CHAPTER 4

RESULT

The findings of the present study are presented under following sub-heads.

4.1 Socio-economic attributes of muga farmers

4.2 Knowledge level of the farmers on improved technologies of muga culture

4.3 Distribution of respondents according to their knowledge level on selected improved technologies of muga culture

4.4 Association between socio-economic characteristics of the muga farmers with the knowledge level of improved technologies of muga culture.

4.5 Adoption level of improved technologies of muga culture by the muga farmers

4.6 Distribution of respondents according to their adoption level on selected improved technologies of muga culture

4.7 Association between socio-economic characteristics of muga farmers and their adoption level of improved technologies of muga culture

4.8 Traditional practices of muga culture

4.9 Cocoon yield under traditional practices and improved practices of muga culture

4.10 Economics of muga silkworm crops under traditional and improved practices

4.11 Constraints for non adoption of improved technologies by the muga farmers.

4.1 : Socio economic attributes of muga farmers

The socio economic attributes of the farmers revealed from the study are presented in Table 4.1.1.

Table 4.1.1: Socioeconomic attributes of muga farmers

Sl. No.	Attributes	Categories	Frequency	Percentage
1	Age	Young (Up to 35 years)	52	26.0
		Middle (36-56 years)	116	58.0
		Old (above 56 years)	32	16.0
2	Sex	Male	175	87.5
		Female	25	12.5
3	Caste	SC	20	10.0
		ST	74	37.0
		OBC	82	41.0
		MOBC	17	8.5
		General	7	3.5
4	Marital status	Married	185	92.5
		Unmarried	15	7.5
5	Education	Illiterate	11	5.5
		Primary level	84	42.0
		Secondary	94	47.0
		Graduate and above	11	5.5
6	Family size	Small (Up to 3 members)	16	8.0
		Medium (4-5 members)	172	86.0
		Big (Above 5 members)	12	6.0
7	Land area under muga food plants	< One acre	81	40.5
		One acre	94	47.0
		> One acre	25	12.5
8	Primary occupation	Agriculture	136	68.0
		Muga culture	53	26.5
		Other	11	5.5
9	Sericulture income	Low (Rs. 30000 to 40000)	180	90.0
		Medium (Rs.40000 to 60000)	11	5.5
		High (Above Rs. 60000)	9	4.5
10	Experience in muga culture	0-10 years	61	30.5
		10-20 years	104	52.0
		Above 20 years	35	17.5
11	Extension participation	Regular	59	29.5
		Occasionally	118	59.0
		Never	23	11.5
12	Mass Media Participation	Regular	60	30.0
		Occasionally	123	61.5
		Never	17	8.5

Age: It is evident from the table that the largest percentages (58.0) of farmers are belonged to middle age category (36 to 56 years), whereas respondents in the old age category (more than 56 years) and young age category (less than 35 years) accounted 16.0 percent and 26.0 percent, respectively (Figure 4.1.1).

Sex: It is also evident from the Table that 87.5 % respondents were belonged to the male category while only 12.5 % were from female category, who are directly involved in muga culture (Figure 4.1.2).

Caste: The Table depicted that among the respondents, larger number of respondents (41.0 %) belonged to OBC followed by ST (37.0 %), SC (10.0 %) , MOBC (8.5%) and 3.5 % general cast (Figure 4.1.3).

Marital status: It has found that only 7.5% of the respondents were unmarried while 92.5% of the respondents were married (Figure 4.1.4).

Education: It could be inferred from the Table that education of majority of respondents (47.0%) had up to secondary level followed by primary level (42.0%) and both graduate level and illiterate 5.5 percent each (Figure 4.1.5)

Family size: It was observed that majority of the respondents (86.0 %) had their family size with 4-5 members, while remaining (8.0 %) had their family with 3 members and 6.0% had above five members (Figure 4.1.6).

Land holdings: It could be seen from the Table that majority (47.0%) of the respondents had 1.0 acre of land under muga culture, 40.5% respondents had less than one acre and 12.5% respondents had above one acre of land under cultivation of muga food plants (Figure 4.1.7).

Primary occupation: It was observed that only 26.5% farmers had taken muga culture as primary occupation while majority of the farmers (68.0%) had taken agriculture as primary occupation. Remaining farmers (5.50%) had other sources of income like business, tea husbandry, etc were considered as primary occupation by the remaining farmers (Figure 4.1.8).

Sericulture income: It was observed that annual income from sericulture (muga culture) of most of the farmers (90.0 %) had low i.e. Rs. 30000 to 40000 only.

Annual income from sericulture of remaining 5.5% of the farmers had Rs. 40000 to 60000 and 4.5% farmers had above Rs. 60000 (Figure 4.1.9).

Experience: It could be evident from the table that majority of the respondents (52.0%) had wide range of experience on muga culture from 10-20 years, whereas 17.5 % respondents had more than 20 years experience. Reaming 30.5 % respondents had less than 10 years experience on muga culture (Figure 4.1.10).

Extension participation: It is also evident from the Table that 29.5 percent of the muga farmers had regularly participated in the extension programme. On the other hand, 59.0 percent muga farmers had occasionally and 11.5 percent had never participated in extension programme (Figure 4.1.11).

Mass media participation: The distribution of the farmers according to their mass media participant in the Table shows that as many as 61.5 percent had occasionally participated to mass media. However, 30.0 percent and 8.5 percent of the respondents had regular and never participated to mass media respectively (Figure 4.1.12).

