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Eco-friendly Farming practices for sustainable agricultural development in Cuddalore District

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Abstract

Eco-friendly farming practices are sustainable, low-cost and environmentally sound methods that support biodiversity and reduce pollution. This study was based on the hypothesis that the knowledge level of paddy farmers significantly influences the adoption of eco-friendly cultivation practices. The research aimed to assess farmers understanding of recommended eco-friendly practices and identify areas with knowledge gaps. Conducted in the Cuddalore district of Tamil Nadu, the study involved 120 paddy farmers selected from 12 villages. The findings revealed that nearly half (48.33%) of the respondents had a medium level of knowledge, followed by 35.00% with high and 16.67% with low knowledge levels. A novel insight from the study was that while farmers had good knowledge in areas such as main field preparation (97.49%) and harvesting (96.66%), their awareness was significantly lower in critical areas like eco-friendly pest and disease management (52.26%) and use of bio-fertilizers (57.08%). This uneven knowledge distribution highlights the need for targeted extension interventions. The study offers new perspectives on practice-specific knowledge among paddy farmers and emphasizes strengthening weak areas to ensure holistic adoption of sustainable farming. These insights contribute to improving eco-agricultural strategies for long-term food security and environmental conservation.

Key words : Eco-system, Conventional paddy farming, natural soil nutrients, bio-pesticides.

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Eco-friendly farming practices are straightforward, cost-effective and pollution-free approaches that have gained acceptance at both social and commercial levels[8]. Rooted in traditional knowledge and validated by scientific research, these practices are designed to work in harmony with nature rather than against it[13]. As modern agriculture faces increasing challenges-such as soil degradation, declining productivity, environmental pollution and the overuse of synthetic inputs-there is a pressing need to adopt farming methods that are sustainable from environmental, economic and social standpoints[6].

Sustainable agriculture focuses on preserving the natural cycles of ecosystems, ensuring long-term productivity without compromising the health of soil, water and biodiversity[3]. Organic farming, a recognized form of eco-friendly agriculture, emphasizes ecological soil management, natural pest and disease control, reduced dependence on external inputs and practices such as crop rotation and mixed cropping. These methods not only improve crop quality and soil fertility but also significantly reduce environmental pollution[10].

Furthermore, the adoption of eco-friendly farming practices enhances biodiversity at multiple levels and contributes to the production of safe, nutritious food[3]. With the increasing global demand for organic products, these practices also hold great potential for export opportunities[9]. Thus, eco-friendly farming emerges as a vital strategy for achieving food security while protecting ecological balance for future generations (Agriculture & Policy, 2023).

The present study employed an **Ex post facto research design**, which is appropriate for investigating phenomena where the independent variables have already occurred and cannot be manipulated[5]. This design was used to assess the knowledge level of paddy farmers regarding recommended eco-friendly farming practices.

In this study, knowledge refers to the understanding that farmers possess about recommended eco-friendly practices in paddy cultivation. A teacher-made knowledge test was developed covering 14 thematic areas with sub-components[12]. Responses were dichotomously scored: 2 for correct and 1 for incorrect answers. The maximum possible score was 76 and the minimum was 38, where a higher score indicated a higher level of knowledge. Using the cumulative frequency method, respondents were classified into low, medium and high knowledge categories[7].

The study was conducted in Cuddalore district of Tamil Nadu, with Bhuvanagiri and Srimushnam blocks purposively selected due to their significance in paddy cultivation (Agriculturedepartment, 2023). From each block, six villages were randomly selected, making a total of 12 villages. A proportionate random sampling technique was adopted to ensure fair representation across villages. Based on the total paddy farming population in each village, a proportionate number of respondents were randomly selected, resulting in a sample size of 120 farmers. Data were collected through personal interviews using a well-structured and pre-tested interview schedule to ensure validity and reliability[4].

Knowledge about an idea or farming practices which help an individual to go for Adoption. Hence, it is necessary to analyze the knowledge level of the farmers on the Recommended eco-friendly agricultural farming practices in paddy[7]. The overall knowledge Level and practice wise knowledge level were studied and the findings are presented in the succeeding pages[8].

Table-1. Overall knowledge level of respondents

S.no.	Category	Number	Percent
1	Low	20	16.67
2	Medium	58	48.33
3	High	42	35.00
	Total	**120**	**100.00**

