**Original Research Article**

**Socio-Economics and Marketing of Arecanut in Zamuang Village, Mizoram, India: An Econometric Case Study**

**ABSTRACT**

Arecanut, commonly known as betelnut or supari in India, is cultivated in large quantities in several countries, including India, Malaysia, Sri Lanka, Indonesia, the Philippines, and some Pacific islands. This study aims to analyse the socio-economic conditions, income distribution, marketing practices, and challenges faced by arecanut farmers in Zamuang village, Mizoram. It specifically examines the roles of gender and education in income patterns and explores the influence of middlemen in arecanut marketing.A descriptive and analytical research design was adopted to assess the socio-economic status, income levels, marketing practices, and challenges of arecanut farmers in Zamuang village, Mizoram. A sample of 100 arecanut farmers was selected through random sampling. Primary data were collected using structured interviews, and secondary data were collected from government reports and academic literature. Data analysis involved graphical representation, percentage analysis, and chi-square tests, which were performed using Microsoft Excel and SPSS, respectively. Findings show thatthe majority of households (70%) depend on arecanut farming as their main source of income. Income inequality is evident, with 68 per cent of farmers earning less than ₹5 lakh annually. The income distribution data shows clear gender disparities in earnings. Findings revealed that 18 per cent of females earn less than ₹5 lakh, 5 per cent earn ₹5–10 lakh, and only 1 per cent earn above ₹10 lakh annually. In contrast, 50 per cent of males earn less than ₹5 lakh, 21 per cent fall in the ₹5–10 lakh range, and 5 per cent earn over ₹10 lakh. However, Chi-square analysis revealed no significant relationship between income and gender or educational attainment. The marketing system is dominated by middlemen from Assam, who control pricing through advance purchase agreements. Farmers face multiple challenges, including poor irrigation, limited fertiliser access, bud rot disease, and the negative impact of illegal arecanut imports from Myanmar. The study concludes that whilearecanut farming is essential for livelihoods in Zamuang village, productivity and income remain constrained. It recommends measures such as promoting intercropping, improving irrigation infrastructure, regulating market access, providing training in modern farming and financial literacy, and enforcing controls on illegal imports to ensure sustainable development and income enhancement for arecanut farmers.

**Keywords:** Socio-Economic Conditions, Middlemen, Marketing challenges, Income Distribution, Gender Differences

**1. INTRODUCTION**

The arecanut palm (*Areca catechu* L.) is an important commercial crop in India. It plays a key role in the political, social, cultural, and economic lives of the people (Sancley & H Mazhar, 2019). It is used in Ayurvedic and veterinary medicines. Arecanut, commonly known as betelnut or supari in India, is grown in large amounts in various countries, including India, Malaysia, Sri Lanka, Indonesia, the Philippines, and some Pacific islands. India is the largest producer of arecanut in the world. The arecanut is mainly chewed by the Indian in its tender, ripe, or processed forms. Globally, there are more than 600 million arecanut chewers, and this number continues to grow (Sun et al., 2024). Arecanut is processed into products like panmasala, gutkha, and scented supari, which are increasingly popular in India (Palaksha, 2017; Jamanal & Murthy, 2022).

According to the National Horticulture Board (2021-2022), Mizoram ranks 7th among the top ten arecanut-producing states in India, producing 14.1 thousand tonnes, which is 1.01 per cent of the national output (Prasad & Savitha, 2024). Arecanut farming provides important livelihoods for many households in Mizoram and is crucial to their economy (Ralte, 2022; Lalmuansangi & Mahasamudram, 2025). In Mizoram, clearing abandoned jhum areas and forest land for arecanut plantations, known locally as Kuhva, has become very popular, especially in the Kolasib and Mamit districts.

Although the contribution of Mizoram seems small compared to leading states like Karnataka (78.98%) and Kerala (7.48%) but the figure is still significant in the context of geographical and demographical characteristics. Mizoram has hilly terrain with limited arable land and a relatively small population. Therefore, contributing over 1 per cent of arecanut production reflects a growing involvement in commercial farming, especially in plantation crops.

Being among the top ten producers indicates that arecanut farming is increasingly important in the agrarian economy of Mizoram. This may be due to the favourable climate for arecanut cultivation, increased awareness among farmers, and possibly state initiatives promoting horticulture and cash crops. Moreover, arecanut is a high-value crop with consistent market demand, providing good income opportunities for farmers in rural and hilly parts of Mizoram.

