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Importance of organic farming for rural economic and agriculture development

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Abstract
Organic farming is a sustainable agricultural approach that emphasizes the exclusion of synthetic inputs such as fertilizers, pesticides, and growth regulators, focusing instead on enhancing soil health, ecosystem balance, and human well-being. This system integrates traditional knowledge with innovative practices, aiming to optimize crop productivity while minimizing environmental impacts. Organic farming's key principles include the use of local renewable resources, promotion of biodiversity, and maintenance of long-term soil fertility through natural processes. The adoption of organic farming in India has significant potential for rural economic development by reducing production costs, improving soil quality, and creating job opportunities. Despite initial challenges, organic farming offers long-term economic and environmental benefits, making it a vital component of sustainable agriculture. This paper explores the importance of organic farming in the context of India's rural economy, its advantages, and the strategies needed to promote its widespread adoption.

Keywords: Organic farming, sustainable agriculture, rural economic development, soil health, biodiversity, natural resources, ecosystem balance, India, environmental sustainability, organic fertilizers

Introduction
Organic farming is a crop production system that excludes use of synthetic compounds such as, fertilizers, pesticides, growth regulators and livestock food additives. It can sustain the health of soils, ecosystems and people by combining tradition, innovation and science because it combines crop management and animal husbandry in the agro-ecosystems which are socially acceptable and ecologically sustainable. Therefore, this system minimizes the use of external inputs and knowledge, and aims at optimization of crop productivity rather than its maximization through renewal and strengthening of ecological processes and functions of farm ecosystems. The major domains included in organic farming are: improved packages of practices, market network, organic standards and certification/regulatory mechanism.

According to the Codex Alimentations Commission, organic farming should be holistic food production system which promotes and enhances health of agro-ecosystems through biodiversity and soil biological activity, and emphasizes on the use of comprehensive management practices excluding synthetic inputs to improve soil health and to restore ecological balance. Thus, main objectives of organic farming include utilization of the available biomass of crops left in the field to enrich soil fertility, supply of balanced nutrients to the plants and improvement in the soil microbial activity, reduction in the cost of production as well as environmental pollution in ecofriendly manner that promotes Formerly Tech. Advisor (FAO) (rtgahukar@gmail.com)and enhances biological activity to develop subsequently the sustainable agriculture system for guaranteed adequate food production. Further, this system promotes self sufficiency by relying upon locally available natural resources and searching an ecofriendly strategy to safeguard biodiversity and other biological processes such as, reducing the use of fossil energy and by providing opportunities to farmers to earn their livelihood satisfactorily.

Need for organic farming
With the Green revolution introduced in late sixties for increasing food production in the country, plant nutrition- responsive crop hybrids with greater potential in crop yields,

application of synthetic agrochemicals, farm mechanization and improved cultural practices were adopted by farmers.

Consequently, crop productivity could be increased 3-4 fold and crop security was achieved to some extent along with environmental security. In recent years, the claim of higher crop production has however been disappointing due to reduction or stagnant crop productivity, soil salinity/alkalinity, decreasing soil fertility levels and susceptibility of crops to pests and diseases. The crops cultivated in low external inputs sustainable agriculture are less attacked by insects, mites and other pests, and pathogens causing soil- borne, seed-borne and foliar diseases. Also, disease incidence is less in soil mixed with soil antagonists such as, *Trichoderma* spp. and fluorescent *Pseudomonas fluorescens.*

Apart from certain disadvantages, environmental problems and risk to human health cropped up in many areas. Awareness in consumerism is increasing with preference to organic foods over those containing toxic chemicals posing health hazards. Food products produced from organic agriculture contain no artificial flavours, preservatives or contaminants. The consensus among consumers, though evidences are dispersed and not easily available, is that food from organic crops is tastier and healthier than those from chemically grown crops. This may probably be attributed to nutritional properties. Pollution of ground water and air with synthetic fertilizers and pesticides is avoided and natural degradation of environment is automatically reduced.

For the first 3-4 years, organic farming is not cost- effective but later economical benefits increase every year since it reduces the production cost by 25-30%, and enhances or at least maintains soil fertility levels while preventing soil erosion. It has positive effect on ecosystem including survival of wildlife in the lowlands and pasture for grazing animals. Likewise, medium and long term effects of agricultural interventions have positive impact on the restoration and maintenance of the natural ecological balance. Cultural practices such as, crop rotations, mix-/inter- cropping, symbiotic associations, cover crops, organic fertilizers and minimum tillage are focusing points of organic farming.

