THE PROFILE CHARACTERISTICS OF MUGA SILKWORM REARERS OF THE SONITPUR DISTRICT OF ASSAM

Abstract

A study was conducted during 2020-2021 to analyze the profile characteristics of 120 muga rearers of the Sonitpur district of Assam. The study revealed that the majority of the respondents (42.50%) belonged to the middle age group. Most of the respondents (47.50%) belonged to the category OBC (Other Backward Class) and had their (35.00%) education up to middle school. Among the respondents, medium-sized (50.00%) family was found to be dominant and farming was their primary occupation with a medium level of income ranging from Rs. 52,000-1,71,000. Regarding the size of operational land holding, the majority (40.83%) of the muga farmers owned operational land holding of 1-2 ha. The majority of the respondents (48.33%) had farming experience between 10-20 years. It was also observed that most of the respondents had a medium level of extension contact (73.33%), medium risk-bearing ability (65.83%), medium decision-making ability (60.83%), and a medium level of marketing orientation (69.17%). As regards training exposure, only 27.50 percent of the respondents had received any training.

Keywords: Muga culture, Rearers, Silkworm, Socio-economic factors

1. Introduction

Sericulture represents a labor-intensive, low-investment, small-scale industry that caters to both marginal and small landholders due to its potential for high returns, short gestation period, and year-round employment opportunities for family members (Goswami *et al*., 2015). It serves as an important tool for rural reconstruction, benefiting the weaker sections of the society (Lakshmanan and Geethadevi, 2005). Sericulture involves the rearing of four types of silkworms, namely eri, muga, mulberry, and tasar. Among these, muga silk production derived from the muga silkworm endemic to Assam and several neighbouring states in Northeast India, holds prominence. Since the muga silkworm *Antheraea assamensis* Helfer is multivoltine in nature, rearing could take place throughout the year. Sonitpur district in Assam is a key contributor to silk production, with a significant portion of the rural populace relying on sericulture for their livelihoods. Currently, sericulture is practiced in approximately 211 villages within the district involving around 8,672 families in various sericultural activities.

In the fiscal year 2022-23, the district produced 149.72 metric tons of raw silk, comprising 146.17 metric tons of eri raw silk, 1.97 metric tons of muga raw silk, and 1.58 metric tons of mulberry raw silk (Anon., 2022-23). While numerous studies have explored the socio-economic aspects of sericulture, there remains a need for further research to identify the key factors influencing the adoption of scientific muga-rearing methods. Despite government initiatives aimed at improving the socio-economic conditions of muga rearers in Sonitpur, there is still a gap in understanding the critical factors affecting long-term sustainability. Given the absence of prior studies on the socio-economic status of muga rearers in the area, this study was conducted in Sonitpur district, Assam.

2. Materials and Methods

The current study was conducted purposively in the Sonitpur district of Assam during 2020–2021, with a sample size of 120 respondents. A multistage sampling design was employed to select the respondents for this study. Out of the 7 development blocks in Sonitpur district, 3 were chosen purposively: Naduar and Balipara blocks under the Tezpur subdivision, and Borchala block under the Dhekiajuli subdivision, due to their higher population of muga rearers. Two villages from each selected development block were chosen: Niz-Borchala and Borjhar from Borchala Development Block, Dharikati and Chariduar from Balipara Development Block, and Hatinga and Tupia Gaon from Naduar Development Block, for the study. With the study objectives in mind, a set of independent variables were selected. Data were collected through personal interviews using a pre-tested questionnaire developed for this purpose. Statistical techniques such as frequency analysis and percentage were employed for data analysis and interpretation.

3. Results and Discussion

For this study, a total of 13 distinct socio-economic and psychological variables were selected and assessed. To analyze the distribution of these traits, respondents were categorized into groups based on each trait, and frequencies and percentages were computed accordingly. Additionally, the mean and standard deviation of various key variables were calculated to provide further insight into the data.

