

Review on Organic Farming Practices in India and its Benefits

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Abstract: In this review paper it is explained about organic farming and the significance of organic farming in the fullest way. It is also a good idea to introduce organic agricultural practices, which are eco-friendly and kind to all living things, including weeds, birds, insects, wildlife, and all other flora and fauna. It has explained about the various methods and impact of organic farming along with the advantages and benefits. With the plenty of research we have a successful organic farming a higher yield can be obtained. It also discussed on the state of organic farming in India with the marketing demand taking about the marketing industry for this farming. It also provides a lot of job opportunities and social values are also conserved in this. In addition to this it is also beneficial to produce higher yields and can prevent many environmental disasters too. India being an agricultural country can overcome the hunger through this way by giving the farmers a good knowledge on the organic farming as opposed to using the insecticides and pesticides. It is also observed that organic crops are the source for giving the higher animal immunity, disease resistance crops and a persistent self-life. It is seen that with 50 percent less mycotoxin can be found along with more secondary metabolites. Higher nutrition crops with the healthy lifestyle are the gift of organic farming.

Keywords: Organic farming benefits, Environmental benefits, Organic Market, Organic Farming Techniques, and Present Status of India in Organic Farming.

I. INTRODUCTION

A natural method of cultivating crops or agricultural goods for food and fibre is called organic farming. The agricultural process uses natural resources without the use of chemicals, including waste, to produce fresh, nutritious food that is healthy in every way. Additionally, it raises the quality and richness of the soil. In simple way it is possible to state that organic farming is returning what is taken from the environment to it. Organic food are produced without

the application of insecticide, pesticides and other chemical composition where growth regulators are avoided.[1] Biological pesticides are the heart of the organic farming where some precaution measures has to be taken prior to the application of any other modern organic pesticides. It enhances the health of animals and higher yield from this can be obtained with the higher class. Low inputs are resulting in the higher quality and quantity of food irrespective of the saying that it produces less profit. If it is utilized in a proper and efficient manner it is possible to get higher yield in any circumstances. The fundamentals of the organic farming are environmental, economic and social sustainability. It main theme is that it preserve the fertility of soil over a long period of time by conserving the organic matter, nitrogen content and nitrogen fixation along with the soil flora and fauna. If the proper recycled organic matter or material such as livestock waste, crops residue, weeds residues and forest debris are put in to together in proper manner will impact in this farming. In India, organic farming is still in its infancy. There were around 2.30 million hectares of farmland grown organically as of March 2019[3]. This represents 2% of the nation's net sown area of 140.1 million hectares. Since a significant portion of this industry is concentrated in a small number of states, several states have taken the lead in expanding the coverage of organic farming. Madhya Pradesh tops the list with 0.76 million hectares under organic farming or more than 27% of India's organic agricultural land [2].

II. LITERATURE REVIEW

As per the research paper of B. Suresh Reddy He provided an explanation of the quality of organic goods and their export to other countries, along with the current state of organic farming in India. S.Siddique et al, had given a knowledge on how we are returning to the nature by adopting the natural way of cultivation. Sezen Ocak had explained about the benefits of the organic farming to the biodiversity in the statistical way of the microbial activities to the pollution control Activities [4]. Mr.M Elayarja et al, also discussed the present challenges and the advantages of Indian organic farming and its

marketing demand. He also extended his knowledge to the food products that are exported to the other nations along with the estimation of the percentage of organic products produced in the nation.

III. TYPES OF ORGANIC FARMING

There are two types of organic farming that is the pure organic farming avowing energy and every unnatural chemical. Fertilizer and insecticides used in pure farming come from natural sources. It's referred to as pure organic farming. High productivity is best achieved by pure organic farming. The second one is integrated organic farming which consists of integrated nutrients management and integrated pest management [13].

IV. ORGANIC FARMING TECHNIQUES

In organic farming we come across many different techniques where few of them are given.

A. Soil Management

In India, the main method used in organic farming is soil management. After cultivation, soil loses nutrients and fertilizer content decreases. The process in which soil is recharging with all the necessary nutrients called soil management [8]. Naturally occurring methods are employed in organic farming to improve soil fertility. It makes use of microorganisms found in animal feces. The microorganisms contribute to the soil's increased fertility and productivity. Soil Management is first in the organic farming methods list [9].

B. Weed Management

Weed removal is the primary goal of organic farming. Unwanted plants, or weeds, coexist alongside the crop. Crop productivity was impacted by weeds adhering to soil nutrients. There are two approaches to dealing with the weed issue. The first is moving or cutting – In this process, we cut the weed manually, or mechanically in the field and second is Mulching – In this process, farmers use a plastic film or plant to residue on the soil's surface to block the weed's growth there by managing the weed growth without interference of any harmful substances [23].