The adverse effects of climate change are becoming more and more problematic since conservation of environment and biodiversity is perceived by people as an important criterion to attain food sufficiency and save our planet from disasters. Organic farming contributes to mitigating the Green houses gases (GFIG) and global warming through its ability to sequester carbon in the soil. Many cultural practices adopted to increase return of carbon in the soil, raising productivity and favouring carbon storage. Local genotypes/cultivars of several crops are preferred due to their resistance to pests, diseases, and the resilience to climatic stress.

The main advantages of Organic Farming in India Rural Economy are as follows

- Organic fertilizers are completely safe and does not produces harmful chemical compounds
- The consumption of chemical fertilizers in comparison to organic fertilizers is always more, especially in unused cultivable lands.
- Moreover, chemical fertilizer needs huge quantities of water to activate its molecule whereas, organic fertilizers does not need such conditions.
- Further, chemical fertilizers almost always have some harmful effects either on the farm produce or on the environment.
- Furthermore, it can also produce harmful chemical compound in combination with chemical pesticides, used to ward-off harmful pests.
- It is estimated that there is around 2.4 million hectare of certified forest area for collection of wild herbs.
- The actual available area for cultivation of organic agriculture in India is much more than that is identified and certified so far.
- India has around 1,426 certified organic farms.
- India produces approximately 14,000 tons of output annually.
- It is estimated, that around 190,000 acres of land is under organic farming in India.
- The total annual production of organic food in India in the last financial year was 120,000 tons.

The key characteristics of organic farming include

- Protecting the long term fertility of soils by maintaining organic matter levels, encouraging soil biological activity, and careful mechanical intervention
- Providing crop nutrients indirectly using relatively insoluble nutrient sources which are made available to the plant by the action of soil micro-organisms
- Nitrogen self-sufficiency through the use of legumes and biological nitrogen fixation, as well as effective recycling of organic materials including crop residues and livestock manures
- Weed, disease and pest control relying primarily on crop rotations, natural predators, diversity, organic manuring, resistant varieties and limited (preferably minimal) thermal, biological and chemical intervention
- The extensive management of livestock, paying full regard to their evolutionary adaptations, behavioural needs and animal welfare issues with respect to nutrition, housing, health, breeding and rearing
- Careful attention to the impact of the farming system on the wider environment and the conservation of wildlife and natural habitats

In totality organic agriculture aims at a sustainable production system based on natural processes. Key characteristics are that organic agriculture:

- relies primarily on local, renewable resources;
- makes efficient use of solar energy and the production potential of biological systems;
- maintains the fertility of the soil;
- maximises recycling of plant nutrients and organic matter;
- does not use organisms or substances foreign to nature (e.g. GMOs, chemical fertilisers or pesticides);
- maintains diversity in the production system as well as the agricultural landscape;
- Gives farm animal's life conditions that correspond to their ecological role and allow them a natural behaviour.

Organic agriculture contributes to poverty alleviation and food security by a combination of many features, such as;

- increasing yields in low-input areas;

- conserving bio-diversity and nature resources on the farm and in the surrounding area;
- increasing income and/or reducing costs;
- producing safe and varied food;
- Being sustainable in the long term.

The very basic approach to organic farming for the sustainable environment includes the following -

1. Improvement and maintenance of the natural landscape and agro-ecosystem.
2. Avoidance of overexploitation and pollution of natural resources.
3. Minimization of the consumption of non-renewable energy resources.
4. Exploitation synergies that exist in a natural ecosystem.
5. Maintenance and improve soil health by stimulating activity or soil organic manures and avoid harming them with pesticides.
6. Optimum economic returns, with a safe, secure, and healthy working environment.
7. Acknowledgement of the virtues of indigenous know-how and traditional farming system.

Some Important benefits of Organic Farming

1. Promotion of Biodiversity

Crop rotation to build soil fertility and raising animals naturally helps promote biodiversity, which promotes greater health across all living species. As organic farms provide safe havens to wildlife, local ecosystems also improve.