3.1 Age

The analysis presented in Table 1 indicates that the majority of the respondents (42.50%) fall within the middle age group (36-50 years), followed by 30.83% in the age group above 51 years, and 26.67% in the age group up to 35 years. These findings are

consistent with prior research conducted by Mech *et al*. (2016), Vijay and Mech (2019), and Sarma *et al*. (2023). The data suggests that individuals in the middle age group are significantly more engaged in muga rearing, likely owing to their energy, potential, and dynamism, which enables them to develop their skills effectively to generate income and maintain a desired standard of living. Nevertheless, it's noteworthy that the age group above 51 years also exhibited a substantial level of involvement compared to the younger cohort. This may be attributed to their maturity and expertise in their respective roles, possibly stemming from their considerable experience in muga culture.

Table 1. Distribution of the respondents according to their age

(n=120)

Sl. No.	Age (years)	Frequency	Percentage (%)
1	Up to 35	32	26.67
2	36-50	51	42.50
3	51 and above	37	30.83

3.2 Caste

The distribution of participants according to their category is documented in Table 2. The findings indicate that the majority (47.50%) of the respondents belonged to the Other Backward Class (OBC), followed by 24.17% categorized under Schedule Tribe (ST), 18.33% under General Caste, and 10.00% under Schedule Caste (SC). Interestingly, there were no muga farmers from Minorities and Other Backward Classes (MOBC) among the respondents. These results are consistent with previous research, which reported that a majority of respondents (85.00%) belonged to the ST category, followed by 10.00% OBC, and 5.00% SC. Notably, none of the respondents were categorized under the General category in the tribal region of Sarguja (C.G) (Kumar *et al*., 2018).

Table 2. Distribution of the respondents according to their category

(n=120)

Sl. No	Category	Frequency	Percentage
1	GEN	22	18.33
2	OBC	57	47.50
3	MOBC	0	0.00
4	SC	12	10.00
5	ST	29	24.17

3.3 Education level

Figure 1 displays the distribution of the respondents according to their educational level. The survey data indicates that the largest segment of the respondents, comprising 35.00%, possessed educational attainment equivalent to completion of middle school. Following this group, 25.83% had completed high school, while 19.17% had attained education up to the higher secondary level. Only 10.83% had completed education equivalent to primary school. Conversely, a minority, constituting 3.33% of the respondents, reported being illiterate, whereas merely 5.83% had achieved graduation or postgraduate qualifications. A higher percentage (27.00) of the sericulture farmers had a high school education followed by 25.00 percent of the respondents who had a middle school and 20.00 percent of them were illiterate (Hadimani *et al.*, 2017), which aligns with our current findings.

