The Pharma Innovation Journal 2023; SP-12(12): 765-769

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2023; SP-12(12): 765-769

www.thepharmajournal.com
Received: 21-10-2023
Accepted: 26-11-2023

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A study on the profile characteristics of the eri silkworm rearers of Udalguri district of Assam

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Abstract
Assam holds a vital and noteworthy place in the country's ericulture map. Since ericulture requires little upfront investment and produces a high level of employment and income, it is now a career for rural reconstruction in non-traditional locations as well. The study analyses the profile characteristics of eri rearers of Udalguri district of Assam. The results of the research showed that majority (50.83%) of the respondents were in the age group of 36-56 years had a middle school education (35.83%), and belonged to small families with 2-4 individuals (56.67%). Most of the (64.17%) of the sericulture farmers in Udalguri district had pucca houses who considered sericulture as their primary source of income (56.67%). The majority of responders (54.16%) did not receive any training experience, and the most of the respondents (35%) invested their own money in eri cultivation. In addition to this, the majority of respondents (46.67%) sell their produce to customers directly.

Keywords: Ericulture, silkworms, rearers, socio-economic, psychological

1. Introduction
Ericulture holds on indomitable distinction among other sericulture activities like mulberry, tasar, muga due to its unique dual characteristics of softness and thermal properties of the silk. North-east India is considered as the original home of eri silkworm, *Samia ricini* Donovan (Sarmah *et al.*, 2009) [1]. Traditional eri silkworm rearing is well-known in the Udalguri districts of Assam. The natural surroundings and climate in Udalguri are ideal for eri growing, hence the farmers there have a solid reputation for producing eri cocoon in big quantities. In Udalguri at present 15,094 numbers of families are engaged in eri culture which is highest amongst all the districts of Assam. During 2020-21 out of total 6573.68 kg of eri cocoon the district has produced 738.38 kg of eri cocoon which is highest among all the districts of Assam (Anonymous, 2021) [2]. Numerous studies on the socio-economic aspects have been undertaken by a variety of researchers, but there is still room for improvement in terms of pinpointing the variables that will likely influence whether or not scientific eri rearing methods are adopted in the future. Even though the State Government had launched numerous development projects to improve the socio-economic circumstances of eri rearers of Udalguri over time, but there is still a need for an analysis of the critical factors affecting eri silkworm rearing for the farmers' long-term sustainability. Since no such study on socio-economic status of eri rearers has been conducted so far in this area the current study was undertaken in the Udalguri district of Assam.

2. Materials and Methods
The current study was done purposively in Udalguri district of Assam in the year 2021–2022, with a sample size of 120 respondents. Snowball technique of sampling design was used to pick the respondents for the present study. Three developmental blocks from Udalguri district *viz.*, Udalguri block, Rowta block and Mazbat block selected purposively where eri rearing being practiced traditionally. A total of 6 (six) sericultural circles from the 3 (three) Development Blocks were selected randomly, out of which 3 villages from each sericultural circle were selected randomly for collection of data. The data were gathered by using the personal interview method with a structured scheduled. The collected data were coded, tabulated and analysed on the part of the objectives of the study. To analyse the data and draw a conclusion for the present study different statistical techniques *viz.*, mean, percentage, frequencies and standard deviation were used.

3. Results and Discussion

For this study, a total of 16 different socioeconomic and psychological variables were chosen and examined. In order to analyse the distribution of the traits, the respondents were divided into groups according to each trait, and the frequency and percentages were calculated. In addition, the mean and standard deviation of various key variables were calculated.

3.1 Age

The data which are depicted in the Table 1 shows that the majority of the respondents (50.83%) were in the middle age group between (36-50 years), followed by 27.50 percent of them were above 51 years old and 21.67 percent of them were belonged to the young age group (18-35 years). These findings are in line with the findings of (Girish *et al.* 2020) [3] . The findings showed that most of respondents in the middle age group were more involved in eri rearing and gathered extensive experience in eri rearing over the time, considering it to be one of the most important sources of income. It was also observed that older respondents' involvement in eri cultivation was significantly higher than younger respondents. The most likely explanation is that they have more experience in this area and have continued their long-standing habit of raising eri silkworms.

