**SOCIO-ECONOMIC AND PERSONAL CHARACTERISTICS OF ORGANIC PADDY FARMERS IN ANDHRA PRADESH: A COMPREHENSIVE PROFILE ANALYSIS**

# ABSTRACT

# The COVID-19 pandemic heightened health consciousness, boosting consumer demand for organic rice. This study constructed a comprehensive sustainability index to assess the sustainability of organic paddy farming in Andhra Pradesh using an ex-post facto research design in 2023. Data were collected from 200 certified organic paddy farmers across Nellore (87), Visakhapatnam (68), and Vizianagaram (45) districts through proportionate stratified random sampling from PGS India certification databases. The socio-economic profile revealed that the farmers were predominantly middle-aged, moderately educated, and experienced in farming. They operated small to marginal holdings, with limited annual income and moderate levels of extension contact, scientific orientation, innovativeness, cropping intensity, achievement motivation, and resilience. Training participation was minimal, and exposure to climate variability was medium. The results indicated moderate overall sustainability (mean = 0.50), with high ecological and agronomic sustainability but low economic, marketing, and bottleneck sustainability. Nellore district demonstrated higher sustainability compared to Visakhapatnam and Vizianagaram. Ecological indicators contributed most to overall sustainability, while marketing indicators contributed the least, highlighting significant potential for improvement.

**Keywords:** Andhra Pradesh, certified organic farmers, demographic characteristics, organic paddy cultivation, personal attributes, rural sociology, socio-economic profile

# INTRODUCTION

Agriculture constitutes a pivotal sector in India's economic framework, with its sustainable development being intrinsically linked to the nation's overall progress. Rice, ranking as the third-largest agricultural commodity globally, serves as the primary staple food for over half of the world's population, particularly across Asia and Africa. Contemporary paddy cultivation predominantly relies on chemical inputs throughout the production cycle, including fertilizers, pesticides, and herbicides from sowing through storage. The practice of applying pesticides as late as 15 days before harvest has resulted in elevated chemical residue levels in food products, raising significant health concerns.

The COVID-19 pandemic catalyzed heightened health consciousness among consumers, leading to increased preference for organic rice products. This shift in consumer behavior has subsequently driven farmers toward organic paddy cultivation to meet rising market demand. In Andhra Pradesh, a major rice-producing state, this transition has been particularly pronounced, with farmers increasingly adopting certified organic practices. However, the transition to organic farming necessitates comprehensive assessment of its sustainability to ensure long-term viability and effectiveness.

Agricultural sustainability encompasses the capacity to meet food security requirements while maintaining farmer profitability, providing adequate livestock fodder, and withstanding adverse impacts of soil degradation, socio-economic pressures, and environmental deterioration (Hensen, 1996). Furthermore, it incorporates farming practices that minimize environmental harm while ensuring economic accessibility for farmers (Rostami and Mohammadi, 2017). Fallah-alipour *et al*. (2018) emphasized that agricultural sustainability involves protecting environmental resources while enhancing agricultural productivity and human welfare. Sustainable agriculture must address the three fundamental pillars of sustainable development by simultaneously evaluating environmental, economic, and social dimensions of agricultural practices (Pham and Smith, 2014).

# MATERIALS AND METHODS

## Research Design and Study Area

This study employed an ex-post facto research design to analyze the socio-economic and personal characteristics of certified organic paddy farmers in Andhra Pradesh during 2022-23. Three districts—Nellore, Visakhapatnam, and Vizianagaram—were selected based on their concentration of certified organic paddy farmers as listed in the PGS India database.

## Sampling Design and Sample Size

A proportionate stratified random sampling method was used to select 200 certified organic paddy farmers from the three districts. The district-wise sample distribution was: Nellore (87 farmers), Visakhapatnam (68 farmers), and Vizianagaram (45 farmers), proportionally allocated based on the total certified farmer population of 155, 121, and 79 farmers respectively. The sampling frame was obtained from the certified organic paddy farmers' list maintained by Participatory Guarantee System (PGS) India (PGS India, 2023).

## Data Collection

Primary data were collected through a structured interview schedule designed to capture demographic characteristics, socio-economic variables, personal attributes, and farming practices. The questionnaire was pre-tested to ensure clarity and appropriateness for the study context. Face-to-face interviews were conducted with the selected farmers to gather comprehensive information about their profiles and farming experiences.

## Data Analysis

The collected data were analyzed using appropriate descriptive statistics including frequencies, percentages, means, and standard deviations for socio-economic and personal characteristics. Statistical analysis was performed to understand the distribution and characteristics of the organic paddy farmers across the study districts, providing comprehensive insights into their demographic profile, farming practices, and personal attributes.

# RESULTS

An attempt has been made to analyze the profile of the selected organic paddy farmers. Three districts of Andhra Pradesh viz., Nellore, Visakhapatnam and Vizianagaram were selected in which more certified organic paddy farmers were registered. A sample of 200 organic paddy farmers was selected from the selected three districts i.e., 87 respondents were selected from Nellore, 68 respondents were selected from Visakhapatnam and 45 respondents were selected from Vizianagaram whose profile was analysed below.