C. Chemical Management in Farming

Both beneficial and detrimental organisms can impact crops. Controlling the proliferation of organisms is necessary to preserve crops and soil. In this process, natural chemicals, herbicides, and pesticides used to protect soil and crops. To keep other organisms under control, the entire space has to be well maintained.

Biological Pest Control method, use living organisms to control pests with or without utilizing any chemicals. Indian farmers use these organic farming techniques in their agricultural practices. The Crop Diversity approach allows for the co-cultivation of several crops to accommodate the rising need for crops. One of the most well-known organic farming methods in India is crop diversification [9].

V. BENEFITS OF ORGANIC FARMING

Organic farming is beneficial in many ways as it use the zero pesticides, less energy and natural resources in abundance resulting in a higher yield. Numerous research have indicated that the organic crops use the less pesticides up to 70% and produce yield of 95- 100%

with the 50% of expenditure on the energy and fertilizers. Organic farms are more capable of withstanding the harsh weather conditions. It increases the taste of the food and contains a higher nutrition which is a major requirement in the present scenario. Pest attack on the plants, diseases are going to reduce into a maximum by making the soil residues to incorporate during the plant growth. The environment pollution, soil erosion resources exploitation etc. can be minimized it also beneficial for the biodiversity with directly or indirectly in food, shelter and the balance of the ecosystem naturally [1]. Organic farms provides safe environment to wildlife as well. We can also witness the reduction in consuming of the energy and use of fertilizers which contributes to the energy conservation. On an average it is said that energy is lowered 30-50% in the organic farming. Also soil erosion can be controlled due to the practice of Mulching of the cover sheet and adopting the different method which retains the soil nutrition rather than washing away which again results in environmental crises [11]. It also helps in the water management in the proper time and requirement is reduced as much as possible. Therefore the organic farming is a step that makes the farming as a successful profession if it is taken care in right direction. When considering the economic benefit it is absorbed that there is a reduction in the inputs and the increase in the output. Effectively use of the genetic potential of plant and animal is inevitable. Hence, the sustainability production levels for the long time can be obtained. While coming to the social benefits it can benefit the small scale farmers and the marginal farmers along with contributing to the employment to the society and the healthier lifestyle can be adopted.[7]

VI. STATISTICAL ANALYSIS OF ORGANIC FARMING BENEFITS TO BIODIVERSITY

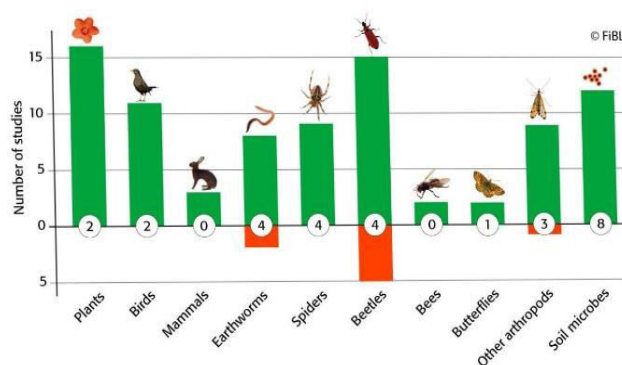


Fig. 1 Effect of organic farming on biodiversity analysis (Sezen Ocak. Ondokuz Mayıs University, Department of animal science.)

Agriculture is habitat for most of the living organisms like birds, insects, flora and fauna. Ideal crop land can provide shelter to all these organisms to incorporate their life in the fullest. For several reasons, crops and agricultural marginal areas are necessary for greater flora richness. Up to six times as many species are farmed organically as conventionally [14]. This kind of organic farming can also benefit a large variety of the insect which will higher the predatory insects and lower the non-predatory insects and pests. What matters most is that the higher abundance of bee diversity can enrich the honey bee farmers which makes their economy strong. Not only this but it can increase the soil microbial activities, their development, which is enhanced in organic farming and is crucial. Biomass and earthworm are increased from 1.2 to 3.2 in organic plots. Species richness of birds that is the invertebrate feeder were increased due to the organic farming because of increasing in food resources. Additionally, there is a rise in the small mammals which was notes in the recent days. Therefore, Growing organically can make a much

healthier place for the biodiversity from the microbial activities to the man's activities [3].

