P-ISSN: 2618-0723
E-ISSN: 2618-0731

NAAS Rating: 5.04
www.extensionjournal.com

International Journal of Agriculture Extension and Social Development

Volume 7; Issue 8; August 2024; Page No. 129-133

Received: 13-06-2024
Accepted: 16-07-2024

Indexed Journal
Peer Reviewed Journal

A comparative insight: Tribal Vs. non-tribal rice farmers attitudes on sustainable farming in Wayanad, Kerala

T Shahlas Binth, A Anil Kumar and KP Smitha

Department of Agricultural Extension, College of Agriculture, Vellayani, KAU, Thiruvananthapuram, Kerala, India

DOI: https://doi.org/10.33545/26180723.2024.v7.i8b.885

Corresponding Author: T Shahlas Binth

Abstract

This article summarizes a study on the attitudes of tribal and non-tribal rice farmers towards sustainable rice farming in the Wayanad district of Kerala. The study defines attitude as the positive or negative reactions of these farmers towards sustainability. This measure serves as an effective tool to assess the degree of sustainability among both groups and to identify the challenges they face in adopting sustainable rice production. The scale was developed using Likert's summated ratings method. A total of 25 statements, balanced between positive and negative, were selected to ensure content validity. Respondents were categorized into three groups: less favorable, favorable, and highly favorable attitudes towards sustainable rice farming, based on mean and standard deviation. The study revealed that over 80% of tribal rice farmers had a highly favorable attitude towards sustainable rice farming, with only 6.67% in the less favorable category. In contrast, 71.11% of non-tribal rice farmers had a favorable attitude towards sustainable practices but tended to prefer conventional or modern farming methods. Factors such as the conservation of indigenous varieties, environmental and biodiversity concerns, cultural acceptance of rice cultivation, and less profit orientation contributed to the more favorable attitude among tribal farmers compared to non-tribal farmers.

Keywords: Sustainable farming, traditional rice farming, attitude, tribal farmers

Introduction

Agriculture plays a pivotal role in the lives of people and the economy of India, with the Green Revolution being the most defining phase of Indian agriculture in the last century. This revolution ensured India's self-sufficiency in cereal needs, impacting most Indian farmers by prioritizing fine cereals like rice and wheat. The expansion of Green Revolution packages into new areas later on resulted in the widespread cultivation of cereals like rice. However, the long-term impacts have become evident, including topsoil degradation, groundwater depletion, water contamination, and biodiversity loss. Crop yields now depend heavily on increased fertilizer use, and fragmented land holdings and low farm incomes push many smallholders toward non-farm economic activities. Climate change science indicates that input-intensive agriculture is both a contributor to and a victim of climate change. Rice production in Kerala increased during the Green Revolution and remained stable until 1984-85. However, Kerala now produces only one-fifth of its annual rice requirement of 3.5-4.0 million tons, with the deficit increasing yearly due to declining rice cultivation. This decline is attributed to land pressure, high production costs, soil fertility degradation, indiscriminate use of insecticides and fungicides, a shift to more profitable plantation crops, and demand for land for non-agricultural purposes. The intensive use of agrochemicals in Kerala has had negative consequences, destroying soil microbiology, reducing soil fertility, and polluting water bodies. Consequently, soil productivity has diminished, water resources are polluted, and biodiversity has decreased. High-intensity cultivation and changes in land use and cropping patterns have significant environmental and social consequences, adversely affecting farmers' practices and overall agricultural performance in Kerala. These issues threaten the sustainability of agriculture in the state, particularly rice farming.