This paper aims to analyse the socio-economic profile of arecanut farmers in Zamuang village, focusing on income distribution, gender differences, marketing practices, and the role of middlemen. It will also identify key challenges faced by farmers and suggest practical solutions for enhancing productivity, market access, and fair income distribution in arecanut farming.

1.1 Objectives of the Study

1. To examine the demographic and socio-economic profile of arecanut farmers in Zamuang village.
2. To analyse income distribution and identify patterns of inequality among farmers.
3. To assess the role of middlemen in the marketing and pricing of arecanut.
4. To identify the major challenges faced by arecanut farmers.

1.2 Hypotheses

1. There is no significant difference in income levels of arecanut farmers in Zamuang village based on gender.
2. There is no significant difference in income levels of arecanut farmers in Zamuang village based on education levels.

1.3 Statement of the Problem

Arecanut farming is crucial to the economy of Zamuang village. However, farmers deal with various key issues, including limited market access, price manipulation by middlemen, inadequate irrigation, poor access to fertilisers, and the threat of diseases like bud rot. Despite relying on arecanut for their livelihoods, most farmers earn modest incomes, with noticeable disparities in income distribution and gender participation. These challenges highlight the need to understand socio-economic conditions better and find sustainable solutions for the farmers.

1.4 Significance of the Study

This study is important as it highlights Zamuang villagers' economic dependency on arecanut farming and the barriers holding them back. By looking into income patterns, gender differences, and the influence of middlemen, the research provides valuable insights into the structural issues affecting rural livelihoods. The findings can assist policymakers, agricultural extension workers, and development practitioners in crafting interventions that improve market access, boost productivity, promote gender inclusion, and support sustainable arecanut farming practices.

**2. LITERATURE REVIEW**

Kumar *et al.* (2023) highlighted the significant role of arecanut farming in Karnataka, India. In 2018–19, the state had 464,582 hectares dedicated to arecanut, producing an annual yield of 620,348 metric tonnes. The Tumkur district relies heavily on crops like coconut and arecanut. The study aimed to examine the key marketing channels and the challenges in promoting arecanut. It identified three main marketing channels in the region. Channel 3 had the highest price spread (₹48,468.76) because it involved more middlemen. In comparison, Channel 2 provided a higher share of producer income in consumer spending (50.26%) and better marketing efficiency (2.06). The study noted that processors were involved in all three channels. Major issues in the marketing process included multiple intermediaries, a lack of technical knowledge, inadequate infrastructure, and unstable market prices. The study suggested improving the marketing system to help farmers achieve better prices.

Jamanal and Murthy (2022) emphasised the crop’s importance as a key commercial product in India with socio-economic effects. They reported that India produces about 17.96 lakh tonnes of arecanut each year from roughly 12.26 lakh hectares, with Karnataka and Kerala making up 70–80 per cent of this area. In Karnataka alone, arecanut is cultivated on over 2.15 lakh hectares. The study surveyed 192 farmers using random sampling, along with five traders, five pre-harvest contractors, five retailers, and one processing plant per district, totalling 360 samples. The findings showed that inconsistent rainfall patterns impacted productivity and the area under cultivation. Labour, making up a significant portion (31.99%) of costs, accounted for 80.75% of the overall cultivation expenses. High processing costs and labour shortages were noted as significant challenges. The authors suggested that increased mechanisation could help address harvesting difficulties.

Mohanraj and Velusamy (2022) stated that arecanut is the most extensively cultivated cash crop in the district, with an annual output of 3,445 tonnes. They chose 120 arecanut growers through proportionate random sampling. The results indicated that about two-thirds of the farmers had a medium level of marketing knowledge. Most farmers (67.50%) sold their produce directly from their farms, while 18.33% sold it in nearby towns. Two-thirds dealt with pre-harvest contractors, and 37.50% preferred existing market infrastructure. The study emphasised the importance of marketing knowledge to improve profitability. It suggested that informed market participation can help farmers’ secure better prices.

Prasad and Savitha (2024) explored how farmers' socio-economic backgrounds in Karnataka's Malnad region affect arecanut marketing. The study identified key factors, such as education, income, and land ownership, as important in shaping farmers’ market participation and decision-making. Through surveys and interviews, the research found that better-educated and financially stable farmers had more access to markets and made informed marketing choices. The authors recommended that policies should support targeted interventions to improve market access for disadvantaged farmers and boost overall marketing efficiency in the arecanut sector.