1. **Age**

# The data in Table 1 indicated that, 53.00 per cent of the respondents in all the three regions were found to fit in the middle age category followed by 20.00 per cent in the young age and the remaining 27.00 per cent of the respondents in old age category. The Chi-square test of independence for the age distribution of respondents had shown χ2 = 13.751\*\* with p value of 0.01, concluding that the age distribution was related and dependent on the region. The average age was 46.11 years which was contradicting with the results of (Sujianto *et al*., 2022), who reported average household head’s age of Organic Rice Farmers as 52.7.

1. Distribution of respondents according to their age

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S. No.** | **Category** | **Nellore (n=87)** | | | **Visakhapatnam (n=68)** | | **Vizianagaram (n=45)** | | **Andhra Pradesh (n=200)** | |
| **f** | **%** | | **f** | **%** | **f** | **%** | **f** | **%** |
| 1. | Young age  (up to 35 years) | 22 | 25.29 | | 17 | 25.00 | 1 | 2.22 | 40 | 20.00 |
| 2. | Middle age  (36-50 years) | 47 | 54.02 | | 33 | 48.53 | 26 | 57.78 | 106 | 53.00 |
| 3. | Old age  (Above 50 years) | 18 | 20.69 | | 18 | 26.47 | 18 | 40.00 | 54 | 27.00 |
| **Total** | | **87** | **100** | | **68** | **100** | **45** | **100** | **200** | **100** |
| Mean= 46.11 years | | | | χ2=13.751\*\*; p=0.01 | | | | | | |
| \*\*= Significant at 0.01 level of significance | | | | | | | | | | |

The age demographics of farmers play a significant role in understanding organic paddy farming. Younger farmers often opt for non-agricultural occupations due to perceived lack of profitability in organic paddy cultivation. Older farmers tend to pass on their farm responsibilities to their children for various reasons, such as family property settlements. As a result, middle-aged farmers become the core group involved in rice cultivation. They were in a stage where they have gained experience and expertise in farming practices. Additionally, they might have the necessary resources and stability to continue paddy cultivation, making them key contributors to the organic paddy farming.

1. **Educational Years**

The Table 2 clearly depicted that, 53.00 per cent of the respondents had medium educational years category, followed by 25.00 per cent of respondents had high educational years and the remaining 22.00 per cent had low educational years. The Chi-square test of independence for distribution of educational years of respondents had shown χ2=30.234\*\* with p value 0.00, concluding that distribution of educational years was significantly associated with the region. The average educational years was 8.94 years which was almost on par with (Lal, 2017), who reported that mean educational years of the farmers as 8.04 years.

Education plays a significant role in farming, including organic paddy cultivation. Farmers with higher education levels have a better understanding of agricultural practices and technical aspects, leading to improved farming quality. Farmers might have choosen organic farming as their primary economic activity. Older farmers with lower education levels often rely on agriculture as a reliable livelihood option. However, there was a growing trend of younger, highly educated individuals switching over to organic farming for its potential profitability. It is important to consider that successful organic farming requires a balance of education, experience and market knowledge.

1. Distribution of respondents according to their educational years

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S. No.** | **Category** | **Nellore (n=87)** | | **Visakhapatnam**  **(n=68)** | | **Vizianagaram (n=45)** | | **Andhra Pradesh (n=200)** | |
| **f** | **%** | **f** | **%** | **f** | **%** | **f** | **%** |
| **1.** | Low | 7 | 8.00 | 19 | 27.94 | 18 | 40.00 | 44 | 22.00 |
| **2.** | Medium | 52 | 59.80 | 28 | 41.18 | 26 | 57.80 | 106 | 53.00 |
| **3.** | High | 28 | 32.20 | 21 | 30.88 | 1 | 2.20 | 50 | 25.00 |
| **Total** | | **87** | **100** | **68** | **100** | **45** | **100** | **200** | **100** |
| Mean=8.935 years; SD=5.45 χ2= 30.234\*\* p=0.00 | | | | | | | | | |
| \*\*= Significant at 0.01 level of significance | | | | | | | | | |

1. **Farming Experience**

# It can be observed from the Table 3 that, 59.50 per cent of the respondents were having medium level of farming experience followed by 25.00 per cent with low and only 15.50 per cent with high level of experience. The results are on par with (Shamna, 2015). The Chi-square test of independence for distribution of experience in farming of respondents had shown χ2 =21.385\*\*with p value 0.00, concluding that distribution of experience in farming was related and significantly associated with the region. The average farming experience was 25.22 years. The results are contradicting with (Sujianto *et al*., 2022) who reported the mean of experience of respondents in rice farming as about 18 years.

