



Organic Farming Techniques, Requirements and Awareness Analysis in MP, India

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Abstract. Climate change adaptation is essential for agricultural sustainability. Building adaptation in the agricultural system requires simultaneous attention to increasing production by adopting varieties of technologies, adopting sustainable land management practices. Though several adaptations options are available in agriculture, not all of them can be applied to all location, as they are mostly location-specific. This paper has finds that organic farming is the global need but still people are not adopting it. A survey for the analysis was done where farmers from different category participate with a questionnaire. It was found that farmers are aware of its techniques and benefits but lack of market restrict them to do production. This paper has list some of the major requirements and impacts of organic farming.

Index Terms: Climate Change, Agriculture, Organic Farming.

I Introduction

Farming faces a big challenge ahead – dealing with climate change. Even if we try hard to stop it, the climate will keep changing for a long time. That's why we need to adapt. If the Earth warms up a little, we might just need to make small changes. But if it gets really hot, we might have to make big changes in how we grow our food [1]. The impact of climate change isn't the same everywhere, even with a little warming, some places might face big changes.

The weather is already messing with how we grow food in many places. Soon, we expect more problems like crazy weather events - floods, droughts, and other disasters that could wreck our crops. Climate change also messes with how we use land for farming in India. Things like water availability, droughts, floods, and even pests are becoming harder to predict [2].

The challenges for farming with climate change are a bit like a puzzle. We worry about having enough water, the quality of our water, crazy weather events, heat being too much for crops, and pests acting weird due to climate changes.



Now, there's a way of farming called organic agriculture. It's like a team effort with nature. It tries to keep the farm healthy by using smart ways to grow food. Organic farming cares about things like having different types of plants and animals, keeping the soil healthy, and recycling waste to help the land. It avoids using too many chemicals and helps keep the air, water, and soil clean [3]. It's like a bundle of good practices that work together to make sure the farm stays healthy.

But there are other ways to farm sustainably too, like taking care of pests or managing water better. The cool thing about organic farming is that it's like a superhero team of good practices all working together. And if you grow food this way, you can get a special certification that makes people pay more for your produce, which is pretty awesome [5].

II. Impacts of Industrial Farming Practices

Weeds - Lots of unwanted plants, called weeds, grow in rice fields in Sri Lanka. There are more than 70 types, and the main ones depend on things like the kind of soil, how much water is there, and how farmers water the fields. Some important ones are *Echinochola crusgalli*, *Ischeamum rugosum*, and *leptochloa chinensis*. In certain areas, like the Dry Zone, not having enough water during crucial times makes the weed problem worse. Also, using certain fertilizers might bring in new types of weeds [7].

Pests - There's a problem with too many bugs in rice fields because people are using too much bug spray. This spray messes up the natural way of keeping bugs in check, where other bugs eat them. Now, we have too many pests, and it's causing issues like breaking the food chain and harming the soil's health [8].

Water Management - Having too much or too little water is a big issue for growing rice in Sri Lanka. When there's too much water, it washes away the nutrients in the soil, causes soil erosion, and makes the soil unhealthy. Sometimes, farmers aren't managing the land properly, like blocking drainage or not taking good care of it [10].

Soil Fertility and Nutrients - The soil in some countries, like Sri Lanka, doesn't have enough of the right nutrients for rice to grow well. Things like zinc, copper, iron, and sulfur are missing. Also, mixing certain fertilizers with water can make the water not good, leading to problems like too much algae, pollution from phosphate, and an increase in harmful substances like cadmium [11].

III. Literature Survey

Ricart et al. [11] recently looked into how much people know about climate change and how ready they are to deal with it. They found not many studies connect what people know about it with how much they're getting ready for it, especially the good



things about getting ready. Other studies say farmers need to not just know about climate change but really understand it to handle the changes in their farming. Understanding is like the first step to get ready for the changes.

A group led by Reddy, A.A. [12] discussed how the Indian government has been pushing for organic farming since 2015 through a nationwide program called Paramparagat Krishi Vikas Yojana (PKVY). This program has about 13.9 million certified organic farmers in 29,859 organic clusters, but it only covers a small part of all the farmland in India, about 0.4%. Some researchers checked how well this program is working and found that organic farmers spend a bit less and get a bit less crop compared to regular farmers. But in the end, they make a bit more money.

