

CHAPTER IV

FINDINGS AND DISCUSSION

The findings of the study and the related discussion are presented in this chapter; the results obtained on various aspects of the study are supported with suitable discussion on each finding. The collected data were classified, tabulated, analyzed, presented, interpreted and discussed systematically in accordance with the objectives of the study.

The facts and findings of the study are presented under the subsequent heads:

- 4.1 Profile characteristics of the silkworm rearers.
- 4.2 Level of satisfaction of silkworm rearers from sericultural extension services.
- 4.3 Relationship with the selected profile characteristics and level of satisfaction of silkworm rearers from sericultural extension services.
- 4.4 Problems and difficulties faced by the silkworm rearers to adopt improved technologies of silkworm rearing practices recommended by the State Department of Sericulture.

4.1 Profile characteristics of the silkworm rearers

To facilitate the detailed view to the reader, an attempt has been made to present the detailed distribution of farmers in separate tables with frequency and percentages for interpretation as given below.

4.1.1 Age

A perusal of Table 4.1.1 and Fig. 4.1.1 of Assam showed that majority (41.66 %) of the respondents belonged to the middle age group followed by the respondents belonged to old age group (33.33 %) and rest (25.00 %) of the respondent's belonged to young age group. It might be because the middle age group people in the village were dependent on the cultivation of host plants and rearing of silkworms. The results were in line with Nishi and Kumar (2016), Rathod *et al.* (2016), Uddin *et al.* (2008), Ranjan *et al.* (2018) and Prasertsang *et al.* (2020).

Similarly, Table 4.1.1 and Fig. 4.1.1 of Karnataka showed that more than half (51.66 %) of the respondents belonged to the middle age category followed by the respondents who falls under old age group (33.33 %) and rest of the 23.33 per cent of the respondents belonged to young age category. The probable reason might be, since, the migration of young aged people to nearby cities for employment and education, rest of the old age and middle age silkworm rearers were dependent on the rearing of silkworms. The results were in line with Nishi and Kumar (2016), Rathod *et al.* (2016), Uddin *et al.* (2008), Ranjan *et al.* (2018), Yarazari (2020) and Ganpat *et al.* (2017).

Table 4.1.1: Distribution of the respondents according to their age (N=120)

Sl. No	Category	Assam		Karnataka	
		F	%	F	%
1	Young age (18-35 years)	15	25.00	14	23.33
2	Middle age (36-55 years)	25	41.66	31	51.66
3	Old age (>55 years)	20	33.33	15	25.00
Total		60	100.00	60	100.00
		Mean = 48.43 S.D = 4.94		Mean = 40.43 SD = 4.42	

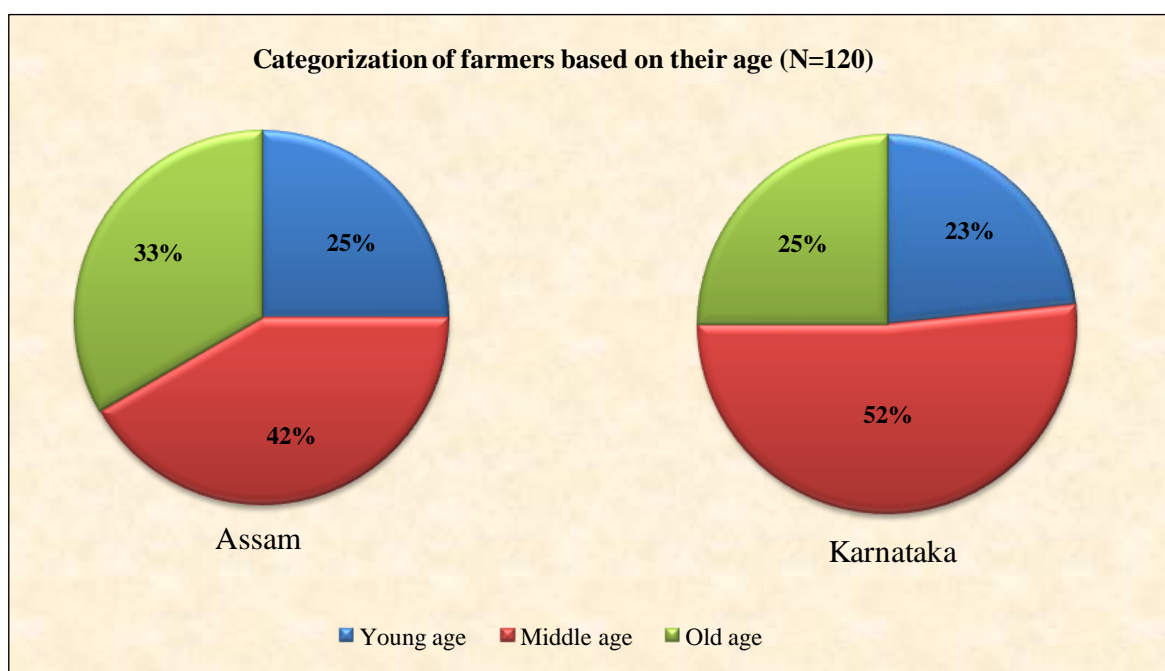


Fig. 4.1.1: Distribution of the respondents according to their age

4.1.2 Educational level

It was observed from Table 4.1.2 and Fig. 4.1.2 from Assam that majority (35.00 %) of the respondents belonged to high school category followed by middle school (31.66 percent), primary school (18.33 %), 8.33 per cent of the respondents had educational level of graduate and above and few (6.66 %) respondents had a higher secondary and above level of education. Respondents had a medium and low level of education because they did not went to school and had selected silkworm rearing as their main occupation. Educated respondents went for government jobs and others started a business. The results were in accordance with Debnath *et al.* (2016), Nishi and Kumar (2016), Uddin *et al.* (2008) and Arcas-Lario *et al.* (2014).

Table 4.1.2: Distribution of the respondents according to their educational level (N=120)

Sl. No	Category	Assam		Karnataka	
		F	%	F	%
1	Up to primary school	11	18.33	10	16.66
2	Up to middle school	19	31.66	9	15.00
3	Up to high school	21	35.00	19	31.66
4	Higher secondary and above	4	06.66	17	28.33
5	Graduate and above	5	08.33	5	08.33
	Total	60	100.00	60	100.00

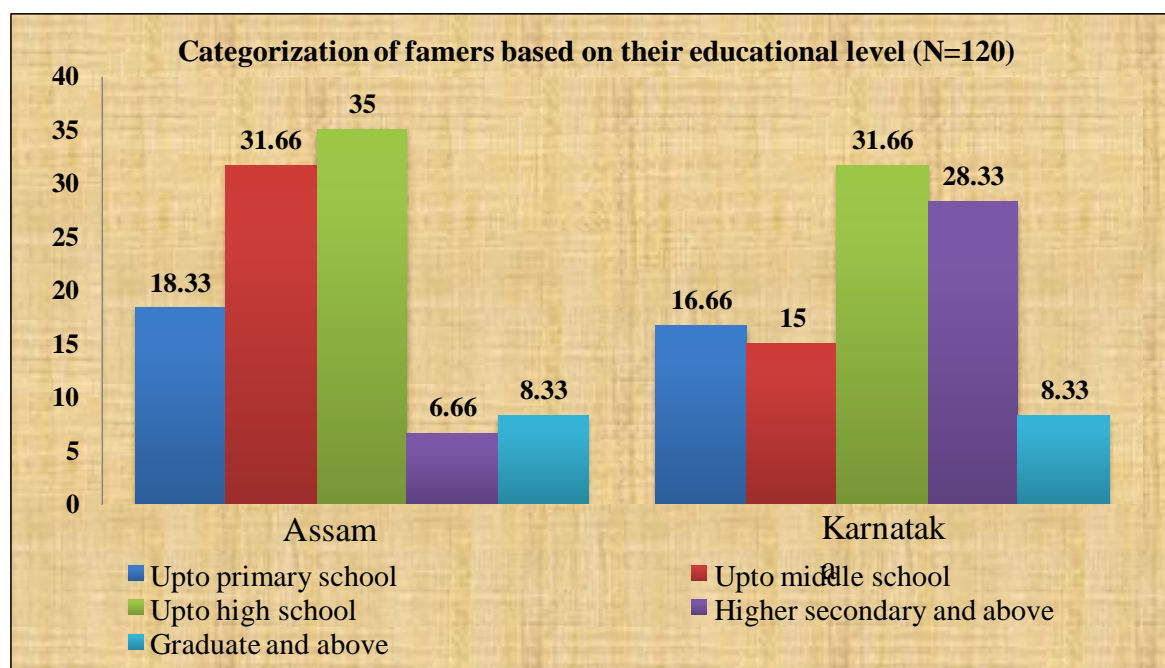


Fig 4.1.2: Distribution of the respondents according to their educational level

Similarly, results presented in the Table 4.1.2 and Fig. 4.1.2 from Karnataka revealed that majority (31.66 %) of the farmers had up to high school education followed by higher secondary and above (28.33 %), primary school (16.00 %), and graduate and above (8.33 %) and 15.00 per cent of the respondents had up to middle school. It can be observed from the Table 4.1.2 that majority of the farmers involved in sericultural activities had up to high school education. Involvement of educated silkworm rearers were very limited, this may be due to overall educational level of farmers in our country is low. The results were in accordance with Nishi and Kumar (2016), Rathod *et al.* (2016), Luo and Timothy (2017) and Sugiarto *et al.* (2019).

4.1.3 Farming experience

It was evident from Table 4.1.3 and Fig. 4.1.3 from Assam that majority (41.66 %) of the respondents had medium farming experience followed by low farming experience (31.66 %) and rest of the farmers were having higher (26.66 %) farming experience. The reason might be due to the fact that the majority of the respondents were from middle age group and young age group. The educational qualifications of the respondents were medium and low and they were continuing their parents' occupations as their main occupation. The results were in accordance with Debnath *et al.* (2016), Balakrishnappa and Rajan (2010) and Goswami *et al.* (2015).

Table 4.1.3: Distribution of the respondents according to their farming experience (N=120)

Sl. No	Category	Assam		Karnataka	
		F	%	F	%
1	Low (<10 years)	19	31.66	20	33.33
2	Medium (10-25 years)	25	41.66	24	40
3	High (>25 years)	16	26.66	16	26.66
	Total	60	100.00	60	100.00
		Mean= 19.01 S.D = 2.94		Mean = 15.48 SD = 3.44	

Similarly, it was revealed from Table 4.1.3 and Fig. 4.1.3 from Karnataka that majority (40 percent) of the respondents had medium farming experience followed by low farming experience (33.33 %) and the rest of the farmers were having higher (26.66 %) farming experience. The reason could be due to the fact that majority of the respondents try to engage themselves in non-farming activities from their early age and only those who failed were used to take up silkworm rearing activities. Also, most of the

young farmers considered silkworm rearing as last option so, young age group of people had not chosen silkworm rearing as a professional activity and it was continued by their parents only. The results were in line with Sugiarto *et al.* (2019), Debnath *et al.* (2016), Yarazari (2020) and Ranjan *et al.* (2018).

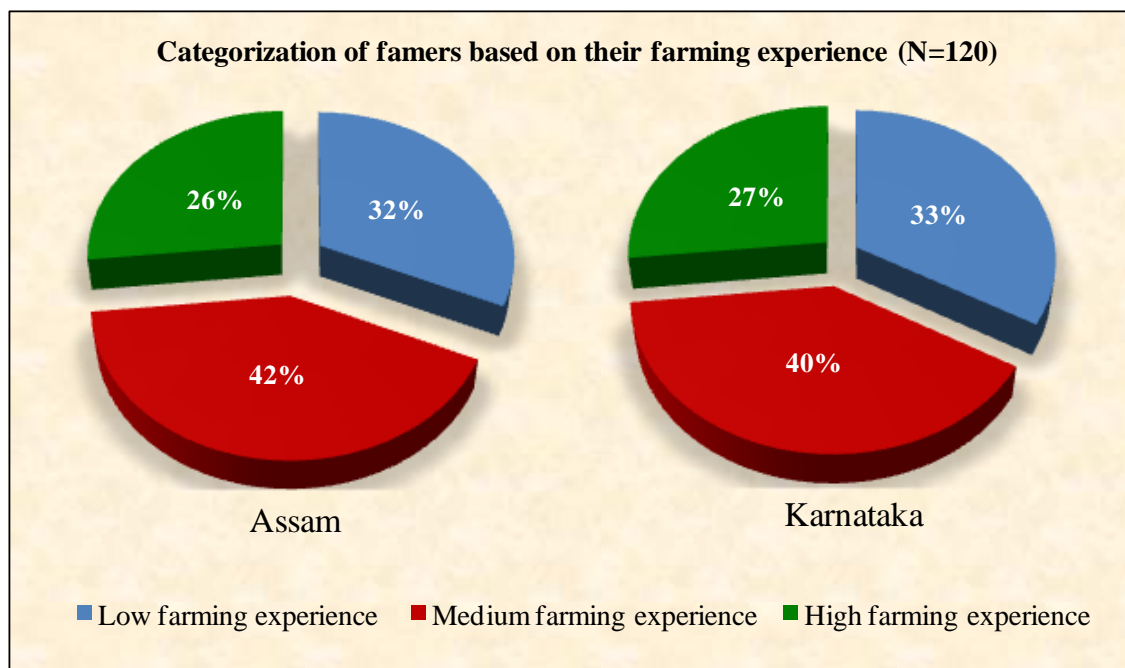


Fig 4.1.3: Distribution of the respondents according to their farming experience

4.1.4 Family size

It was observed from Table 4.1.4 and Fig. 4.1.4 from Assam that majority (63.33 %) of the farmers had medium families having 4-6 members followed by small (16.66 %) families having less than 4 members and rest (13.33 %) of the members belonged to large family having more than 6 members. The probable reason might be due to the fact that the majority of the respondents belonged to the middle age group. Highly educated respondents shifted to the cities and had a nuclear family. The results were in line with Sonowal (2016), Sadangi (2016) and Pegu (2018).

Similarly, the results presented in the Table 4.1.4 and Fig. 4.1.4 from Karnataka showed that majority (76.66 %) of the farmers had medium family having 4-6 members followed by small (11.66 %) and large (11.66 %) family having less than 4 members and more than 6 members in the family respectively. From the study, it was revealed that the majority of the farmers belonged to medium-size family and the probable reason might be due to the fact that most of the families were nuclear. The results were in

line with Mech and Ahmed (2012), Luo and Timothy (2017) and Prasertsang *et al.* (2020).