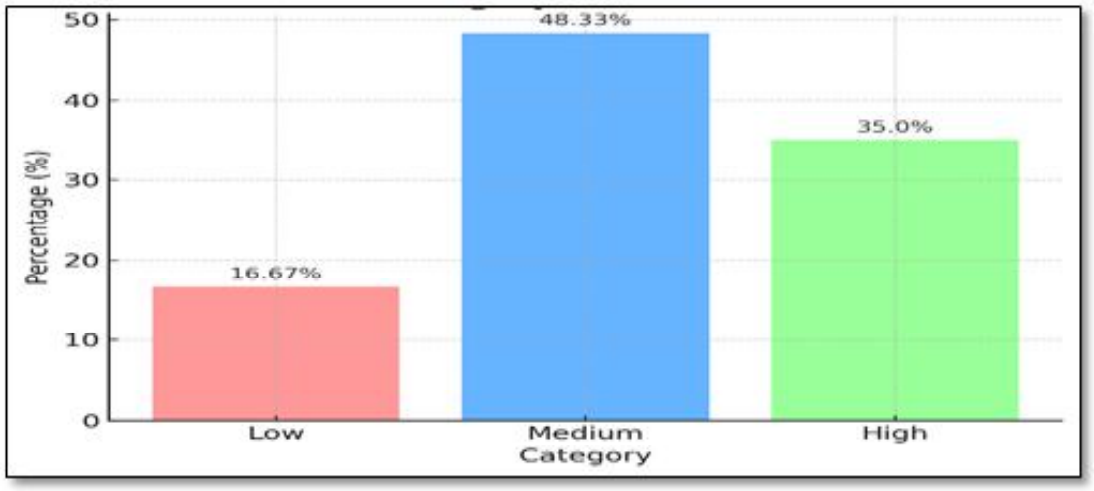

Fig. 1. Category distribution of overall knowledge level of respondents

The results on distribution of the respondents based on overall knowledge level on recommended practices nearly half (48.33 per cent) of the respondents had a medium level of knowledge of eco-friendly farming practices followed by 35.00 per cent of the respondents with high level of knowledge. It is interesting to note that only 16.67 per cent of the respondents were low level of knowledge. The reason might be due to the fact that the majority of the paddy farmers were educated and with medium level of mass media exposure. Mass media viz., newspaper, radio and television also played a vital role in increasing the knowledge among farmer about eco-friendly cultivation. Similar studies have highlighted that farmer awareness and adoption increase when integrated programs like IAMWARM are implemented[4].

The results on distribution of the respondents according to their practice wise knowledge level on recommended practices among the 11 recommended cultivation practices are furnished in table-2.

Most of the respondents (97.49 per cent) had knowledge level about the Main field

Table-2. Practice wise knowledge level of respondents on recommended practices (n=120)

Sl. No	Eco-friendly farming practices	Mean Percentage
1.	Nursery management	85.69
2.	Main Field	97.49
3.	Transplanting	88.69
4.	Bio-fertilizers	57.08
5.	Organic manure	78.53
6.	Water management	77.49
7.	Weed management	79.16
8.	Pest and disease management	52.26
9.	Rodent management	63.33
10.	Harvest	96.66
11.	Post harvest management	63.67
Overall mean percentage		**71.46**

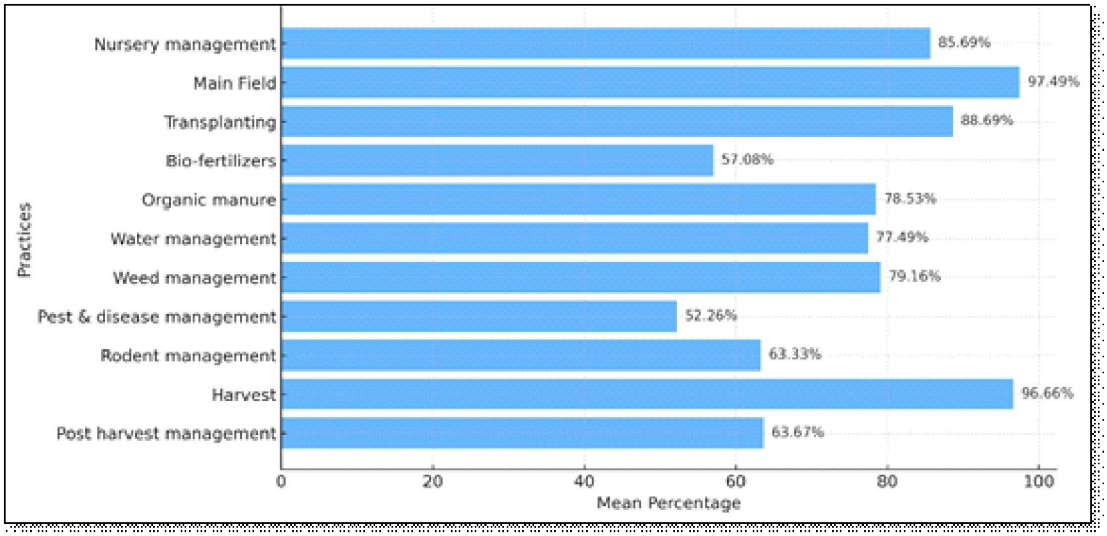

Fig. 2. Mean percentage of adoption of Eco-friendly Farming practices

preparation, followed by harvest (96.66 per cent), transplanting (88.69 per cent), nursery management (85.69 per cent), Water management (77.49 per cent), weed management (79.16 per cent), organic manure (78.53 per cent), post-harvest management (63.67 per cent), Rodent management (63.33 per cent), bio fertilizers (57.08 per cent),Eco friendly pest and disease management (52.26 per cent) . As per the above statement, main field

preparation, harvest, transplanting in main field, nursery management, water management, weed management, organic manure was found to be more than the overall mean percentage (71.46 per cent). Remaining technologies like post-harvest management, rodent management, bio fertilizers, eco-friendly pest and disease management were found to be less than overall mean percentage (71.46 per cent). It could be the inferred that almost all the respondents possessed adequate knowledge in the recommended cultivation practices due to well farming experiences and frequent contact with the state Agricultural department[5].

The study clearly indicates that paddy farmers in Cuddalore district possess a moderate to high level of knowledge regarding eco-friendly farming practices, with 83.33% of the respondents falling under medium and high knowledge categories. The results highlight that farmers are well-informed in key areas such as main field preparation, harvesting, transplanting, and nursery management, which are essential components of sustainable paddy cultivation. However, noticeable knowledge gaps exist in critical areas like eco-friendly pest and disease management and the use of bio-fertilizers, which fall below the overall mean knowledge score. These findings underscore the need for targeted extension interventions and capacity-building programs, particularly in the low-awareness domains. Strengthening knowledge in these areas through training, demonstrations, and effective communication strategies can facilitate the holistic adoption of eco-friendly practices.

Overall, the study provides valuable insights into the current knowledge status of farmers and reinforces the importance of eco-friendly agriculture in achieving long-term sustainability, food security, and environmental conservation. By bridging knowledge gaps and promoting comprehensive awareness, eco-agriculture can become a transformative approach for sustainable rural development In Cuddalore and beyond.

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