VII. CURRENT STATUS OF ORGANIC FARMING IN INDIA

India is being an agricultural country with the higher population required a plenty of food, fiber and shelter. It becomes necessary to produce a larger quantity of the agricultural products in no time. To fulfill this demand it becomes important to adopt a various methods to increase the food manufacturing. Natural farming has advanced as a result of M.S. Swaminathan's "Green Revolution". As a result of using chemical fertilizers and pesticides excessively the soil fertility has drastically decreased and it became very much necessary to enhance the soil fertility by switching to the organic farming. Furthermore, the use of fossil fuels is growing more prevalent every day. Therefore, it is now the way to organic farming [10].

As per the studies India produces the certified organic products of around 2.75 million M T (2019-20) which includes most of the crops from field crops, vegetables, fruits, oil seeds and aromatic and medicinal plants, beverages crops etc. Of the 175 nations that support organic farming in India, India comes in at number 10 in terms of output of certified organic food items. India is now ranked 33rd in the world for the total area under organic agriculture and 88th for the proportion of agricultural land used for organic crops to the total area under cultivation. Almost 4.72 million hectares have been subject to the organic certification procedure; this includes 0.6 million hectares of farmed land under 4.12 million hectares for the collecting of wild harvests in forests, which is the work of almost 6 lakh farmers. India produces functional food crops, fiber crops, and food crops in addition to food crops [5]. In India, The state of Madhya Pradesh has the most area dedicated to organic farming, followed by Maharashtra, Orissa, Karnataka and Uttar Pradesh. When considering the commodities of oil seeds is the single crops cultivated in large scale followed by sugar crops, Milles, Tea & coffee, cotton, Pulses and Medicinal/herbal plants. It is found that the Sikkim state is the first state that produces largest organic food in India. Around 76000 hector of land in India is organic certified and 2.4 million Hector of forest area is certified with the wild herbs. Maharashtra has 50000 hector of area where 10000 hector of land is certified for organic farming. Karnataka has more than 1513 hector of land und organic farming. Further non-agricultural areas include aquaculture, forest and grazing areas. These are totaled 35 million hectares. And all the organic areas together summed up to 107.4 million hectares (Organic World 2021). In India, organic farming is still in its infancy [21].

Due to rising awareness and the 20–25% annual growth in demand for organic farming in developed and emerging nations, this industry is gaining traction in India and creating a sizable export market. As a result, it strengthens the positive ties between the two nations. Because certification standards were created mostly in temperate developed nations, not all of them are applicable in other contexts. Requirements vary depending on whether they are motivated by ideology or scientific facts, particularly in less developed nations where conditions are constantly changing due to socio-ecological factors and evolving technology. [5]. Both the United States Department of Agriculture (USDA) and the European Commission have recognized the NPOP standards and certification conformity evaluation procedures as being equivalent to national requirements in their respective nations. India's organic products that are officially certified by accredited certifying bodies are accepted by the importing countries. The aim of the 2014–15 Paramparagat Krishi Vikas Yojana (PKVY) was to encourage cluster-based participatory certification of organic farming. In India, there are several governmental organizations, non-governmental organizations

(NGOs), and private citizens working to promote organic farming [12].

VIII. MARKETING FOR ORGANIC PRODUCTS IN INDIA

In the recent years India is increasing its market to international level even in the food aspects. The overseas market for these items has a healthy demand for organic products. India has distributed its organic market across the food, drinks, wellness and health, cosmetics, personal care However, the organic food market is seeing the fastest development. India has expanded its market to include the US, the EU, Canada, and New Zealand, the country's top export destinations. Half of India's total organic food exports were oilseeds, with processed foods coming in second at 25%. The bulk of demand for organic food in India originates from these cities. With the emergence of numerous new competitors in the organic food sector, including Conscious Foods, Sresta, Eco Farms, and Organic India, private companies are observing noticeably higher growth and demand from metro areas. Navdanya Morarka Organic Foods is one of them [19].

An further benefit is that organic farming has been a family tradition in some parts of the nation. This is an opportunity for organic farmers to access the rapidly expanding (15–25%) home market connected to the export industry. Farmers who live in unpolluted, rural areas free from the burdens of contemporary life are realizing the advantages of holistic, traditional farming that preserves biodiversity and healthy soil. Over 300 organic items in 19 categories were shipped from India. The biggest exports were non-basmati rice (1634 Mt, or 10%), cotton and textiles (17363 Mt, or 25%), and basmati rice (5243 Mt). oil crops: 17966 Mt (26%) and 2409 Mt (3%), except for sesame. Process foods: 8752 Mt (13%), tea: 2928 Mt and coffee: 5%, honey: 2405 Mt (3%), dried fruits: 1472 Mt (29%), spices, medicinal plants and their processed goods, and other miscellaneous items: 13 percent. Cereals, spices, coffee, vegetables, fragrant oil, herbal and medicinal plants, and pulses make up the remaining product categories (59%) of the market. Europe received 44% of the organic product exports, followed by Canada (22%), the United States (19%), and Asia (13%) [20].