Table 4.1.4: Distribution of the respondents according to their family size (N=120)

Sl. no.	Categories	Assam		Karnataka	
		F	%	F	%
1	Small family (<4 members)	14	23.33	7	11.66
2	Medium family (4-6 members)	38	63.33	46	76.66
3	Large family (> 6 members)	8	13.33	7	11.66
Total		60	100.00	60	100.00
		Mean = 4.66 S.D = 0.88		Mean = 5.05 SD = 0.81	

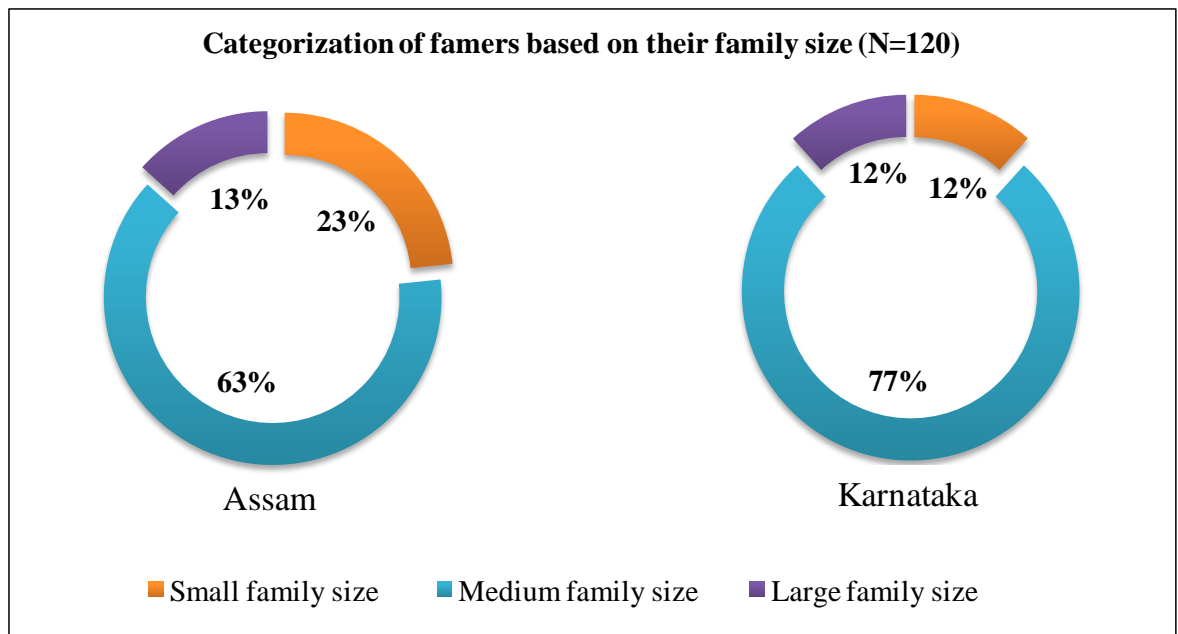


Fig 4.1.4: Distribution of the respondents according to their family size

4.1.5 Labour availability within the household

An overview of the Table 4.1.5 and Fig. 4.1.5 from Assam that majority (66.66 %) of the respondents had medium labour availability who were above 18 years (4-6 members) followed by low (15.00 %) labour availability (<4 members) and very few were high (5.00 %) labour availability (>6 members). The reason might be due to the fact that silkworm rearing is labour oriented activity and the families having members above 18 years become family labour and the majority of respondents belonged to the medium and low family size. The results were in accordance with Wakheta (2013) and Pandey *et al.* (2010).

Similarly, the results showed in the Table 4.1.5 and Fig. 4.1.5 from Karnataka that majority (81.66 %) of the respondents had medium labour availability who were above 18 years (4-6 members) followed by low (11.66 %) labour availability having less than 4 members in the family and very few were high (6.66 %) availability of labour having more than 6 members in the family. The results revealed that the majority of the respondents belonged to the medium labour available within households; the reason might be due to the fact that the majority of the farmers belonged to the medium family and above 18 years or adults who could engage as family labour in silkworm rearing activities. The results were in accordance with Wakheth (2013), Yarazari (2020) and Pandey *et al.* (2010).

Table 4.1.5: Distribution of the respondents according to their labour availability within the household (N=120)

Sl. no.	Categories	Assam		Karnataka	
		Frequency	Percentage	Frequency	Percentage
1	Low (<4 members)	15	25.00	7	11.66
2	Medium (4-6 members)	40	66.66	49	81.66
3	High (> 6 members)	5	8.33	4	6.66
Total		60	100.00	60	100.00
		Mean= 3.51 S.D = 0.65		Mean = 3.88 SD = 10.48	

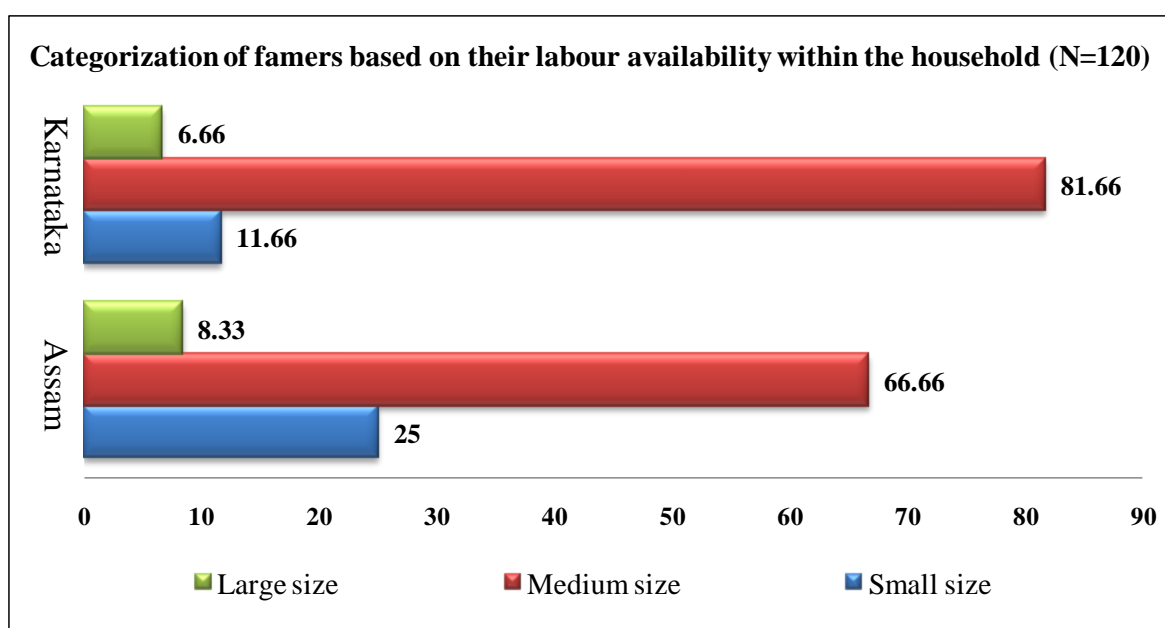


Fig 4.1.5: Distribution of the respondents according to their labour availability within the household

4.1.6 Annual family income

As evident from Table 4.1.6 and Fig. 4.1.6 from Assam that more than half (63.33 %) of the respondents belonged to medium level of annual income category followed by high (20.00 %) level of annual income and low (16.00 %) level of annual income. The probable reason for the medium and low-level annual family income was fragmentation of landholdings, medium and low farming experience, medium and low level of knowledge regarding the silkworm rearing practices. The results were in line with Shashidhara (2003), Suresh (2004), and Uddin *et al.* (2008).

Table 4.1.6: Distribution of the respondents according to their annual family income (N=120)

Sl. no.	Categories	Assam		Karnataka	
		F	%	F	%
1	Low	10	16.66	12	20.00
2	Medium	38	63.33	35	58.33
3	High	12	20.00	13	21.66
	Total	60	100.00	60	100.00
		Mean = 162850 S.D = 71386		Mean = 161083 SD = 71034	

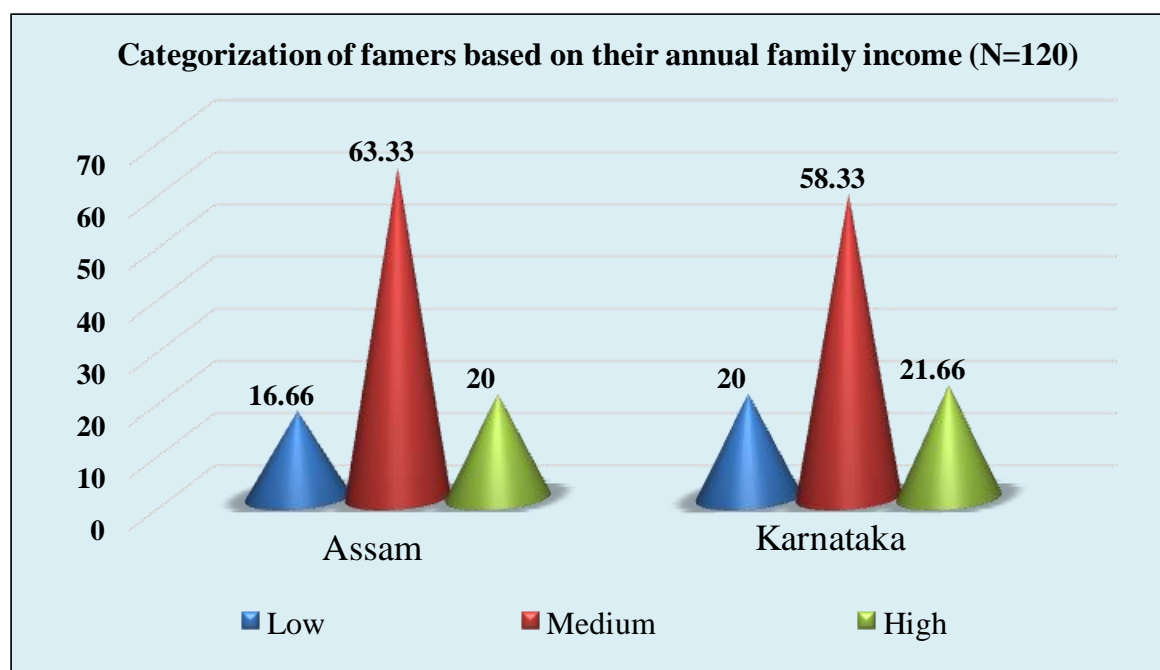


Fig 4.1.6: Distribution of the respondents according to their annual family income

Similarly, it was evident from Table 4.1.6 and Fig. 4.1.6 from Karnataka that more than half (58.33 %) of the respondents belonged to medium level of annual family income category followed by high (21.66 %) level of annual income and low (20.00

%) level of annual family income. It could be inferred from Table 4.1.6 and the reason might be due to the fact that the majority of the respondents belonged to the category of small and marginal landholdings. Apart from this, medium-level availability of farm equipments, medium extension contacts, and medium training exposure could also be the possible reasons for low annual family income. The results were in line with Suneeldutt and Chole (2002) Debnath *et al.* (2016) and Rathod *et al.* (2016) and Yarazari (2020).

4.1.7 Size of operational land holdings

It was observed from Table 4.1.7 and Fig. 4.1.7 from Assam that majority (48.33 %) of the farmers had small landholdings followed by semi-medium (25.00 %), marginal (16.66 %), and medium (10.00 %) landholding farmers. None of the farmers belonged to the large landholding category. The possible reasons for the small and marginal size of operational land hold could be due to large family size, fragmentation of landholdings from one generation to other generations. The results were in accordance with Ganpat *et al.* (2017), Uddin *et al.* (2008) and Rathod *et al.* (2016).

Similarly, it was observed from Table 4.1.7 and Fig. 4.1.7 from Karnataka that majority (55.00 %) of the farmers had small landholdings followed by semi-medium (30.00 %) and marginal land holding farmers (15.00 %). None of the farmers had medium and large-size operational landholding. The results of this study revealed that majority of the respondents were found to have nuclear families. The reason for this would be increase in population and also due to fragmentation of landholdings from one generation to another generation. The results were in accordance with Rathod *et al.* (2016), Yarazari (2020) and Aydogdu *et al.* (2018).

Table 4.1.7: Distribution of the respondents according to their size of operational land holdings (N=120)

Sl. No.	Category	Assam		Karnataka	
		F	%	F	%
1	Marginal (0-1 ha)	10	16.66	9	15.00
2	Small (1-2 ha)	29	48.33	33	55.00
3	Semi medium (2-4 ha)	15	25.00	18	30.00
4	Medium (4-10 ha)	6	10.00	0	0.00
5	Large (>10 ha)	0	0.00	0	0.00
Total		60	100.00	60	100.00
		Mean =2. 07 S.D = 1.29		Mean = 1.63 SD = 0.80	

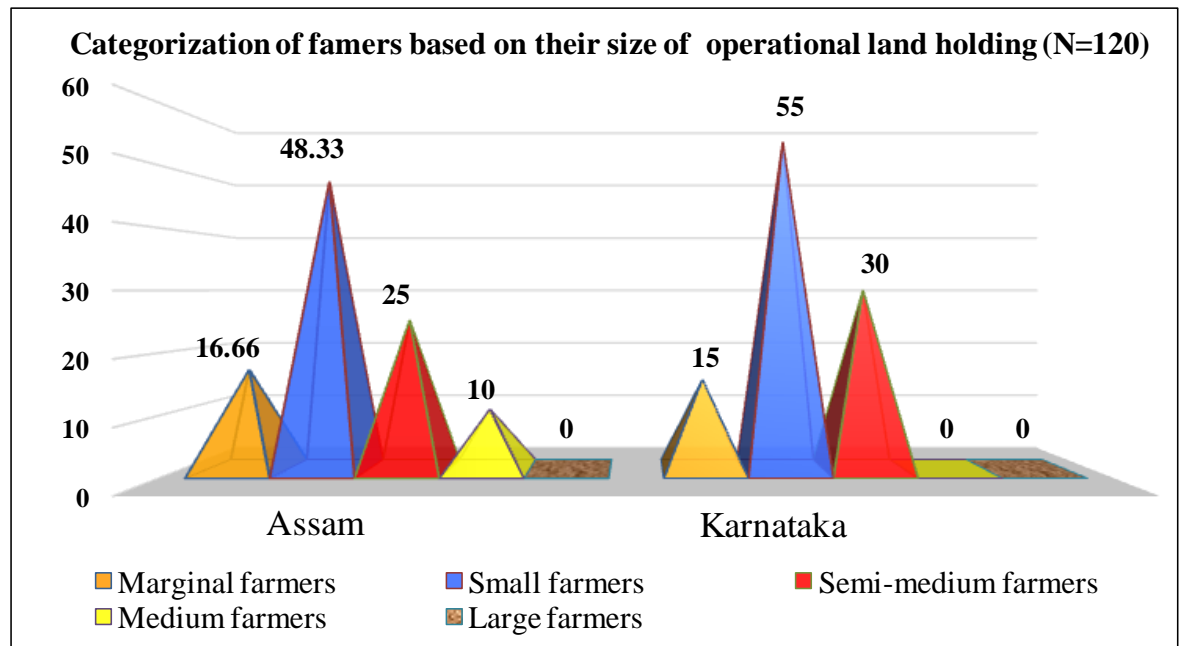


Fig 4.1.7: Distribution of the respondents according to their size of operational landholdings

4.1.8 Farm equipment availability

It was clear from Table 4.1.8 and Fig. 4.1.8 from Assam that majority (43.33 %) of the respondents had medium farm equipment availability with them followed by low (33.33 %) farm equipment availability and rest (23.33 %) of the respondent's falls under the category of high farm equipment availability. The reason might be due to the fact that low and medium levels of annual income as a results respondent were unable to afford the farm equipments, another possible reason could be resource-poor small farmers as they cannot invest in farm machinery. The results were in line with Prasad (1990), Archana (2012), and Punna Rao (1993).