The district of Wayanad, covering an area of 2125 sq.km at the Southwestern tip of the Deccan Plateau and at an altitude of 700 meters above sea level, borders Tamil Nadu, Karnataka, and the Kerala districts of Kannur and Kozhikode. Named after *"Vayal nadu"* or the village of paddy fields, Wayanad is renowned for its tropical climate, lush green hills, valleys, and forests, making it a major eco-tourism spot in southern India. It boasts a rich heritage of ancient religious and cultural traditions reflected in its diverse religious institutions, festivals, and tribal ballads, with a culture primarily oriented around its tribal communities. The district's soil, rich in organic matter, shows wide variation in depth and texture. The unique agro-ecological conditions, combined with the area's isolation from the plains due to poor communication, have led to the development of unique adaptive properties in the local agro-biodiversity. However, large-scale migration from the plains has influenced cropping patterns, leading to the decline of millets and the rise of plantation crops, though the lowlands have retained many indigenous rice landraces. The *Kurumas*, an early cultivator tribe, lost out to migrants and became landless over time, but their conservation efforts have maintained a rich repository of rice genetic variability suited to hill agriculture. Agriculture, particularly rice

cultivation, is the main occupation for most tribal communities, who have practiced traditional cultivation for centuries. However, the introduction of new rice varieties and changing cultivation patterns have impacted their social and economic life, causing many indigenous rice varieties to become extinct. Due to rice being less remunerative, many tribal farmers have shifted to commercial crops like banana and ginger. Factors such as environmental degradation, deforestation, expanding population needs, government cash-cropping programs, and climatic changes have reduced irrigation water for rice fields, leading to reduced rice production, outmigration, and a shift towards cash crops. To combat this situation and sustain rice farming, a combination of technical and socio-cultural practices is needed, including the use of green and animal manure, proper water management, biophysical sign reading for planting times, and indigenous village leadership regulations. Sustainable agriculture, as suggested by Donal and Donald (1995) [4], must produce adequate high-quality food, be environmentally safe, protect the resource base, and be profitable. Government support is crucial for reviving and developing sustainable rice production on a large scale. Efforts should bridge the economy and ecology with social aspects, emphasizing sustainable agriculture to overcome agricultural stagnation. According to the Food and Agriculture Organization (2015), sustainable agriculture must meet the needs of present and future generations while ensuring profitability, environmental health, and social and economic equity. Sustainable agriculture practices secure social and economic equity by balancing environmental well-being and economic profitability, fulfilling the current and long-term needs for food, fiber, and other resources while conserving natural resources and protecting ecosystems (Department of Agriculture and cooperation, 2010). It enhances human capabilities and ensures food security through equitable and efficient resource use.

Methodology

The study focused specifically on Wayanad district in Kerala, chosen for its significance as the homeland of some of India's smallest and most primitive tribal communities. Wayanad district is categorized into three distinct Agro Ecological Units (AEUs): Northern high hills (AEU 15), Wayanad central plateau (AEU 20), and Wayanad eastern plateau (AEU 21). Panchayats with substantial rice cultivation areas from each AEU were selected in consultation with the Assistant Director of Agriculture Office, resulting in the selection of three panchayats for the study: Thavinjal from Northern high hills, Panamaram from Wayanad central plateau, and Thirunelli from Wayanad eastern plateau.

The study involved a total of 180 respondents, comprising 30 tribal rice farmers and 30 non-tribal rice farmers randomly selected from the identified panchayats with the assistance of Krishi Bhavans. Additionally, a focus group consisting of 30 members, including officials and social activists, was chosen to identify, analyse, and triangulate the social issues related to rice farming in the region. In sum, the study encompassed 210 respondents, representing tribal rice farmers, non-tribal rice farmers, and the focus group of officials and social activists.

Attitude refers to a readiness or tendency to react, shaped by experiences, significantly influencing individual behaviour. Measuring attitudes, essential in research, encourages expression and enhances decision-making skills (Baron and Byrne, 1991) [1]. This study examines the attitudes of tribal rice farmers toward sustainability in rice farming. Using the Likert (1932) [9] and Edward (1969) [5] methods for scale construction ensured breadth and intensity in capturing responses. The thumb rule of rejecting item with ‘t-value’ less than 1.89 at 0.05 level of significance was followed. Twenty-five statements, balanced in positivity and negativity, were carefully chosen for content validity, with all showing significant discriminatory power ('t-values'), as given in Table 1. The overall reliability coefficient of 0.806 affirmed the scale's trustworthiness.

Farmers rated their attitudes using a five-point scale from 'strongly agree' (5) to 'strongly disagree' (1), with reversed scoring for negative statements. Scores were summed per respondent to gauge attitude intensity. Mean and standard deviation analysis categorized respondents into less favourable, favourable, and highly favourable attitudes toward rice farming sustainability.