Thanks to market trends and segmentation, the organic food industry is expanding at the quickest rate in history on a global scale. Due to growing knowledge, health and environmental issues are the primary concerns, and this is why growth was almost 19% in 2007. Organic product sales are rising substantially in places like North America and Europe [25]. Studies show that customers' motivations, which take into consideration things like their emotions, awareness of and knowledge about health problems, environmental issues, and nutrition level, are what lead them to buy organic food [26].

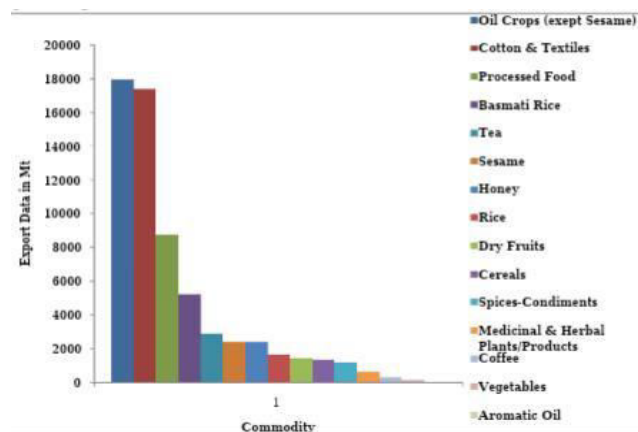


Fig. 3 Commodities wise export data (APEDA 2011-12)

The nations with the highest percentage of organic farming land among all farmlands are Samoa (22.4 percent), French Polynesia

(31.3 percent), and Liechtenstein (37.7%). Ten percent or more of all agricultural land is organic in fifteen nations, setting a new record [27] The organic farming sector needs to see where it stands in relation to these new developments [28].

IX. GLOBAL EXTENSION OF ORGANIC FARMING

There are at least 3.1 million organic farmers managing 72.3 million hectares of cropland throughout 187 countries. In 2019, sales of organic food and drink exceeded 106 billion euros worldwide. Demonstrating the growing interest of modern consumers in adopting environmentally sensitive and health-conscious eating practices. Approximately 75% of global agricultural output is derived from certified organic farming practices. It is among the world's most widespread and economical agricultural systems. India was the world's largest producer of organic foods in terms of the number of producers in 2019. In current scenario, there were 1.4 million more organic food producers in India than in the other nine largest countries in the world put together [15]. Despite the common belief that organic farming is more environmentally friendly than conventional farming, organic farming has pros and cons of its own. Organic farming emits less pollution than conventional farming in terms of its impact on the environment and climate change [16]. Organic farming delivers lower yields on average. The observed production discrepancies could increase even more if more farmers switch to organic farming methods because organic farming requires more knowledge. The extensive expansion of organic agriculture would lead to increased output prices and additional degradation of natural areas. [17] While wise combinations of conventional and organic farming methods could assist increase global agricultural output, organic farming isn't always the greatest solution for long-term agriculture and food security [18].

X. DISCUSSION

Even though it is considered that organic farming is a beneficial in many aspects and conserve the natural resources it is very much important to put in into practice. The prior measures are need to be conveyed to the farmers which is a drawback of this farming. Also the government hands has to reach the farmers in the direct way without the intermediate agencies. It is also considered that organic farming is a slow process and it cannot provide the sufficient food products to meet the demand. But noticeably if it is followed in a proper and right path can overcome this issue.

XI. CONCLUSION

As a result of the organic farming we can overcome many environmental cries. It provides a healthy life style and the conservation of the natural resources and energy in a simple manner. Also increases the nation economy along with the farmer's economy which is called as the backbone of the country. A lot of biodiversity gets food, shelter and the fiber. Here we have not used any synthetic fertilizer or any other agro chemicals which will nullify the pollution. Also increases the soil fertility by enriching the soil with the organic matter. Providing a habitat for a large florals and faunal, microbial activities. Water requirement become reduced during the farming process which reduces the farmers interference. It gives higher output by taking the lesser input which most of the times burdens the farmers. In addition to this, it provides a many local and industrial level of job opportunities to all classes of people and helps to increase the nation GDP and establish the good relationship among the different countries. In order to meet the demand of organic food the government has provided the many financial supports, policies and fund which encourages the farmers to adopt organic farming. Organic farming is the step forward to the nature which benefits the larger

diversity. If it is used correctly, it can boost the microbial activity to the industrial activity. India is a step ahead in the development of the organic products because it is an agricultural country. Organic foods are essential to addressing the world's hunger and health needs. All things considered, it can be said that the country's organic farms may improve people's quality of life, health, and prosperity. However, a number of studies have demonstrated the productivity and sustainability of organic farming.