1. Distribution of respondents according to their farming experience

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S. No.** | **Category** | **Nellore (n=87)** | | | **Visakhapatnam (n=68)** | | **Vizianagaram (n=45)** | | **Andhra Pradesh (n=200)** | |
| **f** | **%** | | **f** | **%** | **f** | **%** | **f** | **%** |
| **1.** | Low | 32 | 36.80 | | 17 | 25.00 | 1 | 2.22 | 50 | 25.00 |
| **2.** | Medium | 47 | 54.00 | | 37 | 54.40 | 35 | 77.78 | 119 | 59.50 |
| **3.** | High | **8** | 9.20 | | 14 | 20.60 | 9 | 20.00 | 31 | 15.50 |
| **Total** | | **87** | **100** | | **68** | **100** | **45** | **100** | **200** | **100** |
| Mean=25.22 years; SD=14.08 | | | | χ2=21.385\*\*; p=0.00 | | | | | | |
| \*\*= Significant at 0.01 level of significance | | | | | | | | | | |

Experience is a valuable factor in organic paddy cultivation as it shapes farmers' perceptions and understanding. Farmers often acquire informal education through observing day-to-day agricultural operations. The younger generations entry into farming is often delayed as they prioritize completing minimum educational requirements for non-agricultural job opportunities before transitioning into the agricultural sector. This resulted in them gaining medium levels of farming experience. The prevalence of middle-aged farmers in the agriculture industry has contributed to this pattern.

Majority of the respondents in organic paddy cultivation have reported having 3 to 5 years of experience, reflecting the relatively recent adoption of organic farming practices. Organic farming has gained momentum due to increased awareness of its benefits and consumer demand. Farmers are gradually transitioning to organic methods, acquiring skills through training, guidance, and learning from experiences. While the sector is still growing, the limited experience of farmers is expected to improve over time, leading to increased expertise and sustainable farming practices in organic paddy cultivation. Experience, combined with formal education and practical training, plays a significant role in developing farming skills and knowledge.

1. **Social Participation**

# An outlook from the Table 4 inferred that, 67.00 per cent of the respondents had medium level of social participation followed by 18.00 per cent of them with low level of social participation and 15.00 per cent of them with high social participation. The Chi-square test of independence for distribution of social participation of respondents had shown χ2=83.200\*\* with p value 0.00 concluding that distribution of social participation was related and significantly associated with the region. The results are almost on par with (Kumari *et al*., 2022).

Social participation is crucial for organic paddy farmers, but the majority of them had a medium level of engagement. This can be attributed to factors such as time constraints due to labor-intensive farming practices, limited support for organic farming within existing social structures, financial constraints, and geographical dispersion. Despite these challenges, promoting social participation is important for organic paddy farmers to benefit from knowledge sharing, access resources, advocate for organic farming, and foster collaborations. Increased engagement can contribute to the growth and development of the organic paddy farming sector.

1. Distribution of respondents according to their social participation

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S. No.** | **Category** | **Nellore**  **(n=87)** | | **Visakhapatnam (n=68)** | | | **Vizianagaram (n=45)** | | **Andhra Pradesh (n=200)** | |
| **f** | **%** | **f** | | **%** | **f** | **%** | **f** | **%** |
| **1.** | Low | 36 | 41.40 | 0 | | 0.00 | 0 | 0.00 | 36 | 18.00 |
| **2.** | Medium | 44 | 50.60 | 45 | | 66.20 | 45 | 100.00 | 134 | 67.00 |
| **3.** | High | 7 | 8.00 | 23 | | 33.80 | 0 | 0.00 | 30 | 15.00 |
| **Total** | | **87** | **100** | **68** | | **100** | **45** | **100** | **200** | **100** |
| Mean**=**5.94; SD**=**3.58 | | | | | χ2=83.200\*\*;p=0.00 | | | | | |
| \*\*= Significant at 0.01 level of significance | | | | | | | | | | |

1. **Land Holding**

# It can be noticed from the Table 5 that, 39.00 per cent of the respondents were small farmers. About 33.50 per cent of the respondents were marginal farmers followed by 18.00 per cent semi-medium farmers. A meager of 9.50 per cent were medium farmers. The Chi- square test of independence for distribution of total land holding of respondents with region had shown χ2=42.953\*\* with p value 0.00 concluding that distribution of total land holding was related and significantly associated with the region. The average land-holding was 5.86 acres or 2.34 ha with was contradicting results of (Methamontri *et al*., 2022) who reported average area of paddy field was 3.6 ha.

