



Organic Farming in Agricultural Practices: A Review

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Creating sufficient food to address the issues of a developing populace has forever been the biggest worry of food strategy creators all over the planet. The review showed that the main benefits of organic farming are ecological insurance and a higher flexibility to natural changes, expanding ranchers' pay and lessening outside input cost, upgrading social limit and expanding work open doors. As well as upgrading food security essentially by expanding the food buying force of nearby individuals. Notwithstanding, the fundamental difficulties of this food creation framework incorporate lower yields in contrast with traditional frameworks, challenges with soil supplement the board, confirmation and market obstructions, and the instructive and research necessities of little holders. The paper infers that despite the fact that OF could introduce a few huge difficulties to limited scope ranchers, it could/ ought to enhance the overall soil health.

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1. INTRODUCTION

Green Revolution (GR) innovations, upheld by strategies, and fuelled by agrochemicals, apparatus and water system, are known to have upgraded farming creation and efficiency. While these innovations extraordinarily assisted with tending to the food security of India, ranchers utilizing these advancements need to rely on the bought inputs [1]. The little ranchers, who with cash stream definition are shy of money, are subsequently found to linger behind enormous ranchers in the reception of advancements. The produces of manures and pesticides, the two significant contributions of GR advancements, need petroleum derivatives and/or costly energy, and are related with serious ecological and wellbeing issues. It is maybe attributable to these informational issues and their adverse consequences, that the Inter-Governmental Board on Environmental Change (IPCC) has noticed that horticulture as rehearsed today (traditional farming, current horticulture or GR agribusiness) represents around one fifth of the anthropogenic nursery impact, creating 50% and 70%, separately of the total anthropogenic methane and nitrogen oxides outflows respectively [2].

India is an agricultural country that contributes a major share in the world food production. The traditional farming methods practiced in India have been replaced by modern farming methods using chemical fertilizers and pesticides to achieve maximum yields of crops. But the conventional farming method is harming the environment and the quality of food we consume [3]. As a result, there has been a gradual shift towards the concept of organic farming in India in recent years. It is a more sustainable farming practice that promotes the use of natural resources and soil conservation techniques to ensure a healthy ecosystem that can benefit both the environment and the farmers.

Through the sections given below, let us understand everything about organic farming in India, its methods, advantages, limitations, and projects that promote organic farming in India.

1.1 What is Organic Farming?

The term was coined by Lord Northbourne in the 1940s. Talking about organic farming definition, it is a method of farming that relies on natural

resources such as crop rotation, organic manure, and biological pest control instead of synthetic chemicals to grow crops. The objective of organic farming is sustainability, protection of the environment, and the preservation of soil health [4]. In essence, organic farming is a holistic approach that aims not only to produce food but also to promote healthy living.

1.2 Organic Farming in India

India has been practicing organic farming methods for centuries; however, the interest in organic farming methods in India has grown in recent years, mainly due to its numerous benefits [5]. The scope of organic farming in India is immense as it is not only better for our health and the environment, but it also saves farmers money on inputs such as pesticides and fertilizer. Organic farming in India has gained popularity, especially in areas of high agricultural productivity, including Maharashtra, Sikkim, Tamil Nadu, and Karnataka.

Organic farming in India is supported by national policies and initiatives, including the National Programme on Organic Production (NPOP) [6]. The program accredits organic production units and promotes organic farming practices in the country. The government has also established a certification system to enable farmers to market their organic produce both nationally and internationally.

2. METHODS OF ORGANIC FARMING

2.1 Crop Rotation and Inter-cropping

Natural agribusiness is essentially subject to soil science and soil wellbeing. Different natural cultivating rehearses which incorporate harvest pivot, blended trimming and intercropping are accepted to help in expanding soil life by improving soil properties and its organic exercises. As per Jean-Paul Courtens (a rancher) "pivots balance soil-building crops (soil improvement harvests) and money crops, and can consider exposed neglected periods to break weed cycles and integrate plant matter into the dirt". So a vegetable harvest can be trailed by high nitrogen requesting yield and afterward by less supplement requiring crops in ensuing years. This strategy keeps a mind weed development and additionally helps in supplement reusing in the environment [7].

2.2 Crop Residues

In agricultural nations like India, lots of harvest buildups are left each year which are an extraordinary wellspring of supplement reusing in soil [8]. For the most part, crop buildups are vaccinated with parasitic hyphae and spores which improve soil wellbeing and help in natural cultivating. The crop deposits incorporate straws, stalks, bristles, cobs of maize and halms of beans, peas, potatoes, and so forth. Whipping sheds are additionally included like oil cakes, rice husks, nut shell, Indian millet and pearl millet .

2.3 On-farm Waste Recycling

Natural waste reusing is vital for economical cultivating as it stifles the utilization of costly and hurtful substance composts. Ranch and family squanders, including pruned branches, straw, and disposed of parts of products of the soil go through fertilizing the soil, anaerobic processing, and thermo-substance medicines (synergist,

pyrolytic and aqueous), which lead to most extreme reusing. This prompts a decrease in the use of customary synthetic manures and other energy sources. Modern waste, family waste, and squanders from MCD is additionally a significant part of natural waste [9].