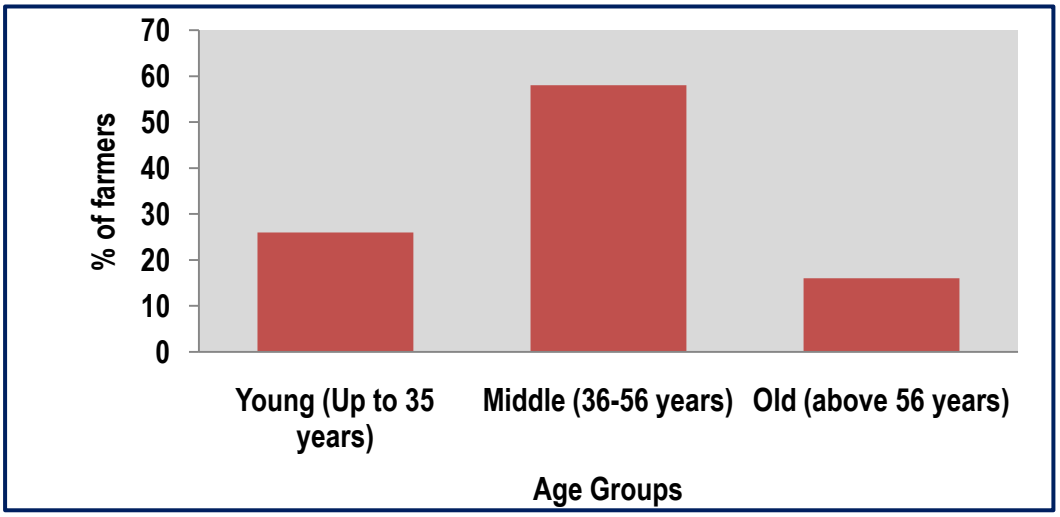

Figure 4.1.1: Age groups of the farmers

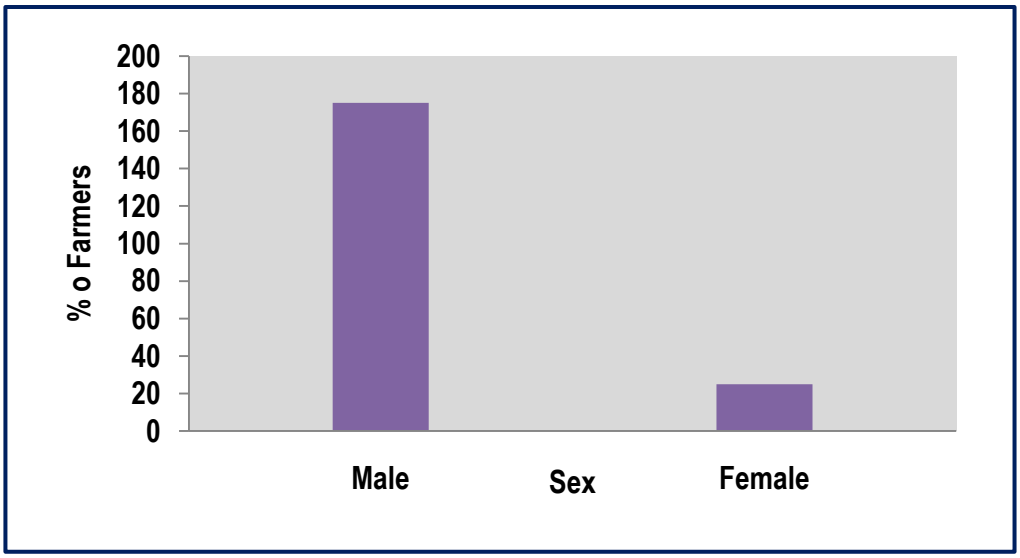

Figure 4.1.2: Sex categories of farmers

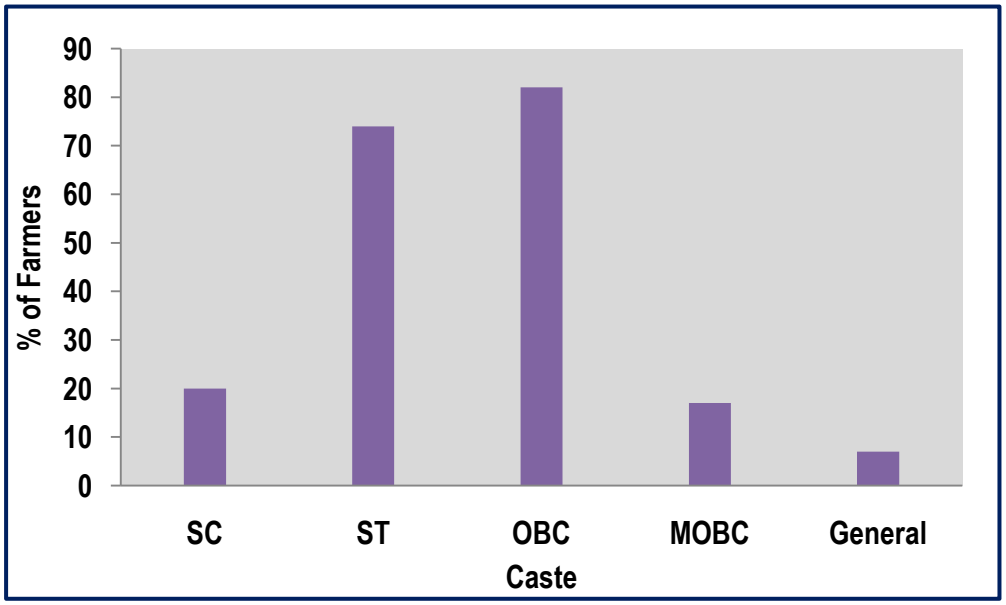

Figure 4.1.3: Caste of the farmers

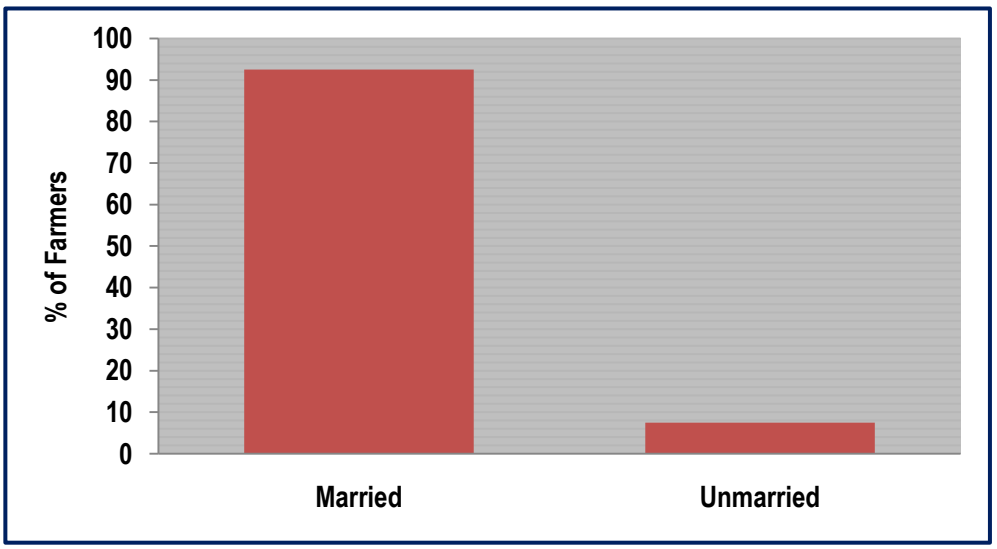

Figure 4.1.4: Marital status of the farmers

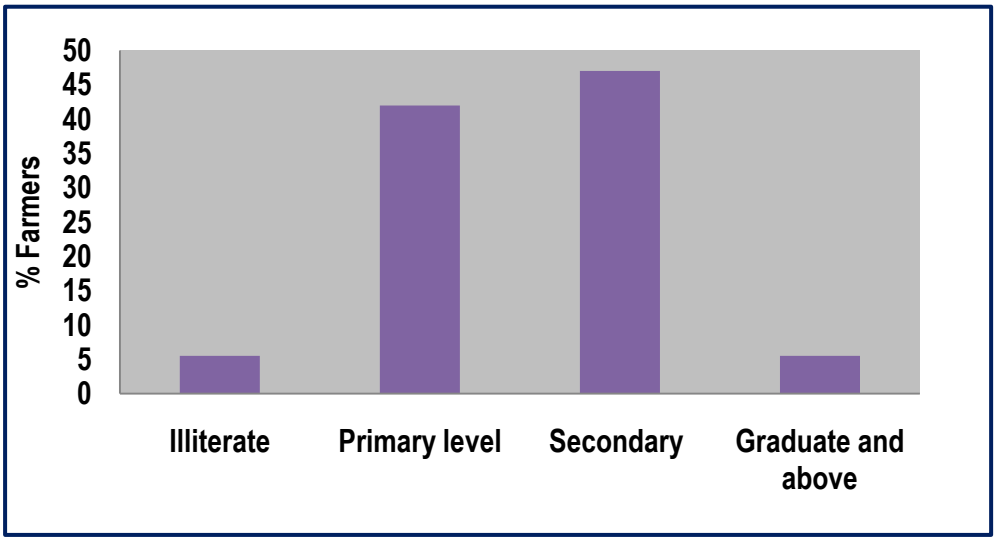

Figure 4.1.5: Education level of farmers

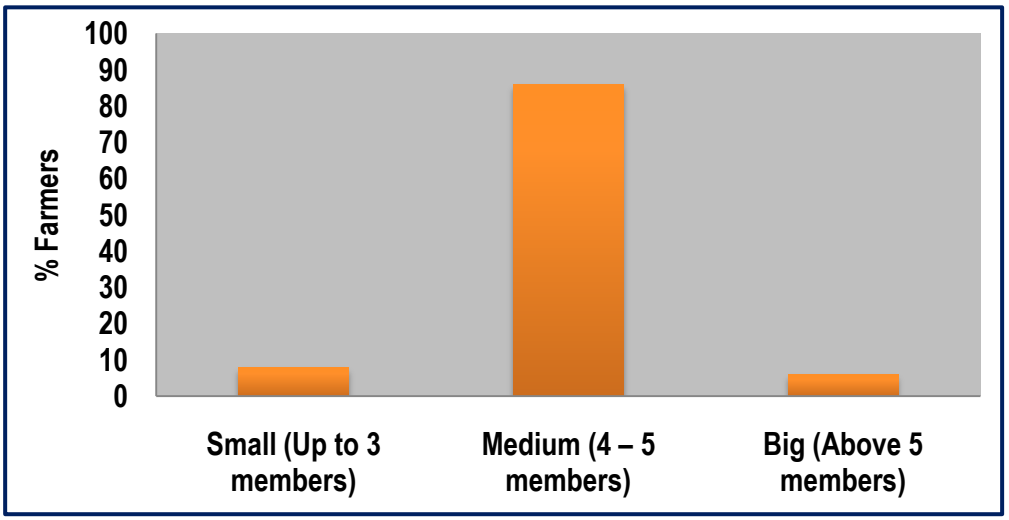

Figure 4.1.6: Family size of the farmers

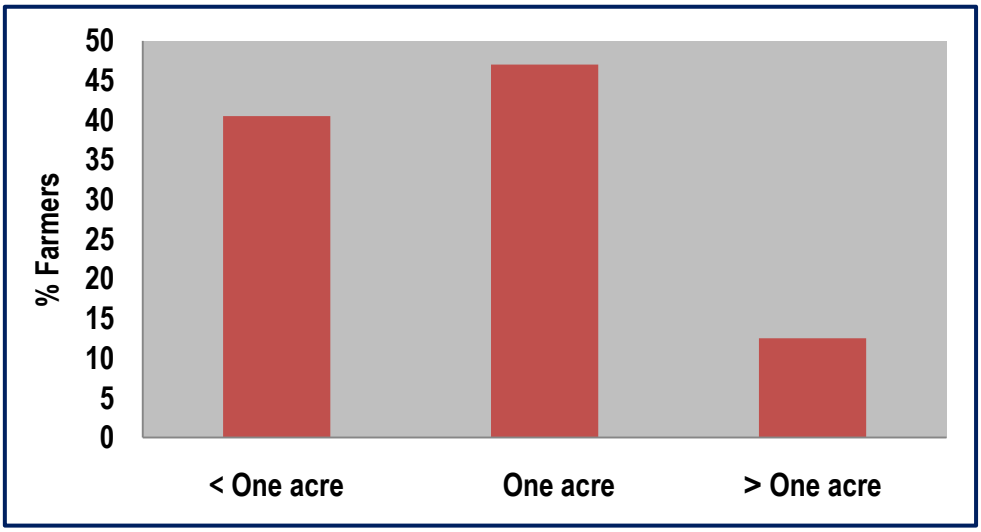

Figure 4.1.7: Land holding under muga food plants

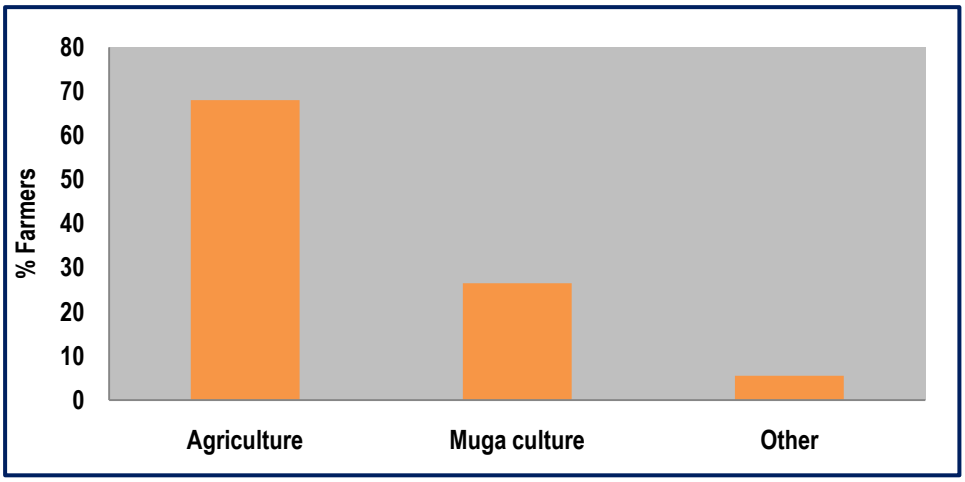

Figure 4.1.8: Primary occupation of the farmers

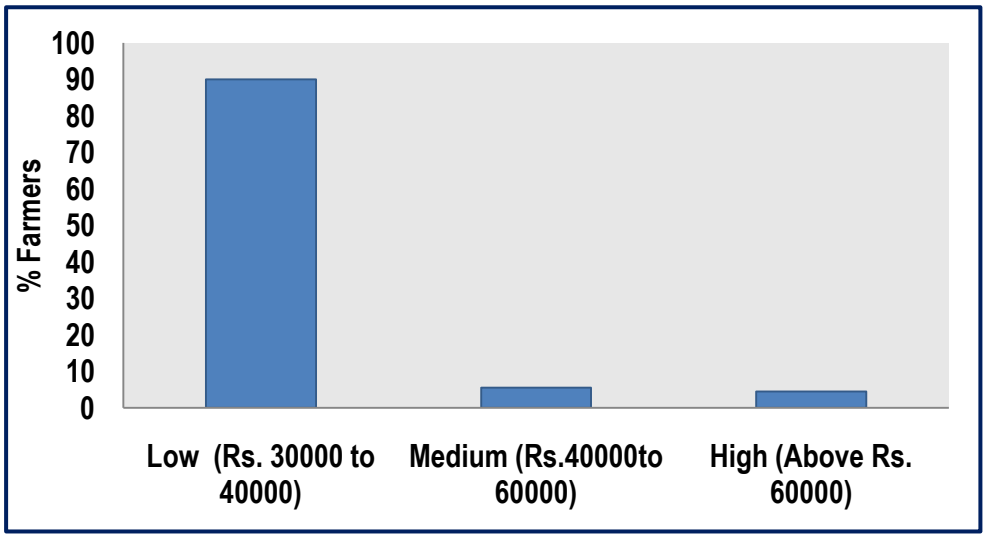

Figure 4.1.9: Sericulture income

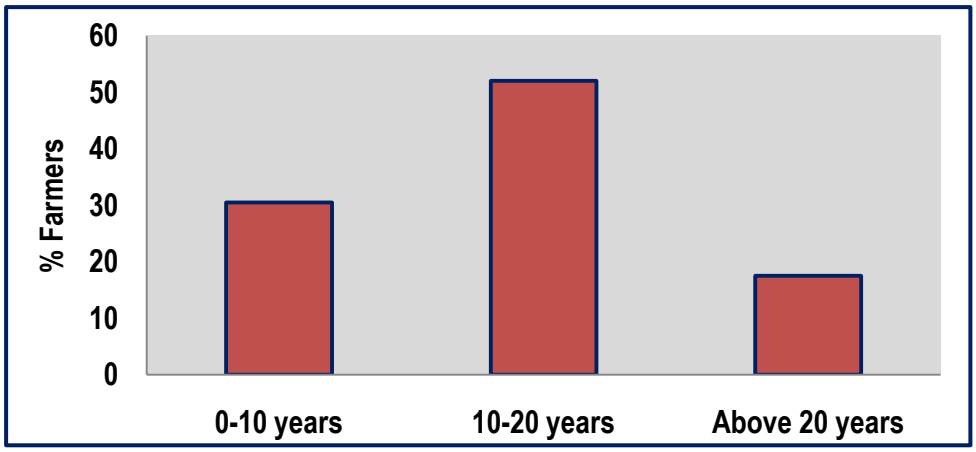

Figure 4.1.10: Experience in Muga culture of the farmers

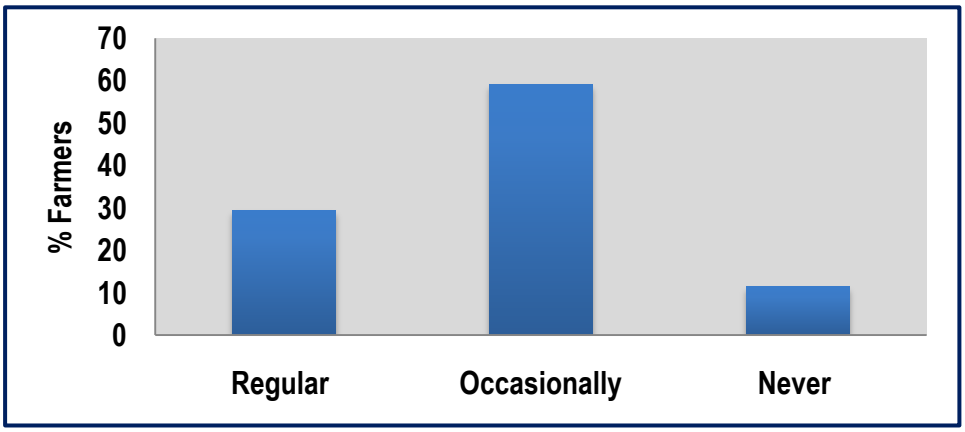

Figure 4.1.11: Extension participation

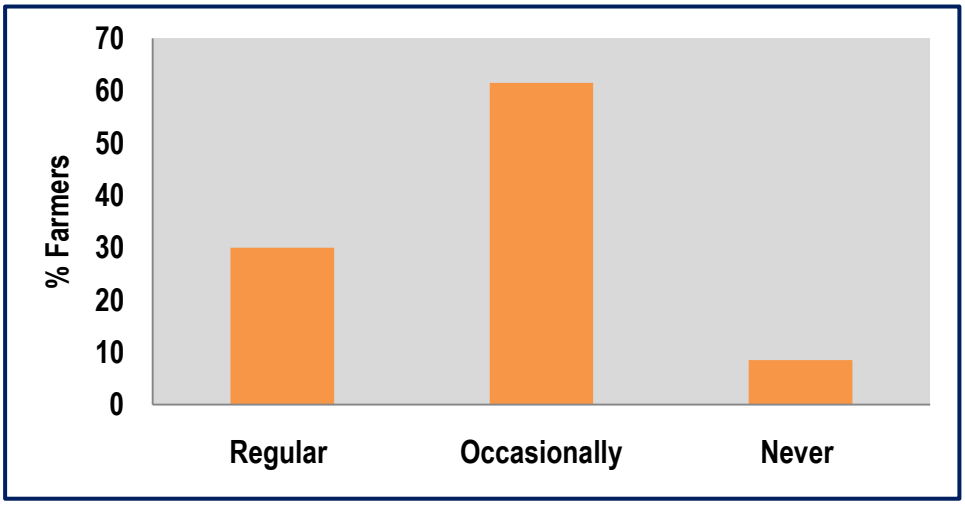

Figure 4.1.12: Mass Media participation

4.2: Knowledge level of the farmers on improved technologies of muga culture:

Data presented in Table 4.2.1 and Figure 4.2.1 indicated that 40.0 per cent of muga farmers had high level of knowledge followed by medium (32.5%) and low (27.5%) knowledge about the improved technologies of muga culture. The Table indicated that that majority of the muga farmers possessed high level of knowledge.

Table 4.2.1: Knowledge level of farmers on improved technologies of muga culture (N=200)

Category	Criteria	Knowledge Score	Frequency	%
Low	Less than (Mean - ½ of SD)	< 66.6	55	27.5
Medium	Between (Mean ± ½ of SD)	66.6-80.4	65	32.5
High	More than (Mean + ½ of SD)	>80.4	80	40.0
Mean 73.5 and SD 13.9				

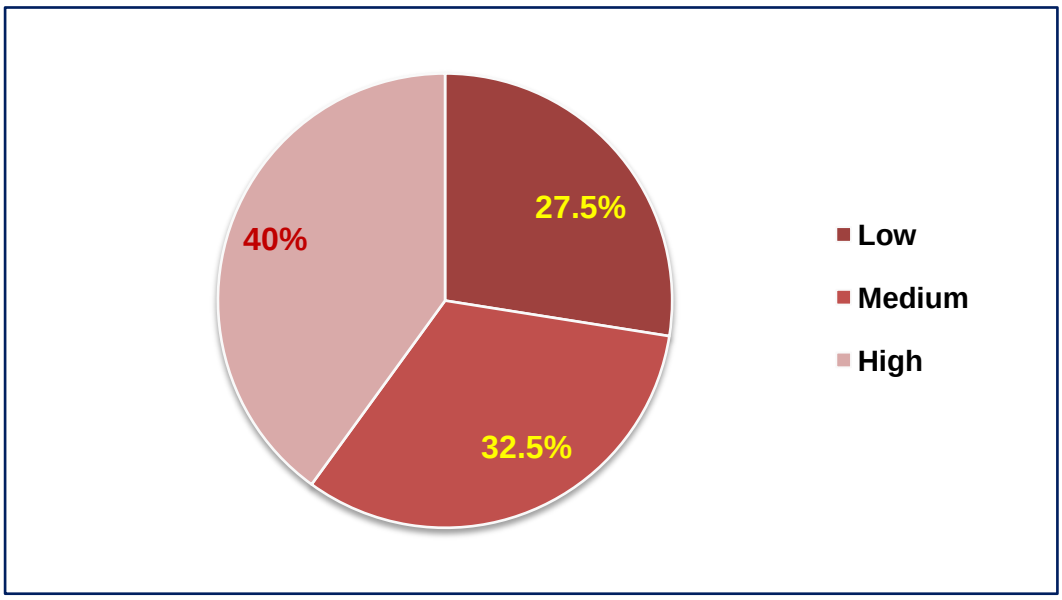

Figure 4.2.1: Knowledge levels of farmers on improved technologies of muga culture

4.3: Distribution of respondents according to their knowledge level on selected improved technologies of muga culture

