

Evaluate Impact of Organic Agriculture to Maintain Food Security in Country

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Abstract

India's agriculture has been built on natural farming since the beginning. On arable farms, organic management is possible, while animals are frequently an important element of the system since manure and slurry may help maintain closed nutrient cycles. It is impossible to completely eliminate nutrient losses to the environment on agricultural fields, regardless of management style, but tolerable loads must be set. Organic farming may help to safeguard the environment and conserve nature in a variety of ways, such as by increasing soil porosity, which results in higher infiltration rates and so helps to mitigate flooding peaks. The goal of this article is to provide a comprehensive assessment of what organic farming can provide. We attempted to investigate the value of organic farming in this rising population and how it may be used as a strategy for food security in this research.

Keywords: Food, Organic, Practices, Farm, Agriculture.

I. INTRODUCTION

Agriculture is vital to the economy of our country. Although it was heartening that India attained food self-sufficiency in the shortest period in the world, our traditional agro system suffered a significant setback, mainly to the indiscriminate use of fertilisers, pesticides, fungicides, and herbicides. This has resulted in a loss of soil fertility, degradation of water supplies, and chemical contamination of food grains. To mitigate the detrimental effects of this situation, it is critical to take a comprehensive approach. Organic Agriculture is a crucial pillar of sustainable agriculture and a solution to our problems of environmental degradation, unsafe food, dirty water, degraded land, and a wide range of illnesses caused by unsustainable agriculture in the recent past. Organic agriculture is not only urgently needed, but also a timely response to environmental degradation, unsafe food, contaminated water, degraded land, and a slew of other agro-maladies caused by unsustainable agricultural systems.

When humans pollute the land and environment with hazardous chemicals and pesticides, organic farming is becoming more popular. Organic farming allows you to replenish the soil with organic compost while also protecting it from toxins. Because soil is the source of many food crops, the food we acquire from organic soils is also healthy for our health. Organic farming contributes to a sustainable rural environment, good soil health, and ecological balance, among other things. This type of agricultural activity may be dated back decades in India. Organic agriculture offers a better potential for reducing all types of pollution while also ensuring long-term viability. This approach has a little negative impact on the economy and aids in biodiversity protection. Toxic substance exposure to humans, animals, and the environment can be decreased. Sustainable agriculture may greatly contribute to rural vitality by expanding the number of farms that use such practises; it can also quadruple a family's revenue when compared to traditional methods. It is extremely cost-effective and provides a high return on organic products. It also contributes to the provision of pesticide-free food, which reduces pollution and creates jobs.

The introduction of the green revolution in India in the early 1960s resulted in a massive rise in agricultural productivity due to the widespread use of chemical fertilisers and pesticides. This, however, proved to be destructive in the long run, and the necessity to revitalise the yielding agricultural scenario became the era's demand, with organic farming as an option. In 2016, India had 1.5 million hectares of organic agricultural, with 0.3 million hectares added the following year. India generates 30% of global organic production but just 2.59 percent of overall agricultural area, according to the World of Organic Agriculture Report 2018. There are around 835,000 certified producers in the country. It was discovered that organic product output and cultivation area have been steadily expanding over time. Research Institute of Organic Agriculture, State of Sustainable

Initiative, and International Trade Center gathered the data. The surge in organic gardening is attributed to entrepreneurs pushing organic farming as well as increased public awareness.

II. THE PROBLEM OF FOOD SECURITY

FAO's main mission since its inception has been to develop sustainable food security for all people. The World Food Summit in 1996, as well as subsequent gatherings and treaties, such as the Right to Adequate Food, reaffirmed this obligation. The 32nd Session of the Committee on World Food Security assessed the food situation in September 2006, acknowledging that the World Food Summit target of halving the number of hungry people by 2015 will not be met; the number of undernourished has remained virtually unchanged since 1990-92, though the percentage of undernourished has decreased.

Household and national food security are complex goals impacted by a variety of factors including technology, human capacities, regulations, pricing, commerce, and infrastructure. Food demand will almost certainly rise in response to rising population pressure and money, even if demand and supply are not equal in all places. Indeed, today's total global agricultural production is adequate to support the world's existing population, and both critical technology and international environmental accords are available to assist with development and conservation.