Table 1: Frequency and percentage distribution of respondents according to their age

Variable	Category	Frequency (N=120)	Percentage
Age	18-35 (Young)	26	21.67
	36-50 (Middle)	61	50.83
	51 and above (Old)	33	27.50

3.2 Education

From the data of Table 2 it was found that the bulk of respondents (35.83%) were middle school passed, while 31.67 percent of respondents were illiterate, 15.83 percent had completed primary education, 13.33 percent had completed high school and only 3.34 percent of respondents had completed higher secondary school. However, no respondent was discovered to complete a graduate or postgraduate degree. The majority of the respondents in this study were literate, but it was inferred from the findings that the majority of the respondents did not have a higher degree of education, it may be because during their childhood, they did not have access to schooling or which could be due to poor financial circumstances, family burden or lack of assistance from family members. (Manju 1997) [4] discovered that in the Belgaum district, 45.00 percent of sericulture farmers had completed elementary or middle school, 17.50 percent had completed high school, and 36.66 percent were illiterate.

Table 2: Frequency and percentage distribution of respondents according to their education

Variable	Category	Frequency (N=120)	Percentage
Education	Illiterate	38	31.67
	Primary school passed	19	15.83
	Middle school passed	43	35.83
	High school passed	16	13.33
	Higher secondary passed	4	3.34
	Graduate and above	0	0

3.3 Family size

The data pertaining to family size of the respondents in Table 3 a large no's of respondents (56.67%) had small families with 2 to 4 members, followed by 40.83 percent who had medium-sized families with 5 to 8 members, and the remaining 2.50 percent who had large families with more than 8 members. In the current study location, small families with 2 to 4 individuals were more prevalent. However, by sticking to the parenting schedule, members of a small family might engage in a variety of occupations to supplement their income. On the other hand, in medium and large-sized family maximum members should participate in diverse activities to generate income that will assist the family. The findings were in line with the findings of (Rabha 2020) [5] .

Table 3: Frequency and percentage distribution of respondents according to their family size

Variable	Category	Frequency (N=120)	Percentage
Family size	Small (2-4)	68	56.67
	Medium (5-8)	49	40.83
	Large (Above 8)	3	2.50

3.4 House type

The table 4 reveals that maximum number of respondents (64.17%) had used pucca houses followed by 35.83 percent kutcha houses and there is no availability of rcc type house. Various government programmes and policies designed to aid farmers in building pucca houses may lead to the development of farmer's pucca houses. (Ananthnag *et al.* 2014) [6] found that the majority of farmers in Karnataka's arid zone had pucca dwellings.

Table 4: Frequency and percentage distribution of respondents according to their house type

Variable	Category	Frequency (N=120)	Percentage
House Type	RCC	0	0
	Kutcha	43	35.83
	Pucca	77	64.17

3.5 Primary source of income

Table 5 demonstrate that sericulture is the primary source of income for the most of the respondents (56.67%), whereas for 30.00 percent of the respondent, agriculture is their main source of income. Among the respondents, just 7.50 percent indicated that their primary source of income was their business, while 5.83 percent earned money on a daily basis. However, none of the respondents reported service, animal husbandry as well as fishery as their primary source of income. Raveesha *et al.* 2016; Alfroz *et al.* (2018) [7, 8] also reported that the majority of respondents said that their primary occupation was in sericulture.

Table 5: Frequency and percentage distribution of respondents according to their primary source of income

Variable	Category	Frequency (N=120)	Percentage
Primary source of income	Agriculture	36	30.00
	Sericulture	68	56.67
	Animal Husbandry	0	0
	Fishery	0	0
	Service (Govt/Private)	0	0
	Daily Wage Earner	7	5.83
	Business	9	7.50

3.6 Average Annual Family Income

It was found from the Table 6 that a large no of the respondent's (75.83%) had average yearly incomes between Rs. 64,732 and Rs. 1,38,300, while (12.50%) of respondents had yearly incomes below Rs. 64,732 and just 11.67% had yearly incomes over Rs. 1,38,300. According to the data, the vast majority of respondents made their income between Rs. 64,732 and Rs. 1,38,300 annually. They had an average annual family income which might be attributed to agricultural damage in their field as a result of the different natural phenomena. Sometimes due to flood results in the loss of crops and as a result profit from farming get reduced. Jakkawad *et al*. (2019) [9] revealed the respondents in the Aurangabad district of Maharashtra had a medium level of income among sericulturists.