Table 4.1.8: Distribution of the respondents according to their farm equipment availability (N=120)

Sl. No	Category	Assam		Karnataka	
		F	%	F	%
1	Low	20	33.33	20	33.33
2	Medium	26	43.33	22	36.66
3	High	14	23.33	18	30
Total		60	100	60	100
		Mean = 10.65	SD = 1.93	Mean = 26.56	SD = 2.45

Similarly, the data showed in the Table 4.1.8 and Fig. 4.1.8 from Karnataka that majority (36.66 %) of the respondents falls under the category of medium farm equipment availability with them followed by low (33.33 %) farm equipment availability and rest (30.00 %) of the respondents comes under the category of high farm equipment availability. The reason might be due to the fact that most of the necessary types of farm equipment were available on a shared basis along with other implements, owned in groups, and on a rent basis to get the work done. The results were in accordance with Zotawana (1987), Punna Rao (1993), Prasad (1990) and Archana (2012).

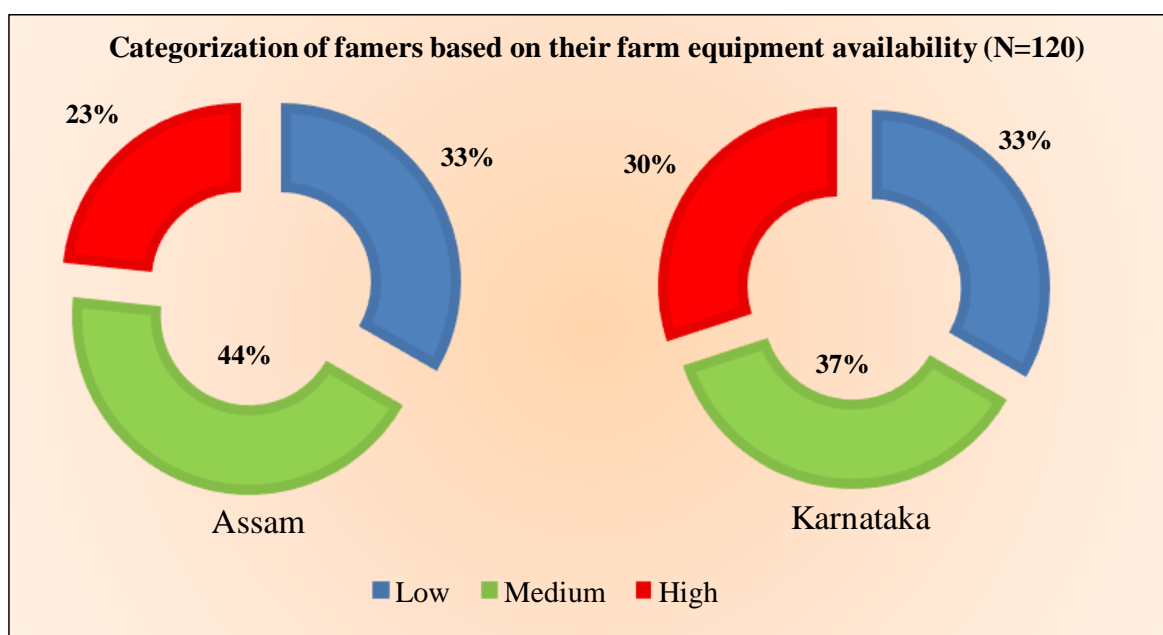


Fig 4.1.8: Distribution of the respondents according to their farm equipment availability

Table 4.1.8(i): Detailed analysis of farm equipment availability in Assam and Karnataka

(N=120)

Sl. No.	Category	Owned		Owned in groups		Hired		Shared (with other implement)		Never used		Owned		Owned in groups		Hired		Shared (with other implement)		Never used	
		F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%
1	Tractor	6	10.00	0	0.00	18	30.00	6	10.00	30	50.00	7	11.66	4	6.67	38	63.33	11	18.33	0	0.00
2	Power tiller	2	3.33	0	0.00	16	26.67	8	13.33	34	56.67	26	43.33	1	1.67	16	26.67	7	11.67	10	16.67
3	Sprayer	40	66.67	0	0.00	0	0.00	6	10.00	14	23.33	48	80.00	5	8.33	1	1.67	1	1.67	5	8.33
4	Drip/Sprinkler	1	1.67	0	0.00	0	0.00	2	3.33	57	95.00	5	8.33	5	8.33	14	23.33	26	43.33	10	16.67
5	Shoot harvester	0	0.00	0	0.00	4	6.67	8	13.33	48	80.00	6	10.00	8	13.33	17	28.33	23	38.33	6	10.00
6	Power tiller sprayer	0	0.00	0	0.00	3	5.00	2	3.33	55	91.67	1	1.66	23	38.33	15	25.00	11	18.33	10	16.67
7	Fertilizer applicator	0	0.00	0	0.00	2	3.33	3	5.00	55	91.67	0	0.00	26	43.33	11	18.33	11	18.33	12	20.00
8	Pruning machine	0	0.00	0	0.00	15	25.00	6	10.00	39	65.00	28	46.66	5	8.33	17	28.33	2	3.33	8	13.33
9	Leaf chopping machine	0	0.00	0	0.00	12	20.00	9	15.00	39	65.00	54	90.00	1	1.67	4	6.67	0	0.00	1	1.67
10	Cocoon harvester	0	0.00	0	0.00	1	1.67	1	1.67	58	96.67	0	0.00	11	18.33	8	13.33	12	20.00	29	48.33
11	Secateurs	50	83.33	0	0.00	0	0.00	3	5.00	7	11.67	58	96.66	0	0.00	1	1.67	1	1.67	0	0.00
12	Others	11	18.33	0	0.00	0	0.00	3	5.00	46	76.67	1	1.66	0	0.00	1	1.67	0	0.00	58	96.67

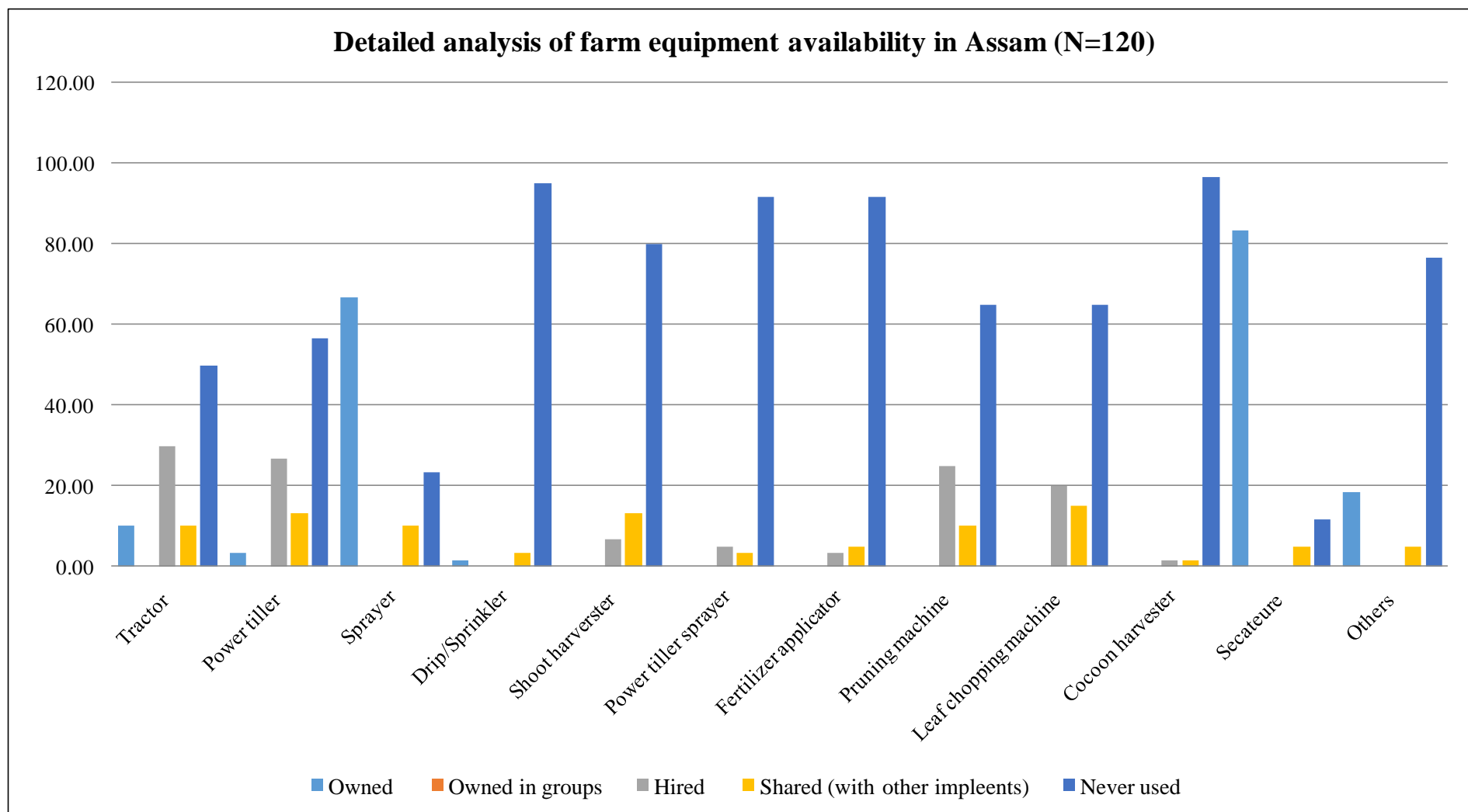


Fig. 4.1.8(i): Detailed analysis of farm equipment availability in Assam

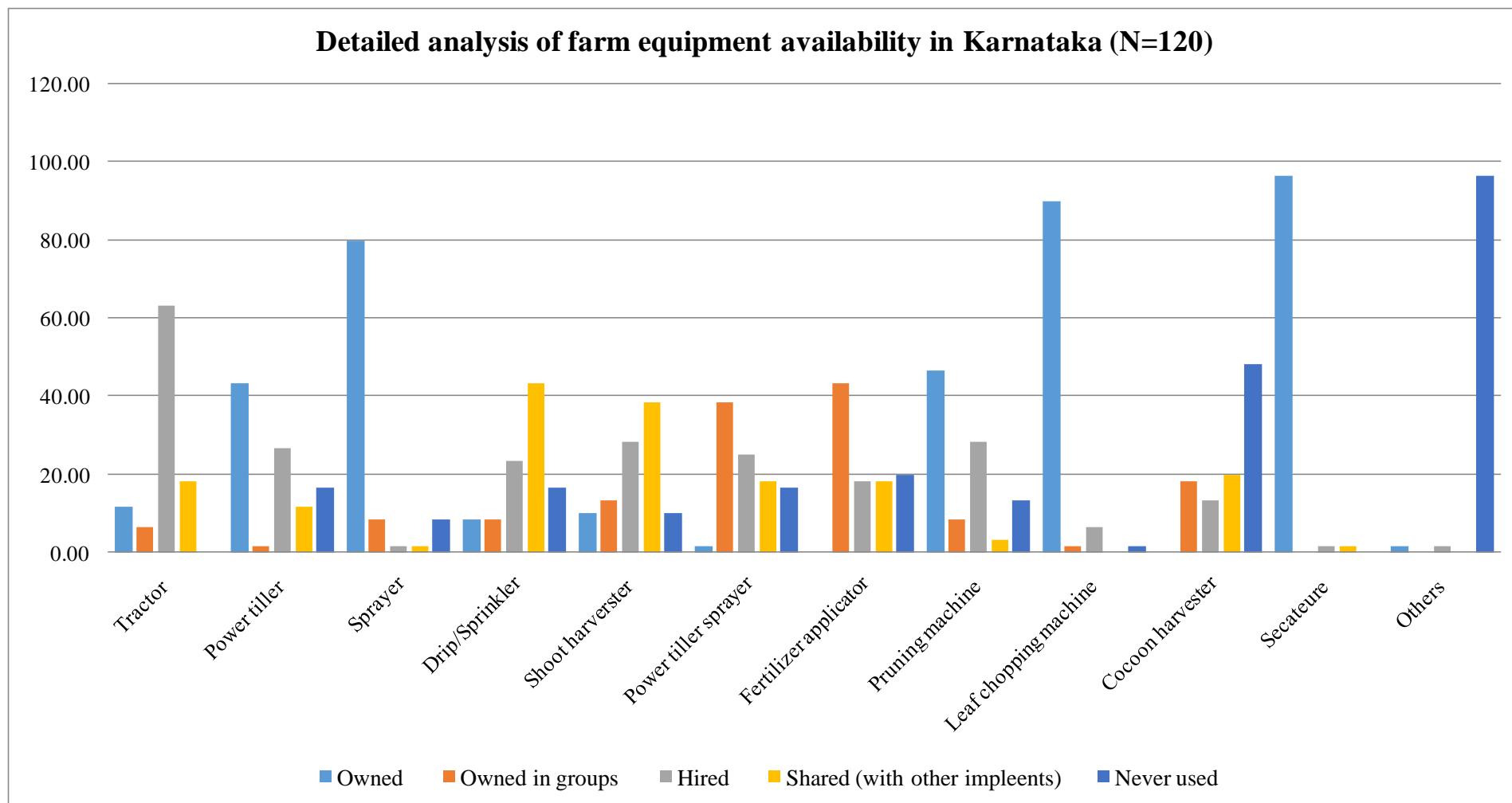


Fig. 4.1.8(ii): Detailed analysis of farm equipment availability in Karnataka

4.1.9 Extension contact

An overview of Table 4.1.9 and Fig. 4.1.9 from Assam that majority (70.00 %) of the respondents belonged to the category of medium extension contact followed by the high (23.33 %) extension contact and low (6.66 %) extension contact. As per the results, few respondents belonged to the low extension category, this is due to the fact that lack of visits of extension workers to those areas and lack of interest and participation of respondents in meetings, the inability of the extension workers to reach all the sections of the peoples. The results were in accordance with Suneeldutt and Chole (2002), Dutta and Chole (2002) Ranjan *et al.* (2017) and Ganpat *et al.* (2017).

