# 5

# SUMMARY AND CONCLUSION

The study titled "**Creating Awareness on Organic Waste Management Practices among Selected Rural Households**" was conducted with the primary goal of improving farmers' knowledge, attitudes, and acceptance of organic waste management for organic farming in order to improve food quality and environmental conditions, ultimately leading to food safety, security, and a healthy, happy, and prosperous lifestyle. Furthermore, transforming organic waste into organic farming inputs is a more effective approach to supplement family income by selling organic fertilizer, boosters, and insecticides to other farmers. As a result, this is regarded as one of the entrepreneurial skills required for farmers to prosper economically.

Since there was more agricultural land and organic waste available, the study was carried out in 15 villages in the Sathiyamangalam block of Erode District. Three stages made up the research design: a household survey, raising awareness of organic waste management techniques, and assessing the training programme's effectiveness. The samples were chosen using purposive sampling techniques. Thirty farm households from the chosen 15 villages, representing equal numbers of marginal (up to 2 ½ acres), small (2 ½ to 5 acres), and large (beyond 5 acres) landholdings, were chosen for a household survey out of a total of 450 households. The techniques of observation and interviewing were used as methods and interview schedule served as a means of gathering data.

Block-level training and village-level training were the two stages of the training and awareness campaign. All of the chosen family heads served as trainees –frontline farmers for the block-level training. All of the village's farmers as well as frontline farmers took part in the village-level training. The awareness campaign was run for a total of six days at the block level and five days at the village level in each hamlet. The training and awareness program's effects were assessed in terms of how it affected the chosen households and the frontline farmers.

The key findings are presented under two headings: A. Household survey, and B.. The impact of the training and awareness programmes conducted.

## A. HOUSEHOLD SURVEY

A household survey was carried out across 450 households in 15 villages, ensuring equal representation from marginal, small, and large-scale farmers. The survey utilized an interview schedule to gather information on current agricultural practices, organic waste management methods, and the challenges faced. It highlighted the importance of adopting organic waste management for organic farming practices. The findings are summarized into three heads: 1. Demographic profile , 2. Agricultural farming practices and 3. Organic waste management practices of the selected households.

### 1. Demographic Profile of the Selected Households

The study reveals a demographic profile of households categorized as marginal, small, and large, with a majority of individuals aged 40-50. Married individuals were more prevalent in these households, while unmarried individuals make up 32 percent, 49 percent, and 45 percent. Family structure favours joint families, with 66 percent, 51 percent , and 64 percent of households having nuclear families. Primary education was more prevalent in small households, with secondary and high secondary education levels varying. Agriculture was the primary occupation, with dairy-related occupations present in 79 percent of marginal, 69 percent of small, and 81 percent of large households.

### 2. Agricultural Farming Practices in the Selected Households

- Sathyamangalam Block, Erode District has red sandy, red loam, and laterite soil types. Water availability influences crop selection, with varied crop patterns and land distribution in wet, dry, and semi-arid areas.
- The study reveals that 31 percent of marginal farmers had wetlands, while 42 percent owned dry land and 29 percent owned semi-arid land. Cropping patterns vary among different groups, with cereal farming showing significant variability. Pulses, nuts, and oilseeds also show varying preferences. Large families were more likely to cultivate groundnuts, while small households preferred sunflowers. Coconut cultivation was stable across all groups. Vegetable and fruit production varies, with large families playing a significant role in bananas, onions, and sugarcane production, while small families dominate tomato and guava agriculture. The study suggests a downward trend in agricultural productivity.