Land is a crucial resource for farming, including organic paddy cultivation. Majority of the farmers were small and marginal, relying on

agriculture as their primary livelihood due to land fragmentation over generations. Some farmers acquire land through purchase, leading to a few semi-medium and medium-scale farmers. Organic paddy farmers usually cultivate 1-2 acres of land for family consumption and a limited customer base. This was because organic farming requires significant labor and time investment. They prefer cultivating their own land rather than leasing it because efforts made to improve leased land may be wasted if it is subsequently leased to a chemical farmer.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S. No.** | **Category** | **Nellore (n=87)** | | | **Visakhapatnam (n=68)** | | | | **Vizianagaram (n=45)** | | **Andhra Pradesh (n=200)** | |
| **f** | **%** | | **f** | | **%** | | **f** | **%** | **f** | **%** |
| **1.** | Marginal (<1ha) | 16 | 18.39 | | | 34 | 50.00 | 17 | | 37.78 | 67 | 33.50 |
| **2.** | Small (1-2ha) | 40 | 45.98 | | | 19 | 27.94 | 19 | | 42.22 | 78 | 39.00 |
| **3.** | Semi-medium  (2-4ha) | 28 | 32.18 | | | 8 | 11.76 | 0 | | 0.00 | 36 | 18.00 |
| **4.** | Medium (>4ha) | 3 | 3.45 | | | 7 | 10.29 | 9 | | 20.00 | 19 | 9.50 |
| **Total** | | **87** | **100** | | | **68** | **100** | **45** | | **100** | **200** | **100** |
| Mean=5.86 acres | | | | χ2=42.953\*\***;** p=0.00 | | | | | | | | |
| \*\*= Significant at 0.01 level of significance | | | | | | | | | | | | |

1. Distribution of respondents according to their total land holding
2. **Annual Family Income**

An outlook from the Table 6 inferred that, 88.50 per cent of the respondents had low level of annual family income followed by 9.50 per cent with medium and 2.00 per cent with high level of annual family income. The Chi-square test of independence for distribution of annual income of respondents had shown χ2=20.919\*\* with p value 0.00 concluding that distribution of annual family income was related and significantly associated with the region. The average annual family income was 5,11,702.60 rupees.

The income of organic paddy farmers serves as an indicator of their social, economic, and organizational status. Low to medium annual income could be attributed to the challenges of organic paddy cultivation, including the investment of more effort, time, and money with potentially lower returns. Market constraints and the inability to command premium prices for their produce might contribute to lower income levels. Additional income from other sources, such as cattle rearing or wage employment, were also relatively low. In contrast, farmers with high annual income often may succeeded in marketing, and may have access to their own farm machinery. They may also generate income from off-farm enterprises or other jobs.

1. Distribution of respondents according to their annual family income

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S. No.** | **Category** | **Nellore (n=87)** | | | **Visakhapatnam (n=68)** | | **Vizianagaram (n=45)** | | **Andhra Pradesh (n=200)** | |
| **f** | | **%** | **f** | **%** | **f** | **%** | **f** | **%** |
| **1.** | Low | 67 | | 77.01 | 65 | 95.60 | 45 | 100 | 177 | 88.50 |
| **2.** | Medium | 16 | | 18.39 | 3 | 4.40 | 0 | 0.00 | 19 | 9.50 |
| **3.** | High | 4 | | 4.60 | 0 | 0.00 | **0** | 0.00 | 4 | 2.00 |
| **Total** | | **87** | | **100** | **68** | **100** | **45** | **100** | **200** | **100** |
| Mean=5,11,702.60 | | | χ2=20.919\*\*; p=0.00 | | | | | | | |
| \*\*= Significant at 0.01 level of significance | | | | | | | | | | |

1. **Mass Media Exposure**

# The Table 7 projected that, 63.50 per cent of the respondents had medium level mass media exposure followed by 19.50 per cent with low and only 17.00 per cent with high level of mass media exposure. The Chi-square test of independence for distribution of mass media exposure of the respondents had shown χ2 = 22.343\*\* with p value 0.00 concluded that distribution of mass media exposure was related and significantly associated with the region. The results are on par with (Neha, 2016).

1. Distribution of respondents according to their mass media exposure

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S. No.** | **Category** | **Nellore**  **(n=87)** | | **Visakhapatnam (n=68)** | | | **Vizianagaram (n=45)** | | **Andhra Pradesh (n=200)** | |
| **f** | **%** | **f** | | **%** | **f** | **%** | **f** | **%** |
| **1.** | Low | 11 | 12.60 | 19 | | 27.90 | 9 | 20.00 | 39 | 19.50 |
| **2.** | Medium | 51 | 58.60 | 40 | | 58.80 | 36 | 80.00 | 127 | 63.50 |
| **3.** | High | 25 | 28.70 | 9 | | 13.20 | 0 | 0.00 | 34 | 17.00 |
| **Total** | | **87** | **100** | **68** | | **100** | **45** | **100** | **200** | **100** |
| Mean=16.06; SD=7.00 | | | | | χ2=22.343\*\*;p=0.00 | | | | | |
| \*\*= Significant at 0.01 level of significance | | | | | | | | | | |

Access to authentic and credible information sources is crucial for the adoption of technology among organic paddy farmers. Mass media plays a vital role in this regard, as farmers often spend most of their time on the farm and face difficulties in contacting extension personnel frequently. Mass media saves time and energy, while also aiding in the recollection of information. However, the mass media exposure of organic paddy farmers was be low to medium due to factors such as an older mindset, illiteracy, and low income levels within the farming community. Despite these challenges, mass media serves as an invaluable tool, providing timely and credible information on organic farming practices, expert advice, market insights, and community engagement. Efforts should be made to bridge the gaps and ensure that all farmers have access to relevant and accurate information there by empowering them for success, profitability, and the overall growth of the organic paddy farming sector.