Hunger, poverty, and environmental destruction, on the other hand, endure even as global human security concerns grow. Furthermore, despite rapid increases in chemical pesticide and fertiliser applications, the last few decades have shown unmistakable evidence of diminishing returns on grains,¹ resulting in lower confidence that these high-input technologies will provide equitable household and national food security in the coming decades. Overall, worldwide cereal output is decreasing², mostly among large producers and exporters. Rural areas in developing countries are home to 75% of the world's 1.2 billion impoverished. They face issues related to subsistence farming in remote and marginal places with limited access to technology. Droughts and floods, crop and animal illnesses, and market shocks are all threats to these subsistence and small-holder livelihood systems. They do, however, have crucial resilience features like as family labour, livelihood diversification (non-farm activities account for 30 to 50% of rural income), and indigenous knowledge, which enable people to exploit dangerous environmental niches and cope with disasters. Pro-poor initiatives centred on efficiency and job creation connected with family farms are likely to enhance the living conditions of these families.

Global malnutrition is caused by a variety of factors other than a shortage of food, including a number of factors that are not related to agriculture. However, new paradigms for agriculture and food supply chains are required to solve the difficulties brought by expanding populations (and inequities) and environmental deterioration.

III. FOOD SECURITY AND ORGANIC AGRICULTURE

Modeling studies have shown no evidence that broad-scale conversion to organic agriculture will result in a significant drop in world food supply or big increases in the conversion of undisturbed regions to agriculture. Conversion studies revealed that domestic food consumption would not suffer, that exports would vary depending on crop, but that the agricultural structure would undoubtedly alter as agriculture became more diverse. As a result of greater investment in research and extension, widespread conversion to organic agriculture would result in higher crop yields than present norms. Organic techniques might meet domestic food demand in northern Europe, but food would be more expensive. Studies in the United States came to similar results. According to a German research, all German crop fields could be converted to organic agriculture without increasing imports or expanding agricultural area if per capita dietary calories from meat were lowered to 21% from the present 39%. According to the research, such a conversion will be achievable by 2017, since a poll found that 40% of German teenagers aim to adopt a low- or no-meat diet in 2017.

Because to BSE, the abandoning of meat eating is rising in Europe, the threshold for this conversion may arrive sooner. Several studies have demonstrated the advantages of a vegetarian diet over a non-vegetarian diet in terms of energy consumption for food production and other nutritional benefits. To maximise the utilisation of nutrients and the space between species, organic farmers plant a range of crops and keep livestock. Low crop production or yield failure owing to biotic and abiotic causes in all of them at the same time provides economic advantages. This has the potential to have a major influence on local food security and resilience. Organic agriculture has proven to outperform conventional agricultural systems under environmental stress in rain-fed environments. Market returns from organic agriculture might possibly help to local food security by raising household income in the correct circumstances. Organic farmers cannot produce enough food for everyone on a

worldwide scale, especially in emerging nations with strong population pressure, and with the current state of knowledge and technology.



Figure 1: organic farming strengthens food security

One prominent argument against organic farming is that it disregards the findings of current agricultural science, thereby representing a purposeful step backwards in history, jeopardising world food security. However, the converse is true: based on a thorough understanding of biological and physiological processes, physiological know-how will eventually be able to replace pharmaceutical help. Biotechnology will very definitely be used in this research. The notion of Sulphur Induced Resistance is an example of how research may lead to significant advancements in crop protection (SIR). Haneklaus et al. will provide detailed information on the possibilities of SIR for organic farming (this volume).

"Reaffirms the right of everyone to have access to safe and nutritious food, compatible with the right to enough food and the basic right of everyone to be free from hunger," says the Rome Declaration on World Food Security. Organic farming, according to a serious but prevalent claim, exacerbates the problem of world hunger by producing lower yields than intensive farming techniques. According to Kimbrell (2002), "World hunger is caused by poverty and landlessness, which prevent people from having access to food. By boosting the cost of farming, driving tens of millions of farmers off the land, and focusing on high-profit export and luxury products, industrial agriculture actually increases hunger ". According to Kimbrell (2002), the only way to solve difficulties associated with industrialised agricultural production is to revert to sound organic farming techniques.

The fact is that due to a drop in soil fertility, per capita food production in Sub-Saharan Africa has decreased by 20% in the last 20 years. Organic farming or small agricultural businesses with comparable business models can help enhance soil fertility and, as a result, increase food output. The same authors noted that 'green revolution' technologies were inapplicable in Sub-Saharan Africa due to the fundamental problem of poor yield potential, as well as political and socio-economic restrictions. Apart from this primary coercion, the promise of genetically modified crops to significantly improve food security through higher yields has yet to be realised, and critical researchers have even raised the concern that genetic engineering will exacerbate the gap between rich and poor in developing countries. Insofar as Liebig's rule of the minimum is the strongest limiting factor that controls crop output, it should be invoked. It is improbable that the growth of genetically modified crops would provide a true breakthrough in food security in poor nations, where fertiliser input is up to 26 times lower than in intensive agricultural systems. In terms of industrialised nations, the findings of an Austrian case study show that even a

complete changeover to organic farming will not jeopardise food security, but will completely meet the criteria of sustainable agricultural production.