2.4 Weed Management in Sustainable Agriculture

To avoid the use of herbicides and chemicals on farms, alternative and sustainable weed management methods are practiced in organic agriculture. This includes cultural weed management methods like crop rotation, crop and cultivar choice, increasing crop density by higher seeding rates, row spacing for earlier canopy closure, weed control by mechanical and physical methods, tillage, soil heating by solar radiation, stale seed bed, mulching, hand weeding, biological weed control and bioherbicides [10].

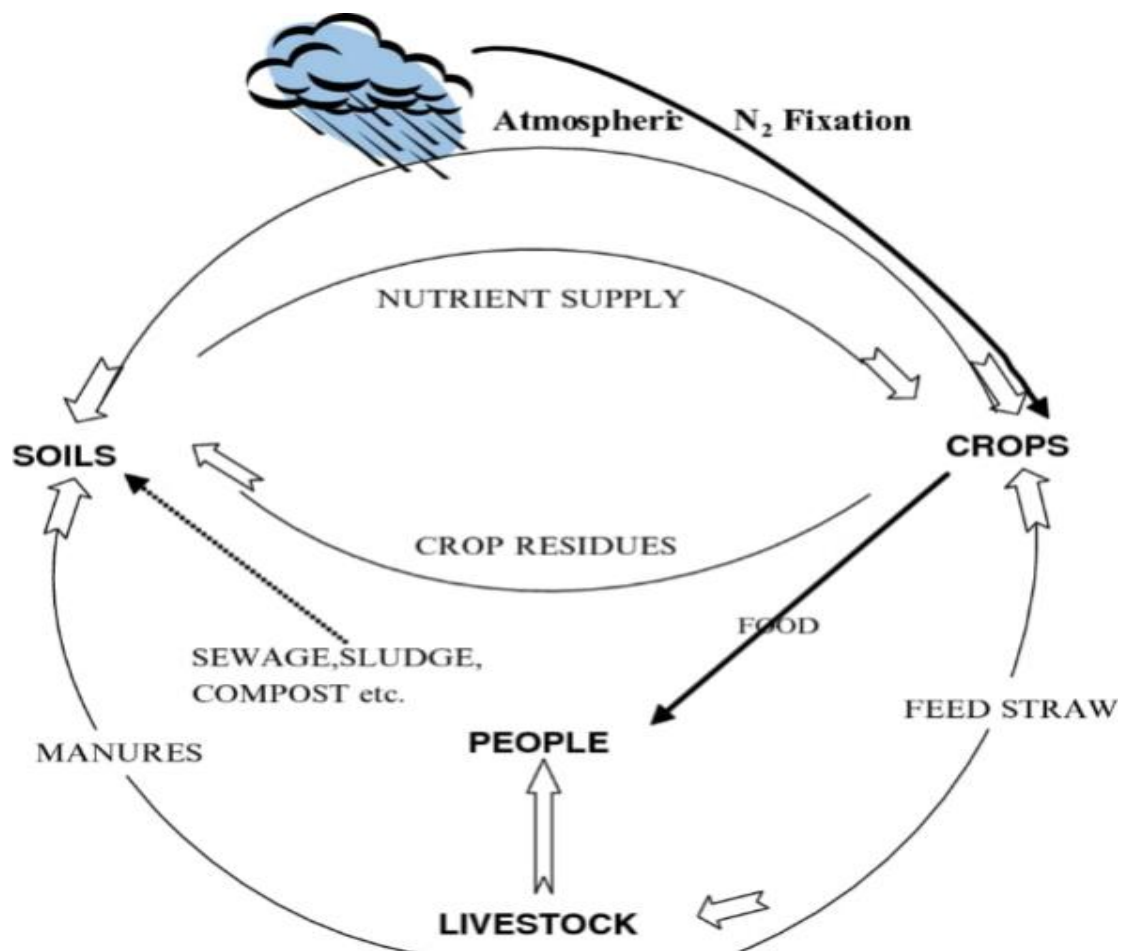


Fig .1. Method for organic farming

2.5 The Transition of Yield from Conventional to Organic Farming

As per the current Agriculture scenario which is mostly dependent on chemical fertilizers, many farmers switches to organic farming. Some farmers believe that using chemicals in agriculture poses a risk to their own health as well as to their cattles [11]. However, switching to organic farming is not just for personal health reasons. The only way for farmers in Punjab, Haryana, and Eastern Uttar Pradesh can keep their yield levels stable is by consistently increasing chemical inputs. Because crop yields are increased by applying chemical fertilisers, it kills beneficial microorganism which is present in the soil, it causes deficiency of micronutrients in the soil likewise Boron and Zinc, yields in irrigated farms may decrease during the transition from conventional to organic farming. Therefore even after conversion initially the yield will be lower but after some period of time yield will be higher,

Natural ranchers need to acquire less cash than traditional ranchers for two reasons; first and foremost, natural ranchers need to purchase less sources like compost and pesticides; and besides, expenses and pay are more equitably dispersed all through the year on broadened natural homesteads. Natural ranchers, but gripe that they face separation [12]. by moneylenders, a conceivable financial dis advantage of natural cultivating. Nonetheless [13]. inferred that this issue is more seen than genuine. Pay and benefit of natural ranches is equivalent or higher when contrasted with ordinary and conventional homesteads [14]. Over the long period of time, natural cultivating offers more benefits contrasted with customary cultivating on the grounds that it guarantees better returns as well as guarantees higher yield security and decreases reliance on outer inputs, in this manner making unfortunate families less emergency inclined. These are significant contentions, particularly in the negligible areas [15].