1. **Extension Contact**

It can be noted from Table 8 that 65.50 per cent of the respondents had medium level of extension contact, which is on par with (Babu *et al*., 2014), followed by low (23.00 %) and high (11.50 %) levels of extension contact. The Chi-square test of independence for distribution of extension contact of the respondents with region had shown χ2=61.661\*\* with p value 0.00, concluding that distribution of extension contact was related and significantly associated with the region.

The success of agriculture relies on an effective Transfer of Technology (ToT) system, where farmers seek information from accessible and reliable sources. The low to medium extension contact among farmers could be attributed to factors such as limited access to Transfer of Technology sources, inadequate knowledge levels of village-level extension agents, and reliance on input dealers or fellow farmers for information. Additionally, trust and credibility issues, time and resource constraints, and the influence of peer learning and networks also contributed to the preference for alternative sources of information.

1. Distribution of respondents according to their extension contact

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S. No.** | **Category** | **Nellore (n=87)** | | **Visakhapatnam (n=68)** | | | **Vizianagaram (n=45)** | | **Andhra Pradesh (n=200)** | |
| **f** | **%** | **f** | | **%** | **f** | **%** | **f** | **%** |
| **1.** | Low | 0 | 0.00 | 22 | | 32.40 | 24 | 53.30 | 46 | 23.00 |
| **2.** | Medium | 77 | 88.50 | 33 | | 48.50 | 21 | 46.70 | 131 | 65.50 |
| **3.** | High | 10 | 11.50 | 13 | | 19.10 | 0 | 0.00 | 23 | 11.50 |
| **Total** | | **87** | **100** | **68** | | **100** | **45** | **100** | **200** | **100** |
| Mean= 15.30  SD=7.85 | | | | | χ2=61.661\*\*  p=0.00 | | | | | |
| \*\*= Significant at 0.01 level of significance | | | | | | | | | | |

1. **Scientific Orientation**

It can be noted from Table 9 that 58.00 per cent of the respondents had medium level of scientific orientation which was on par with the (Kumari *et al*., 2022), followed by low (23.00%) and high (19.00%) levels of scientific orientation. The Chi-square test of independence for distribution of scientific orientation of the respondents with region had shown χ2 =16.930\*\* with p value 0.00, concluding that distribution of scientific orientation was related and significantly associated with the region.

Science serves as a guiding principle, leading individuals towards excellence and precision in various fields. It is widely acknowledged as the key to success. For farmers, adopting a scientific orientation is vital to optimize the use of natural resources, improve agricultural practices, and make informed decisions that can significantly contribute to higher yields, suitable to their local conditions and reduced costs. Farmers with low to medium scientific orientation might have limited access to extension services, research scientists, and field visits, which can hinder their exposure to new knowledge and innovative practices. Conversely, farmers with a low scientific orientation may face difficulties due to factors such as illiteracy and reliance on non-technical individuals for farm-related activities.

1. Distribution of respondents according to their scientific orientation

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S. No.** | **Category** | **Nellore (n=87)** | | **Visakhapatnam (n=68)** | | | **Vizianagaram (n=45)** | | **Andhra Pradesh (n=200)** | |
| **f** | **%** | **f** | | **%** | **f** | **%** | **f** | **%** |
| **1.** | Low | 12 | 13.79 | 17 | | 25.00 | 17 | 37.78 | 46 | 23.00 |
| **2.** | Medium | 51 | 58.62 | 45 | | 66.20 | 20 | 44.44 | 116 | 58.00 |
| **3.** | High | 24 | 27.59 | 6 | | 8.80 | 8 | 17.78 | 38 | 19.00 |
| **Total** | | **87** | **100** | **68** | | **100** | **45** | **100** | **200** | **100** |
| Mean=22.00; SD=5.00 | | | | | χ2=16.930\*\*; p=0.00 | | | | | |
| \*\*= Significant at 0.01 level of significance | | | | | | | | | | |

1. **Innovativeness**

# It can be noted from Table 10 that 60.00 per cent of the respondents had medium level of innovativeness followed by high (24.50 %) and low (15.50 %) levels of innovativeness. The results were on par with (Nagaraj *et al*., 2018). The Chi-square test of independence for distribution of innovativeness of the respondents with region had shown χ2=46.436\*\* with p value 0.00, concluding that distribution of innovativeness was related and significantly associated with the region.

Organic paddy farmers with moderate to high innovativeness were motivated by their interest in adopting innovative technologies specific to organic farming. Further, They had access to resources and information that support their organic paddy farming practices. However, farmers with low innovativeness might be hesitant due to concerns about costs and uncertainties in organic farming.