**3. METHODOLOGY**

**Study Area**

Zamuang is a village in the Zawlnuam Block of Mamit district, Mizoram (Latitude: 24°06'02" N; Longitude: 92°23'51" E). According to the 2011 Census, it had 237 households and a population of 1,107, with a sex ratio of 909 females for every 1,000 males, which is below the state average. The literacy rate is high at 95.92 per cent, with male literacy at 97.86 per cent and female literacy at 93.64 per cent. Children aged 0–6 make up 13.73 per cent of the population, and the child sex ratio (1,338) exceeds the state average (Census, 2011).

The village is mainly inhabited by Scheduled Tribe (ST) communities and governed by a Village Council. Out of the total population, 561 were workers; 83.42 per cent engaged in main work, and 276 were farmers. Arecanut farming is one of the main occupations in Zamuang. The village had 237 households according to the 2011 census (Census, 2011).

**Methods**

This study employed a random sampling technique to ensure fair representation, with a sample size of 100 respondents selected from among arecanut farmers in Zamuang village.

Primary data were collected through interview schedules using a structured questionnaire specifically designed for this research. Secondary data were obtained from a variety of published sources, including reports from government and non-governmental organisations, as well as academic journals relevant to arecanut farming and rural livelihoods.

The data collected were analysed using simple graphical methods, percentages, and Chi-square tests to assess relationships between variables. The analysis was carried out using Microsoft Excel and SPSS software to ensure accuracy and reliability in interpretation.

**4. RESULT AND DISCUSSION**

4.1 Socio-economic Profile

Zamuang village is a predominantly male-headed agricultural structure. About 76 per cent of households are led by males, while only 24 per cent are female-headed, likely due to widowhood or male migration (Table 1). This indicates limited participation of females in formal agricultural decision-making roles.

Table 1: Socio-economic profile of Arecanut farming

|  |  |
| --- | --- |
| **Indicators** | **Percentage (%)** |
| Household head Gender | Male | 76 |
| Female | 24 |
| **Total** | **100** |
| Age of the household head | Less than 40 years | 11 |
| 41-50 years | 34 |
| 51-60 years | 17 |
| 61 and above | 38 |
| **Total** | **100** |
| Educational Qualification | Primary School | 12 |
| Middle School | 27 |
| High School | 42 |
| Higher Secondary School | 10 |
| BA and above | 9 |
| **Total** | **100** |
| Main sources of Income | Arecanut farming | 70 |
| Farming | 16 |
| Govt. Servant | 10 |
| Labourer | 4 |
| **Total** | **100** |
| Annual Income from Arecanut farming | Less than 5 lakhs | 68 |
| 5-10 lakhs | 26 |
| More than 10 lakhs | 6 |
| **Total** | **100** |

Source: Field Survey, 2025

In terms of age distribution, a significant 38 per cent of household heads are 61 years or older, revealing an ageing farming population. Only 11 per cent are under 40 years, suggesting that younger generations are less involved in arecanut farming, possibly due to alternative employment.

Figure 1: Main sources of income and Gender

The education qualifications of the household head were relatively low. While 42 per cent have completed high school, only 9 per cent hold a bachelor’s degree or higher. A large portion (27%) has education only up to middle school, which may affect awareness and use of modern farming techniques or government programs.

Arecanut farming is the backbone of the local economy. About 70 per cent of households rely on it as their primary source of income. Other crops (16%) and government jobs (10%) play minor roles, while only 4 per cent depend on labour work (Table 1). This lack of livelihood diversification makes households economically vulnerable to market and crop-related disruptions.

Main sources of income show a clear gender difference. Among females, 17 per cent rely on arecanut farming, 4 per cent on farming, 2 per cent work in government jobs, and 1 per cent are labourers. In contrast, males participate more widely across all categories: 54 per cent in arecanut farming, 12 per cent in farming, 7 per cent as government servants, and 3 per cent as labourers (Figure 1). This indicates that men dominate income-generating activities, particularly in agriculture and government jobs. Women have limited involvement, indicating potential social and economic barriers. The findings were also corroborated by those of Dharamshi et al. (2023); Vidyakala et al. (2018)

The income distribution data shows that 68 per cent of arecanut farmers earn less than ₹5 lakh annually, placing most farmers in the low to medium income category. Only 6 per cent earn more than ₹5 lakh (Table 1). This suggests significant income inequality, which may be linked to differences in land size, yield, and market access.