- The study shows that 72 percent of large-scale farmers, 39 percent of small-scale farmers, and 21 percent of marginal farmers grow paddy twice annually, whereas all other farmers cultivate maize, black gram, green gram, and horse gram only once a year.
- The study reveals that urea, a nitrogenous fertilizer, was widely used in marginal, small, and large households for nitrogen supplementation, enhancing soil fertility. DAP, a phosphate fertilizer, was also widely used, with marginal households using it at a high rate. The use of these fertilizers demonstrates their importance in improving soil fertility and crop development, highlighting the common awareness of their role in current agricultural techniques.
- Fertilizers, essential for plant growth, provide essential nutrients and trace elements. Marginal farmers allocated approximately Rs. 3,370 per crop for chemical fertilizers, whereas small farmers spent around Rs. 5,680 and large farmers spent about Rs. 10,300 per crop. Marginal farmers spent less due to higher costs and less land.
- Pest attacks were the main problem faced by farmers during cultivation and storage, with 86 percent in marginal, 96 percent in small, and 85 percent in large households. A labor shortage was a significant challenge, particularly for large households, with high demand for high-paying labor. The high cost of fertilizers and pesticides was a significant concern, and water shortages vary in intensity among different household categories.
- Over 50 percent of identified pests in the field were rice moths, whiteflies, and stem borer, while mealy bugs, green worms, white worms, and leaf folders affected 40 percent of marginal and large farmers.
- The study reveals that tomato plants were most affected in marginal households, with 56 percent of the population affected. Cercospora leaf spot was less widespread, while yellow mosaic disease affects 23 percent of tomato crops. Alternaria leaf spot was more prevalent in marginal households, and fruit rot was more pronounced in marginal households. Disease incidence in plants ranges from nine percent to 39 percent and in seeds from four to 18 percent.
- Copper sulphate, deltamethrin, glyphosate, and aluminum phosphate were common pesticides used in various household sizes. Copper sulphate was

prevalent in marginal households, while deltamethrin was more prevalent in large households. Glyphosate was more prevalent in larger agricultural settings. Aluminum phosphate and other pesticides show consistent use.

- Marginal, small, and large farmers expended Rs. 9,900, Rs. 15,590, and Rs. 29,110 per crop, respectively, on chemical pesticides for pest control, yet they continue to face challenges in fully safeguarding their food crops.
- Headaches, eye irritation, rashes, itching, nausea, vomiting, allergies, wheezing, and diarrhea were the most common issues experienced by participants using inorganic fertilizers and pesticides.
- All type of farmers invariably expressed that, pests, dampness, mould, fungus, and insects cause 5–15% of food grain losses during storage on average. They were merely using frequent sun drying as a technique.
- Organic agricultural practices vary across households, with different approaches to soil fertility preservation, organic fertilizer usage, and weed control. Fertilization methods were adopted by 12 percent of marginal, 16 percent of small, and eight percent of large households, while crop rotation, intercropping, tillage methods, and livestock manure were used by varying percentages.

**3. Organic Waste Management Practices in the Selected Household**

Households in selected blocks produced nearly half a kilogram of organic and inorganic waste daily, posing a threat to the ecosystem due to improper disposal, emphasizing the importance of proper waste management.

- Households were using plastic bins for organic waste collection due to their ease of availability, cost-effectiveness, ease of handling, and maintenance.
- The frequency of waste disposal depends on the amount produced, with one-third of households disposing of kitchen waste daily, 66 percent on alternative days, and 24 percent weekly.
- The data indicates that burning was the most prevalent method for disposing of household waste, with dumping in vacant lots being the second most common approach. Government dustbins or corporate waste collection was the third most common, followed by throwing waste on roadsides. The data underscores the

need for responsible waste disposal practices and potential discrepancies in individual choices.

- The majority of respondents (97 percent) expressed concerns about pest-related issues, unhygienic surroundings, environmental pollution, unpleasant odours, and infrastructure challenges. They also mentioned health problems, such as street dog problems, drainage overflows, and the impact of polluted water supplies on the living environment.
- A significant 92 percent of households recycle, with eight percent composting. Newspapers were valuable in the recycling chain, with 54 percent used for wrapping and cleaning glass. 100 percent of bottles were recycled, and 18 percent were repurposed. Plastic covers are versatile, with a significant percentage being reused as bags or dustbins.
- The majority of respondents (85 percent) attribute improper waste disposal to laziness, lack of environmental awareness, and lack of knowledge of proper disposal methods. They also identified space and disposal provisions as constraints, mishandling of dustbins, and dissatisfaction with government waste collection practices as potential areas for improvement. Educational initiatives and informative campaigns are crucial for promoting responsible waste management.
- The consensus unanimously acknowledges the importance of a clean environment in well-being, with 98 percent of farmers reporting a healthy living environment, 95 percent experiencing mental relaxation, and 93percent experiencing overall life satisfaction, highlighting the widespread value of cleanliness.