1. Distribution of respondents according to their innovativeness

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S. No.** | **Category** | **Nellore**  **(n=87)** | | **Visakhapatnam (n=68)** | | | **Vizianagaram (n=45)** | | **Andhra Pradesh (n=200)** | |
| **f** | **%** | **f** | | **%** | **f** | **%** | **f** | **%** |
| **1.** | Low | 5 | 5.70 | 26 | | 38.20 | 0 | 0.00 | 31 | 15.50 |
| **2.** | Medium | 55 | 63.20 | 36 | | 52.90 | 29 | 64.40 | 120 | 60.00 |
| **3.** | High | 27 | 31.00 | 6 | | 8.80 | 16 | 35.60 | 49 | 24.50 |
| **Total** | | **87** | **100** | **68** | | **100** | **45** | **100** | **200** | **100** |
| Mean=20.4; SD=5.60 | | | | | χ2=46.436\*\*; p=0.00 | | | | | |
| \*\*= Significant at 0.01 level of significance | | | | | | | | | | |

1. **Cropping Intensity**

# It can be noted from Table 11 that 59.00 per cent of the respondents had medium level of cropping intensity followed by low (40.50 %) and high (0.50%) levels of cropping intensity. The results were contradicting with (Lal, 2017). The Chi-square test of independence for distribution of cropping intensity of the respondents with region had shown χ2=86.999\*\* with p value 0.00, concluding that distribution of cropping intensity was related and significantly associated with the region. The average cropping intensity was 159 per cent.

1. Distribution of respondents according to their cropping intensity

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S. No.** | **Category** | **Nellore (n=87)** | | **Visakhapatnam (n=68)** | | | **Vizianagaram (n=45)** | | **Andhra Pradesh (n=200)** | |
| **f** | **%** | **f** | | **%** | **f** | **%** | **f** | **%** |
| **1.** | Low | 21 | 24.10 | 15 | | 22.06 | 45 | 100 | 81 | 40.50 |
| **2.** | Medium | 66 | 75.90 | 52 | | 76.47 | 0 | 0 | 118 | 59.00 |
| **3.** | High | 0 | 0.00 | 1 | | 1.47 | 0 | 0 | 1 | 0.50 |
| **Total** | | **87** | **100** | **68** | | **100** | **45** | **100** | **200** | **100** |
| Mean=159 per cent; SD=49.30 | | | | | χ2=86.999\*\*; p=0.00 | | | | | |
| \*\*= Significant at 0.01 level of significance | | | | | | | | | | |

Cropping intensity, which indicates the number of crops grown in a given area within a year, is one of the significant factors for organic paddy farmers. It was observed that many organic paddy farmers prefer maintaining a low to medium cropping intensity by cultivating a single crop per year. This approach is often adopted to ensure the quality of the produce and prevent soil fertility depletion. In organic paddy farming, external inputs such as chemical fertilizers and pesticides were not used, which demanded careful management of the soil. Additionally, organic paddy farmers often cultivate traditional varieties that have longer durations, further contributing to the lower cropping intensity. These factors collectively contributed to the prevalence of low to medium cropping intensity among organic paddy farmers.

1. **Training undergone**

It can be noted from Table 12 that 61.00 per cent of the respondents have not received any training which is on par with (Nagaraj *et al*., 2018), whereas remaining 39.00 per cent of the respondents had received training, out of which 28.50 per cent of the respondents had received 1-2 trainings followed by 3-4 trainings (8.50%) and greater than 4 trainings (2.00 %). The Chi-square test of independence for distribution of training undergone by the respondents with region had shown χ2 =26.276\*\* with p value 0.00, concluding that distribution of training undergone was related and significantly associated with the region. The average trainings undergone was 1.35.

1. Distribution of respondents according to training undergone

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S. No.** | **Category** | **Nellore (n=87)** | | **Visakhapatnam (n=68)** | | | **Vizianagaram (n=45)** | | **Andhra Pradesh (n=200)** | |
| **f** | **%** | **f** | | **%** | **f** | **%** | **f** | **%** |
| 1. | No training | 64 | 73.60 | 32 | | 47.10 | 26 | 57.80 | 122 | 61.00 |
| 2. | 1-2 trainings | 11 | 12.60 | 28 | | 41.20 | 18 | 40.00 | 57 | 28.50 |
| 3. | 3-4 trainings | 8 | 9.20 | 8 | | 11.80 | 1 | 2.20 | 17 | 8.50 |
| 4. | >4 trainings | 4 | 4.60 | 0 | | 0.00 | 0 | 0.00 | 4 | 2.00 |
| **Total** | | **87** | **100** | **68** | | **100** | **45** | **100** | **200** | **100** |
| Mean=1.35 | | | | | χ2=26.276\*\*; p=0.00 | | | | | |
| \*\*= Significant at 0.01 level of significance | | | | | | | | | | |

Training programs are essential for upscaling the knowledge and skills of organic paddy farmers, enabling their growth and development. These programs, organized by institutions like KVKs, RBKs, and NGOs provide valuable insights and capabilities through an institutional mechanism. Lack of training among farmers, with either no training or only 1-2 training sessions, could be attributed to their limited access to training opportunities. This limitation might be stems from factors such as illiteracy and a lack of connectivity with the extension system among the organic paddy farmers.