Table 4.1.9: Distribution of the respondents according to their extension contact (N=120)

Sl. No	Category	Assam		Karnataka	
		F	%	F	%
1	Low	04	06.66	07	11.66
2	Medium	42	70.00	47	78.33
3	High	14	23.33	06	10.00
Total		60	100.00	60	100.00
		Mean = 7	SD = 2.254	Mean = 7.83	SD = 2.256

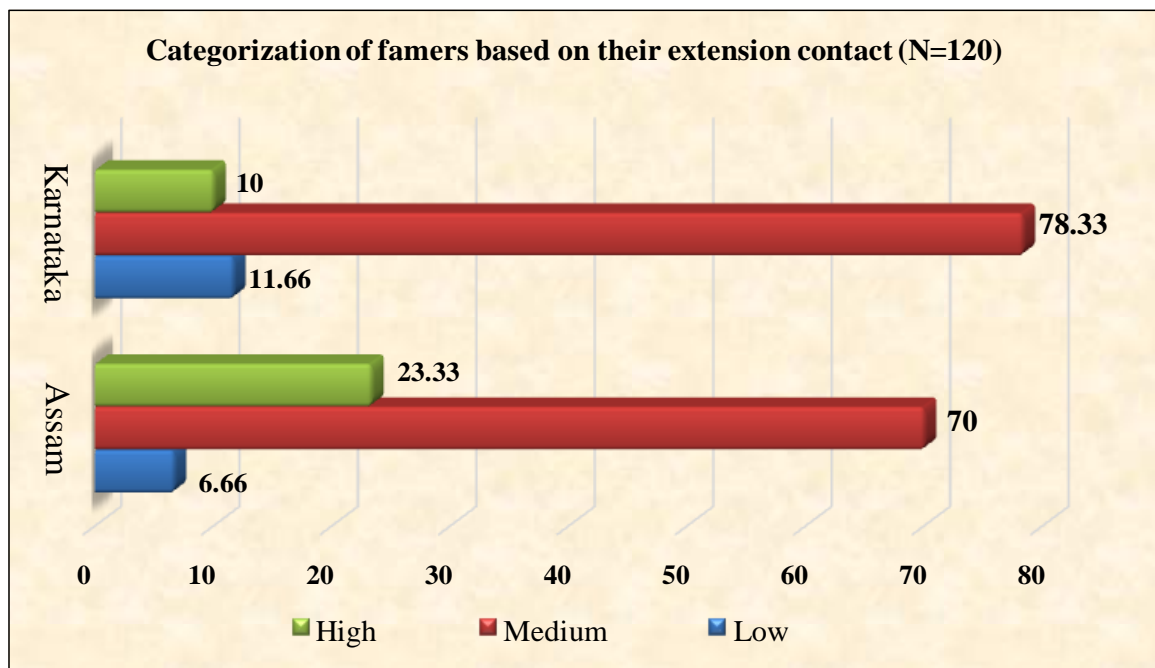


Fig 4.1.9: Distribution of the respondents according to their extension contact

Similarly, the results presented in the Table 4.1.9 and Fig. 4.1.9 from Karnataka that majority (78.33 %) of the farmers belonged to medium extension contact followed by low (11.66 %) and high (10.00 %) extension contact with farmers. The possible reason might be due to the fact that majority of the farmers had medium level of extension contact, which is a good indication and therefore, it might provide to reach all the farmers and to bring desirable changes. More efforts to reach the respondents who had low extension contact and make them adopt new scientific silkworm rearing practices by conducting training programmes and group meetings by the extension officers. The results were in line with Uddin *et al.* (2008), Dutta and Chole (2002) and Ganpat *et al.* (2017).

Table 4.1.9(i): Detailed analysis of extension contact in Assam and Karnataka**(N=120)**

Sl. No.	Category	Assam								Karnataka							
		Frequently (15 days)		Often (30days)		Seldom (60 days)		Never		Frequently (15 days)		Often (30days)		Seldom (60 days)		Never	
		F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%
1	VLEW	0	0.00	1	1.67	13	21.67	46	76.7	0	0.00	0	0.00	38	63.33	22	36.67
2	SEO	0	0.00	35	58.33	23	38.33	2	3.3	3	5.00	27	45.00	30	50.00	0	0.00
3	SI/SD	51	85.00	3	5.00	4	6.67	2	3.3	51	85.00	9	15.00	0	0.00	0	0.00
4	CSB Scientists	0	0.00	0	0.00	6	10.00	54	90.0	0	0.00	0	0.00	33	55.00	27	45.00
5	KVK/ AAU Scientists	0	0.00	2	3.33	36	60.00	22	36.7	0	0.00	18	30.00	42	70.00	0	0.00
6	NGO	0	0.00	0	0.00	9	15.00	51	85.00	0	0.00	1	1.67	15	25.00	44	73.33
7	Others	0	0.00	10	16.67	6	10.00	44	73.3	0	0.00	31	51.67	1	1.67	28	46.67

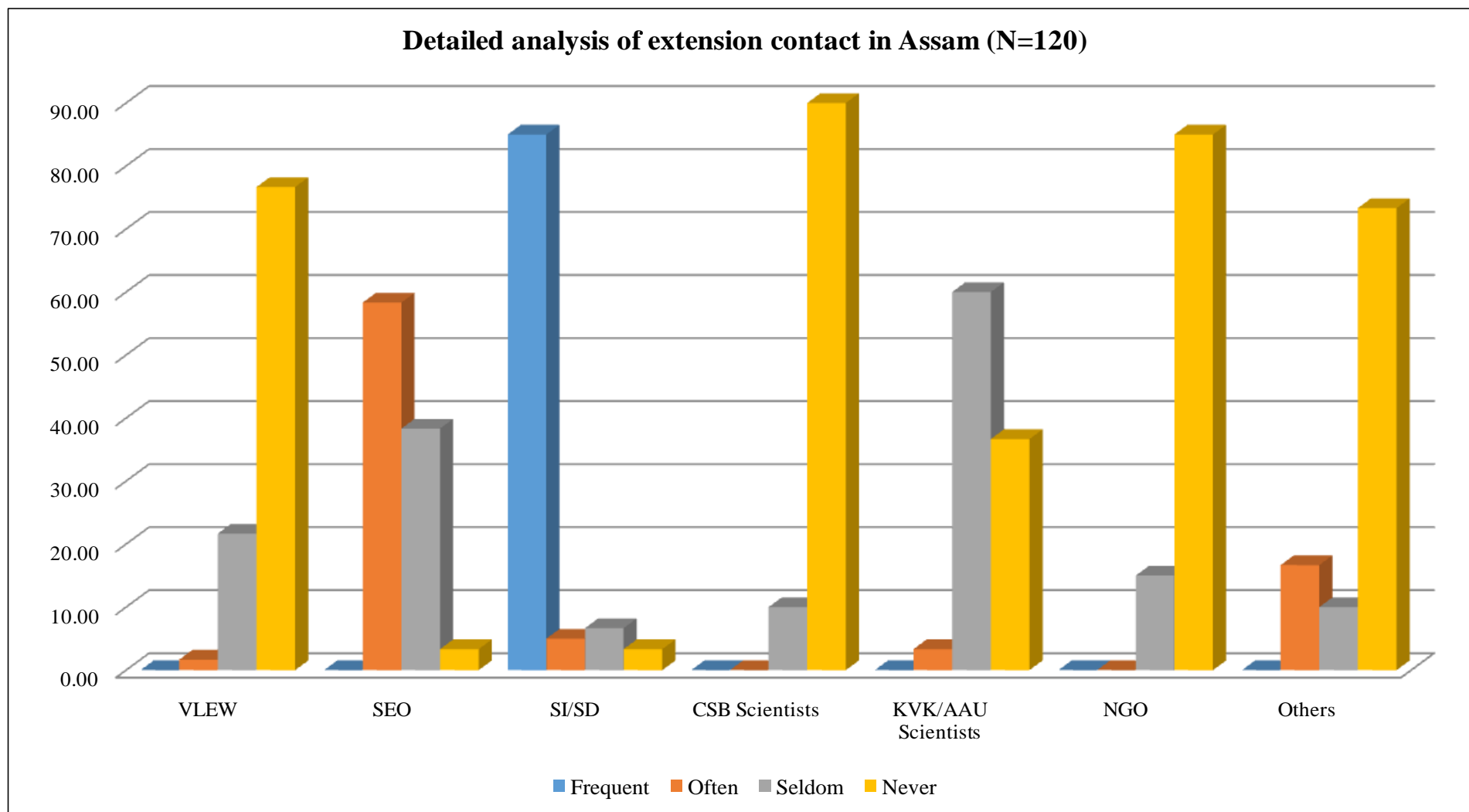


Fig 4.1.9(i): Detailed analysis of extension contact of farmers in Assam

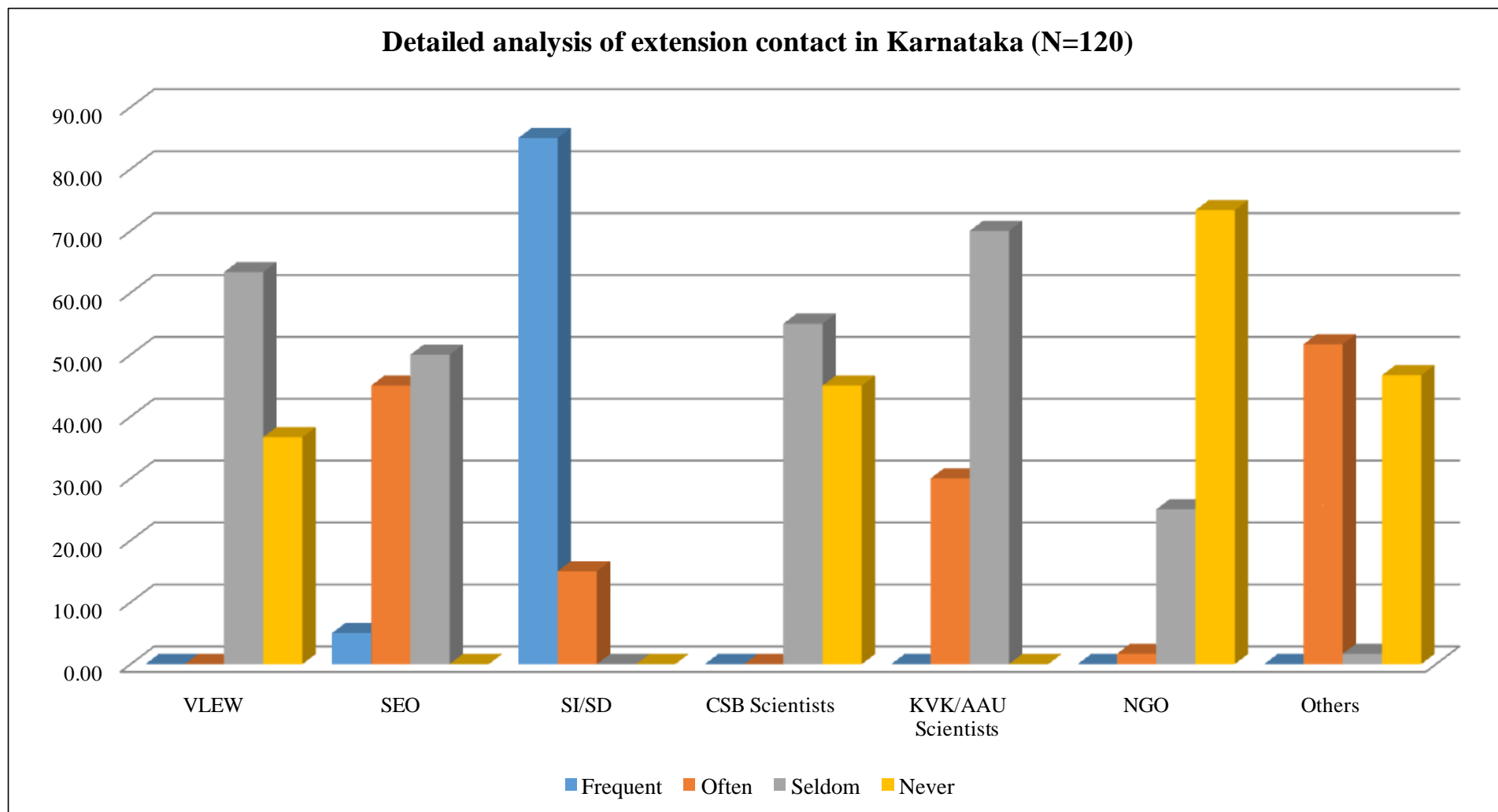


Fig 4.1.9(ii): Detailed analysis of extension contact of farmers in Karnataka

4.1.10 Membership in the farming organization

It is evident from Table 4.1.10 and Fig. 4.1.10(i) & 4.1.10(ii) from Assam that more than half (56.66 %) of the respondents were not a member of any of the farming organizations and 43.33 per cent of the respondents were registered as a member of the farming organizations. Out of those who were members (43.33 %) of the farming organization, majority of the respondents (28.33 %) occasionally participated in the group meetings followed by regular (8.33 %) and remaining (6.66 %) respondents never participated in the group meetings. The probable reason for members and non-members of the farming organization was lack of awareness, less exposure to training, less interaction with extension personnel. Those who were a member of the farming organizations had contact with extension workers for solving their problems and also having more interest in participating in the group meetings to get the latest information related to the silkworm rearing practices. The results were in accordance with Pandey *et al.* (2015), Nishi and Kumar (2016) and Rathod *et al.* (2016).

Table 4.1.10: Distribution of the respondents according to their membership in the farming organization

Category	(N=120)			
	Assam		Karnataka	
	F	%	F	%
Membership position				
a) Member	26	43.34	41	68.34
b) Non- member	34	56.66	19	31.66
Total	60	100.00	60	100.00
Participation in the meetings of the institution				
a) Regular	5	08.34	8	13.34
b) Occasionally	17	28.34	27	45.00
c) Never	04	06.66	06	10.00

Similarly, from Table 4.1.10 and Fig. 4.1.10(i) & 4.1.10(ii) from Karnataka, it was revealed that 68.34 per cent of the respondents were registered members of the farming organization, and 31.66 per cent of the respondents were not registered as a member of the farming organization. Those who were a member of the farming organization, the majority (45.00 %) of the respondents occasionally participated in the group meetings of institutions followed by regular (13.33 %) and the rest (10.00 %) of the respondents never participated in the group meetings.