## B. THE IMPACT OF THE TRAINING AND AWARENESS PROGRAMME CONDUCTED

Based on the household survey, a training and awareness programme was developed to provide information on organic waste for organic farming methods that promote agricultural sustainability. In the first step, 450 trainees who were willing to work as front-line farmers had a six-day training and then communicated the information they learnt to their fellow members, both men and women.

In the second stage, five days of training and awareness were provided in each village to the whole community of the selected 15 villages. Lectures, participation debates, demonstrations, seminars, displays, and field excursions were all part of the training programme. Visual aids utilised during training included charts, posters, brochures, booklets, and a training manual. The training and awareness programme's impact was assessed in terms of knowledge gained, attitudes established, and trainees' acceptability of using organic waste for organic agricultural techniques by the frontline farmers and the selected households.

The major findings are summarized below.

**1. Impact of Training and Awareness on the Trainees – Frontline Farmers**

The study evaluated the impact of village-level training on organic waste for organic farming practices, including the number of farmers benefitted, feedback on teaching methods, knowledge and attitude changes, and acceptance of organic farming practices.

- Over 95 percent of farmers believe group discussion was the best method for communicating organic agricultural practices, as it encourages individual responsibility, clarification of doubts, and contribution to solutions.
- Field visits were highly useful for farmers, as they provided a tangible view of organic farming practices, demonstrating that a picture is equivalent to 1,000 words.
- The lecture method and demonstration were deemed satisfactory by 92 percent and 86 percent of farmers, as lectures provided background knowledge and demonstrations provided opportunities for participation and observation.
- The study identified notable variations in knowledge scores among marginal, small, and large farmers both before and after the training program, thereby disproving the hypothesis concerning knowledge scores.
- All farmers improved their knowledge score, with small farmers showing the highest increase at 38.36, followed by marginal farmers at 37.31. This is attributed to exposure to agricultural practices, large networks, and interest in learning new concepts. As a result, the hypothesis based on average knowledge scores, which revealed no significant differences before and after the awareness programmes, was rejected.

- The data reveals that the trainees' attitude scores improved across all landholding categories—marginal, small, and large farmers—demonstrating the awareness programmes positive effect on their views about organic farming. As a result, the hypothesis regarding the average attitude scores did not show significant differences before and after the training, leading to its rejection.
- Farmers were knowledgeable about the health advantages of organic farming but lacked awareness regarding its economic benefits, government support, organic certification bodies, and strong market demand for organic products. Increased awareness is essential for transitioning farmers to organic farming practices.
- The awareness programmes significantly improved farmers' attitudes towards organic farming, enhancing their understanding of the economic and environmental benefits. Participants were educated on government schemes, organic certification bodies, and market demand, leading to a significant increase in their overall attitude.
- The awareness programmes significantly improved the acceptance of organic farming practices among selected farmers, supporting the hypothesis that training and awareness will enhance their adoption.
- The study indicates that farmers were increasingly accepting the usage of organic agricultural practices as a productive alternative for preventing pests and diseases.
- Organic farming practices were generally accepted by all farmers, possibly due to resource availability, simple technology, cost-effectiveness, and health consciousness.

**2. Impact of Awareness on the Selected Households**

The current studies analysed chosen farm households' adoption of organic waste for organic agricultural methods throughout a year, monitoring it through visits and direct observation. Economic benefits were noted, such as lower costs for chemical fertilisers and pesticides, as well as enhanced food grain conservation and value. The study also examined farmers' perspectives and recommendations for improved organic waste management in organic farming.