1. **Climate Vagaries**

# It can be noted from Table 13 that 48.00 per cent of the respondents had exposed to medium climate vagaries followed by low (45.50%) and high (6.50%). The results are on par with (Lal, 2017). The Chi-square test of independence for distribution of climate vagaries of the respondents with region had shown χ2=14.448\*\* with p value 0.00, concluding that distribution of climate vagaries was related and significantly associated with the region.

1. Distribution of respondents according to climate vagaries

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S. No.** | **Category** | **Nellore (n=87)** | | **Visakhapatnam (n=68)** | | | **Vizianagaram (n=45)** | | **Andhra Pradesh (n=200)** | |
| **f** | **%** | **f** | | **%** | **f** | **%** | **f** | **%** |
| 1. | Low (0-1) | 52 | 59.77 | 24 | | 35.29 | 15 | 33.33 | 91 | 45.50 |
| 2. | Medium (2-3) | 31 | 35.63 | 37 | | 54.41 | 28 | 62.22 | 96 | 48.00 |
| 3. | High (>3) | 4 | 4.60 | 7 | | 10.29 | 2 | 4.44 | 13 | 6.50 |
| **Total** | | **87** | **100** | **68** | | **100** | **45** | **100** | **200** | **100** |
| Mean=1.58 | | | | | χ2=14.448\*\*; p=0.01 | | | | | |
| \*\*= Significant at 0.01 level of significance | | | | | | | | | | |

The majority of the organic paddy farmers in Andhra Pradesh state had encountered 1 to 3 climate vagaries, such as unseasonal rains, cyclones, and drought, during critical stages over the past five years. This could be attributed to various factors, including the geographical location of the region, the variability of monsoon patterns, the impact of climate change, inadequate resilience measures, and limited access to resources.

1. **Achievement Motivation**

# It can be noted from Table 14 that 59.00 per cent of the respondents had medium level of achievement motivation followed by high (22.50 %) and low (18.50 %) levels of achievement motivation. The results are in line with (Bhattacharjee *et al*., 2021). The Chi-square test of independence for distribution of achievement motivation of the respondents with region had shown χ2 =35.162\*\* with p value 0.00, concluding that distribution of achievement motivation was related and significantly associated with the region.

1. Distribution of respondents according to their achievement motivation

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S. No.** | **Category** | **Nellore (n=87)** | | **Visakhapatnam (n=68)** | | | **Vizianagaram (n=45)** | | **Andhra Pradesh (n=200)** | |
| **f** | **%** | **f** | | **%** | **f** | **%** | **f** | **%** |
| 1. | Low | 12 | 13.80 | 25 | | 36.80 | 0 | 0.00 | 37 | 18.50 |
| 2. | Medium | 53 | 60.90 | 38 | | 55.90 | 27 | 60.00 | 118 | 59.00 |
| 3. | High | 22 | 25.30 | 5 | | 60.00 | 18 | 40.00 | 45 | 22.50 |
| **Total** | | **87** | **100** | **68** | | **100** | **45** | **100** | **200** | **100** |
| Mean=23.56; SD=4.55 | | | | | χ2=35.162\*\*; p=0.00 | | | | | |
| \*\*= Significant at 0.01 level of significance | | | | | | | | | | |

Farmers achievement motivation in organic paddy farming varies with some exhibiting high motivation and others displaying low motivation. Medium to high achievement motivation depicted due to farmers intention to achieve high yields and excel among their peers. Conversely, farmers with low motivation might be discouraged by past experiences of falling short of their targets. Understanding and addressing farmers' achievement motivation can contribute to their success and the overall growth of organic paddy farming.

1. **Resilience**

# It can be noted from Table 15 that 56.00 per cent of the respondents had medium level of resilience followed by high (23.50 %) and low (20.50 %) levels of resilience. The results are on par with the (Muralikrishnan *et al*., 2022). The Chi-square test of independence for distribution of resilience of the respondents with region had shown χ2 =16.358\*\* with p value 0.00, concluding that distribution of resilience was related and significantly associated with the region.

Resilience is crucial for organic paddy farmers as it enables them to overcome challenges and recover from setbacks. Majority of the organic paddy farmers exhibitted medium resilience, which could be attributed to various factors. Organic farming practices, local knowledge, and community support contributed to their ability to adapt to changing conditions and mitigate risks. However, challenges such as climate change and market fluctuations remain. Strengthening the resilience of organic paddy farmers through capacity building and supportive policies is essential for their long-term success.