Data presented in the Table 4.3.1 and Figure 4.3.1, it could be observed that majority of the farmers were having knowledge about spacing of host plants (94.5%) followed by inter-cropping with muga host plants (87.0%), early stage rearing (86.5%), pruning schedule (81.5%) and lahdoi (81.0%). The large number of farmers was also possessed knowledge in pre-brushing care (74.0%), application of FYM and NPK (64.5%), control of stem borer (63.0%) and improved mountage (78.0%). While, very less number of respondents had knowledge about biological control of uzi fly (39.5%), mother moth examination (24.5%) and egg surface disinfection (33.5%).

Table 4.3.1: Distribution of respondents according to their knowledge level on selected improved technologies of muga culture (N=200)

Sl. No.	Name of technologies	Number of farmers	%	Rank
1	Spacing of host plants	189	94.5	I
2	Application FYM and NPK	129	64.5	VIII
3	Pruning schedule	163	81.5	IV
4	Control of stem borer	126	63.0	IX
5	Intercropping	174	87.0	II
6	Pre brushing care	148	74.0	VIII
7	Early stage silkworm rearing	173	86.5	III
8	Biological control of uzi fly	79	39.5	X
9	Lahdoi	162	81.0	V
10	Improved mountage	156	78.0	VI
11	Mother moth examination	49	24.5	XII
12	Egg surface disinfection	67	33.5	XI

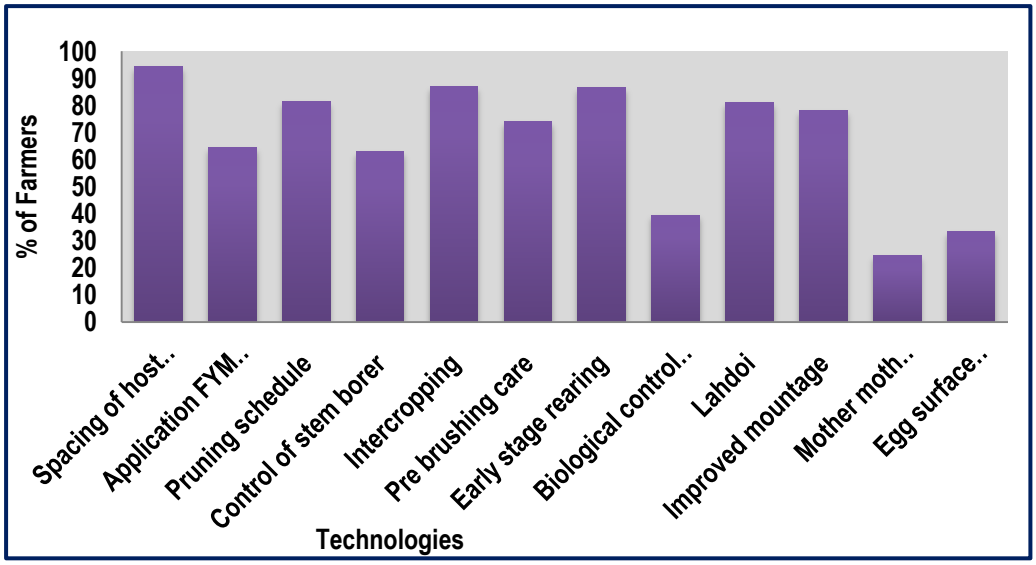

Figure 4.3.1: Distribution of respondents according to their knowledge level on selected improved technologies of muga culture

4.4: Association between socio-economic characteristics of muga farmers and their knowledge level about improved technologies of muga culture

In the present investigation, an attempt was made to ascertain the relationship between selected personal and socio-economic variables of muga farmers and their knowledge level about the improved technologies. Results of different analysis are presented below.

4.4.1 Correlation Test: The results of correlation analysis presented in Table 4.4.1 and Figure 4.4.1 revealed that socio-economic characteristics of the farmers namely age, land holding, experience and extension participation had positive and significant relationship with the knowledge level of improved technologies of muga culture. Seri income was found to be positive relationship with the knowledge level but not significant. On the other hand, socio-economic characteristics of the farmers namely education, family size and mass media participation had negative relationship with the knowledge level on improved technologies of muga culture.