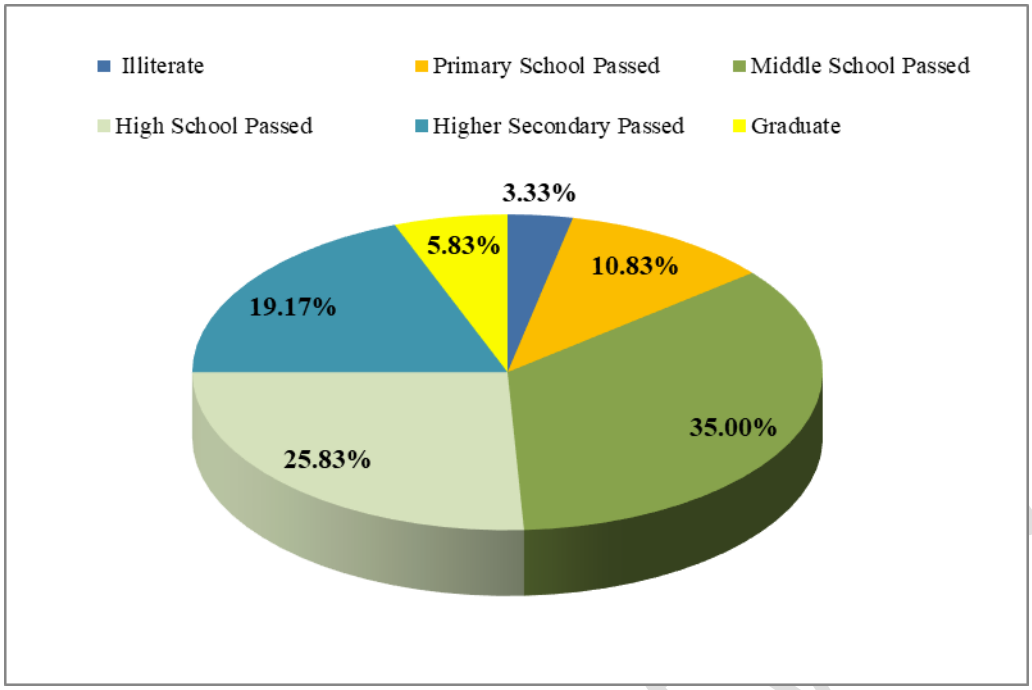

Fig. 1 Distribution of the respondents according to their educational level

3.4 Family size

It is revealed from Table 3 that the majority (50.00 %) of the respondents belonged to medium-sized families followed by small-sized families (31.67 %) and large-sized families (18.33 %). In contrast with the findings, Bhagabaty *et al.* (2018) revealed that 60.00 percent of the respondents belong to a small family, whereas 15.00 % and 25.00 % of the respondents belong to large and medium-sized families, respectively.

Table 3. Distribution of the respondents according to their family size

(n=120)

Category	range	Frequency	Percentage (%)
Small Family	2-4	38	31.67
Medium Family	5-7	60	50.00
Large Family	More than 8	22	18.33

3.5 Operational land holding

Table 4 illustrates the distribution of the respondents categorized by the size of their land holdings. The results indicate that the predominant proportion (40.83%) of the respondents fell within the small land-holding category, possessing 1-2 hectares of land, followed by semi-medium (35.83%), marginal (13.33%), and medium (10.00%) land holding capacities. Notably, no respondents were identified as having a large land holding capacity exceeding 10 hectares. According to the study findings, a significant portion of the respondents were classified under the small and semi-medium farmer categories. This trend is likely attributable to the fragmentation of ancestral land over successive generations, leading to the small land holdings of the respondents. The results are consistent with the observations made by Roy and Sarkar (2015), who noted that sericulture was predominantly undertaken by individuals from economically weaker sections with very limited land holdings in Alomtola village, West Bengal. Comparable findings were also documented by Sonowal (2016) and Buragohain (2019) in the eri sector of Assam.

Table 4. Distribution of the respondents according to their land-holding

(n=120)

Category	Score range	Frequency	Percentage (%)
Marginal	Below 1 ha	16	13.33
Small	1 to 2 ha	49	40.83
Semi medium	2 to 4 ha	43	35.83
Medium	4 to 10 ha	12	10.00
Large	10 ha and above	0	0

3.6 Primary occupation of the family

The findings presented in Figure 2 indicate that the majority (71.67%) of the respondents primarily engaged in farming as their main occupation. This was followed by 17.50% of the respondents who combined farming with business activities and 10.83% who combined farming with service-related occupations. Notably, no respondents in the study

area reported engaging in both farming and business alongside service occupations simultaneously. The study revealed that farming was the predominant occupation among the respondents. Geetha (2010) conducted a case study on the socio-economic profile of farm women engaged in sericulture activities, noting that 83.00% of the women practiced sericulture as their primary occupation, while 12.00% were involved as sericulture laborers, and 3.00% were engaged in both agriculture and sericulture-related business activities. Similarly, Hadimani *et al*. (2017) observed that the majority (60.00%) of the respondents in Bidar district, Karnataka, considered agriculture as their main occupation, with 20.00% of them also participating in agriculture alongside subsidiary enterprises.