Results and Discussion

The attitudes of tribal and non-tribal rice farmers toward sustainable rice farming were measured and categorized into less favourable, favourable, and highly favourable groups (Fig. 1). Data (Table 2) revealed that over 80% of tribal rice farmers had a highly favourable attitude toward sustainable rice farming, with only 6.67% in the less favourable category. The practice of traditional cultivation is a significant reason behind their positive attitude. Traditional rice cultivation has been integral to the lives of tribal farmers in the Wayanad district for centuries. These practices include using green and animal manures, practicing minimal tillage, accurately reading biophysical signs for proper planting times, and adhering to socio-cultural regulations based on indigenous knowledge. Such methods enable sustainable food production and ensure long-term soil fertility.

Tribal farmers view traditional farming as environmentally safe and beneficial, enhancing local biodiversity by encouraging natural predators and promoting healthy resource use, thereby minimizing pollution. This perspective aligns with Kumar's (2018) study on the changing patterns of paddy cultivation among Kerala's tribal farmers. Tribal farmers recognize the value of indigenous rice varieties and prioritize their conservation. They understand that these native varieties are not only a crucial part of their agricultural heritage but also possess unique qualities that contribute to the resilience and sustainability of their farming systems. This recognition is deeply embedded in their cultural practices and agricultural knowledge, making the conservation of these varieties a priority in their farming strategies (Chovatia, *et al.*, 2017) [2].

Rice holds cultural significance for them, leading to a focus on quality and nutritional value over profit, which further fosters their favourable attitude toward sustainable farming. For tribal communities, rice is not merely a crop but a staple that plays a central role in their cultural rituals, festivals, and daily sustenance (Pimentel, 2019) [10]. This profound cultural connection to rice means that their farming practices are driven by a commitment to producing high-quality,

nutritious food that sustains their community and preserves their cultural identity, rather than maximizing financial gain. Their low market orientation reflects a deep-rooted belief in traditional practices that improve the quality and nutritive value of the produce. Tribal farmers often operate within a subsistence economy where the primary goal is to feed their families and communities. This self-sufficient approach is underpinned by traditional farming methods that have been passed down through generations, emphasizing ecological balance, soil health, and the nutritional content of their crops (Garret, 1997) [7]. Their adherence to these practices showcases a holistic understanding of agriculture that prioritizes long-term sustainability and community well-being over immediate economic benefits.

In contrast, the majority (71.11%) of non-tribal rice farmers had a favourable attitude toward sustainable rice farming (Table 3), but they tend to prefer conventional or modern farming methods over traditional practices. The influence of modernity and the introduction of new rice varieties have led most non-tribal farmers to adopt modern agricultural practices. With the advent of advanced farming technologies and improved rice strains, non-tribal farmers are increasingly turning to these innovations to boost their productivity and competitiveness. This shift is driven by the desire to maximize yield and efficiency, often at the expense of traditional methods that have been sidelined in favour of more contemporary approaches. As a result, the agricultural landscape among non-tribal farmers is markedly different, characterized by the widespread use of hybrid seeds and modern farming equipment.

Despite the superior quality of indigenous rice, societal pressures compel non-tribal farmers to embrace modern farming techniques. The cultural and economic dynamics within these communities often prioritize modernity and technological advancement, leading to a diminished appreciation for the traditional varieties that are known for their exceptional taste and nutritional benefits. Non-tribal farmers face societal expectations to conform to the latest agricultural trends, which promise higher short-term gains and are often perceived as more prestigious or progressive. This societal push towards modernization can overshadow the inherent advantages of indigenous rice, causing farmers to adopt practices that prioritize immediate economic returns over long-term sustainability.