The mean income of ₹4,98,871 reflects the average annual income of arecanut farmers. However, this figure is likely skewed by a few high-income earners, being significantly greater than the median. The median income of ₹3,33,000 represents the midpoint of the income distribution, providing a more accurate picture of what a typical farmer earns each year. The mode, ₹1,00,000, which is the most frequently occurring income, suggests that many farmers earn at the lowest recorded income level.

The analysis reveals a maximum annual income of ₹25,00,000 and a minimum of ₹1,00,000 among arecanut farmers in Zamuang village. The lowest earners (₹1,00,000) likely represent small-scale farmers with limited land and productivity. In contrast, the highest earners (₹25,00,000) may be large landowners with higher yields.

Figure 2: Gender and average annual income from Arecanut cultivation

The income distribution data shows clear gender disparities in earnings. Among females, 18 per cent earn less than ₹5 lakh annually, 5 per cent fall into the ₹5–10 lakh range, and only 1 per cent earn more than ₹10 lakh. In comparison, 50 per cent of males earn less than ₹5 lakh, 21 per cent fall in the mid-range, and 5 per cent earn above ₹10 lakh (Figure 2). This demonstrates that men not only dominate the income brackets overall but are also more likely to achieve higher income levels. The studies by Anand & Thampi (2021) and Ara (2021) also reported similar findings.

4.2 Test of Hypotheses

Chi-square tests were conducted to test the null hypotheses that there are no significant differences in the annual income levels of arecanut farming in Zamuang based on gender and educational attainment.

Table 2: Chi-Square Test Results

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variables** | **Chi-Square Value** | **Degrees of Freedom (df)** | **p-value** | **Significance Level (α)** | **Result** |
|  Educational level | 6.55 | 8 | 0.586 | 0.05 | Not significant |
| Gender | 0.729 | 2 | 0.695 | 0.05 | Not significant |

Note: Computed by SPSS 20.

The chi-square analysis reveals that there is no statistically significant association between annual income and two key variables: gender and educational qualification of arecanut farmers in Zamuang village (Table 2).

For annual income and gender, the p-value is 0.695, which is greater than the 0.05 significance level, and we accept the null hypothesis (Table 2). This means that differences in income between male and female-headed households are not statistically significant. Although male-headed households dominate numerically, income levels do not vary significantly by gender within the sample.

For annual income and educational qualification, the p-value is 0.586, again above the 0.05 significance level, and we failed to reject the null hypothesis (Table 2). This suggests that higher education levels do not lead to higher income from arecanut farming. Farmers with lower education levels often earn similar incomes to those with higher qualifications, likely because income is more influenced by landholding size, market access, and buyer dependency rather than formal education.

**4.3. Mode of purchase and role of middlemen**

Arecanut farmers in Zamuang village primarily sell their produce at the farm gate. Buyers are middlemen from Assam, who buy arecanuts in bulk, usually using leno bags (60–70 kg) priced at ₹1,500 and jute bags (40–50 kg) priced at ₹1,000. These middlemen often enter advance purchase agreements during the flowering stage, well before harvest time. Farmers typically receive 50 per cent or less of the payment upfront, with the rest paid after the arecanuts are harvested. While this system provides immediate cash flow, it limits the ability of the farmers to negotiate prices and reduces their control over the marketing of their produce.

Middlemen are crucial in the marketing process in Zamuang village. Their role significantly affects pricing and the overall economic outcomes for farmers. Their activities can be categorised as follows:

**i. Purchasing:** Middlemen often buy arecanuts in advance, offering partial payment (typically 50% or less) in exchange for harvesting rights after the crop matures. This arrangement gives farmers immediate cash but forces them to accept lower prices and relinquish market control.

**ii. Harvesting:** The harvest usually happens between November and February when the arecanuts fully mature. Middlemen or their hired labourers do the harvesting, with payment made afterwards. Although this relieves farmers of labour responsibilities, it increases their reliance on intermediaries.