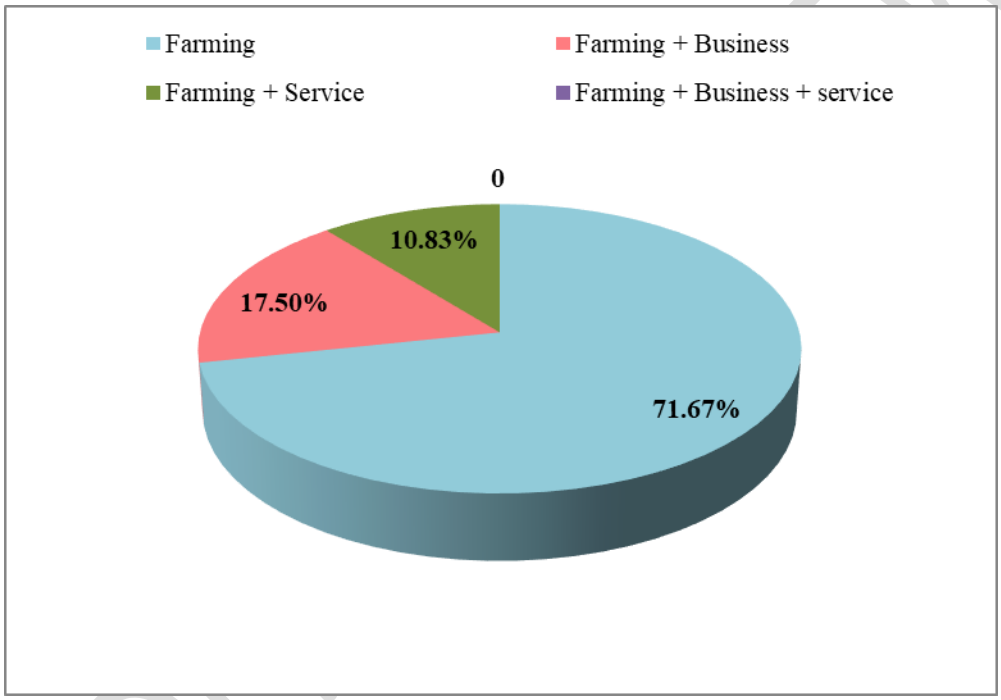

Fig 2. Distribution of the respondents according to their primary occupation of the family

3.7 Annual Family Income

From Table 5, it is evident that the majority (80.00%) of the respondents fell into the medium income bracket, reporting annual earnings ranging from Rs. 52,000 to Rs. 1,71,000. Following this, 14.17% of the respondents reported an annual income exceeding Rs. 1,71,000, while only 5.83% of the respondents reported a low annual income, specifically below Rs. 52,000, within the overall sample. The findings indicate that the prevalence of moderate annual income among respondents can be attributed to factors like limited education, lack of permanent employment, inadequate extension services, suboptimal farming

profitability, low technology adoption, limited marketing access, and reliance on intermediaries, leading to lower selling prices for their produce. Anitha and Viswanathan (2013) found that in Tamilnadu, 24.00% of women respondents earned between Rs. 20,001 to 25,000 per month, followed by 22.00% earning Rs. 10,001 to 15,000 per month. Buragohain (2019) discovered among Kachari Tribe eri silkworm rearers in Jorhat district, 65.84% had an annual income of Rs. 1,00,001 and above, with 13.33% earning between Rs. 35,001-75,000.

Table 5. Distribution of the respondents according to their annual family income

(n=120)

Category	Range	Frequency	Percentage
Low	Below 52,000	7	5.83
Medium	52,000-1,71,000	96	80.00
High	Above 1,71,000	17	14.17

3.8 Farming experience

The distribution of the respondents according to their farming experience is documented in Table 6. The results showed that the preponderance (48.33%) of the respondents possessed farming experience ranging between 10 to 20 years, with 36.67% reporting below 10 years of experience, and 15.00% reporting over 20 years of experience. Analysis from Table 1 further elucidates that a significant proportion of muga farmers in Sonitpur district fall within the middle-aged demographic, thereby correlating with a medium level of farming experience. Vijay and Mech (2019) observed that a majority (52.00%) of trained farmers demonstrated proficiency in muga culture, having 10 or more years of experience.