Migration to Wayanad from other parts of Kerala has also contributed to this shift. The influx of people from different regions brings diverse agricultural practices and preferences, further promoting the adoption of modern techniques. Migrants may introduce new crop varieties and farming methods that they are familiar with, thereby influencing the local agricultural practices. This demographic change accelerates the transition towards modern agriculture, as the collective farming community adapts to a blend of old and new practices to meet the changing demands and conditions. Consequently, many non-tribal farmers use chemical fertilizers and pesticides without environmental considerations. The adoption of modern agricultural practices often comes with a reliance on synthetic inputs to enhance crop growth and protect against pests and diseases. However, this approach can lead to the neglect of environmental impacts, such as soil degradation, water contamination, and loss of biodiversity. The widespread use of chemical fertilizers and pesticides among non-tribal farmers reflects a prioritization of short-term agricultural productivity over ecological sustainability, which can have detrimental long-term effects on the environment and the health of the farming ecosystem.

Their economic and market orientations result in an unfavourable attitude toward sustainable rice farming, and the high costs and lower profitability of rice farming have driven many to switch to cash crops. Non-tribal farmers often operate within a market-driven framework that emphasizes immediate financial returns. This economic focus makes them less inclined to adopt sustainable practices that may not offer quick profits. Furthermore, the rising costs of inputs and the fluctuating prices of rice can make rice farming less attractive compared to more lucrative cash crops. As a result, many farmers opt to grow crops like spices, rubber, or vegetables, which promise higher and more stable income, even if it means abandoning more sustainable, traditional methods of rice cultivation.

Improving non-tribal farmers' attitudes towards sustainable farming will require increased access to technology, extension services, inputs, and awareness of sustainable agriculture methods' feasibility. An analysis of variance (ANOVA) between tribal and non-tribal rice farmers' attitudes toward sustainable rice farming (Table 4) showed a significant difference, with a 'P' value of less than 0.05. The key factors contributing to tribal farmers' favourable attitudes include their focus on conserving indigenous varieties, concerns about the quality of life, environmental and biodiversity issues, cultural acceptance of rice cultivation, and lower profit orientation compared to non-tribal farmers. These factors underscore the holistic approach tribal farmers have towards sustainable agriculture, emphasizing environmental stewardship, cultural heritage, and community well-being. Consequently, many non-tribal farmers use chemical fertilizers and pesticides without environmental considerations. The adoption of modern agricultural practices often comes with a reliance on synthetic inputs to enhance crop growth and protect against pests and diseases. However, this approach can lead to the neglect of environmental impacts, such as soil degradation, water contamination, and loss of biodiversity. The widespread use of chemical fertilizers and pesticides among non-tribal farmers reflects a prioritization of short-term agricultural productivity over ecological sustainability, which can have detrimental long-term effects on the environment and the health of the farming ecosystem.

Their economic and market orientations result in an unfavourable attitude toward sustainable rice farming, and the high costs and lower profitability of rice farming have driven many to switch to cash crops. Non-tribal farmers often operate within a market-driven framework that emphasizes immediate financial returns. This economic focus makes them less inclined to adopt sustainable practices that may not offer quick profits. Furthermore, the rising costs of inputs and the fluctuating prices of rice can make rice farming less attractive compared to more lucrative cash crops. As a result, many farmers opt to grow crops like spices, rubber, or vegetables, which promise higher and more stable income, even if it means abandoning more sustainable, traditional methods of rice cultivation.