- Male participation was higher than females and young individuals, with greater enthusiasm for knowledge acquisition and new concepts, despite limited youthful participation.
- The outcome shows improvements in vermicomposting adoption, with marginal and small farmers using silpaulin sheets and compost pits, and producing compost bags from discarded polythene bags, recognizing its importance in organic farming.
- Following education, farmers started using organic growth boosters, with neem cake being the preferred choice due to its availability, affordability, effectiveness, and efficiency. Marginal farmers used organic manure tea, while large farmers used Amuthakaraisal and Jeevamirtham
- Farmers used neem leaf powder, extract, cow dung extract spray, and cow urine seed treatment to control pests and diseases. After training, nearly half of selected households started organic farming practices, introducing new methods like light traps, yellow sticky traps, and neem kernel extract.
- The study analyzed the adoption of organic methods to prevent and control insects and pests during post-harvesting. The methods involved applying neem extract to gunny and polythene bags, coating pulses with red soil, and utilizing powders made from neem leaves, pungam leaves, and nochi leaves.
- Following the awareness programmes, all farmers adopted organic methods for managing insects and pests during post-harvest, which included treating gunny bags with neem extract, coating pulses with red soil, and applying neem leaf powder.
- Organic agricultural practices, including organic fertilizer, growth boosters, and pesticides, have significantly reduced food grain losses for all farmers, with large farmers showing the most reduction.
- It is worth mentioning that transforming organic waste into organic repellent might help reduce insect and pest assaults on stored grains. On average, marginal, small, and big farmers may save 46 kg, 91 kg, and 274 kg of food grains, respectively. The equivalent monetary values are Rs 1,315, Rs 2,489, and Rs 7,166 for marginal, small, and large farmers, respectively
- Organic farming practices reduce farmers' expenditure on chemical fertilizers and pesticides, benefiting marginal and small farmers by 50 percent and large farmers by 75 percent. On average, these farmers save Rs. 7,885/-, Rs. 12,759/-

and Rs. 31,866/- per crop. Organic fertilizers, growth boosters, and pesticides also reduce chemical use, providing health benefits.

- All marginal, small, and large farmers unanimously expressed and agreed that organic farming was cost-effective, convenient, and easy to access for all farmers, including marginal, small, and large ones. It was also chemical-free, tasty, and easy to eat. Most farmers use self-produced inputs like seeds, manures, leaf extracts, and natural plant protectors, and consider soil nutrient enhancement as an advantage.
- Regarding suggestions for better adoption of organic farming, 71 percent of farmers suggested conducting an awareness campaign to promote organic products for pest control. Seventy-one percent need support in marketing produce, technical guidance, and subsidies for raw materials and infrastructure. These suggestions should be implemented by government and extension agencies.

Summarized findings with objectives :

| **Research Objectives** | **Research Findings/ Summary** |
|---|---|
| a. Identify the farming practices and organic waste management practices of marginalized farmers, smallholders and large farmers | The study profiles households as marginal, small, and large, predominantly consisting of individuals aged 40–50, with a majority being married. Unmarried individuals make up 32%, 49%, and 45% of each household type, respectively. Joint family structures were favoured, with 66%, 51%, and 64% of households identified as nuclear.<br><br>Education levels vary, with primary education more common in small households. Agriculture was the main occupation, with dairy present in 79% of marginal, 69% of small, and 81% of large households. Land ownership shows that 31% of marginal farmers have wetlands, while 42% own dry land, and 29% own semi-arid land. Cropping patterns vary, with significant differences in cereal farming and preferences for pulses, nuts, and oilseeds noted. Large farmers tend to cultivate groundnuts, while small households favour sunflowers, with coconut cultivation stable across groups. |