2. Reduction of Farm Pollution

While "farm smog" is not real, traditional farming does create its own forms of pollution with respect to runoff from synthetic fertilizer and chemical pesticides, which harm the surrounding areas. That runoff seeps into the local groundwater supply. As harmful chemicals are eliminated from use through organic farming, the environment benefits. Organic farming improves the soil, removes the risk of groundwater pollution and rehabilitates soil in areas where damage to water supplies has already occurred.

3. Better-tasting Food

It's not your imagination: organic food truly tastes better than products that come from conventional farms and methods. Organic produce tends to have lower nitrate content than non-organic varieties, leading to fruits that not only taste sweeter but also have higher antioxidant levels. Science shows that organic farming isn't just tastier but better for you, too!

4. Fewer Environmental Toxins

At present, less than one half of one percent of farm acreage in the United States is devoted to organic farming methods. This means that there are over 900 million acres of farmland being treated with chemical fertilizers, pesticides, and other toxic substances required by livestock farming. As the percentage of organic farms increases, the environment also benefits.

5. Job Creation

Studies compiled by the Organic Farming Research Foundation have shown that there are more than 10,000 certified organic producers in America, in comparison with almost two million traditional farms. However, organic farms tend to bring in more profits, despite requiring more employees. It is easy to see the economic benefits derived from job creation that would come from an increase in organic farming.

6. Better Soil Quality

According to research done by Cornell University, forty billion dollars are lost annually due to topsoil destruction caused by conventional farming's dependency on chemical fertilizers. If those fertilizers and ammonia were replaced by the use of organic farming methods, topsoil health would improve. The healthier soil would in turn produce vegetables and fruits with higher amounts of minerals and micronutrients.

7. Helping in the Fight Against Climate Change

Organic farming reduces the use of non-renewable energy, because it avoids the use of chemical pesticides and fertilizers, which require large amounts of fossil fuel to produce. Organic farming also returns more carbon to the soil, which then lessens the greenhouse effect and global warming.

8. Preservation of the Culture of Agriculture

Around the world, every culture has at least one thing in common: food. Organic farming celebrates biodiversity and good health, and it removes harmful toxins from our environment and from our food. That is something to encourage and celebrate!

organic compost and instill confidence among farmers that the quality of soil will be maintained by its use. In this context, the following strategies can be considered: -

1. Farmers using different types of organic fertilizers such as bio-fertilizer, vermi-compost, cow dung, compost, etc. For nutritional management for organic farming will lead to higher crop production without any decline in soil productivity, thereby increasing income.
2. Organic fertilizer is prepared scientifically in laboratories by selecting beneficial microorganisms from soil. When making biofertilizer the number of beneficial bacteria can be more or less than a million in 1 gram. These are azotobacter, Rhizobium, Blue-green algae.
3. The use of biofertilizer such as vermicompost, green compost and oil cakes provides all the nutrients of the soil, leading to high production of the crop.
4. For organic farming, the most important task is to select the appropriate seeds, for this, farmers can purchase seeds from reliable or government institutions. For example, farmers can also buy and contect Rajendra Prasad Central Agricultural University, Pusa, Samastipur and get other suggestions.
5. Farmers also need to undergo training for organic farming. The number of Agricultural Training Centres in Bihar is not large and it is also far from the rich of farmers. The Bihar government will have to come forward in this direction and develop agricultural training centres.

Conclusion

1. Organic farming output support the human health.
2. Organic farming is very important for agriculture for today.

3. Increase economic status of farmer by organic farming.
4. Organic farming increases soil health.
5. Organic grain produce have Nutritional benefits.
6. Organic farming Decrease the cost of cultivation.
7. Organic farming plays very important role in balancing of traditional and modernise cultivation.
8. Organic farming plays very important role in balancing of traditional and modernise cultivation.
9. Organic farming promote Animal husbandry.
10. Demand of organic food grain product is higher.
11. Organic farming is very useful to the environment health.
12. Organic farms are better than conventional farms.
13. Organic farming plays an important role to generating jobs
14. Organic Farming is economically supporting for economic development
15. Organic Agriculture is support the sustainable growth

Suggestion
1. Gangetic co-ridor project of organic farming in the district should sincerely promoted among the farmers of diara areas.
2. Scientific inventions and technological basketepping by the scientist and government department (agriculture) should be regularly monitored and evaluated at least for five years since the start of the organic cultivation.
3. Identification of markets of such organic products along with certification of the products may be helpful in promoting organic agriculture.

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