Another group led by Paul, B. [13] checked if Indian farmers like using eco-friendly fertilizers and other good stuff for farming. Most farmers like using regular stuff because the good things are more expensive. But only about 5% of all farmers use the good stuff a lot. Even though small farmers are really important for food, changing from regular stuff to good stuff needs help from the government. The study suggests the government needs to invest to make the good options better and cheaper.

Babajani, Arezou et al. [14] looked at three big programs in Sikkim, India, Bhutan, and Sri Lanka, trying to make farmers do organic farming. Sikkim fully switched to organic farming, Bhutan is trying, and Sri Lanka is running a toxin-free plan. The study found that to do this on a big scale, you need good leaders, cheap certifications, slowly using fewer chemicals with clear plans, sharing information, getting better market access with higher prices, and giving good stuff for farming. The important things pushing for these changes include making life better in rural areas, using old farming practices more, dealing with health problems from chemicals, and saving nature. But there are problems too, like not having enough good farming stuff, not enough access to good markets, not enough knowledge about better ways to farm, and the certifications being too expensive.

Nayak, Ashish et al. [15] studied how managing waste through composting is crucial to reduce environmental issues and improve the soil on farmlands. They focused on the effects of food waste compost (FWC) and leaf yard compost (LYC) at different rates on soil properties and the growth and yield of Swiss chard (*Beta vulgaris L.*). They collected food waste, leaves and yard waste, and animal dung and composted them. They then applied the compost to the soil at different rates. The study found that increasing the amount of FWC significantly increased the height, leaf area, and fresh yield of Swiss chard.

III. Data Collection and Analysis

The research took place in Damoh district in Madhya Pradesh, India. This area has well-off farmers who grow different kinds of crops and veggies. Many young farmers here are getting into organic farming, aiming to set a new standard for farming. We

used a set of organized questions to talk to the farmers. The first part asked about things like their age, education, experience, connections with different groups, and their background in growing veggies. The next part looked into what the farmers think about climate change and how it affects growing veggies.

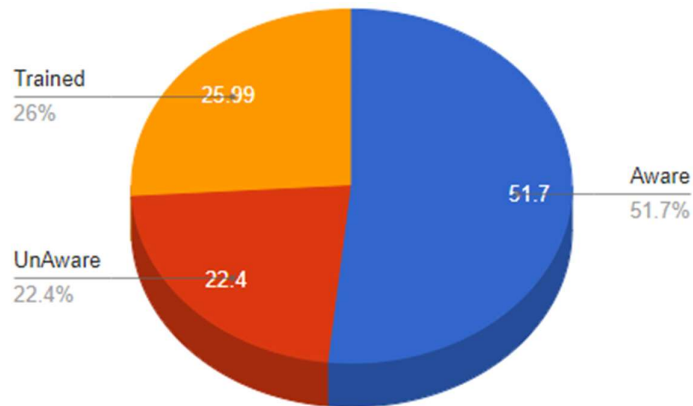


Fig. 1 Awareness about organic farming.

Fig. 1 shows that most of farmers are aware of the organic farming and some are even trained by the different government training programs. Most of the unaware people have very little lands of farming. So understanding of the organic farming is rich in this area.

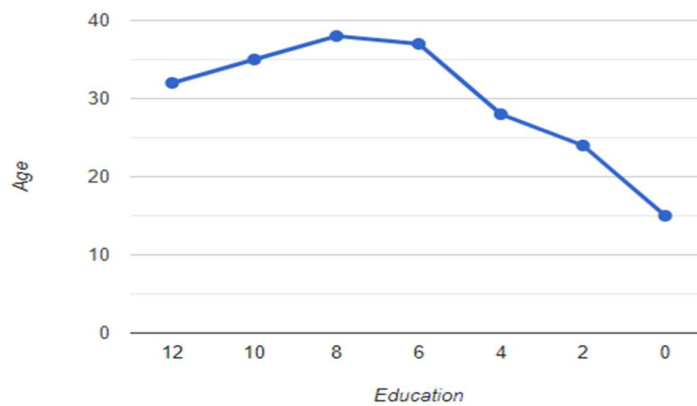


Fig. 2 Age, Education and Awareness Value based organic farming.