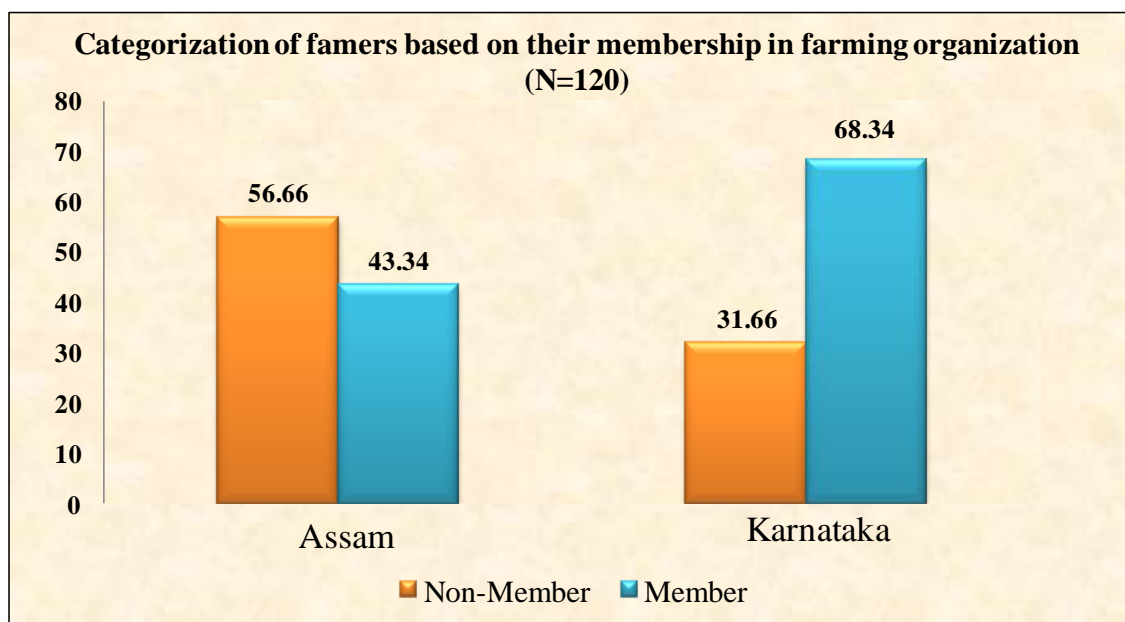


Fig 4.1.10(i): Distribution of the respondents according to their membership in the farming organization

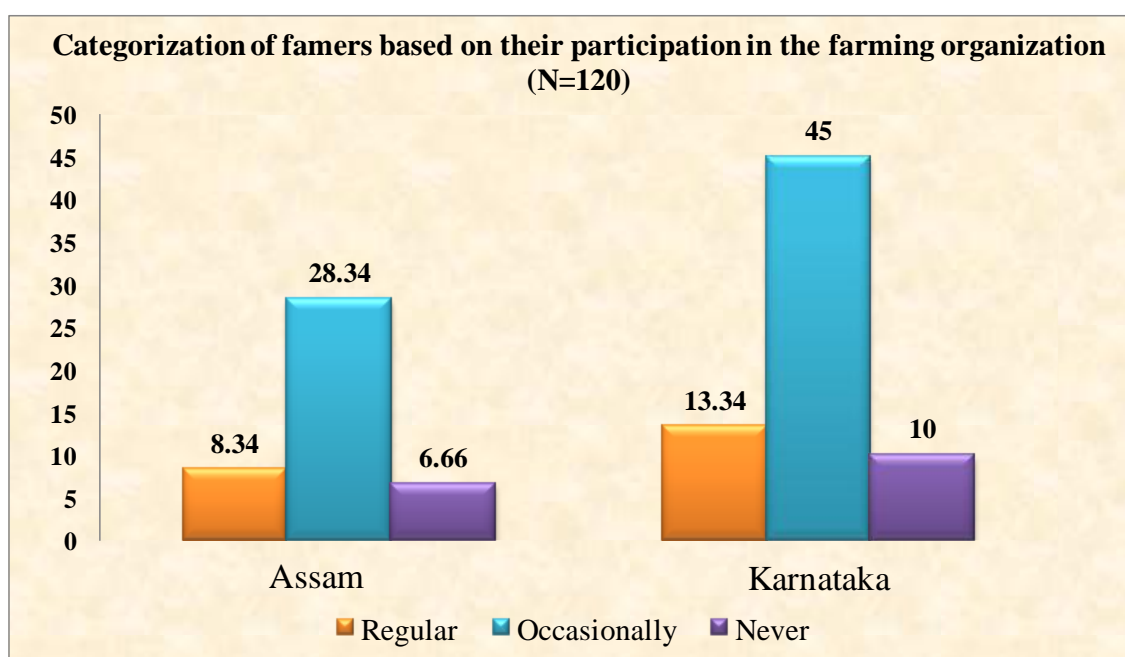


Fig 4.1.10(ii): Distribution of the respondents according to their participation in the farming organization

The reason might be due to the fact that the majority of the respondents had medium training exposure, less extension contact, fewer communication channels used for collecting the information and there was also less interest in the farming organization as well as the less participation in the group meeting in the farming institutions. Hence, it is desired to encourage the farmers to become members of any farming organization. The

results were in accordance with Ganpat *et al.* (2017) and Nishi and Kumar (2016), Rathod *et al.* (2016), Pandey *et al.* (2015) and Ganpat *et al.* (2014).

4.1.11 Extent of communication channels used for collecting information

The results presented in the Table 4.1.11 and Fig. 4.1.11 from Assam showed that majority (46.66 %) of the respondents had medium communication channels used for collecting information followed by high (31.66 %) and rest (21.66 %) of the respondents had low communication channels used for collecting information. The reason might be due to the fact that the low level annual income category of respondents were unable to purchase the different information collecting tools, The results were in accordance with Ranjan *et al.* (2017), Hasan and Sharma (2011) and Awatade *et al.* (2018).

Similarly, it was evident from Table 4.1.11 and Fig. 4.1.11 from Karnataka that majority (45.00 %) of the respondents belonged to the medium category of communication channels used for collecting information followed by high (30.00 %) and rest (25.00 %) of the respondents belonged to low communication channels used for collecting information. The majority of the farmers belonged to middle age and old age category; hence, their interest in utilization of mass media might be low because of their old age. Further, the majority of the farmers belonged to small landholding and a low level of education that restricted them to medium level in communication channels used for collecting information. Better utilization of available communication channels to get accurate and up-to-date information might help to get better price of cocoon and silk price thereby to get more profit. The results were in accordance with Ranjan *et al.* (2017), Awatade *et al.* (2018), Avilesh *et al.* (2017), Ganpat *et al.* (2014), Ogbonna and Agwu (2013) and Upadhyay *et al.* (2011).

Table 4.1.11: Distribution of the respondents according to their extent of communication channels used for collecting information (N=120)

Sl. No.	Category	Assam		Karnataka	
		F	%	F	%
1	Low	13	21.66	15	25
2	Medium	28	46.66	27	45
3	High	19	31.66	18	30
Total		60	100.00	60	100.00
		Mean =14.4	SD = 1.16	Mean = 15	SD = 1.82

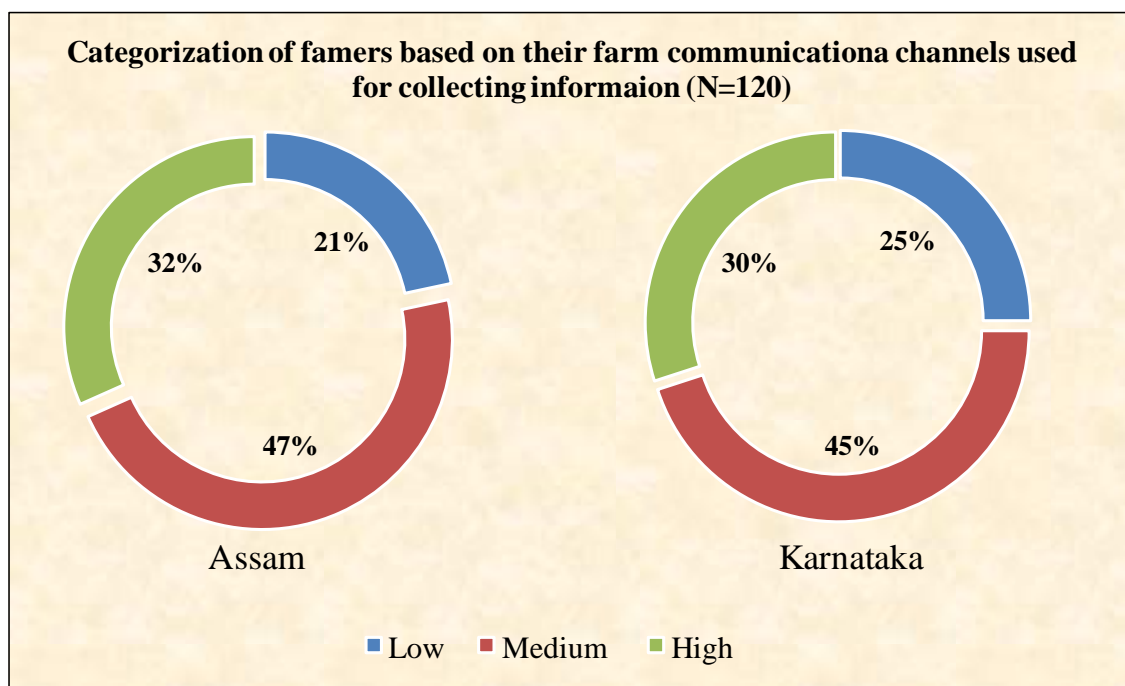


Fig 4.1.11: Distribution of the respondents according to their extent of communication channels used for collecting information

Table 4.1.11(i): Detailed analysis of extent of communication channels used for collecting information in Assam and Karnataka (N=120)

Sl. N.	Category	Assam								Karnataka							
		Most regular		Regular		Not regular		Never		Most regular		Regular		Not regular		Never	
1	Extension agent	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%
2	Radio	11	18.33	5	8.33	27	45	17	28.33	0	0	0	0	45	75	15	25
3	Television	0	0	0	0	28	46.67	32	53.33	0	0	9	15	42	70	9	15
4	Print media	37	61.67	16	26.67	7	11.67	0	0	25	41.67	35	58.33	0	0	0	0
5	Social media	6	10	5	8.33	39	65.00	10	16.67	1	1.67	46	76.67	13	21.67	0	0
6	Fellow farmers/Neighbours	3	5	4	6.67	48	80	5	8.33	2	3.33	24	40	34	56.67	0	0
7	Group meetings	37	61.67	20	33.33	2	3.33	1	1.67	43	71.67	15	25	1	1.67	1	1.67
8	Training/ Exposure visits	3	5.00	4	6.67	46	76.67	7	11.67	0	0	29	48.33	9	15	22	36.67
9	Field day/ Exhibition	2	3.33	18	30	30	50	10	16.67	0	0	30	50	19	31.67	11	18.33
10	Diff. commuter-based information sources/mobile apps	0	0	8	13.33	44	73.33	8	13.33	0	0	8	13.33	37	61.67	15	25
11	KCC	0	0	3	5	26	43.33	31	51.67	0	0	0	0	40	66.67	20	33.33
12	others	0	0	0	0	44	73.33	16	26.67	0	0	0	0	44	73.33	16	26.67

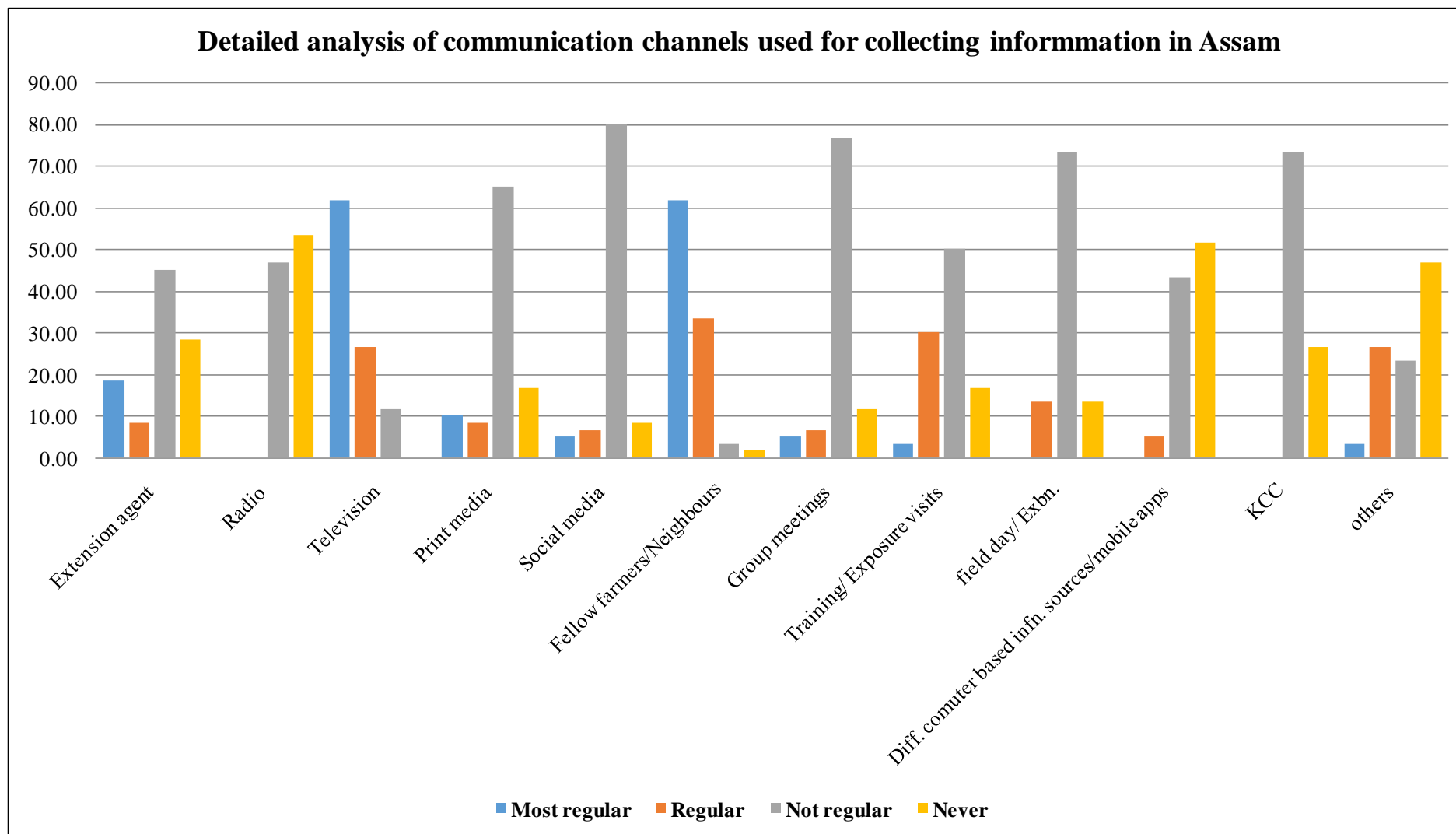


Fig. 4.1.11(i) Detailed analysis of communication channels used for collecting information in Assam