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REFERENCES

- [1] D.G. Hoel et al., "Does Organic Farming Benefits Biodiversity Biological Conservation" UK, Elsevier, 2005.
- [2] Sarah K. Lowder a, Marco V. Sánchez b , Raffaele Bertini "Which farms feed the world and has farmland become more concentrated?" UK, Elsevier, 2021.
- [3] B.Suresh Reddy, "Agricultural Economy Research Review", CSE National Conclave on Sustainable Food System, 2010.
- [4] S.Siddique et.al, "Organic Farming:the Return to Nature", Springer Science+Business Media New York, (2014).
- [5] Shukla et al. "Organic Farming Current Status in India", ResearchGate, <https://www.researchgate.net/publication/344319922> (2013).
- [6] Benefits of Organic Farming. Agricultural, letter, Vol 11. Issue 5. Luamme lohn University of Georgia (May 2021)
- [7] Mr. M Elayarja et al. Organic Farming in India Benefits and Challenges (2020).
- [8] Cacek, Terry Organic farming: The other Conservation Farming system. Journal of Soil and Water Conservation (1984).
- [9] Chhonkar, P.K. Organic farming science and belief. Journal of the Indian Society of Soil Science (2003).
- [10] Albert, H. An Agricultural Testament, Other India Press and Research Foundation for Science Technology and Ecology, Goa (2000)
- [11] Singh, N. 2019, March 05) Economic and Environmental Aspects of Organic Farming. (March 5, 2019).
- [12] Yadava A. K Current Status of Organic Farming and Role of Government Institutions India (August 8, 2019).
- [13] Kankam, T. Okese, K. A., & Boamah, J. Organic Farming Types, Principles, Methods and Importance (June 8, 2020)
- [14] Charyulu D. K., & Dwivedi, AK Economics of Organic Farming and Farming India (November 17, 2016).
- [15] H. Willer, B. Schlatter, J. Trávníček, L. Kemper, J. Lernoud Organic agriculture worldwide 2018: current statistics Research

- Institute of Organic Agriculture (FIBL), Frick, Switzerland, BIOFACH, Nuremberg, Germany (2020)
- [16] C. Sean, "Organic farming and climate change: the need for innovation Sustainability", (2020)
- [17] E.M. Meemken, M. Qaim "Organic agriculture, food security, and the environment" *Ann. Rev. Resour. Econ.*, 10 (2018),
- [18] Ashoka Gamage, Ruchira Gangahagedara, Jeewan Gamage, Nepali Jayasinghe, Nathasha Kodikara, Piumali Suraweera, Othman e Merah "Role of organic farming for achieving sustainability in agriculture" 2023.
- [19] Dr. M. Ponniah "Production and Marketing of Organic Products in India" 2022
- [20] Ummiyah HM, Sumati Narayan, Pradeep Kumar, Ambreen Nabi, Malik Ajaz and Mudasir Magray "Export of organic products: Opportunities and challenges" December 2017
- [21] Roshan Raj Bhujel "Organic Agriculture in India: A Review of Current Status, Challenges, and Future Prospects" April 2023
- [22] Kulhade A, Gupta A et al. "Role of organic farming in indian agriculture". 2016
- [23] BK Dhaka, Prakriti, RD Jat, Kamal, Amit Sharma and Preeti "Weed management options under organic farming: A review" 2023
- [24] Emerging Trends in Sustainability of Organic Farming and its Impact on Purchase Intention -A Review & Research Agenda January 2019 Sujaya H., Meghana Salins& P. S. Aithal
- [25] Sayantan Bear (2018). Analysis, Reports, Emerging Organic Food Market. 1-43, <https://www.livemint.com/politics/dJmimxJ>.
- [26] Hoang Viet Nguyen, Ninh Nguyen (2019). Organic Food Purchase in an Emerging Market. *International Journal of Environment Research and Public Health*, 16(6), 1-17, <https://doi:10.3390/ijerph16061037>.
- [27] Willer H and M Yusefi. "The world of organic agriculture: Statistics and emerging trends 2007. 9th edition. International Federation of Organic Agriculture Movements and the Research Institute of Organic Agriculture (2008).
- [28] V Basil Hans and Raghavendra Rao "Organic Farming for Sustainable Development in India" *ACTA SCIENTIFIC AGRICULTURE* (ISSN: 2581-365X) (2018)