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ORGANIC AGRICULTURE EXPANDS AND CONTRIBUTES TO SUSTAINABLE FOOD SECURITY

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ABSTRACT
Global food security problem has raised concerns on the best agricultural practices that will stand the test of time to replace the already failing conventional agriculture. Yields are reportedly decreasing despite the increasing use of inputs. To solve this problem, researches have revealed that organic agriculture can get the needed results in more sustainable manner. The impacts of organic production up-scaled to regional and global levels give an initial quantification of the potential extent of changes that large scale conversion might induce.

Introduction

"Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life." Modern crop production technology has considerably raised output but has created problems of land degradation, pesticide residues in farm produce, gene erosion, atmospheric and water pollution. With exploding population and rapid depletion and degradation of the natural resource base, sustainable agriculture has assumed very great significance. The task of meeting the needs of the present generation without eroding the ecological assets of the future generations is receiving top priority by environmental planners. The article presents this discussion based on experience gained in practice and encompasses the following hypotheses, i. Organic agriculture is sustainable and diverse, ii. Organic farmers produce more and better quality products and achieve higher income, iii. Organic products provide market access and create added value and iv. Organic agriculture increases self-confidence and mobilizes new partnerships.

Concept of organic agriculture

Organic agriculture is one among the broad spectrum of production methods that are supportive of the environment. Organic production systems are based on specific standards precisely formulated for food production and aim at achieving agro ecosystems, which are socially and ecologically sustainable. It is based on minimizing the use of external inputs through use of on-farm resources efficiently compared to industrial agriculture. Thus the use of synthetic fertilizers and pesticides is avoided.

Definition of organic agriculture

Organic agriculture is a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to

local conditions, rather than the use of inputs with adverse effects.

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Table 1. Difference between sustainable and modern agriculture

Sl. No.	Particulars	Sustainable Agriculture	Modern Agriculture
1	Plant nutrients	Farmyard manure, compost, green manures, bio fertilizers and crop rotations are used.	Chemical fertilizers are used.
2	Pest control	Cultural methods, crop rotation and biological method are used.	Toxic chemicals are used.
3	Use of resources	The rate of extraction from forests, fisheries, underground water resources and other renewable resources do not exceed the rate of regeneration.	The rate of extraction exceeds the rate of regeneration. Falling of trees, deforestation, overgrazing and pollution of water bodies takes place.
4	Quality of food materials	Food materials are safe.	Food materials contain toxic residues.
5	Ecology	Stable ecology.	Fragile ecology.

Organic agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved. The popularity of organic farming is gradually increasing and now organic agriculture is practiced in almost all countries of the world, and its share of agricultural land and farms is growing.

Principles of organic agriculture

The Principles of organic agriculture serve to inspire the organic movement in its full diversity. It is based on four basic principles. The principles are to be used as a whole. They are composed as ethical principles to inspire action.

- Principle of health: Organic agriculture should sustain and enhance the health of the soil, plant, animal and human as one and indivisible.
- Principle of ecology: Organic agriculture should be based on living ecological systems and cycles, work with them, emulate them, and help sustain them.
- Principle of fairness: Organic agriculture should build on relationships that ensure fairness with regard to the common environment and life opportunities.
- Principle of care: Organic agriculture should manage in a precautionary and responsible manner to protect the health well-being of current and future generations and the environment.

Current situation: There are two different kinds of organic farms in the world. i. Certified organic farms - producing for a premium price market and ii. Non-certified organic farms - producing for their own households and for local markets.

Most organic farms in developed countries, where markets are more developed, are certified by a third party and produce for a premium price market. In recent years there has been a substantial growth in the number of certified farms in developing countries, although these still (with the exception of a few countries) represent a very small percentage of total farm numbers. Apart from third party certification there are other methods of organic quality assurance for the market place. These can be in the form of self-declarations or participatory guarantee systems. There are also situations where the relation between the consumer and the producers are strong enough to serve as a sufficient trust building mechanism, and no particular other verification is needed.