Table 4.4.1: Correlation between socio-economic attributes of muga farmers and their knowledge level on improved technologies of muga culture

Variable code	Independent Variables	Correlation coefficient (r)
X_1	Age	0.983**
X_2	Education	0.082
X_3	Family size	-0.085
X_4	Sericulture income	0.147
X_5	Land holding	0.249*
X_6	Experience	0.975**
X_7	Mass media participation	-0.034
X_8	Extension participation	0.991**

**** Significant at the 0.01 level,* Significant at the 0.05 level**

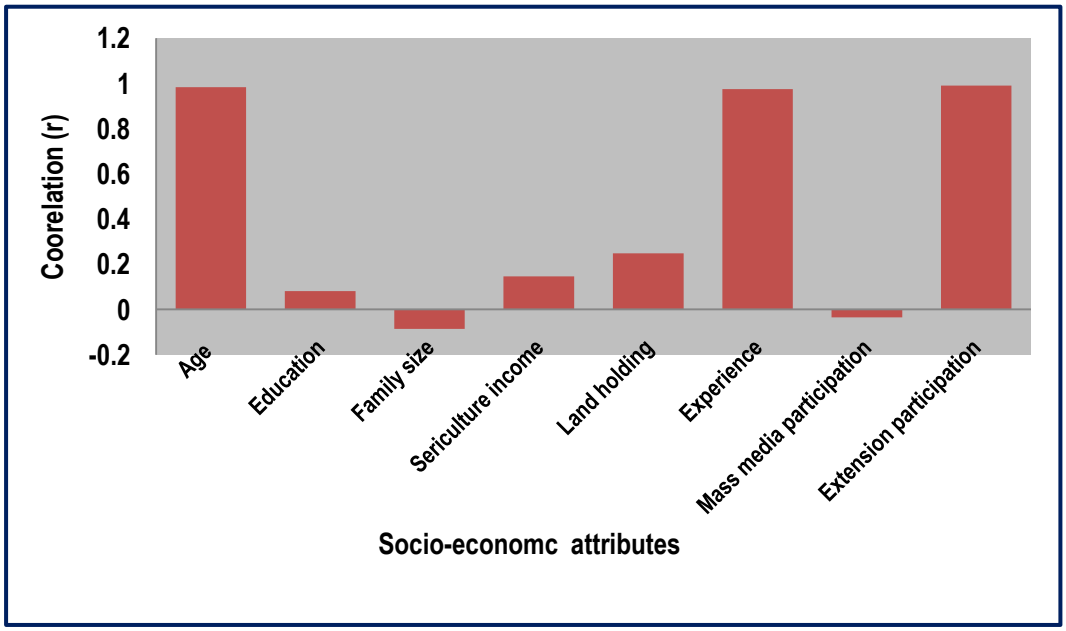

Figure 4.4.1: Correlation between socio-economic attributes of muga farmers and their knowledge level on improved technologies of muga culture

4.4.2 Multiple Linear Regression Co-efficient: Data presented in the Table 4.4.2, it could be observed that the regression co-efficient of the personal and socio-economic variables of the respondents namely age (X_1) and extension participation (X_8) were found highly significant at 1 per cent level among muga farmers towards knowledge level about improved technologies. While the variables experience (X_6) was found to be significant at 5 per cent level. Further, the variables like family size (X_3), Sericulture income (X_4) and mass media participation (X_7) were found negative relationship while the variables education (X_2) and land holding (X_5) were found negatively significant relationship with the knowledge level about improved technologies.

The value of co-efficient of multiple determination (R2) was 0.968 with significant F value (12.132 **). It clearly indicates the 96.8 per cent variation in the knowledge level of the respondents was explained by all the variables put together.

Table 4.4.2: Multivariable relationship between socio-economic attributes of muga farmers and their knowledge level on improved technology of muga culture

Variable code	Independent Variables	Regression Coefficient (B)	Standard Error	t-Value
	Intercept	-33.85	6.051	-5.594
X_1	Age	0.91	0.271	3.378**
X_2	Education	0.14	0.493	0.288
X_3	Family size	-0.23	0.667	-0.347
X_4	Sericulture income	0.0006	0.0003	-0.241
X_5	Land holding	0.21	0.746	0.286
X_6	Experience	0.503	0.233	2.307*
X_7	Mass media participation	-0.13	0.434	-0.309
X_8	Extension participation	6.82	0.753	9.049**
	R^2	0.968		
	F	12.132**		

** Significant at the 0.01 level,* Significant at the 0.05 level

4.4.3 Chi-square test: Result of Chi-square test performed to establish the relationships between socio-economic variables and knowledge of farmers about improved technologies are presented in Table 4.4.3. Relationships between different socio-economic variables with the knowledge level of farmers about improved technologies of muga culture are shown below.

Table 4.4.3: Association between of socio-economic variables and knowledge of farmers on improved technologies (Chi-square test)

Sl. No.	Variables	Chi-square value
1	Age	465.21**
2	Education	28.05
3	Family size	22.09
4	Sericulture income	115.98*
5	Land holding	17.34
6	Experience	332.87**
7	Mass media participation	25.92
8	Extension participation	319.09**

** Significant at the 0.01 level,* Significant at the 0.05 level

Age and knowledge: The chi -square test revealed that there was a significant association at 1.0 % level between the age and knowledge level of muga farmers

Education and knowledge: The association between the education and knowledge level was found positive among the muga farmers.

Family size and knowledge: The association between the family size and knowledge level was positive in the muga farmers.

Sericulture income and knowledge: The degree of association between Sericulture income and knowledge level indicated a positive and significant association at 5 % level.

Land holding and knowledge: The degree of association between land holdings and knowledge level had a positive among the muga farmers.

Experience and knowledge: The degree of association between experience and knowledge level had a significant association at 1 % level of muga farmers.

Mass media participation and knowledge: The association between the mass media and knowledge level was found positive among the muga farmers.

Extension participation and knowledge: The association between the extension participation and knowledge level was found to be significant at 1 % level among the muga farmers.

4.5: Adoption level of improved technologies of muga culture by the muga farmers

From the perusal of the data presented in Table 4.5.1 and Figure 4.5.1, it was clear that 51.5 per cent of the respondents had low extent of adoption about improved technologies of muga culture. A considerable amount of respondents was medium extent of adoption (27.5%) followed by high extent of adoption (21.5%) group of the improved technologies of muga culture.

Table 4.5.1: Adoption level of improved technologies by the muga farmers (N=200)

Category	Criteria	Adoption Score	Frequency	%
Low	Less than (Mean - ½ of SD)	<50.5	103	51.5
Medium	Between (Mean ± ½ of SD)	50.5-68.5	54	27.0
High	More than (Mean + ½ of SD)	>68.5	43	21.5
Mean 59.5 and SD 18.0				

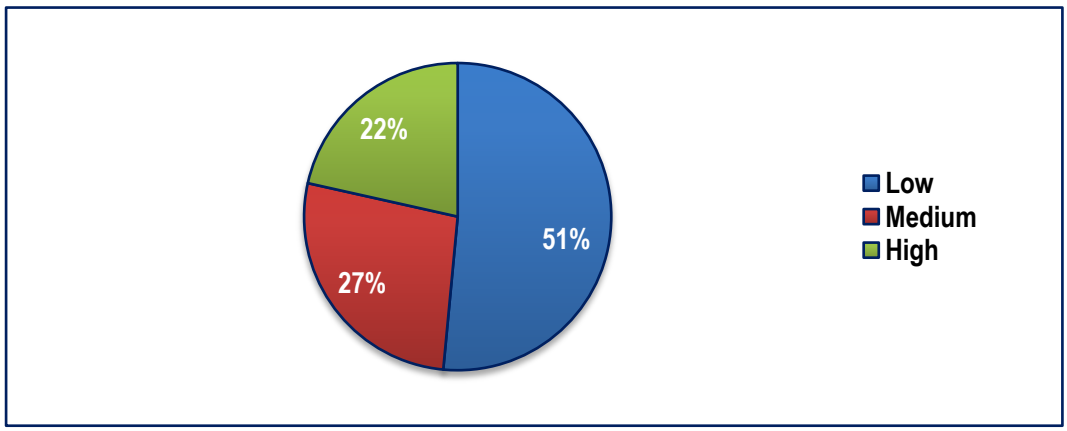

Figure 4.5.1: Adoption level of improved technologies of muga culture

4.6: Distribution of respondents according to their adoption level on selected improved technologies of muga culture

Distribution of respondents according to their adoption level on selected improved technologies of muga culture are presented in the Table 4.6.1 and Figure 4.6.1.

Table 4.6.1: Distribution of respondents according to their adoption level on selected improved technologies of muga culture (N=200)

Sl. No.	Technologies	Full adoption		Partial adoption		Non adoption	
		Nos.	%	Nos.	%	Nos.	%
1	Spacing of host plants	128	64.0	56	23.5	16	8.5
2	Application FYM and NPK	17	8.0	87	43.5	96	48.0
3	Pruning schedule	54	27.0	84	42.0	62	31.0
4	Control of stem borer	39	19.5	63	31.5	98	49.0
5	Intercropping	47	23.5	84	42.0	69	34.5
6	Pre brushing care	111	55.5	37	18.5	52	26.0
7	Early stage silkworm rearing	57	28.5	84	42.0	59	29.5
8	Biological control of uzi fly	6	3.0	22	11.0	172	86.0
9	Lahdoi	34	17.0	78	39.0	88	44.0
10	Improved mountage	23	11.5	43	21.5	134	67.0
11	Mother moth examination	00	0.0	7	3.5	193	96.5
12	Egg surface disinfection	00	0.0	3	1.5	197	98.5
Average		**43**	**21.5**	**54**	**27.0**	**103**	**51.5**

Data presented in the table, revealed that majority of the respondents fully adopted spacing of host plants (64.0%), whereas partial and non adoption of the technology was noticed in 23.5% and 8.0% of the respondents respectively. Similarly, 55.5% of the respondents were found to fully adopt pre-brushing care,

while partial and non-adopters of the technology were observed to be 18.5% and 26.0% respectively. From the Table, it is also depicted that lesser number of the respondents fully adopted other technologies *viz*. early stage rearing (28.5%) followed by pruning schedule (27.0%), intercropping (23.5%), control of stem borer (19.5%), lahdoi (17.0%), improved mountage (11.5%), application of FYM and NPK (8.0%), and biological control of uzi fly (3.0%). Partial adoption of these technologies were found to be high in case of application of FYM and NPK (43.5%) followed by 42.0% each in case of pruning schedule, intercropping and early stage rearing. Partial adoption was observed 39.0%, 31.0%, 21.5% and 11.0% in the cases of lahdoi, control of stem borer, improved mountage and biological control of uzi fly respectively. No respondents were found to fully adopt two technologies namely mother moth examination and egg surface disinfection. Partial adopters of mother moth examination and egg surface disinfection were noticed in 3.5% and 1.5% of the respondents respectively. Non adoption of technologies were observed as high in egg surface disinfection (98.5%) followed by mother moth examination (96.5%), biological control of uzi fly (86.0%), improved mountage (67.0%), control of stem borer (49.0%), application of FYM and NPK (48.0%), lahdoi (44.0%), intercropping (34.5%), pruning schedule (31.0%) and early stage rearing (29.5%).