Table 6: Frequency and percentage distribution of respondents according to their average annual family income

Variable	Category	Frequency (N=120)	Percentage	Mean	S.D.
Average annual family income	Low (Below Rs. 64,732)	15	12.50	1,01,516	36,784
	Medium (Rs. 64,732 to Rs. 1,38,300)	91	75.83		
	High (Above Rs. 1,38,300)	14	11.67		

3.7 Labour availability within household

The table 7 shows that (60.83%) of respondents had below or up to 2 working members in their households, while 35.83 percent of the respondents had medium labour ranging 2-4 working family members in their homes. However, only 3.34 percent of respondents reported that they had a labour availability of more than 4 members in their family.

Table 7: Frequency and percentage distribution of respondents according to their labour availability within household

Variable	Category	Frequency (N=120)	Percentage	Mean	S.D.
Labour availability within household	Low (Below or equal 2)	73	60.83	2.56	0.91
	Medium (2-4)	43	35.83		
	High (Above 4)	4	3.34		

3.8 Size of operational land holding

According to data presented in Table 1, the majority of respondents (55%) were marginal farmers with land holdings of less than 1 ha, and 37.50 percent were small farmers with land holdings of between 1 and 2 ha. In contrast, just 6.67 percent of respondents were classified as semi-medium, with land holdings between 2 and 4 ha, and only 0.83 percent were classified as medium, with land holdings between 4 and 10 ha. The respondents total land holding included the tapioca and other host plant cultivation area. It can be stated that eri culture as an enterprise which can be undertaken for economic gain by medium to semi-medium as well as small and marginal farmers. It can be used as a primary source of income for marginal and small farmers. This observation is line with the those made by (Ali *et al.* 2017; Chanotra *et al.* 2019) [10, 11].

Table 8: Frequency and percentage distribution of respondents according to their size of operational land holding

Variable	Category	Frequency (N=120)	Percentage
Size of operational land holding	Marginal (below 1 ha)	66	55.00
	Small (1-2 ha)	45	37.50
	Semi medium (2-4 ha)	8	6.67
	Medium (4-10 ha)	1	0.83
	Large (Above 10 ha)	0	0

3.9 Farming experience

The data in the Table 9 on the respondents farming experience revealed that the majority of the respondent's (75.83%) had medium farming experience i.e., between 10 and 20 years while, 14.17 percent had high farming experience, i.e., more than 20 years and 10 percent had low level of farming experience i.e., less than 10 years. According to the findings the majority of the respondents had eri rearing and host plant cultivation experience. Moreover, a proper need-based training on various aspects of recommended eri culture practices and eri production would be sustained for better livelihood generation.

Table 9: Frequency and percentage distribution of respondents according to their farming experience

Variable	Category	Frequency (N=120)	Percentage
Farming experience	Low (Below 10)	12	10.00
	Medium (10 to 20)	91	75.83
	High (Above 20)	17	14.17

3.10 Extension contact

As shown in Table 1 the majority of the respondents (55.00%) experienced a moderate amount of extension contact. Afterward, 32.50 percent of respondents stated that they had a high extension contact followed by 12.50 percent respondents who had low extension contact with different extension agents. Because of the ratio gap between extension agents and respondents the majority of the respondents had a medium level of extension contact. Chamuah *et al.* (2022) [12] reported that bulk of the sericulture farmer had medium level of extension contact.

Table 10: Frequency and percentage distribution of respondents according to their extension contact

Variable	Category	Frequency (N=120)	Percentage	Mean	S.D.
Extension contact	Low (Below 2)	15	12.50	4.025	1.248
	Medium (2 to 5)	66	55.00		
	High (Above 5)	39	32.50		

3.11 Source of collecting information

It was evident from the Table 11 that most of the respondents (55.83%) used medium-level sources to gather information, compared to (35.83%) of respondents who used low-level sources to collect the different extension related information. On the other had only 10.00 percent of respondents had high level of source for extension contact.

Table 11: Frequency and percentage distribution of respondents according to their source of collecting information

Variable	Category	Frequency (N=120)	Percentage	Mean	S.D.
Source of collecting information	Low (Below 10)	43	35.83	10.95	1.078
	Medium (10-12)	67	55.83		
	High (Above 12)	10	8.33		

3.12 Membership in farmer's organization

Table 12 revealed that majority of the respondent's (71.67%) were members of any organization, while only 28.33 percent of the respondents were not members of farmer's organization. One possible explanation is that the respondents were very social. These findings are in line with the findings of Hedge (2017) [13].