Table 1: Selected attitude statements with 't-value' more than 1.89

Sl. No	Statements	t value
1.	It is important to use healthy seeds of locally adapted varieties to get a good potential yield and there by maintenance of genetic diversity (+)	5.58
2	Minimum tillage/ ploughing conserves the chemical and physical qualities of the soil (+)	2.96
3	Application/ addition of organic fertilizers, green manure crops and mulches can increase soil fertility and maintain soil humidity (+)	9.96
4	Crop rotation and diversification can reduce pests and diseases (+)	4.48
5	Soil tests should be conducted before application of fertilizers (+)	5.53
6	Soil and water are basic factors of production and should be exploited for greater production (-)	4.77
7	Rice yield can be increased only by increased use of chemical fertilizers (-)	4.28
8	Biological control is environmentally safe to control and reduce damage of farm pests and diseases (+)	2.47
9	Burning the field after harvesting is very useful to kill diseases and microbes (-)	3.96
10	Encouragement of natural pest enemies in the rice fields helps to keeps the pests of rice at control (+)	9.96
11	Agrochemicals are not toxic to fish and other organisms in water bodies (-)	2.57
12	Large quantity of inputs can be used in rice farming as long as it is profitable (-)	5.38
13	Farm traditions, culture and indigenous knowledge are of little use in sustainable rice farming (-)	3.85
14	To prevent flooding and water logging, conservation of rice fields has to be strictly enforced (+)	3.58
15	Natural resources must be protected for next generations (+)	3.81
16	Participating in farmer groups can improve farmers' knowledge and experience (+)	3.58
17	Forest destruction has no effect on degradation of soil and water resources (-)	2.53
18	Efficient use of water and soil conservation practices will not ultimately lead to sustainable yields of crops (-)	2.47
19	Adoption of sustainable farming practices is a costly affair(-)	2.50
20	People who have higher social status adopt more sustainable farming technologies than the people who have low social status(-)	2.29
21	Agricultural scientists and policy makers should expand efforts to develop innovations to increase production through sustainable farming (+)	4.00
22	Farm labour should be replaced whenever possible by more efficient machines (+)	4.96
23	It is better to practice specialized farming rather than diversification of farming system (-)	3.89
24	The primary goal of farmers should be to increase quantity rather than quality of the products produced in their farm (-)	3.78
25	Efforts at community level are necessary for restoring the lost biodiversity of rice fields (+)	2.36

(+: Positive statement - : Negative statement)

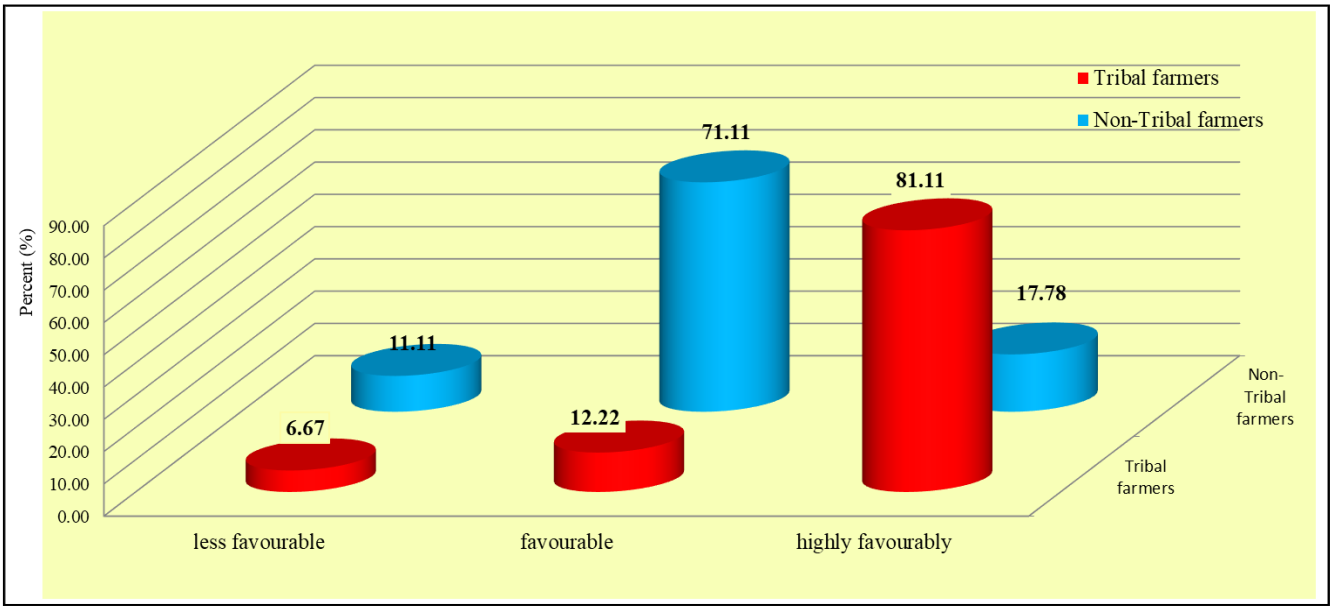

Fig 1: Attitude of tribal and non-tribal farmers towards the sustainability of rice farming