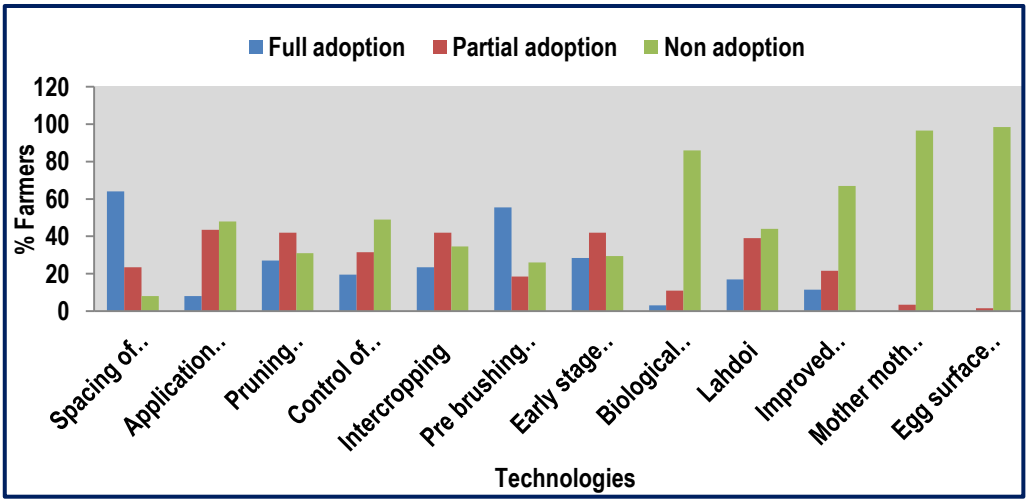

Figure 4.6.1: Distribution of respondents according to their adoption level on selected improved technologies of muga culture

4.7: Association between socio-economic characteristics of muga farmers and their adoption level of improved technologies of muga culture

The results of various test performed to establish the relationship between selected personal and socio-economic variables of muga farmer and their adoption level about the improved technologies are presented below.

4.7.1 Correlation Test: The result of correlation analysis with regard to the personal and socio-economic variables of the muga farmers and their adoption level of improved technologies are presented in Table 4.7.1 and Figure 4.7.1, revealed that socio-economic characteristics of the respondents namely age, sericulture income, land holding, experience and extension participation had positive and education had negatively significant relationship with the adoption level of improved technologies of muga culture. However, family size and mass media participation had no significant relationship with the adoption level of improved technologies of muga culture.

Table 4.7.1: Correlation between socio-economic attributes of muga farmers and their adoption level of improved technologies

Variable code	Independent Variables	Correlation Coefficient (r)
X_1	Age	0.972**
X_2	Education	-0.945**
X_3	Family size	-0.122
X_4	Sericulture income	0.845**
X_5	Land holding	0.268*
X_6	Experience	0.899**
X_7	Mass media participation	-0.0298
X_8	Extension participation	0.951**

** Significant at the 0.01 level,* Significant at the 0.05 level

4.7.2 Multiple Linear Regression Co-efficient: Data presented in the Table-4.7.2, it could be observed that the regression co-efficient of the personal and socio-economic variables of the respondents namely age (X_1), experience (X_6)

and extension participation (X_8) were found highly significant at 1 per cent level towards adoption level of improved technologies. Further, the variables like education (X_2), family size (X_3), land holding (X_5) and mass media participation (X_7) were found negative relationship. The sericulture income (X_4) had a positive relationship with the adoption level of technologies among the farmers.

The value of co-efficient of multiple determination (R2) was 0.742 with significant F value (15.32 **). It clearly indicates the 74 per cent variation in the adoption level of the respondents was explained by all the variables put together.

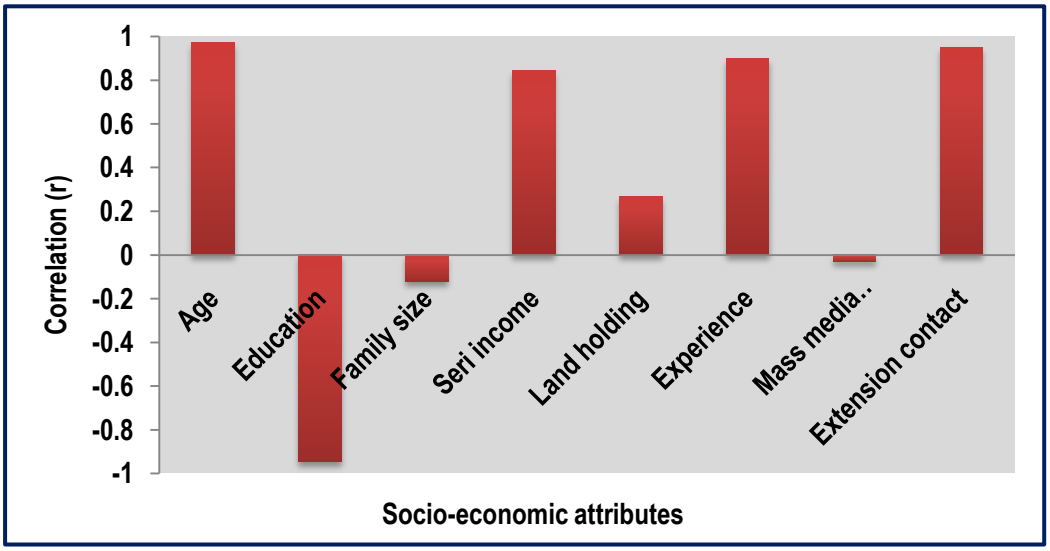

Figure 4.7.1: Correlation between socio-economic attributes of muga farmers and their adoption level of improved technologies

4.7.3 Chi-square test: Result of Chi-square test performed to establish the relationships between socio-economic variables and improved technologies adoption level of the farmers are presented in Table 4.7.3. Relationships between different socio-economic variables with the knowledge level of farmers about improved technologies of muga culture are shown below.

Age and adoption: The chi-square test revealed that there was a significant association at 1 % level between the age and improved technology adoption level of muga farmers

Table 4.7.2: Multivariable relationship between socio-economic attributes of muga farmers and their adoption level

Variable code	Independent Variables	Regression coefficient (B)	Standard Error	t-Value
	Intercept	-20.59	12.226	-1.684
X_1	Age	1.309**	0.299	4.379
X_2	Education	-0.887	1.855	-0.478
X_3	Family size	-0.536	0.692	-0.774
X_4	Sericulture income	0.0006	0.0008	0.645
X_5	Land holding	-1.181	0.782	-1.509
X_6	Experience	1.920**	0.194	3.106
X_7	Mass media participation	-0.007	0.461	-0.015
X_8	Extension participation	2.729**	0.979	2.786
	R^2	0.742		
	F	15.32**		

** Significant at the 0.01 level,* Significant at the 0.05 level

Education and adoption: The association between the education and improved technology adoption level was found positive in muga farmers.

Family size and adoption: The association between the family size and improved technology adoption level was found positive among the muga farmers.

Income and adoption: The degree of association between income and improved technology adoption level indicated a positive and significant association at 1 % level of significance among the muga farmers.

Land holding and adoption: The degree of association between land holdings and improved technology adoption level had a positive among the muga farmers.

Experience and adoption: The degree of association between experience and improved technology adoption level had a significant association at 5 % level in among the muga farmers.

Mass media participation and adoption: The association between the mass media and improved technology adoption level was found positive among the muga farmers.

Extension participation and adoption: The association between the extension participation and improved technology adoption level was found to be significant at 5 % level in muga farmers.

Table 4.7.3: Association between of socio-economic variables of the farmers and adoption of improved technologies (Chi-square test)

Sl. No.	Variables	Chi square value
1	Age	366.25**
2	Education	49.74
3	Family size	44.23
4	Sericulture income	303.84**
5	Land holding	23.07
6	Experience	204.58 *
7	Mass media participation	58.58
8	Extension participation	150.268 *

** Significant at the 0.01 level,* Significant at the 0.05 level

4.8: Traditional practices of muga culture

In the present investigation, an effort was made to know about the traditional practices followed by the muga farmers during various activities of muga culture. The most common traditional practices of muga culture strictly followed by the farmers are presented in tabular form under following sub heads.

4.8.1 Selection of Healthy Brood : Prior to selection of a healthy brood of silkworm, the farmers strictly observed various symptoms and behaviours from egg to adult (moth) stages to assure better production of cocoon in the subsequent

crop. Various symptoms and characters were found to observe by the muga farmers in different stages of the life cycle of muga are stated in Table 4.8.1.

Table 4.8.1: Selection criterion of healthy brood of muga silkworm in traditional method

Sl. No.	Stages	Symptoms/ characters of healthy brood of muga silkworm
1	Newly hatched worms	Quick movement of newly hatched worms to the leaf surface
2	Larval stage	i) Prompt movement of 4th and 5th stage larvae during day time ii) Light green body color and uniform growth (Plate 18) iii) Copper colour head (Plate 19) iv) Free from diseases and no mortality v) Feeding of entire leaf (start feeding from the leaf apex to the leaf midrib and following up to the leaf stalk (Plate 20) vi) Instantaneous response while touch and possessed more than one solid form of excreta in fifth stage larvae
3	Cocoon/ pupal stages	i) Uniform size, compact and bright cocoon shell (Plate 21) ii) Alive pupae with pointed posterior end. (Plate 22) iii) Light chocolate colour of pupae
4	Adult stage	i) Peak emergence at the evening ii) Deep brown colour of wings (Plate 23 and 24) iii)Alive moths for 5-6 days after egg laying
5	Egg stage	i) Uniform egg laying around the *Khorika* (Plate 25) ii) Brown colour of eggs without any depression.

4.8.2: Disinfection: Prior to use appliances of rearing and seed production and the grainage house, disinfection is very essential to prevent various diseases of

silkworm during rearing. Traditional methods of disinfection followed by the farmers are cited in Table 4.8.2.

Table 4.8.2: Traditional methods of disinfection followed by muga farmers

Sl. No.	Activities	Techniques
1	Disinfection of appliances	Once the activities are over, all the appliances used in silkworm seed production and rearing, like c*hakari pera*, *khorika*, *chaloni* etc were kept over the kitchen fire till further used to kill the germs of diseases (Plate 26)
2	Disinfection of grainage house (a house where silk worm eggs are produced)	i) Splashed floor and walls of the grainage house with cow dung mixed mud prior to enter seed cocoons ii) Hanged up leaves and twigs of Tulsi (*Ocimum sanctum*) at the walls of the grainage house iii) Sprayed Tulsi leaf concoction on the floor and walls of grainage house during grainage

4.8.3: Silkworm seed production: The traditional methods followed during silkworm seed production are presented in the Table 4.8.3.

Table 4.8.3: Traditional methods of silkworm seed production

Sl. No.	Activities	Techniques
1	Preservation of seed cocoons	i) Seed cocoon preserved at perforated bamboo cage locally called '*chakari pera*' in single layer (Plate 27) ii) During winter, the seed cocoons were kept near the kitchen fire and exposed in to sunlight for early emergence of moths (Plate 28).