Scope of organic agriculture in India

Only 30% of India's total cultivable area is covered with fertilizers where irrigation facilities are available and in the remaining 70% of arable land, which is mainly rain-fed, negligible amount of fertilizers is being used. Farmers in these areas often use organic manure as a source of nutrients that are readily available either in their own farm or in their locality. The northeastern region of India provides considerable opportunity for

organic farming due to least utilization of chemical inputs. It is estimated that 18 million hectare of such land is available in the north east, which can be exploited for organic production. 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.

Major components to use in organic agriculture:

i. Farm Yard Manure and Crop residues
ii. Composting
iii. Green Manure
iv. Bio-fertilizer

Advantages of Organic agriculture:

Organic agriculture is good for biodiversity. Organic farmers use more agro-ecological methods. So that the benefits for using organic agriculture are,

- Environmental benefits of organic agriculture.
- Nutrient management in organic farming.
- Pest and disease management in organic farming.
- Safety and quality of organically produce foods.
- Lower input cost.

Organic agriculture and soil quality: Results from different long term experiments

- The organically treated soils were physically more stable, contained smaller amounts of soluble nutrients and were found to be biologically more active than conventional. (Mader *et al*., 2002)
- Under organic farming the soil organic matter captures and retains more water in the crop root zone.

Pathways of transition to organic production

The increased productivity associated with conversion to organic production can arise from one or more of a number of different mechanisms. The diversification that is generally linked to a conversion to organic agriculture can in itself leads to increased income (or reduced expenses).

- Intensification of a single component of the farm system - such as home garden intensification with vegetables and trees.
- Addition of new productive elements to a farm system- such as fish or ducks in paddy, fruit or fodder trees planted in fields or products from N fixing crops- that boosts total food production, but does not affect the productivity of staples.
- Better use of natural capital to increase total farm production, by water harvesting or irrigation scheduling enabling growth of additional dry land crops, increased supply of water for irrigated crops or both.
- Improvements in per hectare yields of staples through the introduction of new regenerative elements into farm systems (e.g. integrated pest management) or locally appropriate crop varieties and animal breeds. (Pretty *et. al.*, 2002)

Multi-dimensional challenges and needs for research in organic agriculture:

- Eco-functional intensification is knowledge intensive.
- Develoment of agro-ecological methods.
- Adoption of agro-ecological methods.
- Value chain development for various markets.
- Evidence for decision makers.
- Global collaboration in research and innovation.

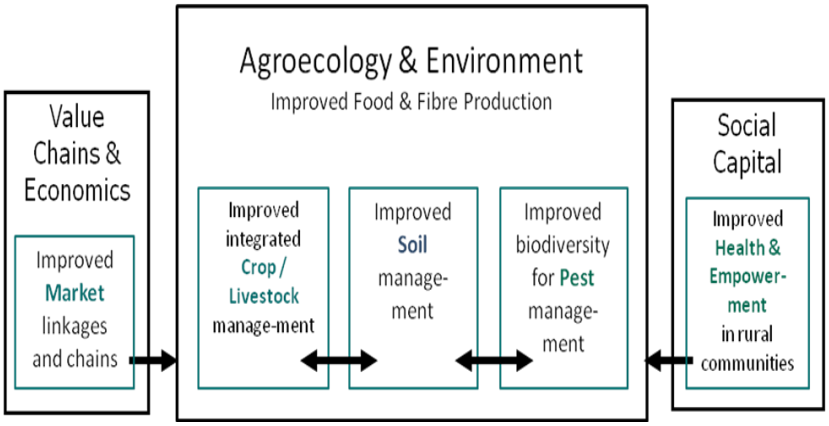

Fig. 1. Multi-dimensional challenges in organic agriculture

Conclusion

The interest in organic agriculture in developing countries is growing because it requires less financial input and places more reliance on the natural and human resources available. Organic farming is eco-friendly and keeps the soils healthy without polluting environment and it is an alternative renewable source of nutrient supply. Studies to date seem to indicate that organic agriculture offers comparative advantage in areas with less rainfall and relatively low natural and soil fertility levels. In vast areas of the country, where limited amount of chemicals are used and have low; productivity, could be exploited as potential areas for organic agriculture. India has tremendous potential to grow crops organically and emerge as a major supplier of organic products in the world's organic market. Need is for putting up a clear strategy on organic farming and its link with the markets.

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