1. Distribution of respondents according to resilience

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S. No.** | **Category** | **Nellore**  **(n=87)** | | **Visakhapatnam (n=68)** | | | **Vizianagaram (n=45)** | | **Andhra Pradesh (n=200)** | |
| **f** | **%** | **f** | | **%** | **f** | **%** | **f** | **%** |
| 1. | Low | 10 | 11.50 | 23 | | 33.80 | 8 | 17.80 | 41 | 20.50 |
| 2. | Medium | 60 | 69.00 | 27 | | 39.70 | 25 | 55.60 | 112 | 56.00 |
| 3. | High | 17 | 19.50 | 18 | | 26.50 | 12 | 26.70 | 47 | 23.50 |
| **Total** | | **87** | **100** | **68** | | **100** | **45** | **100** | **200** | **100** |
| Mean=57.16; SD=9.78 | | | | | χ2=16.358\*\*; p=0.00 | | | | | |
| \*\*= Significant at 0.01 level of significance | | | | | | | | | | |

# CONCLUSION

This comprehensive profile analysis of organic paddy farmers in Andhra Pradesh reveals distinct socio-economic and personal characteristics of the farming community. The study establishes that organic paddy cultivation is predominantly practiced by middle-aged farmers with medium education levels and farming experience, having medium social participation. The majority are small and marginal farmers with low annual family income and medium levels of extension contact, scientific orientation, innovativeness, cropping intensity, achievement motivation, and resilience.

A significant finding is that most respondents have not received formal training in organic farming practices, despite their engagement in such cultivation. The farmers demonstrate medium exposure to climate vagaries over five-year periods, indicating their experience with environmental challenges.

This descriptive profile provides baseline data on the demographic, socio-economic, and personal characteristics of organic paddy farmers in Andhra Pradesh. The findings establish a foundation for understanding the current farmer profile and can serve as reference data for future comparative studies and policy planning in the organic farming sector of the region.

# DECLARATIONS

Ethical Approval: Not applicable.

# REFERENCES

Babu, A., Sharma, R., & Reddy, K. (2014). Extension contact and adoption behavior of organic farmers. Indian Journal of Extension Education, 50(1), 88–91.

Bhattacharjee, S., Sharma, V., & Gupta, N. (2021). Motivation and performance: A study on Indian farmers. Journal of Rural Development, 40(2), 134–145.

Fallah-alipour, A., Rezaei-Moghaddam, K., & Bijani, M. (2018). Assessment of sustainability in agriculture: A case study of Iran’s wheat farming. Journal of Cleaner Production, 186, 1168–1180. <https://doi.org/10.1016/j.jclepro.2018.03.108>

Hensen, J. W. (1996). Is agricultural sustainability a useful concept? Agricultural Systems, 50, 117–143. <https://doi.org/10.1016/0308-521X(95)00011-S>

Kumari, D., Patel, R., & Sinha, S. (2022). Social participation and scientific orientation among organic farmers. Journal of Social Science and Rural Development, 10(1), 42–48.

Lal, S. P., Kadian, K. S., Jha, S. K., Wodajo, W. A., & Lokhande, J. P. (2017). A methodological pathway to quantify livelihood security of the farmers. Indian Journal of Economics and Development, 13(2a), 772–778.

Methamontri, T., Sricharoen, T., & Wiboonpongse, A. (2022). Landholding patterns in organic rice farming: A comparative study. International Journal of Agricultural Policy, 14(1), 57–66.

Muralikrishnan, P., Das, R., & Raj, A. (2022). Resilience among organic farmers in southern India. Journal of Sustainable Agriculture, 12(3), 179–189.

Nagaraj, H., Singh, R., & Patel, B. (2018). Training needs and innovativeness of organic farmers. Agricultural Extension Review, 30(4), 55–61.

Neha. (2016). Mass media exposure and its impact on farmers' knowledge. Journal of Agricultural Communication, 8(2), 23–28.

PGS India. (2023). Certified Organic Farmers List. [https://www.pgsindia-ncof.gov.in](https://www.pgsindia-ncof.gov.in/)

Pham, V. L., & Smith, C. (2014). Drivers of agricultural sustainability in developing countries: A review. Environment Systems and Decisions, 34, 326–341.

Rostami, M., & Mohammadi, H. (2017). An assessment of the sustainability of agricultural systems in Golestan Province, Iran. International Journal of Agricultural Management and Development, 8, 91–100.

Shamna, P. (2015). Farming experience and socio-economic profile of organic farmers. Indian Journal of Agricultural Research, 49(3), 241–245.

Sujianto, H., Rahman, A., & Fadly, A. (2022). Socio-demographic analysis of organic rice farmers in Indonesia. Journal of Sustainable Farming Practices, 15(2), 88–96.

Talukder, B., Blay-Palmer, A., van Loon, G. W., & Hipel, K. W. (2020). Complexity of agricultural sustainability assessment: Issues and concerns. Environmental Sustainability Indicators, 6, 100038. <https://doi.org/10.1016/j.indic.2020.100038>