Table 12: Frequency and percentage distribution of respondents according to their membership in farmer's organization

Variable	Category	Frequency (N=120)	Percentage
Membership in farmer's organization	Yes	86	71.67
	No	34	28.33

3.13 Training exposure

The data presented in the Table 13 revealed that majority of the respondents (54.17%) did not undergo any training programme on sericulture, while only 45.83 percent of respondents undergo training programme on sericulture. Based on the findings, it is evident that several respondents had very limited awareness of scientific practises of eri culture However, some of the respondents did not receive training based on their needs. It was observed in this study that the vast majority of farmers in sericulture industry did not have adequate training chances, so there is a gap arise. There is a need for them to receive need- based trainings

Table 13: Frequency and percentage distribution of respondents according to their Training exposure

Variable	Category	Frequency (N=120)	Percentage
Training exposure	Yes	55	45.83
	No	65	54.17

3.14 Source of Credit

It was evident from Table 14 that the majority of respondents (35.00%) invested their own money in silkworm rearing, while 26.66 percent of respondents borrowing credit from friends followed by 15.00 percent borrowing credit from relatives. However, 11.67 percent of respondents relied on money lenders for credit, and another 11.67 percent people had access to banks for credit. Lack of education, ignorance of financial strategies, and the lengthy process required to acquire a loan from a nationalized bank may all contribute to the lack of access to credit. Gajendra (2019) [14] stated that the majority of respondents (52.50%) invested their own money in the growth of horticulture crops like paddy.

Table 14: Frequency and percentage distribution of respondents according to their source of credit

Variable	Category	Frequency (N=120)	Percentage
Source of credit	Family	42	35.00
	Friends	32	26.66
	Relatives	18	15.00
	Money lenders	14	11.67
	Bank	14	11.67
	Other	0	0

3.15 Knowledge level

Majority of the respondent's (62.50%) had a medium level of knowledge about scientific eri rearing procedures followed by 25.83 percent who had a high level of knowledge and rest of 11.67 percent respondents had a low level of knowledge. The lack of training and knowledge about enhanced eri culture methods could be the likely cause. The above-mentioned findings were consistent with those of Moulasab and Sudhakara (2017) [15].

Table 15: Frequency and percentage distribution of respondents according to their knowledge level

Variable	Category	Frequency (N=120)	Percentage	Mean	S.D.
Knowledge level	Low (Below 3)	14	11.67	4.80	1.05
	Medium (3 to 5)	75	62.50		
	High (Above 5)	31	25.83		

3.16 Marketing Channel

The information on respondent's marketing channels, shown in Table 16, showed that the majority of respondents (46.67%) sell their produce directly to consumers (producer - consumer), while 35.00 percent of respondents sell their produce through village traders (producer - village traders-consumer). Furthermore, only 18.33 percent of the respondents had the opinion that their product was sold to consumer through government agencies (producer-government agencies-consumer).

Table 16: Frequency and percentage distribution of respondents according to their marketing channel

Variable	Category	Frequency (N=120)	Percentage
Marketing channel	Producer-consumer	56	46.67
	Producer-village trader-consumer	42	35.00
	Producer-village trader-primary wholesaler-consumer	0	0
	Producer-commission agent-consumer	0	0
	Producer-Government agencies-consumer	22	18.33

4. Conclusion

The study found that, compared to young age group most of the respondents belonged to the middle age. Therefore, focus should be given to engage youngsters in eri rearing activities through various extension efforts. Most of the respondents in this study were literate, but the majority of the respondents did not have a higher degree of education. Though a farmer can earn income from eri rearing without having a higher education but it is necessary to inspire and motivate them to adopt scientific recommended technologies for eri rearing. Scientist and extension personal should take appropriate step to reduce the gap between farmers and extension person for

more income generation. Since most of the farmers had a medium level of training exposure therefore, it is important to offer timely and demand-driven training to raise the farmers' knowledge levels and to generate a positive attitude towards the scientific eri rearing. From the findings of the research, it can be concluded that eri industry is massively strong enough to build a unique identity in the study area amongst every segment of the society, including the poor, large farmers and elderly people. To increase productivity and generate more cash, rearers must be encouraged to use the scientifically proven techniques. It is imperative that the Udalguris rearers understand the economic significance of eri and view it as a potential alternative farm-based plan for their future sustainable means of living.

5. Acknowledgement

The author with immense pleasure and whole heartedly wishes to express his heartfelt gratitude and indebtedness to his Major Advisor and members of the advisory committee of Assam Agricultural University, Jorhat, for their competent and illuminating guidance and support, enthusiastic encouragement, timely advice, innovative suggestions and guidance in planning and execution of the research study and in preparation of manuscript.

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