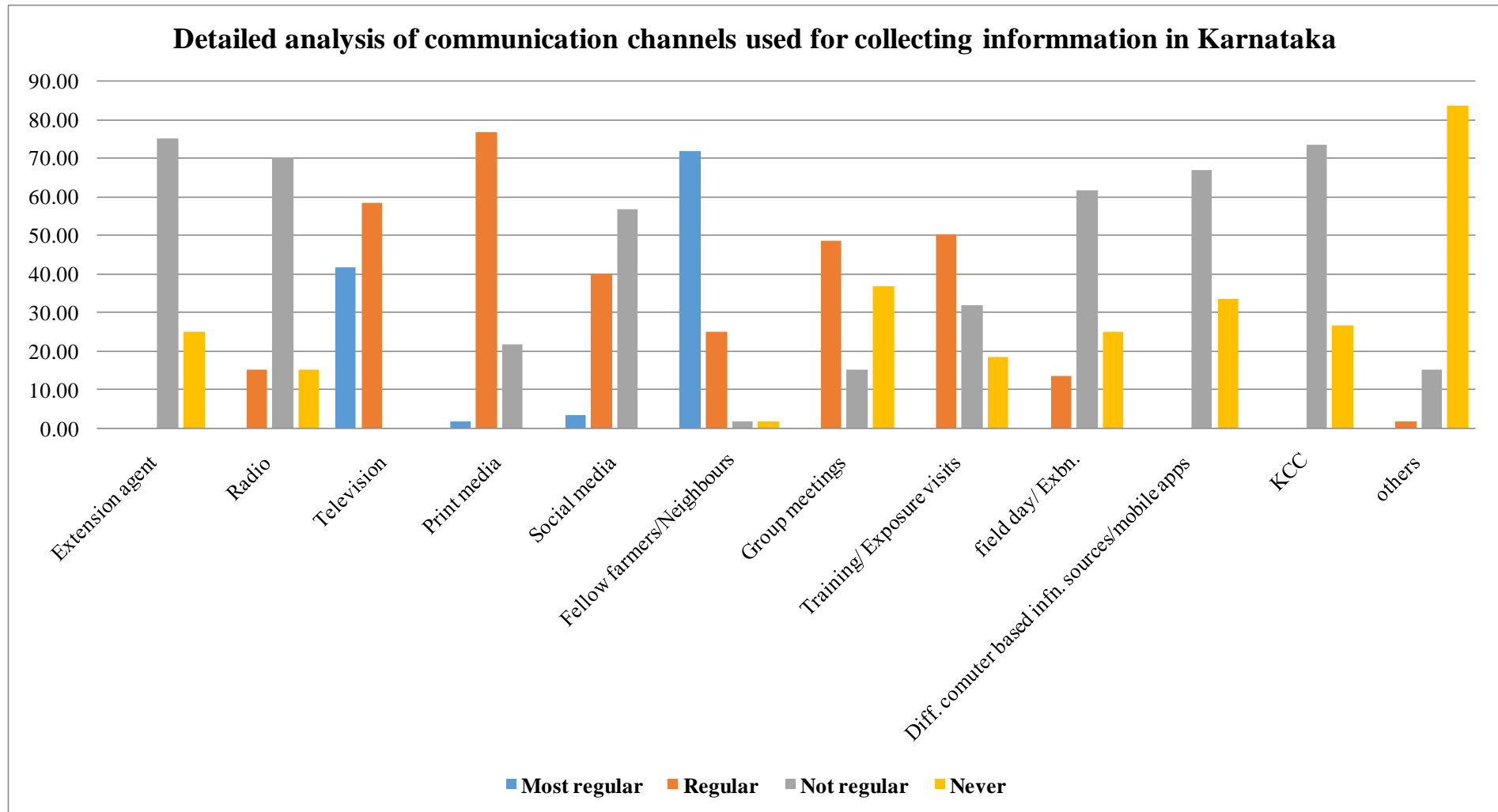


Fig. 4.1.11(ii) Detailed analysis of communication channels used for collecting information in Karnataka

4.1.12 Training exposure

As evident from Table 4.1.12 and Fig. 4.1.12 from Assam that majority (46.66 %) of the respondents falls under the category of medium training exposure followed by low (40.00 %) training and rest (13.33 %) of the respondents comes under the high training exposure category.

The reason for low training exposure in Assam state was due to the fact that lack of extension workers visits to the farmers field, less awareness of training programmes importance, less knowledge about the importance of training programmes, and lack of interest to attend the training programmes. The results were in line with Ramalakshmi (2012), Pandey *et al.* (2015), Asokhan *et al.* (2008), Sarada and Prabhakar (2009) and Chetia (2013).

Similarly, it was clear from the Table 4.1.12 and Fig. 4.1.12 from Karnataka that majority (66.66 %) of the respondents falls under the category of medium training exposure followed by low (23.33 %) training and rest (10.00 %) of the respondents come under the high training exposure category.

The reason could be the fact that low level of knowledge regarding the importance of attending the training programmes and less interest in attending the training programmes. Hence, there is a great opportunity to create awareness among the farmers about the importance of the training programmes which will bring the desirable changes among the farmers. So that, they could better utilize the training thereby they could get more knowledge on scientific silkworm rearing practices. The results were in line with Ramalakshmi (2012), Chetia (2013), Chauhan (2010), Manju (1997) and Pandey *et al.* (2015).

Table 4.1.12: Distribution of the respondents according to their training exposure (N=120)

Sl. No.	Category	Assam		Karnataka	
		F	%	F	%
1	Low (<7 days)	24	40	14	23.33
2	Medium (7-14 days)	28	46.66	40	66.66
3	High (>14 days)	8	13.33	6	10
	Total	60	100	60	100
		Mean = 1.5	SD = 0.87	Mean = 1.76	SD = 0.69

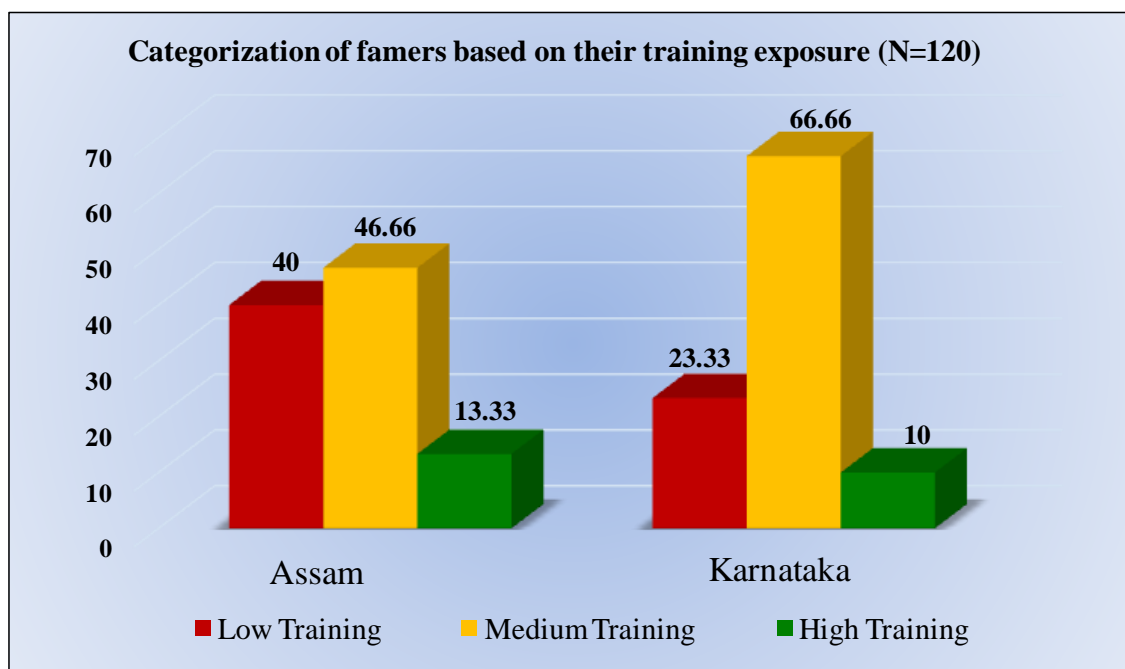


Fig 4.1.12: Distribution of the respondents according to their training exposure

4.1.13 Knowledge level of the farmers about host plant cultivation and silkworm rearing

A perusal of Table 4.1.13 and Fig. 4.1.13 from Assam that majority (60.00 %) of the sericulture farmers belong to the medium level of knowledge category followed by high (21.66 %) level of knowledge and rest (18.33 %) of the sericulture farmers falls under the category of low level of knowledge. The reasons for low level of knowledge regarding the silkworm rearing practices were, low farming experience, more number of young aged and middle aged respondents, and their age might limit their knowledge to medium level. The results were in accordance with Khalache and Gaikwad (2011), Ali *et al.* (2013), Susikaran and Sridhar (2013), Rathod *et al.* (2016) and Kamble (2008).

Similarly, it was clear from Table 4.1.13 and Fig. 4.1.13 from Karnataka that majority (60.00 %) of the silkworm rearers fall under the category of medium level knowledge and 20.00 per cent of the respondents had high level of knowledge and low (20.00 %) level of knowledge regarding the host plant cultivation and silkworm rearing practices. The reason might be due to the fact that the majority of the respondents belonged to the middle-age category, having lack of education, lack of farming experience, and low training exposure, might restrict the farmers to the medium level of knowledge regarding the host plant cultivation and silkworm rearing practices. The results were in accordance

with Mech *et al.* (2016), Khalache and Gaikwad (2011), Rathod *et al.* (2016), Yarazari (2020), Kamble (2008) and Moulasab *et al.* (2017).

Table 4.1.13: Distribution of the respondents according to their knowledge level of farmers about host plant cultivation and silkworm rearing (N=120)

Sl. No.	Category	Assam		Karnataka	
		F	%	F	%
1	Low	11	18.33	12	20.00
2	Medium	36	60.00	36	60.00
3	High	13	21.66	12	20.00
Total		60	100.00	60	100.00
		Mean = 15.03 SD = 1.02		Mean = 15.01 SD = 0.91	

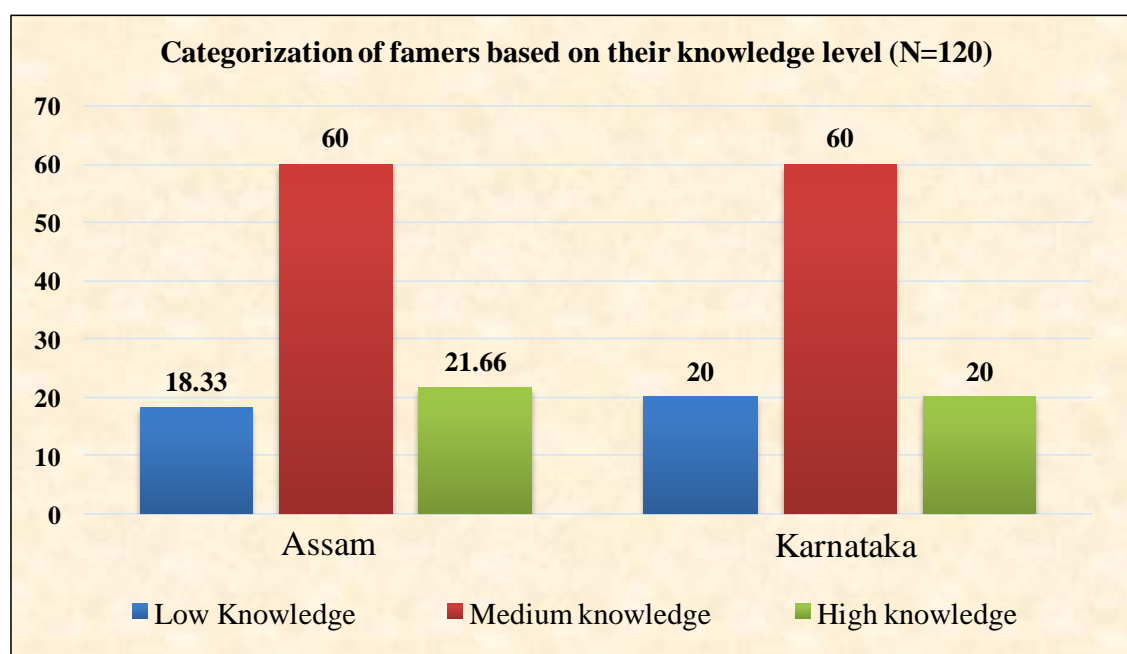


Fig 4.1.13: Distribution of the respondents according to their knowledge level of farmers about host plant cultivation and silkworm rearing

4.2 Level of satisfaction of silkworm rearers from sericultural extension services

It could be inferred from Table 4.2 and Fig. 4.2 from the state of Assam that majority (68.33 %) of the respondents falls under the category of medium level of satisfaction followed by 16.66 per cent of the respondents who belonged to the low level of satisfaction and rest (15.00 %) of the respondents comes under the high level of satisfaction category.

Majority of the respondents had expressed a medium level of satisfaction with sericultural extension services. The reason might be due to the fact that, extension

workers were unable to provide the services up to the desired level. Respondents were never asked about their opinions, promises made to the respondents were not kept by the extension workers, farmers were not treated fairly and equally, extension officers had difficulty in contacting farmers, at the time of their needs sericultural extension officers were not ready to help all the respondents, when sericulture officers want to do something farmers opinion were not taken into consideration. Therefore, study results showed medium and low level of farmers' satisfaction with sericultural extension services. The results were in line with Elias *et al.* (2016), Naz (2018), Awatade *et al.* (2019), Sugiarto *et al.* (2019) and Chaturvedani *et al.* (2016).

Table 4.2: Distribution of respondents according to their level of satisfaction

Sl. No.	Category	Assam		Karnataka	
		F	%	F	%
1	Low	10	16.66	9	15.00
2	Medium	41	68.33	45	75.00
3	High	9	15.00	6	10.00
	Total	60	100.00	60	100.00
		Mean = 58.33 S.D = 6.51		Mean = 47.61 S.D = 6.69	

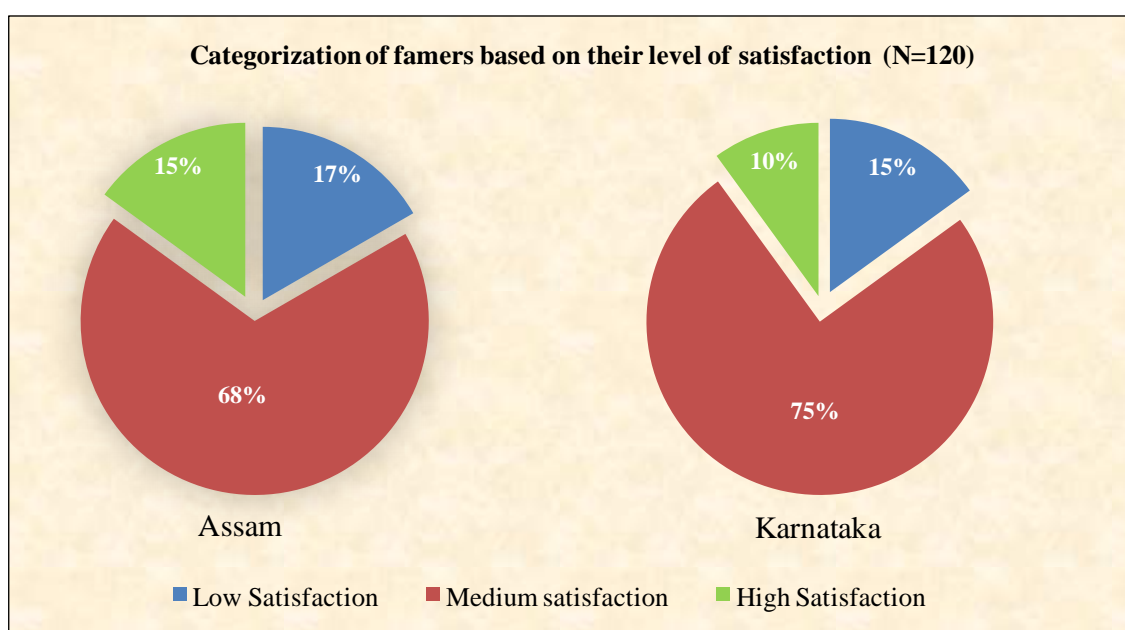


Fig 4.2: Distribution of respondents according to their level of satisfaction

Similarly, it was evident from Table 4.2 and Fig. 4.2 from Karnataka that majority (75.00 %) of the respondents belonged to the medium level of satisfaction followed by 15 per cent of the respondents were low level of satisfaction and rest of the farmers belonged to high (10.00 %) level of satisfaction.