2	Coupling of moths	i) Moths were allowed to couple naturally before midnight at least for 10-12 hours. The hind wings of female moths of each pair are tied in "*kharika*" (bunch of dry thatch grass) with the help of cotton thread (Plate 29). Sometimes more than one pair of moths are tied at the same kharika to minimize the quantity of kharikas and space. ii) The *kharikas* along with the moths are hanged in a rope and allowed the moths to lay eggs At the time of shortage of male moths, the female moths were tied in *khorikas* and hanged it on branches of plants or bamboos in outside to allow coupling with wild male moths at night
3	Depairing of moths	After 10-12 hours of pairing, paired moths were exposed to smoke produced through burning of paddy straw for a few minutes at the evening for decoupling (Plate 30).
4	Egg laying and egg preservation	i) Moths were allowed to lay eggs for maximum three days. After three days of egg laying, female moths were removed from the kharika and the eggs along with *khorikas* were kept in dark and shady place until hatching (Plate 31). ii) Used to hang of tulsi leaves/twigs with the kharikas to prevent disease outbreaks during rearing (Plate 32)

4.8.4: Silkworm rearing: The traditional methods of muga silkworm rearing and cocoon harvesting techniques followed by the farmers are presented in the Table 4.8.4.

Table 4.8.4: Traditional methods of muga silkworm rearing

Sl. No.	Activities	Techniques
1	Selection of host plants for rearing of muga silkworms	i) The *nahorpotia* leaves (resemble with the leaves of Indian iron wood (*Mesua ferrea*) of *som* trees were selected for rearing of muga silkworm (Plate 33) ii) Sometimes, newly hatched worms were brushed at Dighlati plants (*Litsea salicifolia)* to reduced disease of silkworm (Plate 34)
2	Pre brushing care	i) Cleaned up of dry leaves and twigs of the selected plants before brushing of silkworm. Burnt dry leaves, undergrowths, twigs and debris in the rearing field to repel pests and predators of silkworms through smoking (Plate 35) ii) Used rotten fish or dead birds or frog to control red ants nested in the host plants before brushing (Plate 36).
3	Brushing of worms	On the day of hatching, *khariks*' with the hatched worms were hanged on twigs plants or tied at the tree trunk of the selected host (Plate 37).
4	Griddle around the host plants	The tree trunks of the host plants were wrapped at 2/3 feet above the ground by pseudo stems of banana plants or bunch of thatch grass to check the worms crawl down to ground (Plate 38).

5	Transfer of worms	i) At the time of finish the leaf of one host plants, the worms crawl down to tree trunk for searching leave at another plant. At that time, the farmers picked the worms and put at another plants having with quality leaves. Transfer of worms from one plants to another were done generally at third or fourth stage with the help of triangular trays made up of bamboo called *'Chaloni'* (Plate 39) ii) At the time of transferring worms, weekend worms were sorted out and put them to other plants having tender leaves for quick growing.

4.8.5: Traditional mountage, harvesting and stifling of cocoons: The traditional system involved for mounting mature worms to spin cocoons, harvesting of cocoons and stifling of cocoons are presented in the Table 4.8.5.

Table 4.8.5: Traditional mountage, harvesting and stifling of cocoons

Sl. No.	Activities	Techniques
1	Mounting of ripen worms	i) The ripen worms collected at evening with the help of bamboo basket and put them in to mountage (farmers termed as 'jail') for cocooning. ii) The jails were prepared by semi dry leave and twigs of certain plants locally named as *nahor* (*Mesua ferrea*), *hingori* (*Castanopsis* sp.), *azar* (*Lagerstroemia speciosa*), *bhomlati* (*Celastrus monospermus*), etc (Plate 40)

		iii) Jails were kept in open and well-aerated shed prepared temporarily in the rearing field itself and keep watch for protection from birds, lizards, bats, owl, snake, etc.
2	Harvesting of cocoons	i) After 6-7 days in summer and 8-12 days in winter of spinning, the cocoons were harvested (Plate 41). ii) After harvesting, the flimsy and melted cocoons were sorted out. The cocoons, which are used as seed, were kept in shady places with utmost care and other cocoons used for reeling purpose were stifled immediately to kill the pupae.
3	Stifling of cocoons	The cocoons are exposed in to bright sunlight or hot smoke generate by burning of fire wood for stifling (Plate 42). After dying of pupae, farmer also used to expose the cocoons in sunlight for 2-3 days to reduce the moisture contents of the cocoons as well as pupae.

4.9: Cocoon yield under traditional practices and improved technologies of muga culture

Performances of muga silkworm seed and commercial crops in terms cocoon yield and ERR under traditional and improved practices are presented in Table 4.9.1 to 4.9.4. Graphical representation of yield data in both the seed and commercial crops are presented in Figure 4.9.1 and 4.9.2. Data presented in the Table 4.9.1, it could be observed that average cocoon yield per laying in Chatua and Bhadia seed crops during 2014 under traditional practice was 31 and 20 with the ERR of 28.48 and 26.93 percent respectively. Similarly, the average cocoon yield per laying in Chatua and Bhadia seed crops during 2015 under traditional

practice was 37 and 19 with the ERR of 33.45 and 26.51 percent respectively. On the other hand, it could be observed from the Table 4.9.2 that average cocoon yield per dfl in Chatua and Bhadia seed crops during 2014 under improved practice was 47 and 42 with the ERR of 41.80 and 58.93 percent respectively. Similarly, the average cocoon yield per laying in Chatua and Bhadia seed crops during 2015 under improved practice was 45 and 24 with the ERR of 40.53 and 33.45 percent respectively.

Data presented in the Table 4.9.3, it was found that in traditional practice, the average cocoon yield per laying in Jethua and Kotia commercial crops during 2014 was 49 and 43 with the ERR of 43.43 and 58.95 percent respectively. Similarly, the average cocoon yield per laying in Jethua and Kotia commercial during 2015 was 47 and 43 with the ERR of 42.21 and 60.40 percent respectively. On the other hand, data presented in the Table 4.9.4, it could be observed that in improved practice, the average cocoon yield per dfl in Jethua and Kotia commercial crops during 2015 was 62 and 58 with the ERR of 55.28 and 68.92 percent respectively. Similarly, the average cocoon yield per dfl in Jethua and Kotia commercial during 2015 was 65 and 52 with the ERR of 58.2 and 62.4 percent respectively.

The t-test conducted for equality of variance in ERR between traditional and improved practices, it was observed that t- test was highly significant at 1 & 5% level of significance in all the seed and commercial crops in both the years (Table 4.7.6, 4.7.8, 4.7.10 and 4.7.12). Hence, there is a clear difference of yield between the improved and traditional practice of muga culture. In other sense, it could be depicted from the results of descriptive statistics presented in Table 4.7.5, 4.7.7, 4.7.9 and 4.7.11 that improved practice was better than traditional practice in terms of cocoon yield and ERR in muga culture.

Table 4.9.1: Average performance of muga seed crops in different seasons under traditional practice

Crops	Number of farmers	Layings brushed (Nos.)	Fecundity (Nos.)	Hatching (%)	Worms brushed (Nos.)	Loss of worms due to incidence of pest (%)	Loss of worms due to incidence of diseases (%)	Other loss of worms (%)	Cocoon yield (Nos.)	Cocoon yield/ laying (Nos.)	ERR (%)
Chatua Seed crop 2014	30	244	135	80	26352	18.5	32.0	21.0	7505	31	28.48
Bhadia Seed crop 2014	30	234	120	62	17410	16.6	33.8	22.7	4689	20	26.93
Chatua Seed crop 2015	30	212	140	80	23744	16.5	36.5	13.6	7942	37	33.45
Bhadia Seed crop 2015	30	206	122	60	15079	15.0	29.8	28.7	3997	19	26.51

Table 4.9.2: Average performance of muga seed crops in different seasons under improved practice

Crops	Number of farmers	Dfls brushed (g)	Fecundity (Nos)	Hatching (%)	Worms brushed (Nos.)	Loss of worms due to incidence of pest (%)	Loss of worms due to incidence of diseases (%)	Other loss of worms (%)	Cocoon yield (Nos.)	Cocoon yield per dfl (Nos.)	ERR (%)
Chatua Seed crop 2014	30	250	140	80	28000	14.0	22.8	21.4	11704	47	41.80
Bhadia Seed crop 2014	30	233	120	60	16776	11.4	13.2	16.5	9886	42	58.93
Chatua Seed crop 2015	30	230	140	80	25760	12.0	26.5	21.0	10441	45	40.53
Bhadia Seed crop 2015	30	221	120	60	15912	14.6	28.0	24.0	5323	24	33.45

Table 4.9.3: Average performance of muga commercial crop in different seasons under traditional practice

Crops	Number of farmers	Layings brushed (Nos.)	Fecundity (Nos.)	Hatching (%)	Worms brushed (Nos.)	Loss of worms due to incidence of pest (%)	Loss of worms due to incidence of diseases (%)	Other loss of worms (%)	Cocoon yield (Nos.)	Cocoon yield per dfl (Nos.)	ERR (%)
Jethua commercial crop 2014	30	312	140	80	34981	15.5	19.7	21.4	15172	49	43.4
Kotia commercial crop 2014	30	257	120	60	18504	10.7	12.8	17.6	10940	43	58.9
Jethua commercial crop 2015	30	225	140	80	25237	14.5	24.7	18.6	10763	47	42.2
Kotia commercial crop 2015	30	244	120	60.0	17592	11.0	10.0	18.2	10757	43	60.4

Table 4.9.4: Average performance of muga commercial crops in different seasons under improved practice

Crops	Number of farmers	Dfls brushed (g)	Fecundity (Nos)	Hatch-ing (%)	Worms brushed (Nos.)	Loss of worms due to incidence of pest (%)	Loss of worms due to incidence of diseases (%)	Other loss of worms (%)	Cocoon yield (Nos.)	Cocoon yield per dfl (Nos.)	ERR (%)
Jethua commercial crop 2014	30	325	140	80	36400	8.6	15.8	20.3	20099	62	55.3
Kotia commercial crop 2014	30	279	140	60	23464	7.2	5.5	18.4	16160	58	68.9
Jethua commercial crop 2015	30	309	140	80	34571	8.8	14.8	18.1	20072	65	58.2
Kotia commercial crop 2015	30	278	140	60	23338	8.3	11.3	17.9	14333	52	62.4

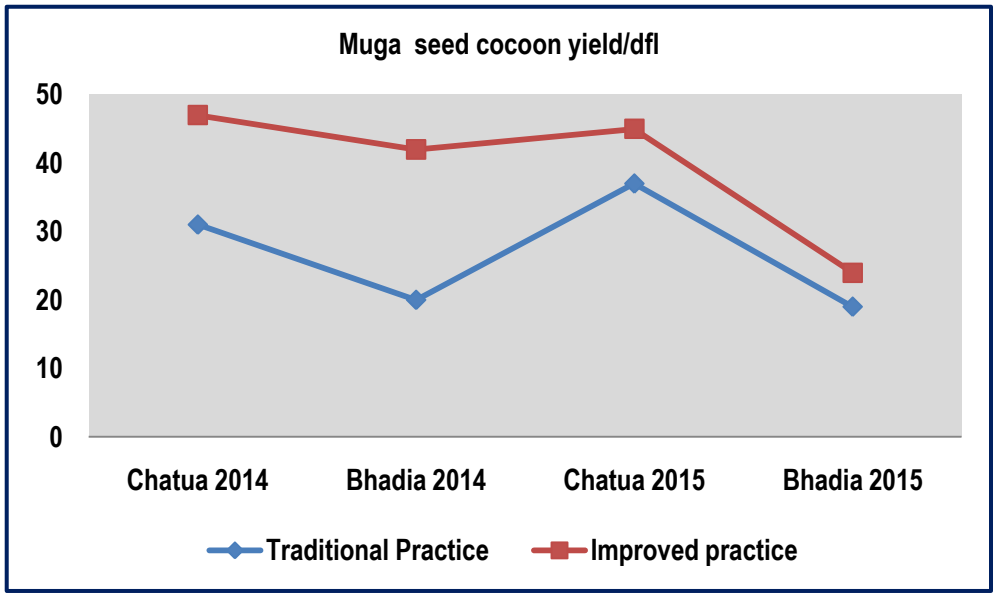

Figure 4.9.1: Muga seed crops performance under traditional and improved practice in different seasons