Table 6. Distribution of the respondents according to their farming experience

(**n=120)**

Category	Range (Years)	Frequency	Percentage
Low	Below 10 years	44	36.67
Medium	10-20 years	58	48.33
High	Above 20 years	18	15.00

3.9 Extension contact

The distribution of respondents according to their source of extension contact is illustrated in Figure 3. The analysis revealed that a substantial majority of the respondents demonstrated a moderate level of extension contact (73.33%), with 17.50% and 9.17% indicating low and high levels of extension contact, respectively. This prevalence of respondents exhibiting a medium level of engagement with extension sources likely stems from the diverse educational backgrounds within the study area, encompassing individuals ranging from highly educated to illiterate. Additionally, the heterogeneity of the respondents in terms of age and education suggests that literate, young, and middle-aged individuals may find it easier to access these sources compared to their illiterate and older counterparts. This finding aligns with previous research by Hadimani *et al*. (2017), who similarly noted that a majority (62.00%) of the respondents in Bidar district, Karnataka, reported medium extension contact.

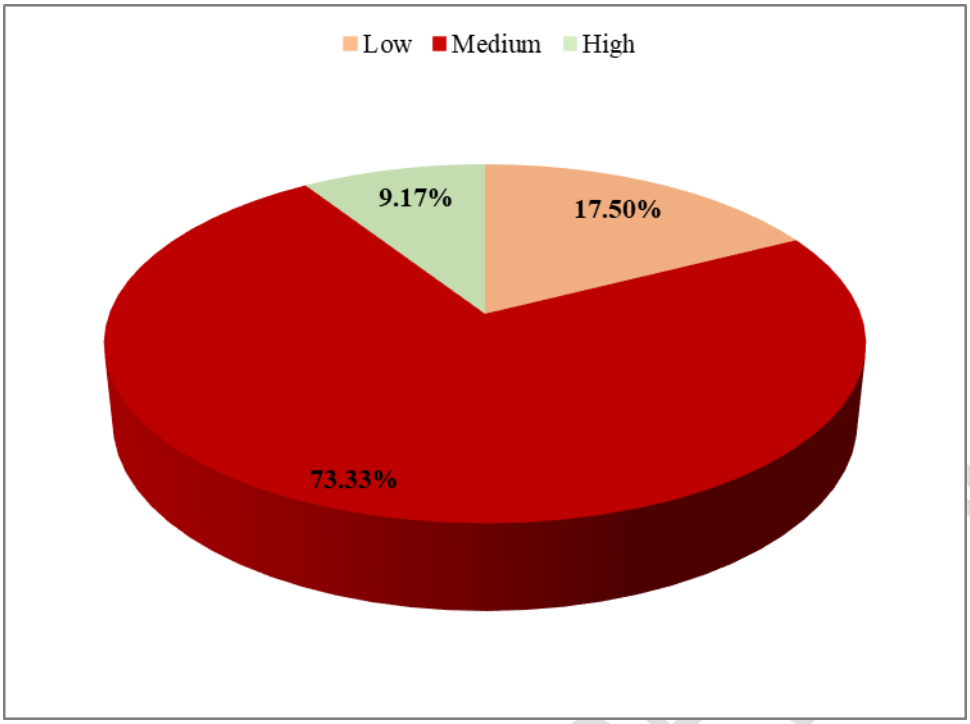

Fig 3. Distribution of the respondents according to their source of extension contact

3.10 Risk-bearing ability

The data revealed that a majority (65.83%) of the respondents displayed a moderate level of risk-bearing ability. This tendency could be linked to factors such as poor financial conditions and lower levels of education. Additionally, 15.83% of the respondents exhibited a high level of risk-bearing ability, while 18.33% demonstrated a low level (Table 7). Similarly, Borah (2020) observed that the majority (67.50%) of muga rearers in Lakhimpur district possessed a moderate level of risk-bearing ability, followed by 24.17% with a high level and 8.33% with a low level of such ability.