IV. BENEFITS OF ORGANIC FARMING

Environmental benefits

Organic agriculture's influence on natural resources favours agro-ecosystem interactions that are critical for both agricultural output and environmental protection. Soil formation and conditioning, soil stability, waste recycling, carbon sequestration, nitrogen cycling, predation, pollination, and habitats³⁴ are some of the ecological services derived. Conventional agriculture has enormous environmental costs, and the evidence for considerable environmental improvement through conversion to organic agriculture is overwhelming. Organic farming systems outperformed conventional farming systems in 12 of the 18 environmental impact indicators studied (floral diversity, faunal diversity, habitat diversity, landscape, soil organic matter, soil biological activity, soil structure, soil erosion, nitrate leaching, pesticide residues, CO₂, N₂O, CH₄, NH₃, nutrient use, water use, and energy use), according to a review of over 300 published reports. Conventional agriculture also has large pre-consumer human health costs, notably in the use of pesticides⁴². Pesticides are expected to harm 25 million agricultural labourers in underdeveloped nations each year.

Food made organically is safe and of high quality.

Organic foods are becoming more popular, owing to customer views of their quality and safety, as well as the favourable environmental effect of organic cultivation techniques. The term "organic" is a process assertion, not a health claim. Organically grown foods have been shown to have lower pesticide and veterinary medicine residue levels, as well as lower nitrate levels in many situations. However, no obvious patterns in organoleptic quality variations between organically and conventionally farmed foods have been identified.

It is common knowledge that crop quality is influenced by a complex interaction of elements such as soil type and mineral ratios in added compost, manure, and fertiliser. As a result, it's difficult to distinguish between the effects of the environment and the agricultural system. In future investigations, information on the quality of products produced on organic farms might be collected.

V. CHALLENGES

Despite advancements in the area, organic farming has failed to make its way into the mainstream of agriculture. It's not simple to switch to organic agricultural practises, and farmers aren't getting the premium they deserve for their produce.

- A very low output to fulfil 276 million tonnes of food grain, with one of the primary challenges being a lack of marketing.
- There is no policy in place to encourage farmers to promote organic agriculture.
- Pesticides and chemicals used to eradicate weeds have created pests and weeds.
- Farmers face low productivity during the transition period because organic farming prohibits the use of synthetic pesticides; farmers also face severe pest attack; and organic products are damaged due to a lack of suitable infrastructure and cold storage facilities because they are mostly perishable.
- Organic products are costly due to high labour costs and limited yields, discouraging people from purchasing them. To properly accomplish the organic mission, the barriers must first be addressed.

VI. CONCLUSIONS

Organic agriculture is gaining popularity in underdeveloped nations since it involves less financial investment and relies more on local natural and human resources. Organic agriculture appears to give a comparative advantage in locations with less rainfall and poor natural and soil fertility levels, according to studies so far.

Labor generates a good return, which is critical in a situation when paid labour is essentially non-existent. Organic agriculture does not need large-scale expenditures in irrigation, electricity, or foreign inputs; rather, organic agricultural policies have the potential to increase local food security, particularly in rural regions. Organic agriculture may have the greatest influence on people's mindsets. It employs traditional and indigenous farming knowledge while also using contemporary technology to manage and develop variety, integrate biological principles and resources into farming systems, and increase agricultural productivity in an environmentally sustainable manner. Traditions, rather of being a hindrance to development, may become an intrinsic part of it. Farmers are forced to learn new skills and viewpoints, as well as to innovate, when they switch to organic farming. This results in a higher level of involvement in farming, which can lead to more prospects for rural employment and economic development. Conversion to organic agriculture therefore helps to the empowerment of farmers and local communities by placing a greater focus on the utilisation of local resources and self-sufficiency.

Different policies and assistance should be implemented, as well as more study and effort in these areas, with much relying on the relevance of present studies. Policymakers must invest in programme and policy changes to encourage organic farming. The demand for food grains is rising in tandem with the population growth. In light of rising demand, diminishing natural resources, excessive use of man-made chemicals, and public health concerns, farmers should adopt an integrated production strategy that incorporates both chemical and non-chemical production methods.

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