The reason might be due to the fact that in-time availability of sericultural extension services was not up to the desired level, fewer visits to the sericulture farmers' field. A higher level of education may be disappointed with the quality of technical advice received from the sericultural extension officers. More educated silkworm rearers were more comfortable in using the technologies to get sericulture-related information. In addition to this, low education, low farming experience, low communication channels used would make farmers difficult to understand the technical services provided by the sericultural extension officers. Hence, silkworm rearers showed medium and low level of satisfaction with sericultural extension services. The results were in accordance with Ovharhe *et al.* (2020), Kassem *et al.* (2021), Agholor *et al.* (2013), Ganpat *et al.* (2014), Rathod *et al.* (2016), Adesiji *et al.* (2010), Awatade *et al.* (2019) Chand *et al.* (2014) and Chaturvedani *et al.* (2016).

4.2.1 Independent sample t-test analysis for assessment of difference in level of satisfaction of silkworm rearers from sericultural extension services in Assam and Karnataka

Independent t-test was administered to assess the differences in level of satisfaction of silkworm rearers. From Table 4.2.1 we observed that satisfaction level of farmers from sericultural extension services of Assam and Karnataka was significant ($t=8.887$) ($p=0.000$) and the reason for this were, silkworm rearers of Assam had lower membership position and occasionally participated in the group meetings which leads to medium and low level of farmers satisfaction from sericultural extension services. The number of trainings conducted by the extension officers were very less as compared to Karnataka State Department of Sericulture, the reason might be extension officers were unable to cover all the section of the silkworm rearers, less interest of silkworm rearers in attending training programmes, less field visits by the extension officers, unable to provide the quality advisory supportive services to the silkworm rearers. The knowledge level of silkworm rearers on host plant cultivation and silkworm rearing practices was low and medium as compared to Karnataka silkworm rearers, the reason might be majority of silkworm rearers had low farming experience, more number of young aged and middle aged respondents, and their age might limit their knowledge to medium level. The State Department of Sericulture was doing its best to satisfy the silkworm rearers but still farmers feel it as less.

In case of Karnataka, silkworm rearers had higher membership position in farming organization and level of participation in the group meetings too, the probable reason might be, silkworm rearers had more training exposure as compared to Assam silkworm rearers. Here, silkworm rearers were more satisfied with the extension advisory services provided by the agents in farmers' group meetings. Silkworm rearers had medium extension contact as compared to Assam silkworm rearers. Here, silkworm rearers were moderately satisfied with sericultural extension services. Level of satisfaction of farmers from sericultural extension services from the both the states it was medium level. The difference in the level of satisfaction from both states it was significant. However, both the state extension service providers should improve their activities to satisfy the silkworm rearers.

Table 4.2.1: Independent sample t-test for assessment of difference in level of satisfaction of silkworm rearers

Levene's test for equality of variance		t-test for equality of means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Score	Equal variances assumed	0.73	0.392	8.887	118	0.00	10.71667	1.20586
	Equal variances not assumed			8.887	117.07	0.00	10.71667	1.20586

4.3 Relationship with the selected profile characteristics and level of satisfaction of silkworm rearers from sericultural extension services

4.3.1 Relationship with the selected profile characteristics and level of satisfaction of silkworm rearers from sericultural extension services in Assam

To understand the nature of the relationship between selected profile characteristics of the silkworm rearers with their level of satisfaction from sericultural extension services an attempt had been made to find out if there exists any relationship of the profile characteristics of silkworm rearers viz., age, educational level, farming experience, family size, labour availability within the household, annual family income, size of operational landholdings, farm equipment availability, extension contact, membership in farming organization, extent of communication channels used for collecting

information, training exposure and knowledge level of farmers about the cultivation of host plants and silkworm rearing practices with the level of satisfaction of silkworm rearers from sericultural extension services in Assam.

Table 4.3.1: Correlation coefficient of profile characteristics of farmers with the level of satisfaction from sericultural extension services in Assam

Sl. No.	Independent variables	'r' values	p values
1	Age	0.328*	0.011
2	Farming experience	0.322*	0.012
3	Family size	0.261*	0.044
4	Labour availability within the households	0.266*	0.040
5	Annual family income	0.294*	0.023
6	Size of operational landholdings	0.265*	0.041
7	Farm equipment availability	-0.179 NS	0.171
8	Extension contact	0.285*	0.027
9	Extent of communication channels used for collecting information	0.336**	0.009
10	Training exposure	0.373**	0.003
11	Knowledge level of farmers about cultivation of host plants and silkworm rearing practices	0.354**	0.006

*Correlation is significant at the 0.05 level

NS – Non-Significant

**Correlation is significant at the 0.01 level

It was clear from Table 4.3.1 that Pearson's correlation was carried out to know the influence of the independent variables of silkworm rearers over their dependent variable level of satisfaction of silkworm rearers from sericultural extension services. The calculated correlation coefficient (r) values of age, farm experience, family size, labour availability within the household, annual family income, operational size of landholdings, extension contact, the extent of communication channels used for collecting the information, training exposure and knowledge level of farmers were positively significant with the level of satisfaction. The other variable farm equipment availability was negative and non-significant with level of satisfaction of farmers from sericultural extension services.

4.3.1.1 Age versus level of satisfaction of farmers from sericultural extension services

From Table 4.3.1 it was clear that age was found to be positively correlated ($r=0.328^*$) with level of satisfaction of farmers from sericultural extension services. This signifies that as age increases their level of satisfaction from extension services also increases which indicates old age farmers were more satisfied than young age farmers. The relationship was found to be significant at 0.05 level of significance ($p=0.011$). Hence, the formulated null hypothesis was rejected and alternative hypothesis was accepted. The results indicated that elder farmer and the younger farmers had a significantly different level of satisfaction on the sericultural extension services perhaps younger farmers had a moderate level of satisfaction as compared to the old age farmers who were more satisfied. The younger farmers were less flexible and less willing to use innovative activities due to fear of risk in contrast to old age farmers, who were more flexible to use more innovative activities because of more farming experience. The present findings were in line with the findings of Ganpat *et al.* (2014), Chaturvedani *et al.* (2016) and Naz (2018).

4.3.1.2 Farming experience versus level of satisfaction of farmers from sericultural extension services

It was evident from Table 4.3.1 that farming experience was found to have positive influence ($r=0.322^*$) over the level of satisfaction of farmers from sericultural extension services. It signifies that the higher the farming experience higher would be the level of satisfaction of farmers from sericultural extension services. The influence was found to be significant at 0.05 level of significance ($p=0.012$). Hence, the formulated null hypothesis was rejected and alternative hypothesis was accepted. The reason might be experience in farming increased, they would have a higher knowledge level regarding the technology-wise and there will be more satisfaction with the extension services. The present findings were in line with the results of Balakrishnappa and Rajan (2010) and Chaturvedani *et al.* (2016).

4.3.1.3 Family size versus level of satisfaction of farmers from sericultural extension services

It was evident from Table 4.3.1 that family size was found to be positively correlated ($r=0.261^*$) with level of satisfaction of farmers from sericultural extension services, which indicates that the higher the family members higher would be the level of satisfaction of farmers from sericultural extension services. The association was found to

be significant at 0.05 level of significance ($p=0.044$). Hence, the formulated null hypothesis was rejected and alternative hypothesis was accepted. The probable reason might be due to the fact that more family members would help them in reducing the hiring of outside labours for post-rearing activities like cocoon harvesting, cocoon cleaning and grading which requires more labours. Hence, proper guidance from the sericultural extension services would make them to utilize the family members in their silkworm rearing activity efficiently which will make them to get more profit by reducing the labour cost. The present findings were in line with the results of Sudha and Gandhimathi (2015) and Prasertsang *et al.* (2020).

4.3.1.4 Labour availability within the household versus level of satisfaction of farmers from sericultural extension services

It was evident from Table 4.3.1 that labour availability within the households was positively correlated ($r=0.266^*$) with the level of satisfaction of farmers from sericultural extension services, which indicates that higher the availability of labour within the households higher would be the level of satisfaction of farmers from sericultural extension services. The influence was found to be significant at 0.05 level of significance ($p=0.040$). Hence, the formulated null hypothesis was rejected and alternative hypothesis was accepted. The probable reason might be due to the fact that silkworm rearing is more labour-intensive activity and farmers would like to acquire more information, advisory services, and technical guidance from the sericultural extension officers regarding the silkworm rearing practices which made them more satisfied with extension services provided by them. The present findings were in line with the results of Pandey *et al.* (2010) and Wakhel (2013).

4.3.1.5 Annual family income versus level of satisfaction of farmers from sericultural extension services

It was clear from Table 4.3.1 that annual family income had positive influence ($r=0.294^*$) over the level of satisfaction of farmers from extension services, which indicated that higher the family income higher would be the satisfaction level. The relationship was found to be significant at 0.05 level of significance ($p=0.023$). Hence, the formulated null hypothesis was rejected and alternative hypothesis was accepted. The reason might be due to the fact that the quality of technical support services provided by the sericultural extension officers would help the farmers to earn more. The income level

of farmers increased as farmers received proper guidance regarding silkworm rearing and host plant cultivation aspects at the right time of need from the extension officers. The present findings were in line with the results of Ranjan *et al.* (2018), Yarazari (2020) and Debnath *et al.* (2016).

4.3.1.6 Size of operational landholding versus level of satisfaction of farmers from sericultural extension services

It was evident from Table 4.3.1 that size of operational landholding was found to be positively correlated ($r=0.265^*$) with the level of satisfaction of the farmers from sericultural extension services, which indicated higher the size of operational landholding higher would be the level of satisfaction of farmers from sericultural extension services. The association was found to be significant at 0.05 level of significance ($p=0.041$). Hence, the formulated null hypothesis was rejected and alternative hypothesis was accepted. This might be due to the fact that landholding provides an economic base for the farmers to practice new agricultural technologies. The land also provides regular movement to make optimum utilization of the farm resources for achieving more profits. The present findings were in line with the results of Ranjan *et al.* (2018) and Rathod *et al.* (2016).

4.3.1.7 Farm equipment availability versus level of satisfaction of farmers from sericultural extension services

The results in Table 4.3.1 exhibited that farm equipment availability was found to be negatively correlated ($r=-0.179$ NS) with level of satisfaction of farmers from sericultural extension services, which indicated that the higher the farm equipment with farmers lesser would be the level of satisfaction of farmers from sericultural extension services. The relationship was found to be non-significant. Hence, the formulated null hypothesis was accepted. This might be due to the fact that farmers were not getting the information related to the new technologies, latest machineries or farm equipments, hence, the farmers would expect more from the extension officers which they were not able to provide back to the farmers. The present findings were in line with the results of Archana (2012) and Prasad (1990).

4.3.1.8 Extension contact versus level of satisfaction of farmers from sericultural extension services

The results in Table 4.3.1 revealed that extension contact had positive influence ($r=0.285^*$) over the level of satisfaction of farmers from sericultural extension services, which signifies that higher the extension contact more would be the level of satisfaction from sericultural extension services. The association was found to be significant at 0.05 level of significance ($p=0.027$). Hence, the formulated null hypothesis was rejected and alternative hypothesis was accepted. The reason might be due to the fact that extension participation exposes farmers to new areas of farming techniques with a knowledge and achievement. Also, it provides the opportunities for gaining knowledge about sericultural innovations. Further, participation in different extension programmes by farmers provides a lot of opportunities to acquire more information about silkworm rearing practices and host plant cultivation. Silkworm rearers approach extension officers and get the information when they need regarding scientific silkworm rearing practices which made them to satisfy with the services provided by them. The present findings were in line with the results of Manju (1997), Ranjan *et al.* (2017) and Suneeldutt and Chole (2002).

4.3.1.9 Extent of communication channels used for collecting information versus level of satisfaction of farmers from sericultural extension services

It was clear from Table 4.3.1 that there was a positive ($r=0.336^{**}$) relationship between communication channels used for collecting information and level of satisfaction of farmers from sericultural extension services, which indicates that higher the level of communication channels used higher would be the level of satisfaction of farmers from sericultural extension services. The association was found to be significant at 0.01 level of significance ($p=0.009$). Hence, the formulated null hypothesis was rejected and alternative hypothesis was accepted. The reason might be due to the fact that use of different communication channels for collecting the information updated the farmers with practicing new methods in silkworm rearing and host plant cultivation and management. The present findings were in line with the results of Hasan and Sharma (2011), Kameswari *et al.* (2011) and Avilesh *et al.* (2017).

4.3.1.10 Training Exposure versus level of satisfaction of farmers from sericultural extension services

The results in Table 4.3.1 revealed that training exposure had positive influence ($r=0.373^{**}$) over level of satisfaction of farmers from sericultural extension services, which indicated that higher level of training exposure higher would be the level of satisfaction of farmers from sericultural extension services. The relationship was found to be significant at 0.01 level of significance ($p=0.003$). Hence, the formulated null hypothesis was rejected and alternative hypothesis was accepted. The reason might be due to the fact that training is one of the means by which desired changes in knowledge and skills could be attained. An individual who receives training becomes more knowledgeable and skillful in rearing the silkworms and cultivation of host plants. Silkworm rearing requires more skills. The present findings were in line with the results of Sarada and Prabhakar (2009), Chauhan (2010) and Pandey *et al.* (2015).

4.3.1.11 Knowledge level of farmers versus level of satisfaction of farmers from sericultural extension services

The results from Table 4.3.1 exhibited that there was a positive correlation ($r=0.354^{**}$) with knowledge level of farmers and the satisfaction level of farmers from sericultural extension services, which indicated that the higher the knowledge level higher would be the level of satisfaction from sericultural extension services. The association was found to be significant at 0.01 level of significance ($p=0.006$). Hence, the formulated null hypothesis was rejected and alternative hypothesis was accepted. The reason might be due to the fact that more knowledge regarding farming would help in understanding the current and future needs and preferences through interactions and observations of extension officers. The present findings were in line with the results of Mech *et al.* (2016) and Susikaran and Sridhar (2013).