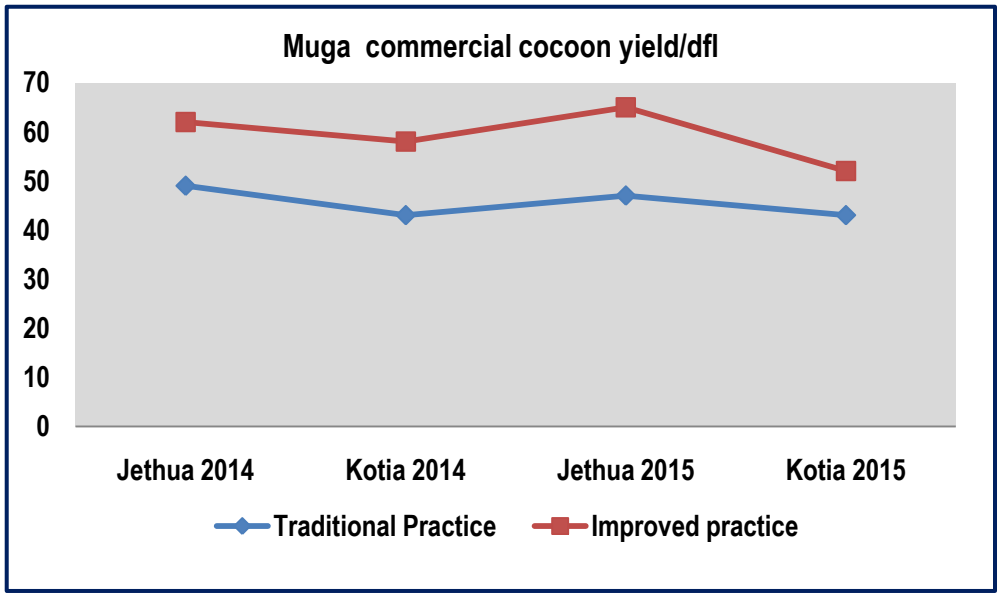

Figure 4.9.2: Muga commercial crops performance under traditional and improved practice in different seasons

Table 4.9.5: Descriptive statistics on ERR of Chatua Seed crops under traditional and improved practice

Crops	Practices	Number	Mean	Standard Deviation	Standard Error Mean
Chatua Seed 2014	Traditional	30	28.48	9.15579	1.67161
	Improved	30	41.80	9.87636	1.80317
Chatua Seed 2015	Traditional	30	33.45	13.72900	2.50656
	Improved	30	40.53	7.22803	1.31965
Pooled	Traditional	30	30.96	9.05176	1.65262
	Improved	30	41.16	6.64603	1.21339

Table 4.9.6: t- Test for Equality on ERR of Chatua Seed crops under traditional and improved practice

Crops	t-test				
	t	Degree of Freedom	Significant (2-tailed)	Mean Difference	Standard Error
Chatua Seed 2014	-5.419	58	.000**	-13.32333	2.45880
Chatua Seed 2015	-2.501	58	.015*	-7.08333	2.83272
Pooled	-4.975	58	.000**	-10.20067	2.05024

** Significant at 1% level, * Significant at 5% level

Table 4.9.7: Descriptive statistics on ERR of Bhodia Seed crops under traditional and improved practice

Crops	Practices	Number	Mean	Standard Deviation	Standard Error Mean
Bhodia Seed 2014	Traditional	30	26.92	9.66758	1.76505
	Improved	30	58.93	10.72449	1.95801
Bhodia Seed 2015	Traditional	30	26.51	10.52517	1.92162
	Improved	30	33.45	10.42581	1.90348
Pooled	Traditional	30	26.72	7.98935	1.45865
	Improved	30	46.19	7.95449	1.45228

Table 4.9.8: t- Test for Equality on ERR of Bhodia Seed crops under traditional and improved practice

Crops	t-test				
	t	Degree of Freedom	Significant (2-tailed)	Mean Difference	Standard Error
Bhodia Seed 2014	-12.140	58	.000**	-32.00333	2.63614
Bhodia Seed 2015	-13.835	58	.000**	-37.42000	2.70479
Pooled	-16.861	58	.000**	-34.70667	2.05835

** Significant at 1% level

Table 4.9.9: Descriptive statistics on ERR Jethua Commercial crops under traditional and improved practice

Crops	Practices	Number	Mean	Standard Deviation	Standard Error Mean
Jethua Commercial 2014	Traditional	30	43.43	12.07551	2.20468
	Improved	30	55.28	7.04250	1.28578
Jethua Commercial 2015	Traditional	30	42.21	9.26047	1.69072
	Improved	30	58.20	7.81312	1.42647
Pooled	Traditional	30	42.82	7.37568	1.34661
	Improved	30	56.74	5.64553	1.03073

Table 4.9.10: t- Test for Equality on ERR of Jethua Commercial crops under traditional and improved practice

Crops	t-test				
	t	Degree of Freedom	Significant (2-tailed)	Mean Difference	Standard Error
Jethua Commercial 2014	-4.644	58	.000**	-11.85333	2.55222
Jethua Commercial 2015	-7.227	58	.000**	-15.98667	2.21210
Pooled	-8.210	58	.000**	-13.92300	1.69581

** Significant at 1% level

Table 4.9.11: Descriptive statistics on ERR of Kotia Commercial crops under traditional and improved practice

Crops	Practices	Number	Mean	Standard Deviation	Standard Error Mean
Kotia Commercial 2014	Traditional	30	58.95	14.27367	2.60600
	Improved	30	68.92	6.76224	1.23461
Kotia Commercial 2015	Traditional	30	60.40	10.46327	1.91032
	Improved	30	62.39	10.73842	1.96056
Pooled	Traditional	30	59.68	8.63966	1.57738
	Improved	30	65.65	7.30488	1.33368

Table 4.9.12: t- Test for Equality on ERR of Kotia Commercial crops under traditional and improved practice

Crops	t-test				
	t	Degree of Freedom	Significant (2-tailed)	Mean Difference	Standard Error
Kotia Commercial 2014	-3.459	58	.001**	-9.97333	2.88366
Kotia Commercial 2015	-.726	58	.471	-1.98667	2.73736
Pooled	-2.896	58	.005**	-5.98233	2.06563

** Significant at 1% level

Table 4.9.13: Summarized ERR variations of seed and commercial crops in traditional and improved practice

Crops	Practices	Number	Mean	Standard Deviation	Standard Error Mean
Chatua Seed 2014	Traditional	30	28.48	9.15579	1.67161
	Improved	30	41.80	9.87636	1.80317
Bhodia Seed 2014	Traditional	30	26.93	9.66758	1.76505
	Improved	30	58.93	10.72449	1.95801
Jethua 2014	Traditional	30	43.43	12.07551	2.20468
	Improved	30	55.28	7.04250	1.28578
Kotia Commercial 2014	Traditional	30	58.95	14.27367	2.60600
	Improved	30	68.92	6.76224	1.23461
Chatua Seed 2015	Traditional	30	33.45	13.72900	2.50656
	Improved	30	40.53	7.22803	1.31965
Bhodia Seed 2015	Traditional	30	26.51	10.52517	1.92162
	Improved	30	33.45	10.42581	1.90348
Jethua Commercial 2015	Traditional	30	42.21	9.26047	1.69072
	Improved	30	58.20	7.81312	1.42647
Kotia Commercial 2015	Traditional	30	60.40	10.46327	1.91032
	Improved	30	62.39	10.73842	1.96056
Chatua Seed Pooled	Traditional	30	30.96	9.05176	1.65262
	Improved	30	41.16	6.64603	1.21339
Bhodia Seed Pooled	Traditional	30	26.72	7.98935	1.45865
	Improved	30	46.19	7.95449	1.45228
Jethua Commercial Pooled	Traditional	30	42.82	7.37568	1.34661
	Improved	30	56.74	5.64553	1.03073
Kotia Commercial Pooled	Traditional	30	59.67	8.63966	1.57738
	Improved	30	65.65	7.30488	1.33368

Table 4.9.14: Summarization of t- Test result on ERR of Seed and Commercial crops under traditional and improved practice.

Crops	t-test				
	t	Degree of Freedom	Significant (2-tailed)	Mean Difference	Standard Error
Chatua Seed 2014	-5.419	58	.000	-13.32333	2.45880
Bhodia Seed 2014	-12.140	58	.000	-32.00333	2.63614
Jethua Commercial 2014	-4.644	58	.000	-11.85333	2.55222
Kotia Commercial 2014	-3.459	58	.001	-9.97333	2.88366
Chatua Seed 2015	-2.501	58	.015	-7.08333	2.83272
Bhodia Seed 2015	-13.835	58	.000	-37.42000	2.70479
Jethua Commercial 2015	-7.227	58	.000	-15.98667	2.21210
Kotia Commercial 2015	-.726	58	.471	-1.98667	2.73736
Chatua Seed Pooled	-4.975	58	.000	-10.20067	2.05024
Bhodia Seed Pooled	-16.861	58	.000	-34.70667	2.05835
Jethua Commercial Pooled	-8.210	58	.000	-13.92300	1.69581
Kotia Commercial Pooled	-2.896	58	.005	-5.98233	2.06563

4.10: Economics of muga cocoon yield under traditional and improved practices

In order to assess the economics, the cost of cocoon yield both in traditional and improved practices were calculated based on the actual expenditures and prevailing market rate of different items. The calculated cost of coccon yield under traditional and improved practice at farmers level are presented in the Table 4.10.1, 4.10.2, 4.10.3 and 4.10.4.