Table 2: Attitude of tribal rice farmers towards the sustainable rice farming

Sl. No.	Categories	Frequency	Percent (N=90)
1	Less favourable attitude	6	6.67
2	Favourable attitude	11	12.22
3	Highly favourable attitude	73	81.11

Table 3: Attitude of non-tribal rice farmers towards the sustainable rice farming

Sl. No.	Categories	Percent (n=90)
1	Less favourable attitude	11.11
2	Favourable attitude	71.11
3	Highly favourable attitude	17.78

Table 3: Analysis of variance between tribal and non-tribal rice farmers towards the attitude of sustainable rice farming

Source of Variation	Sum of squares	Degrees of freedom	Mean square	F-value	P-value	F-critical value
Between Groups	1140.05	1	1140.05	66.98773	5.07E-14*	3.894232
Within Groups	3029.344	178	17.01879			
Total	4169.394	179				

NS: Non-Significant, *: significance at 0.05 level

Conclusion

The study reveals that over 80% of tribal rice farmers in Wayanad have a highly favourable attitude toward sustainable rice farming, primarily due to their reliance on traditional cultivation methods that enhance environmental safety, biodiversity, and long-term soil fertility. These farmers prioritize the conservation of indigenous rice varieties, which are integral to their cultural heritage and agricultural resilience. In contrast, while 71.11% of non-tribal rice farmers also view sustainable farming favourably, they often adopt modern agricultural practices due to societal pressures and the introduction of new rice varieties, which prioritize short-term productivity and economic gains over traditional methods. This shift is further influenced by migration patterns that introduce diverse farming practices, accelerating the transition towards modern agriculture in the region.

Acknowledgements

With a deep sense of gratitude, I sincerely thank the Indian council of Agricultural Research (ICAR) and Kerala Agricultural University (KAU), Thrissur for their continuous guidance and financial support provided for the period of this research work.

Competing Interests

Authors have declared that no competing interests exist.

Ethics Approval

This research was conducted in accordance with the guidelines set by the Indian Council of Agricultural Research (ICAR) and Kerala Agricultural University (KAU), Thrissur. All authors listed in the manuscript have confirmed their agreement to authorship, read and approved the manuscript, and provided consent for its submission and publication. The manuscript, in part or in full, has not been submitted or published elsewhere. The study respected the consents and values of all respondents, ensuring no harm was done. Participants provided their information freely and willingly.

Data Availability

The participants of this study consented to the public sharing of their data. Data supporting the findings are available within the article and/or its supplementary materials. References for all data are provided in the article. This statement addresses consent, data availability, and referencing clearly and succinctly.

References

1. Baron RA, Byrne D. Social psychology: understanding human interaction. New Delhi: Prentice-Hall of India Pvt. Ltd.; c1991.
2. Chovatia JV, Kalsariya BN, Kanani MK. Scale development for measuring the attitude of cotton growers towards drip irrigation system. Gujarat J Ext Educ. 2017;28(2):214-217.
3. Department of Agriculture and Cooperation. Agricultural statistics at a glance [Internet]; c2010 [cited 2020 Oct 10]. Available from: https://desagri.gov.in/documents-reports/agricultural-statistics-at-a-glance/
4. Donal LP, Donald LW. Technology for sustainable agriculture. Sci Am. 1995;237(3):182-186.
5. Edwards AL, Kilpatrick FPA. A technique for the construction of attitude scales. J Appl Psychol. 1969;32:374-384.
6. Food and Agriculture Organization. FAO and the post-2015 development agenda: sustainable agriculture [Internet]; c2015 [cited 2022 Dec 20]. Available from: http://www.fao.org/sustainable-development-goals/overview/fao-and-the-post-development-agenda/sustainable-agriculture/en/
7. Garrett HE. Statistics in psychology and education. Mumbai: c1967. p. 1-119.
8. Kumar S. Research in operations management and information systems interface [Internet]; c2018 [cited 2021 Sep 5]. Available from: https://doi.org/10.1111/poms.12961
9. Likert RA. Technique for measurement of attitude. Psychol Stud. 1932;5(2):106-107.
10. Pimentel LJ. Some biases in Likert scaling usage and its correction. Int J Sci Basic Appl Res. 2019;45(1):183-191.