Table 7. Distribution of the respondents according to their risk-bearing ability

(n=120)

Categories	Range	Frequency	Percentage
Low	Below 12.52	22	18.33
Moderate	Between 12.52 and 18.05	79	65.83
High	Above 18.05	19	15.83

3.11 Decision-making ability

Table 8 illustrates that the majority (60.83%) of the respondents exhibited a moderate level of decision-making ability. This trend may stem from various factors such as limited education, a moderate level of risk-bearing ability, inadequate exposure to training, and insufficient knowledge regarding certain aspects of muga rearing. Additionally, 23.33% of the respondents demonstrated a high level of decision-making ability, while 15.83% displayed a low level. Saikia and Ghosh (2018) identified low participation of women in decision-making processes across various sericulture activities in Jorhat district, Assam. Furthermore, Rabha and Saikia (2021) investigated women's involvement in eri culture within Kamrup district, Assam. Their study revealed varying degrees of women's participation in decision-making across different activities, ranging from 85.83% for disease-free laying procurement to 27.50% for nutrient management. Specifically, women's decision-making capacities in cultural traditions, cocoon and silk selling, and the adoption of new technologies were reported at 71.67%, 70.83%, and 45.83%, respectively.

Table 8. Distribution of the respondents according to their decision-making ability

(n=120)

Categories	Range	Frequency	Percentage
Low	Below 10.89	19	15.83
Moderate	Between 10.89 and 17.13	73	60.83
High	Above 17.13	28	23.33

3.12 Marketing orientation

As depicted in Figure 4, it is evident that the majority (69.17%) of the respondents exhibited a medium level of marketing orientation, followed by 10.83% with a low level and 20.00% with a high level of marketing orientation. The prevalence of a medium level of marketing orientation among respondents can be attributed to various factors, including the absence of proper marketing channels, limited marketing knowledge, inadequate access to

appropriate technologies, lack of capital, and low-income levels. These factors collectively contribute to a limited understanding among respondents regarding current and future market opportunities. Gogoi *et al*. (2017) highlighted the substantial demand for muga silk both domestically and internationally; however, they also noted a significant gap between demand and supply in the Assam region.

