledge and information, enhanced networking and communication, on line trading and e-commerce facilities, decision support system are some of the significant advantages of ICT. Most importantly, in the contemporary scenario social media is revolutionised the things and penetrated in rural areas with rapid speed and disseminating the information with almost no time.

Use of ICT for organic farming

Innovation in ICT plays a key role in improving productivity in agriculture and the value chain. ICT food traceability systems have become very important risk management instruments that allow food business operators or authorities to resolve food safety issues and foster consumer trust (Sangwan and Komal, 2016). ICT-enabled marketing and market access play an important role, especially in terms of information on market prices and demand. ICT-enhanced marketing and qualification further reinforces small-scale producers' potential to raise sales by enhancing their local and foreign market position. For various purposes, including land-use planning, crop forecasting and early warning systems, among others, GIS and Agro Meteorological Technologies have been implemented into programmes from the

very beginning. In order to track risks from the rising number of natural disasters, space technology is also important (Anitha and Navyashree, 2015). Furthermore, the use of cell phones for the sharing of information, such as disease surveillance and pest monitoring, has become more widespread. ICT strategies for the later stages of the agricultural value chain are also increasingly prevalent (e.g., post-harvest, transport, storage).

Organic farming production system mainly consist of:

1. Crop production
2. Water management
3. Fertilizer Application
4. Fertigation
5. Pest management
6. Harvesting
7. Certification
8. Post-harvest Management
9. Transporting of food and food products
10. Packaging
11. Branding
12. Food preservation
13. Food processing/value addition
14. Food safety, Food storage
15. Food marketing

All stakeholders of organic farming need information and knowledge about these phases to manage them efficiently. Any method used to obtain information and expertise in any industry to make decisions should provide reliable full, succinct information on time or on time. The information provided by the system must be easy to access, cost-effective and well secured from unauthorised daces in a user-friendly format. Any method used to obtain formation and expertise in any industry to make decisions should provide reliable full, succinct information on time or on time. Thein formation provided by the system must be easy to access, cost-effective and well secured from unauthorised access in a user-friendly format. Since it is made up of three main technologies, information and communication technology (ICT) will play an important role in preserving the information characteristics described above. They are: computer technology, technology for communication and technology for knowledge management. These technologies are used for data, information and knowledge processing, sharing and management.