| | |
|---|---|
| | Vegetable and fruit production varies, with large farmers heavily involved in bananas, onions, and sugarcane, while small farmers dominate tomato and guava farming. The study indicates a downward trend in agricultural productivity, with 72% of large farmers, 39% of small farmers, and 21% of marginal farmers growing paddy twice a year. Other farmers typically cultivate maize, black gram, green gram, and horse gram only once annually. |
| b. Analyzing organic waste management that contributes to the provision of organic agricultural inputs | The study highlights the widespread use of urea and DAP fertilizers among marginal, small, and large households to enhance soil fertility and crop development. Marginal farmers spent about Rs. 3,370 per crop on chemical fertilizers, while small and large farmers spent Rs. 5,680 and Rs. 10,300, respectively, with marginal farmers spending less due to higher costs and smaller land areas.<br><br>Pest attacks were a significant challenge, affecting 86% of marginal, 96% of small, and 85% of large households, with rice moths, whiteflies, and stemborers being the most common pests. Labour shortages particularly impacted large households, which also faced high fertilizer and pesticide costs, alongside varying water shortages.<br><br>In marginal households, 56% of tomato plants were affected, with diseases like yellow mosaic and Alternaria leaf spot prevalent. Pesticides commonly used included copper sulphate, deltamethrin, glyphosate, and aluminium phosphate, with marginal households favouring copper sulphate and larger farms using glyphosate more frequently. Expenditures on pesticides were Rs. 9,900 for marginal, Rs. 15,590 for small, and Rs. 29,110 for large farmers, yet challenges in pest control remained.<br><br>Participants reported health issues such as headaches, eye irritation, and nausea due to the use of inorganic fertilizers and pesticides.<br><br>The study indicates a significant increase in vermicomposting adoption among marginal and small farmers, who utilized silpaulin sheets, compost pits, and recycled polythene bags for compost production. Farmers became aware of organic farming's importance and began using organic growth boosters, with neem cake being the most popular choice due to its affordability and effectiveness. |

| | |
|---|---|
| | Marginal farmers favoured organic manure tea, while large farmers preferred Amuthakaraisal and Jeevamirtham. Pest and disease control methods included neem leaf powder, extracts, cow dung sprays, and cow urine treatments. After receiving training, nearly half of the participating households adopted organic farming practices, implementing techniques such as light traps and sticky traps.<br><br>The study also explored organic pest control methods during post-harvest, where farmers applied neem extract to storage bags and coated pulses with red soil. Following the training, all farmers embraced these organic techniques, enhancing their pest management strategies during post-harvest activities. |
| c. Identify differences in agricultural practices before and after organic farming training between marginal farmers, small farmers and large farmers | The chosen small, marginal, and large farmers' knowledge, attitudes, and acceptance of organic waste for organic farming practices improved dramatically before and after the training and awareness programmes, but there was no discernible difference among the farmers. It is vital to underline that farmers from all categories understand that organic farming helps both consumers and the environment and that organic waste management is easy and quick to implement |
| d. Analyse the impact of organic farming training on the knowledge, attitudes and acceptance and opinions of adoption before and after the training, between marginal farmers, small farmers and large farmers | The study found that male farmers participated more than females and young individuals, showing a strong enthusiasm for learning about organic agricultural practices. Over 95% of farmers preferred group discussions for knowledge exchange, as this method promotes responsibility and solution-sharing. The lecture method and demonstrations were also well received, with 92% and 86% satisfaction rates, respectively.<br><br>Knowledge scores improved for all farmers post-training, with small farmers showing the highest increase at 38.36 points, followed by marginal farmers at 37.31. This improvement was linked to greater exposure to agricultural practices and a willingness to learn.<br><br>Attitude scores also improved across all landholding categories, indicating the training's positive impact on perceptions of organic farming. While farmers were aware of the health benefits of organic farming, they lacked knowledge about its economic advantages, government support, and market demand for organic products. The training addressed these gaps, enhancing farmers' |