Fig. 2 shows that young age farmers have good awareness about the benefits of the organic farming. Most of the young farmers have done some training as well. Old age farmers have little awareness and adoption for the organic farming.

Organic and Conventional Farming

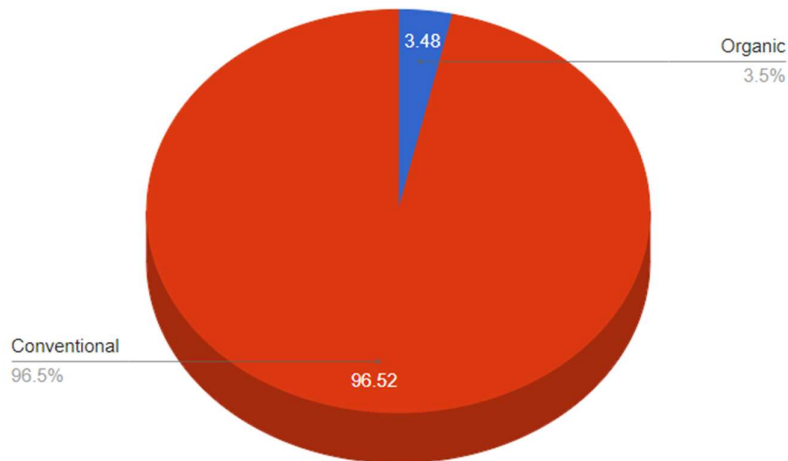


Fig. 3 Farmers doing organic farming.

Fig. 3 shows that very little farmers are doing organic farming, most of farmers have knowledge but due to lack of market to sale they approach for the conventional farming. It was also found that those who are doing organic farming have graduation and large farm land.

V. Requirements of Organic Farming

Crop Productivity Many research have been conducted to investigate how organic farming, particularly methods such as vermicomposting and bio-fertilizers, affects crop yield. Vermicomposting, according to Cidón [16], is favorably related to income and agricultural output. This link stems from the benefits of vermicomposting, which decreases nitrogen concentration while also stabilizing output and increasing yield. This not only boosts farmers' revenue, but also reduces the cost of purchasing and applying nitrogen fertilizer [17]. Unlike chemical fertilizers, which may leave nitrate residues that can be harmful to customers' health, vermicomposting organically increases nutritional content. This enrichment is essential for increasing agricultural plant yields. Vermicomposting minimizes nutrient leaching activities in nitrogen fertilizers, boosting crop plants' ability to properly use vital nutrients for production, according to [17]. Production has been increased.



Product Quality Crop product quality is an important consideration when considering numerous physiological processes and outcomes in crop plants, such as texture, taste, appearance, nutritional and safety qualities, and overall quality, which influence consumer value and environmental impact. Recent research indicates that vermicomposting is connected with improved product quality, including changes in processing, increased durability and storage for final products, and improved physiological qualities, as many customers expect [18]. As a result, vermicomposting needs ongoing testing and empirical data to assure consistent outcomes. Furthermore, vermicompost feeds crops with necessary nutrients that improve the quality of farm output. These nutrients are easily absorbed by plants, allowing them to blossom properly and with few faults. When compared to chemical fertilizers, vermicomposting has a higher nutritional content. It raises the pH of the juice.

V. Conclusion

When it comes to making farming better, especially dealing with changes in the environment, there are some smart ideas. We can use different types of crops, change the way we use land, and learn new ways to grow plants. It's also important to manage water and soil wisely and teach farmers new tricks to make things work well. On a bigger scale, countries and regions can help farmers by offering financial support, insurance, and useful information. The key is to keep experimenting and trying new things to make sure farming stays good for everyone. And here's an important tip: using natural things like worm compost, seaweed, and other organic stuff can make the soil better. It's like giving the plants the right kind of food. Also, doing clever things like changing the types of crops we grow and how we arrange them in the fields can make farms more productive and diverse. All of these ideas are used to get more food and make farming better for everyone.

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