Table 4.10.1: Calculated annual cost of muga seed cocoon yield under traditional methods (Unit area**: 1.0 acre)**

Particulars	**Unit**	**Quantity**	**Rate (Rs)**	**Amount (Rs)**
A. Plantation maintenance				Nil
B. Rearing appliances				
Temporary shed (Tarpaulin, bamboo, rope, etc)	Lump-sum	1	-	1500
Bamboo chaloni for transferring worms	No.	30	15	450
Rearing net	No.	0	0	0
Bamboo for erection of nylon nets	No.	0	0	0
Bamboo box type mountage	No.	0	0	0
Plastic basin/bucket	No.	4	150	600
Bamboo baskets	No	4	200	800
Torch light	No	2	300	600
Farm appliances (Dao, Spade, etc)	Lump-sum	-	--	600
Subtotal (B)				4550
20% depreciation cost of (B)				**910**
C. Rearing cost				
Cost of layings production (Including transportation of seed cocoons, grainage appliances, labour, etc)	Nos	448	10	4480
Disinfectants	Lump-sum	--	--	0
Human labour	No	70	200	14000
Miscellaneous	Lump-sum	--	--	500
Subtotal				**18980**
Total Cost (B+C)				**19890**
Say				**19900**

Table 4.10.2: Calculated annual cost of muga seed cocoon yield under improved technology (Unit area**: 1.0 acre)**

Particulars	**Unit**	**Quantity**	**Rate (Rs)**	**Amount (Rs)**
(A) Plantation maintenance (Av. number of plants 300)				
Urea (@ 80 g per plant)	kg	24	8	192
SSP (@ 120 g per plant)	kg	36	8	288
MOP(@ 30 g per plant)	kg	9	10	90
FYM(@ 10 kg/plant)	cft	600	8	4800
Cost of insecticides/pesticides	Lump -sum			300
Human labour for cultural operation and application of inputs, insecticides/ pesticides, etc	No.	6	200	1200
Subtotal (A)				**6870**
(B) Rearing appliances				
Temporary shed (Tarpaulin, bamboo, rope, etc)	Lump -sum	1	-	1500
Bamboo chaloni for transferring worms	No.	30	15	450
Rearing net	No.	2	3500	7000
Bamboo for erection of nylon nets	No.	8	120	960
Bamboo made box mountage	No.	10	700	7000
Plastic basin/bucket	No.	4	150	600
Bamboo baskets	No	4	200	800
Torch light	No	2	300	600
Farm appliances (Dao, Spade, etc)	Lump -sum	-	--	600
Subtotal (B)				**19510**
20% Depreciation cost of (B)				**3902**
(C) Recurring expenditure of rearing				
Cost of dfls	g	467	8	3736
Disinfectants	Lump -sum	--	--	400
Human labours	No	50	200	10000
Miscellaneous	Lump -sum	--	--	500
Subtotal (C)				**14636**
Total Cost (A+B+C)				**25408**
Say				**25400**

Table 4.10.3: Annual cost of muga commercial cocoon yield under traditional methods (Unit area**: 1.0 acre)**

Particulars	**Unit**	**Quantity**	**Rate (Rs)**	**Amount (Rs)**
A. Plantation maintenance				Nil
B. Rearing appliances				
Temporary shed (Tarpaulin, bamboo, rope, etc)	Lump-sum	1	-	1500
Bamboo chaloni for transferring worms	No.	30	15	450
Rearing net	No.	0	0	0
Bamboo for erection of nylon nets	No.	0	0	0
Bamboo box type mountage	No.	0	0	0
Plastic basin/bucket	No.	4	150	600
Bamboo baskets	No	4	200	800
Torch light	No	2	300	600
Farm appliances (Dao, Spade, etc)	Lump-sum	-	-	600
Subtotal (B)				4550
20% depreciation cost of (B)				**910**
C. Recurring expenditure of rearing				
Cost of layings production (Including transportation of seed cocoons, grainage appliances, labour, etc)	Nos	518	10	5180
Disinfectants	Lump-sum	-	-	0
Human labour	No	75	200	15000
Miscellaneous	Lump-sum	-	-	500
Subtotal				**20680**
Total cost (B+C)				**21590**
Say				**21600**

Table 4.10.4: Annual cost of muga commercial cocoon yield under improved technology (Unit area**: 1.0 acre)**

Particulars	**Unit**	**Quantity**	**Rate (Rs)**	**Amount (Rs)**
A. Plantation maintenance (Av. number of plants 300)				
Urea (@ 80 g per plant)	kg	24	8	192
SSP (@ 120 g per plant)	kg	36	8	288
MOP(@ 30 g per plant)	kg	9	10	90
FYM(@ 10 kg/plant)	cft	600	8	4800
Cost of insecticides/pesticides	Lump -sum			300
Human labour for cultural operation and application of inputs, insecticides/ pesticides, etc	No.	6	200	1200
Subtotal (A)				**6870**
(D) Rearing appliances				
Temporary shed (Tarpaulin, bamboo, rope, etc)	Lump -sum	1	-	1500
Bamboo chaloni for transferring worms	No.	30	15	450
Rearing net	No.	2	3500	7000
Bamboo for erection of nylon nets	No.	8	120	960
Bamboo made box mountage	No.	10	700	7000
Plastic basin/bucket	No.	4	150	600
Bamboo baskets	No	4	200	800
Torch light	No	2	300	600
Farm appliances (Dao, Spade, etc)	Lump -sum	-	--	600
Subtotal (B)				**19510**
20% Depreciation cost of (B)				**3902**
(E) Recurring expenditure of rearing				
Cost of dfls	g	596	8	4768
Disinfectants	Lump -sum	--	--	400
Human labours	No	65*	200	13000
Miscellaneous	Lump -sum	--	--	500
Subtotal (C)				**18668**
Total Cost (A+B+C)				**29440**
Say				**29500**

The data presented in the table, it could be seen that the calculated cost of cocoon production Rs.19900.00 in seed and Rs. 21600.00 in commercial crop (table 4.10.1 and 4.10.3) was low in traditional practice than the cost of cocoon production Rs. 25400.00 in seed and Rs. 29500.00 in commercial crop under improved technology (table 4.10.2 and 4.10.4). But, benefit cost ratio in traditional practice was not as good as improved technology due to low yield of cocoons in both the seasons. From the Table 4.10.5 and 4.10.6, it could be seen that the net return from cocoon yield was Rs. 2020 in seed and Rs. 17623 in commercial crop under traditional practice annually. On the other hand, net return from the cocoon yield was Rs. 13297 in seed and Rs. 33301 in commercial crop under improved practices. The calculated benefit cost ratio under traditional practice was 1: 0.10 and 1: 0.80 in seed and commercial crop respectively. Calculated benefit cost ratio under improved practice was 1: 0.52 in seed and 1: 1.30 in commercial crop whice was higher than traditional pracice.

Table 4.10.5: Economics of muga seed crops under traditional and improved practices (Unit area**: 1.0 acre)**

Sl. No	**Particulars**	**Traditional Practice**	**Improved practice**
1	Number of crops reared anuually	2	2
2	quantity of layings/ dfls brushed annually (nos/g)	448 nos	467g
3	Annual cocoon yield (nos)	**12067**	**18677**
4	Return from sale proceeds of cocoon (Rs**.)**		
	i) Sale proceeds of seed cocoons (@ 60% of total yield and Rs 3.00 per cocoon)	21720	33619
	ii) Sale proceeds of reeling cocoon (@ 40% of the total yield and Rs.1.50 per cocoon)	7240	11206
	Gross return (i + ii)	**28960**	**44825**
5	Annual cost of cocoon production (Rs.)	19900	25400
6	Net return (Rs.)	2020	13297
7	Benefit Cost Ratio (BCR)	1 : 0.10	1 : 0.52

Table 4.10.6: Economics of muga commercial crops under traditional and improved practices (Unit area**: 1.0 acre)**

Sl. No	**Particulars**	**Traditional Practice**	**Improved practice**
1	Number of crops reared anuually	2	2
2	quantity of layings/ dfls brushed annually (nos/g)	518 nos	596g
3	Annual cocoon yield (nos)	**22196**	**35332**
4	Return from sale proceeds of cocoon (Rs**.)**		
	i) Sale proceeds of commercial cocoons (@ Rs 2.00 per cocoon of 80% of the total yield)	35513	56851
	ii) Sale proceeds of flimsy cocoon (@ lump sum 350/- per kg and approximately 10.6 kg in traditional and17 kg in improved practice)	3710	5950
	Gross return (i + ii)	**39223**	**62801**
5	Annual cost of cocoon production (Rs.)	21600	29500
6	Net return (Rs.)	17623	33301
7	Benefit Cost Ratio (BCR)	1 : .80	1 : 1.30

4.11: Constraints for partial and non-adoption of improved technologies by the muga farmers

The most serious constraints for low and non adoption of improved practices of muga culture are presented in the Table 4.11.1 and Figure 4.11.1. The table indicated that the muga farmers in the study area were facing number of constraints that restricted their action towards adoption of improved practices. It was evident from the table that inclination towards traditional practice (WMS 2.43), lack of knowledge (WMS 1.80) and non availability of silkworm seeds on time (WMS 1.69) were the most serious constraint and they were ranked as I, II and III respectively. Based on the WMS, other constraints were non remunerative (ranked IV), lace of time (ranked V), non availability of materials (ranked VI), high cost & labour

intensive (ranked VII), non availability of own farm (ranked IX) and marketing of cocoons (ranked X).

Table 4.11.1: Constraints of muga farmers for low and non adoption of improved technology

Sl. No.	Constraints	Weighted Mean Score	Rank
1	Lack of knowledge	1.80	II
2	Lack of time	1.61	V
3	Non availability of materials	1.57	VI
4	High cost	1.53	VII
5	Inclination towards traditional practice	2.43	I
6	Non remunerative	1.64	IV
7	Non availability of silkworm seeds on time	1.69	III
8	Labour intensive	1.53	VII
9	Non availability of own farm	1.42	IX
10	Marketing of cocoon	1.18	X

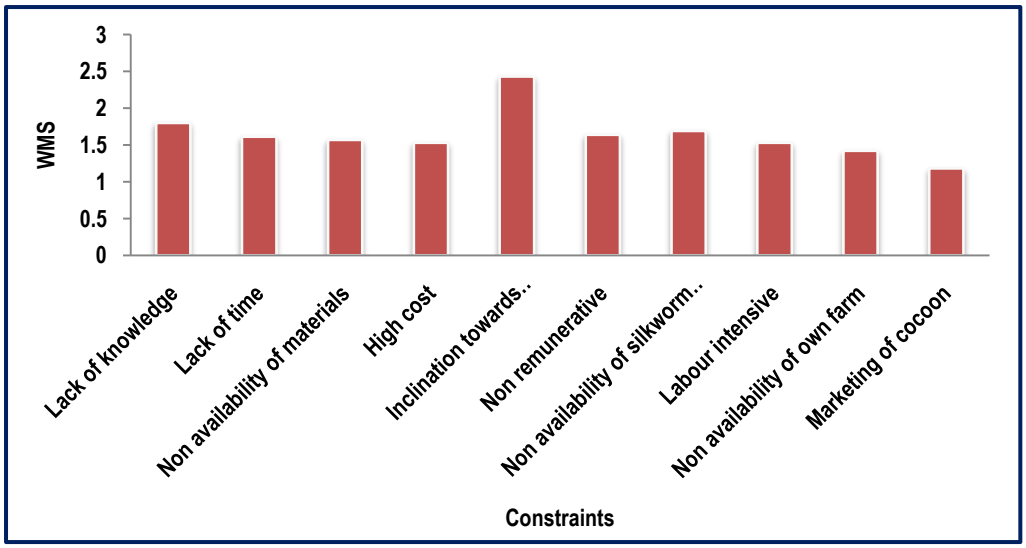

Figure 4.11.1: Constraints of muga farmers for low and non adoption of improved technology of muga culture