**iii. Price Control and Market Manipulation:** A major concern in arecanut farming is price manipulation by middlemen. Because farmers lack direct market access, they must accept prices set by buyers, who buy at suppressed rates and sell at higher margins. This reduces the profits, raises financial vulnerability, and maintains a cycle of economic dependency and exploitation.

**5. CHALLENGES FACED BY ZAMUANG ARECANUT FARMERS**

**a. Irrigation:** An inadequate and unreliable water supply limits productivity, especially during dry seasons and affects crop health and yield.

**b. Fertilisers:** Poor use or lack of access to quality fertilisers leads to nutrient-deficient soil and weak crop performance.

**c. Market Price Controlled by middlemen:** Middlemen dominate pricing, leaving farmers with minimal profit and limited control over their produce's value.

**d. Bud Rot Disease:** This major fungal infection harms arecanut palms, causing yield loss and increased maintenance costs.

**e. Illegal Myanmar arecanut imports:** Smuggled arecanuts disrupt local markets by lowering prices, threatening the income of domestic farmers.

**f.** **Lack of Financial Literacy:** Due to limited financial literacy, many arecanut farmers in Zamuang village do not practice systematic saving. This leads to a lack of funds to prepare farmland for the next cultivation season.

**g. Farming technique:** Farmers face significant challenges in adopting effective farming techniques, which negatively impact both productivity and long-term sustainability.

**6. CONCLUSION**

The study explored the socio-economic conditions, income patterns, marketing practices, and challenges faced by arecanut farmers in Zamuang village, Mizoram. Arecanut farming is the primary livelihood for most households, yet income levels remain low for the majority, with evident inequality in landholding and market access. Although men dominate agricultural income activities, statistical analysis showed no significant difference in income based on gender or educational background, indicating that structural factors such as access to land and markets play a larger role.

Marketing is largely controlled by middlemen from Assam, who often enter into advance purchase agreements, leaving farmers with little bargaining power and reduced profits. Farmers also face critical issues such as inadequate irrigation, limited access to quality fertilisers, disease outbreaks like bud rot, and competition from illegal arecanut imports. To ensure sustainable and equitable growth, the study recommends promoting intercropping systems, improving irrigation infrastructure, regulating market access through cooperatives, and establishing local processing units. Empowering farmers, especially women, with training and resources is essential to increase productivity and resilience. Overall, the study highlights the need for integrated support to improve both production and marketing. Addressing these challenges will enhance farmer incomes and ensure the long-term sustainability of arecanut farming in Zamuang.

**7. RECOMMENDATION**

**a. Promotion of intercropping or mixed cropping:** Shift from arecanut monoculture to intercropping systems to improve land use, enhance income diversity, and lessen risks from crop failure.

**b. Construction of water supply and storage tanks:** Build irrigation infrastructure, including water tanks, to ensure a sufficient and reliable water supply for arecanut farming, especially during dry periods.

**c. Establishment of arecanut sheath leaf processing units:** Create small-scale units to process arecanut sheath leaves into biodegradable plates and packaging, generating extra income and reducing waste.

**d. Ban and regulation of illegal arecanut imports from Myanmar:** Implement strict measures to control illegal arecanut imports that disrupt local markets and hurt domestic farmers' incomes.

**e. Provision of fertilisers at subsidised rates:** Ensure access to quality fertilisers at government-subsidised rates to improve soil health, boost productivity, and support small farmers.

**f. Elimination of market price manipulation by middlemen:** Enable direct market access through farmer cooperatives, digital platforms, and regulated markets to fight exploitation and ensure fair pricing.

**g. Management and prevention of bud rot disease:** Apply disease control tactics through early detection, use of fungicides, and training on best practices to protect arecanut palms and maintain yields.

**h.** **Training in modern farming techniques**: Providing proper training from qualified experts will help farmers use modern and efficient farming methods. This will increase productivity.

**i. Financial Literacy training:** Organising village-level financial literacy programme for arecanut farmers in Zamuang. These programs should focus on the importance of saving regularly, budgeting for different seasons, and planning for farming expenses. This approach will help ensure the timely preparation of farmland and improve financial stability.

**DISCLAIMER (ARTIFICIAL INTELLIGENCE)**

Author(s) hereby declares that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during the writing or editing of this manuscript

**CONSENT**

Verbal consent was obtained from all participants after explaining the purpose and nature of the study. Participation was voluntary, and confidentiality was assured.

**COMPETING INTERESTS**

The authors have declared that no competing interests exist.

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