| | |
|---|---|
| | understanding of the economic and environmental benefits of organic practices.<br><br>Overall, the study confirmed that training and asareness significantly increased acceptance of organic waste for organic farming among participants, who appreciated its resource availability, simplicity, cost-effectiveness, and health benefits. This suggests a growing trend towards adopting organic methods as a viable solution for pest and disease management.. |
| e. Identify the economic impact before and after the training, between marginal farmers, small farmers and large farmers | Fertilizers, essential for plant growth, provide essential nutrients and trace elements. Marginal farmers allocated approximately Rs. 3,370 per crop for chemical fertilizers, whereas small farmers spent around Rs. 5,680 and large farmers spent about Rs. 10,300 per crop. Marginal farmers spent less due to higher costs and less land.<br><br>Marginal, small, and large farmers expended Rs. 9,900, Rs. 15,590, and Rs. 29,110 per crop, respectively, on chemical pesticides for pest control, yet they continue to face challenges in fully safeguarding their food crops.<br><br>The study looked at how organic methods are used to get rid of pests after the harvest. It focused on things like putting neem extract on storage bags, covering pulses with red soil, and using powders made from neem, pungam, and nochi leaves. Following the training and awareness, all farmers adopted these methods, which led to significant reductions in food grain losses, particularly among large farmers.<br><br>It is worth mentioning that transforming organic waste into organic repellent might help reduce insect and pest assaults on stored grains. On average, marginal, small, and large farmers may save 46 kg, 91 kg, and 274 kg of food grains, respectively. The equivalent monetary values are Rs 1,315, Rs 2,489, and Rs 7,166 for marginal, small, and large farmers, respectively.<br><br>Furthermore, farmers had to spend less money on chemical fertilizers and pesticides when they used organic waste for organic farming; large farmers saved about 75%, while marginal and small farmers saved nearly 50%. On average, marginal, small, and large farmers saved Rs. 7,885, Rs. 12,759, and Rs. 31,866 per crop, respectively. The use of organic inputs not only decreased chemical dependency but also brought health advantages. |

## CONCLUSION

With the majority of farmers adhering to the simple methods of applying organic fertilizesr, boosters, and pesticides with sound understanding, it is possible to draw the conclusion that the village-wide programme that was started to inform, encourage, and persuade farmers to adopt organic waste for organic farming practices was successful. This led to the preservation of soil fertility, human health, and food grain savings in addition to the protection of insects, pests, and disease. Although there were no discernible differences between the selected small, marginal, and large farmers, their knowledge, attitudes, and acceptance of organic farming practices improved considerably before and after the training and awareness programmes. Furthermore, farmers had to spend less money on chemical fertilizers and pesticides when they used organic waste for organic farming; large farmers saved about 75%, while marginal and small farmers saved nearly 50%.

It is worth noting that farmers of all backgrounds recognized that organic farming and organic waste management were better for the environment and humans. To summarize, organic waste management for organic farming is unquestionably the best solution for resolving all environmental, agricultural, and health issues, reducing financial burdens, and ensuring a happy and healthy existence for future generations.

**“Reduce, reuse, recycle – it’s not just a slogan, it’s a way of life.”**

**“If we seed the Agriculture, it will feed the Nation”**

# LIMITATIONS/ CONSTRAINTS

Adopting organic farming and organic waste management may initially provide some difficulties for farmers. Organic and conventional farming may easily switch land resources, but not the other way around. To enhance the handling of organic waste as an input in organic farming, continuous education and awareness campaigns are required.

For the efficient management of insects, pests, and diseases in economically important crops, organic fertilizers and pesticides hold great potential. Nevertheless, there are several drawbacks, including a short shelf life, a delayed reaction time, and the enormous quantities needed per unit area. Creating organic waste management plans can be a cost-effective and sustainable substitute for chemical pesticides and fertilizers for all types of farmers.

The lack of proper infrastructure for composting and waste segregation further limits practical application. Moreover, the impact of awareness programs may depend heavily on continued external support, raising concerns about the sustainability of outcomes once the intervention ends. Finally, variations in socio-economic and environmental conditions across different villages mean that the results may not apply to all rural areas.

# RECOMMENDATIONS

- There have to be more need-based, specially created training and awareness campaigns about organic waste treatment methods.
- Further research is needed to standardize the extraction procedure and evaluate the pest-repellent properties of plant products.
- More labs and units must be set up in key locations across India in order to evaluate the quality of organic products.
- The indigenous sciences shall be developed, revitalized, and applied via research.
- Further research on the sustainable organic agricultural revolution that makes use of regional natural resources is necessary to fight climate change.
- To increase public awareness of the benefits and necessity of organic waste for organic farming, public media such as television, movies, and radio are used.
- The government should make agriculture cognitively stable in order to entice young people to return to it. The government may encourage and acknowledge PhD and dissertation work in the field of organic waste for organic farming by providing funding and other required support.
- The government, scientific community, farmers, and the general public should work together to end the use of chemicals in agriculture and guarantee that future generations have access to wholesome food.