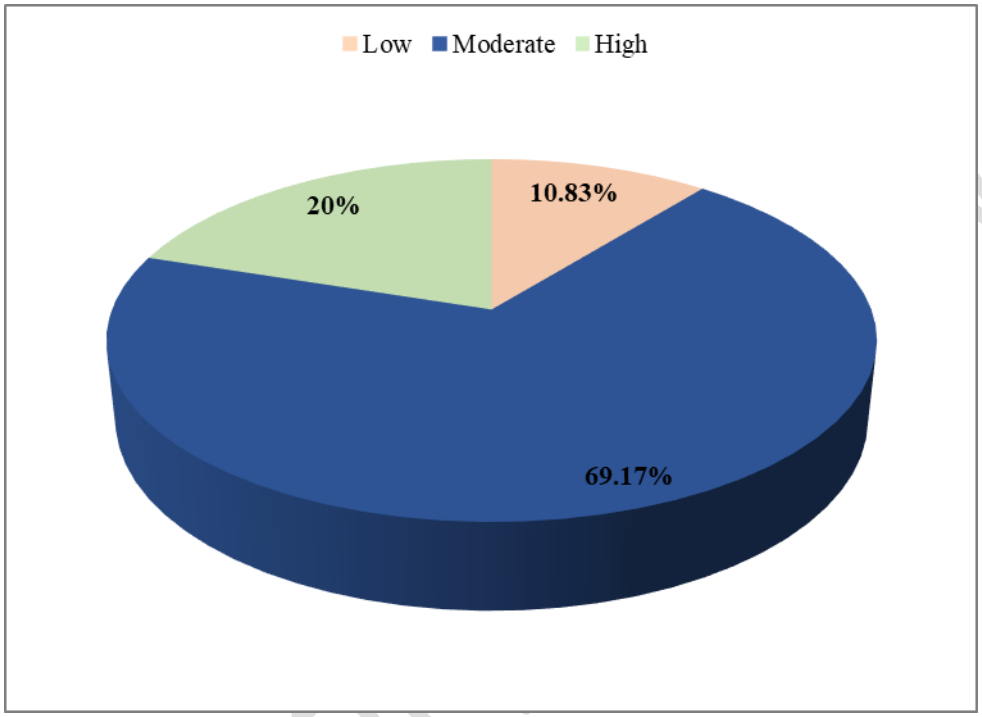

Fig 4. Distribution of the respondents according to their marketing orientation

3.13 Training Exposure

The findings presented in Figure 5 reveal that 72.50% of the respondents had not participated in any training related to muga rearing. Conversely, 27.50% of the respondents had undergone training covering various aspects of muga-rearing practices. This disparity suggests that only a portion of the rearers possessed comprehensive information regarding training opportunities, likely attributable to respondents lack of awareness and the existing gap in ratios between muga rearers and extension agents. Vijay *et al*. (2019) noted that trained farmers exhibited knowledge in various aspects of muga rearing, with 99.30% and 96.70% of farmers knowledgeable about seed cocoon selection and pre-brushing care, respectively. However, only 25.30% of farmers were familiar with mother moth examination, and 30.70% knew egg surface sterilization.

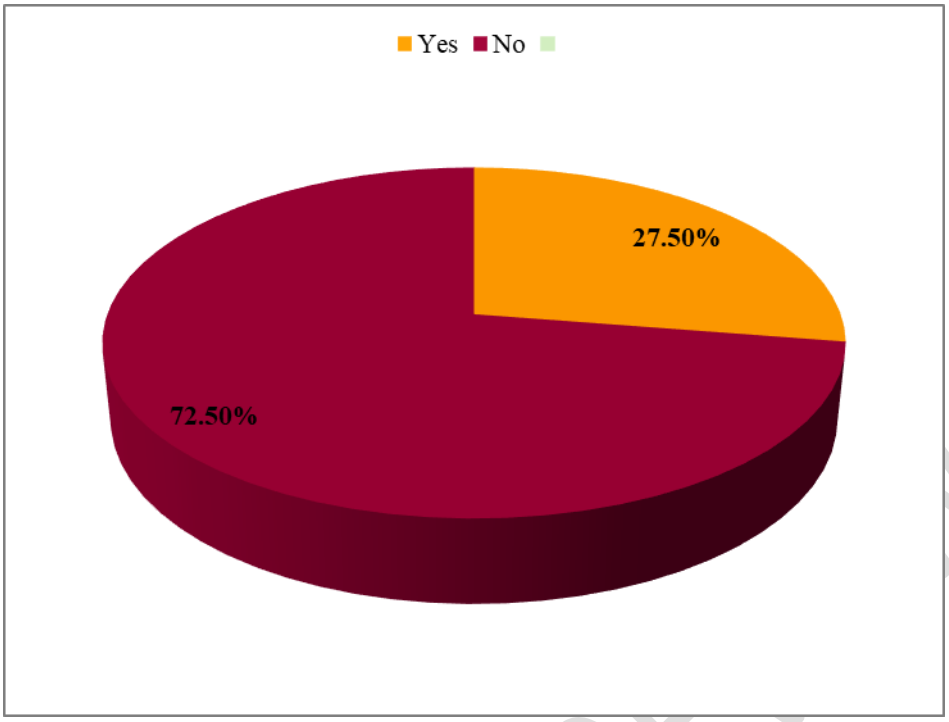

Fig 5. Distribution of the respondents according to their training exposure

4. Conclusion

The study highlights the predominance of middle-aged respondents over younger participants in muga-rearing activities, suggesting a need for targeted efforts to engage the youth in such endeavours through various extension initiatives. While the majority of the respondents were literate, they lacked higher levels of education, emphasizing the importance of inspiring and motivating them to adopt scientifically recommended technologies for muga rearing. Efforts to bridge the gap between farmers and extension personnel are crucial for enhancing income generation opportunities. Given the moderate level of training exposure among respondents, timely and demand-driven training initiatives are essential to elevate their knowledge levels and foster a positive attitude towards scientific muga-rearing practices. The research findings underscore the substantial strength of the muga industry in establishing a distinct identity across various segments of society, including low-income individuals, large-scale farmers, and the elderly. Encouraging rearers to adopt scientifically proven techniques is imperative for enhancing productivity and increasing revenue generation. Sonitpur's rearers must recognize the economic significance of muga and perceive it as a viable alternative for sustainable livelihoods in the future.

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