One of the main strategies for replacing lost soil has always been the FYM [16]. It provides soil organic matter (SOM), which serves as a marker for soil life, soil health, and even soil productivity. The sole "input" required for improving SOM is plant biomass [17]. In addition to improving the soil texture in drylands and providing nutrients to crops, organic manures also serve as mulches. They shield crops from the damaging effects of high temperatures, enhance seed germination,

boost the soil's capacity to retain water, and establish the ideal microclimate for the growth of advantageous soil bacteria [18]. Soils that have been raised organically are often more adapted to endure water stress and nutrient loss. Their strong potential to prevent soil deterioration and numerous experiments.

The problem-makers, who focused exclusively on the market and ignored the soil's vitality, cannot be trusted to find a solution to the dilemma of dying soils. Continued reliance on the market as the driving force behind agricultural organisation will not result in the restoration and healing of soil health. The key to this recovery is finding organic methods of renewal and regaining the understanding that the land has a right to share its output in order to preserve its health. To meet everyone's need, that right must be respected [19].

2.6 Can Organic Farming Feed the World?

As we all know Population pressure is increasing day by day in order to provide food to everyone and to ensure the availability of food we have to grow more number of crops on the same piece of land [20]. High-yielding systems are currently failing to feed the world, not because of problems with productivity, but because of problems with food distribution, social from inorganic to organic farming, less food will be available due to yield losses during conversion period. Such organically produced foods are expensive to purchase by the middle class and poor families.

2.7 Present scenario of Organic Farming

Starting around 2020, India positions eighth concerning natural horticultural land and first in quite a while of the complete number of makers, as per APEDA 2020-21. [21]. As of Walk 31, 2021, the absolute region under natural creation (as characterized by the NPOP) was 4339184.93 hectares. This involves a cultivable area of 2657889.33 hectares and a wild collect assembling area of 1681295.61 hectares . Madhya Pradesh is the main natural maker among every one of the states, trailed by Maharashtra, Karnataka and Rajasthan.

2.8 Advantages of Organic Farming

Organic farming boasts a myriad of advantages that contribute to environmental sustainability, human health, and the overall well-being of

ecosystems. One key advantage is the absence of synthetic pesticides and fertilizers, reducing the risk of harmful chemical residues in soil, water, and food products. Organic farming promotes soil health through practices such as crop rotation, cover cropping, and the use of organic matter, enhancing soil structure, fertility, and microbial activity. Biodiversity conservation is another notable advantage, as organic farms typically harbor a greater variety of plant and animal species. Avoiding genetically modified organisms (GMOs) is a hallmark of organic farming, ensuring that crops are non-GMO and free from genetic engineering. Furthermore, organic farming emphasizes animal welfare by prohibiting the routine use of antibiotics and promoting access to outdoor spaces for livestock. The reduction of greenhouse gas emissions is inherent in organic practices, as they often involve less energy-intensive methods and emphasize carbon sequestration in the soil. Consumers benefit from organic farming through access to nutritious and flavorful produce, as organic crops tend to have higher levels of certain vitamins, minerals, and antioxidants. Overall, the advantages of organic farming extend beyond individual farms to encompass global environmental and health considerations, making it a sustainable and conscientious approach to agriculture.

2.9 Disadvantages of Organic Farming

While organic farming offers numerous benefits, it also presents certain challenges. One major disadvantage is lower crop yields compared to conventional farming. Organic methods often rely on natural fertilizers and pest control, which can be less potent than synthetic alternatives, resulting in reduced productivity per acre. Weed control is another issue, as organic farming prohibits the use of synthetic herbicides. Managing weeds through manual labor or alternative methods can be labor-intensive and time-consuming, impacting overall efficiency. The transition period from conventional to organic farming can also be economically challenging for farmers, as it takes time for soil health and productivity to fully recover under organic practices. Additionally, organic produce may be more expensive for consumers due to lower yields and higher production costs. Addressing these challenges requires ongoing research and innovation to enhance organic farming techniques and make them more economically viable without compromising sustainability.

3. CONCLUSION

In this review paper, it is demonstrated that there are differences in viewpoints on organic farming, particularly among experts. Although there is much disagreement on the profitability and yield growth of organic farming, there is broad agreement regarding its potential to safeguard human health and preserve the environment. Strong opinions are held against organic farming, primarily due to issues with how feasible it is to feed a billion people, its financial and economic viability, the availability of organic inputs, and the spread of knowledge. But numerous studies have shown that organic farming is successful and long-lasting. While supporting organic farming, a lot of individuals support the careful conversion of farms to organic practices in order to minimize yield loss. Currently, there are no government assistance programs or subsidies.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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