4.3.2 Relationship with the selected profile characteristics and level of satisfaction of farmers from sericultural extension services in Assam

For the independent variables *viz.*, educational level and membership in the farming organization the chi-square test was administered to know its association with the level of satisfaction of silkworm rearers from sericultural extension services of Assam and the obtained results were as follow;

Table 4.3.2: Chi-square test of profile characteristics of farmers with the level of satisfaction from sericultural extension services in Assam

Sl. No.	Independent variable	X ² values	p values	Crammer's V values (Association strength)
1	Educational level	87.909	0.048	0.605
2	Membership in the farming organization	26.805	0.039	0.668

4.3.2.1 Education versus level of satisfaction of farmers from sericultural extension services

From Table 4.3.2 it was clear that educational level exhibited significant association ($X^2=87.909$) with satisfaction level of silkworm rearers from sericultural extension services. It indicates level of education would make significant changes in the satisfaction level of silkworm rearers. The association was significant at 0.1 level of significance ($p= 0.098$). Hence, the formulated null hypothesis was rejected and the alternative hypothesis was accepted and the Cramer's V value confirmed that the association strength was at moderate level. The reason might be more educated respondents have more educational knowledge regarding farming and they can assess the extension officers' work and make their own decision, and they were comfortable with using the latest technologies to access and use most up-to-date information retrieved, unlike the less educated respondents. The present findings were in line with the results of Altarawneh *et al.* (2012), Aydogdu *et al.* (2018) and Chaturvedani *et al.* (2016), and Nishi and Kumar (2016)

4.3.2.2 Membership in farming organization versus level of satisfaction of farmers from sericultural extension services

From Table 4.3.2 it was clear that the membership in farming organization exhibited significant association ($X^2=26.805$) with satisfaction level of silkworm rearers from sericultural extension services. It indicates membership in farming organization would make significant changes in the satisfaction level of silkworm rearers. The association was significant at 0.1 level of significance ($p= 0.098$). Hence, the formulated null hypothesis was rejected and the alternative hypothesis was accepted and the Cramer's V value confirmed that the association strength was at moderate level. This might be due to the fact that more participation in the farming organization would get more information regarding silkworm rearing practices and host plant cultivation.

4.3.3 Relationship with the selected profile characteristics and level of satisfaction of farmers from sericultural extension services in Karnataka

In order to understand the nature of the relationship between selected profile characteristics of the silkworm rearers with their level of satisfaction from sericultural extension services an attempt has been made to find out if there exists any relationship of the profile characteristics of silkworm rearers *viz.*, age, education, farming experience, family size, labour availability within the household, annual family income, size of operational land holdings, farm equipment availability, extension contact, membership in the farming organization, the extent of communication channels used for collecting information, training exposure and knowledge level of farmers about the cultivation of host plants and silkworm rearing with the level of satisfaction of silkworm rearers from sericultural extension services in Karnataka.

Table 4.3.3: Correlation coefficient of profile characteristics of farmers with the level of satisfaction from sericultural extension services in Karnataka

Sl. No.	Independent variables	'r' values	p values
1	Age	0.405**	0.001
2	Farming experience	0.296*	0.022
3	Family size	0.059 NS	0.655
4	Labour availability within the households	-0.043 NS	0.743
5	Annual family income	0.299*	0.020
6	Size of operational land holdings	0.272*	0.035
7	Farm equipment availability	-0.044 NS	0.737
8	Extension contact	0.272*	0.036
9	Extent of communication channels used for collecting information	0.378**	0.003
10	Training exposure	0.328*	0.011
11	Knowledge level of farmers about the cultivation of host plants and silkworm rearing	0.314*	0.015

*Correlation is significant at the 0.05 level

NS – Non-Significant

**Correlation is significant at the 0.01 level

It was clear from Table 4.3.3 that computed 'r' value of age, farming experience, annual family income, size of operational land holdings, extension contact,

knowledge level of silkworm rearers were positively significant with the level of satisfaction. The other variable family size was positively non-significant, labour availability within households and farm equipment availability were negatively non-significant, communication channels and training exposure were negatively significant with the level of satisfaction of farmers from sericultural extension services.

4.3.3.1 Age versus level of satisfaction of farmers from sericultural extension services

From Table 4.3.3 age was found to be positive influence ($r=0.405^{**}$) over the level of satisfaction of the farmers from sericultural extension services, which indicated that higher the age higher would be the level of satisfaction. The relationship was found to be significant at 0.01 level of significance ($p=0.001$). Hence, formulated null hypothesis was rejected and alternative hypothesis was accepted. Young silkworm rearers do not give more emphasis on extension workers' visits to them than as old age silkworm rearers. Old aged farmers had more farming experience to understand the extension workers and they would analyze the work done by the extension officers than the young age farmers. The present findings were in line with the findings of Ganpat *et al.* (2014) and Chaturvedani *et al.* (2016).

4.3.3.2 Farming experience versus level of satisfaction of farmers from sericultural extension services

It was evident from Table 4.3.3 that farming experience had found to be positive influence ($r=0.296^*$) over the level of satisfaction of farmers from sericultural extension services, which indicates that higher the farming experience higher would be the satisfaction level. The relationship was found to be significant at 0.05 level of significance ($p=0.022$). Hence, the formulated null hypothesis was rejected and alternative hypothesis was accepted. The reason could be due to the fact that farmers having more farming experience would know the difficulties in farming than low farming experienced farmers and seek for the new alternative farming practice and adopt new technologies suggested by the extension officers. The present findings were in line with the findings of Aydogdu *et al.* (2018) and Sugiarto *et al.* (2019).

4.3.3.3 Family size versus level of satisfaction of farmers from sericultural extension services

It was evident from Table 4.3.3 that family size had found to be positive influence ($r=0.059$ NS) over the level of satisfaction of farmers from sericultural extension

services. The relationship was found to be non-significant ($p=0.655$). Hence, formulated null hypothesis was accepted, probable reason might be due to the fact that fewer family members might get a piece of reliable information from the sericulture extension officers, they could discuss with officers regarding the silkworm rearing practices and farmers could personally interact with extension officers and get accurate and adequate information and technical advice from them. The present findings were in line with the findings of Luo and Timothy (2017) and Prasertsang *et al.* (2020).

4.3.3.4 Labour availability within the household versus level of satisfaction of farmers from sericultural extension services

It was evident from Table 4.3.3 that labour availability within the households was found to be negative influence ($r=-0.043$ NS) over the level of satisfaction of farmers from sericultural extension services, which indicated that higher the labour availability within the households lower would be the satisfaction level of farmers from sericultural extension services. The relationship was found to be non-significant ($p=0.743$). Hence, the formulated null hypothesis was accepted. The probable reason might be due to that fact that respondents would expect the quality of technical support services from the sericulture extension officers which they were unable to provide all the respondents in that area. Lower the number of labour availability, more and adequate supportive guidance and advisory services they would give. The present findings were in line with the findings of Wakhet (2013) and Yarazari (2020).

4.3.3.5 Annual family income versus level of satisfaction of farmers from sericultural extension services

It was clear from Table 4.3.3 that annual family income had found to be positive influence ($r=0.299^*$) over the level of satisfaction of farmers from sericultural extension services, which indicated that higher the family income higher would be the satisfaction level. The relationship was found to be significant at 0.05 level of significance ($p=0.020$). Hence, formulated null hypothesis was rejected and alternative hypothesis was accepted. The reason might be due to the fact that income of the family was most important factor in fulfilling individuals and attaining family needs. Individual family income directly influences the economic viability, stability, and rational behavior of the individual. Hence, increase in the family income level increases the access to different input services provided by the sericultural extension officers in the silkworm rearing

practices. The present findings were in line with the results of Manju (1997), Suresh (2004), Suneeldutt and Chole (2002) and Uddin *et al.* (2008).

4.3.3.6 Size of operational landholding versus level of satisfaction of farmers from sericultural extension services

It was clear from Table 4.3.3 that size of operational landholding had found to be positive influence ($r=0.272^*$) over the level of satisfaction of farmers from sericultural extension services, which indicated that higher the landholdings higher would be the satisfaction level. The relationship was found to be significant at 0.05 level of significance ($p=0.035$). Hence, the formulated null hypothesis was rejected and alternative hypothesis was accepted. The probable reason might be due to the fact that higher landholding farmers were able to adopt more silkworm rearing activities in contrary to the low level of landholding farmers, or maybe due to commodity produced and extension services provided to the small and larger landholding farmers, they can go for any other silkworm rearing practices suggested by the sericultural extension officers. The present findings were in line with the results of Aydogdu *et al.* (2018), Uddin *et al.* (2008) and Debnath *et al.* (2016).

4.3.3.7 Farm equipment availability versus level of satisfaction of farmers from sericultural extension services

It was clear from Table 4.3.3 that farm equipment availability had found to be negative influence ($r=-0.044$ NS) over the level of satisfaction of farmers from sericultural extension services, which indicated higher availability of farmer equipment lower would be the satisfaction level. The relationship was found to be non-significant. Hence, the formulated null hypothesis was accepted. The reason might be due to the fact that extension workers should provide the latest information related to the new mechanization in the market to the farmers, here lack of information to farmers was the main reason for the dissatisfaction with extension services. The present findings were in line with the results of Zotawana (1987), Prasad (1990) and Archana (2012).

4.3.3.8 Extension contact versus level of satisfaction of farmers from sericultural extension services

It was clear from Table 4.3.3 that extension contact had found to be positive influence ($r=0.272^*$) over the level of satisfaction of farmers from sericultural extension services, which indicated that higher the extension contact higher would be the satisfaction

level. The relationship was found to be significant at 0.05 level of significance ($p=0.036$). Hence, the formulated null hypothesis was rejected and alternative hypothesis was accepted. The reason might be due to the fact that sericultural extension worker was the main sources of information and training to farmer in adopting latest silkworm rearing practices and frequent contact with farmers was important for improving the effectiveness of extension services. The present findings were in line with the results of Hasan and Sharma (2011), Ogbonna and Agwu (2013), Awatade *et al.* (2018) and Kameswari *et al.* (2011).

4.3.3.9 Communication channels used for collecting information organization versus level of satisfaction of farmers from sericultural extension services

It was clear from Table 4.3.3 that communication channels used had found to be positive influence ($r=0.378^{**}$) over the level of satisfaction of farmers from sericultural extension services, which indicated that higher the communication channels used for collecting information higher would be the satisfaction level. The relationship was found to be significant at 0.01 level of significance ($p=0.003$). Hence, the formulated null hypothesis was rejected and alternative hypothesis was accepted. The reason might be due to farmers having more communication channels were socially rich, innovative and advanced farmers. They mainly used new and advanced channels to get up-to-dated information in farming.

4.3.3.10 Training exposure versus level of satisfaction of farmers from sericultural extension services

It was clear from Table 4.3.3 that training exposure had found to be positively correlated ($r=0.328^*$) with the level of satisfaction of farmers from sericultural extension services, which indicated that higher training exposure higher would be the level of satisfaction. The relationship was found to be significant at 0.05 level of significance ($p=0.011$). Hence, the formulated hypothesis was rejected and alternative hypothesis was accepted. The present findings were in line with the results of Chetia (2013), Manju (1997) and Sarada and Prabhakar (2009).

4.3.2.11 Knowledge level of farmers versus level of satisfaction of farmers from sericultural extension services

It was clear from Table 4.3.3 that knowledge level of farmers had found to be positive influence ($r=0.314^*$) over the level of satisfaction of farmers from sericultural

extension services, which indicated that higher the level of knowledge of the farmers higher would be the satisfaction level with sericultural extension services. The relationship was found to be significant at 0.05 level of significance ($p=0.015$). Hence, the formulated null hypothesis was rejected and alternative hypothesis was accepted. The probable reason might be due to higher knowledge in silkworm rearing helps him in understanding the technical advice given by the extension officers related to silkworm rearing practices. The present findings were in line with the results of Susikaran and Sridhar (2013), Ali *et al.* (2013) and Yarazari (2020).

4.3.4 Relationship with the selected profile characteristics and level of satisfaction of farmers from sericultural extension services in Karnataka

For the independent variables *viz.*, educational level and membership in the farming organization the chi-square test was administered to know its association with the level of satisfaction of silkworm rearers from sericultural extension services of Karnataka and the obtained results were as follow;

Table 4.3.4: Chi-square test of profile characteristics of farmers with the level of satisfaction from sericultural extension services in Karnataka

Sl. No.	Independent variable	X ² values	p values	Crammer's V values (Association strength)
1	Educational level	93.100	0.565	0.623
2	Membership in the farming organization	22.619	0.542	0.614

4.3.4.1 Educational level versus level of satisfaction of farmers from sericultural extension services

From Table 4.3.4 it was clear that educational level exhibited non-significant association ($X^2=93.100$) with satisfaction level of silkworm rearers from sericultural extension services. It indicated level of education would not make any significant changes in the satisfaction level of silkworm rearers. Hence, the formulated null hypothesis was accepted and Crammer's V value revealed that the association strength was at low level. The probable reason might be due to more educated people would prefer more technological-related sources of information rather than depending only on information provided by the extension officers. The present findings were in line with the results of Chaturvedani *et al.* (2016) and Nishi and Kumar (2016).

4.3.4.2 Membership in farming organization versus level of satisfaction of farmers from sericultural extension services

From Table 4.3.4 it was clear that membership in the farming organization had non-significant association ($X^2=22.619$) with satisfaction level of silkworm rearers from sericultural extension services. It indicated membership in the farming organization would not make any significant changes in the satisfaction level of silkworm rearers. Hence, formulated null hypothesis was accepted and Crammer's V value revealed that the association strength was at low level. The reason might be due to membership in farming organizations and participation in farming institutions help him to gain more knowledge regarding farming, group meetings would help in adopting new silkworm rearing practices in his farm and other members in the group can share wide range ideas and thoughts.

4.4 Problems and difficulties faced by the silkworm rearers to adopt improved technologies of silkworm rearing practices recommended by the State Department of Sericulture

4.4.1 Problems and difficulties faced by the respondents in silkworm rearing activities in Assam and Karnataka

An attempt was made to find out the problems perceived by the farmers in adopting the improved technologies of silkworm rearing. The different constraints faced by silkworm rearers in the study area were elicited through an open-ended schedule. Based on the responses obtained from the respondents, frequency, percentages, and rank were calculated for each problem and difficulty faced by the farmers. The ranking was carried out based on constraints that were cited most faced by the farmers and presented in Table 4.4.1.1.

It is evident from Table 4.4.1.1 in Assam, the continuous fluctuations in the weather conditions and the flood were reported as a major problem by the respondents (I rank) followed by high labour wages and high input costs (II rank), lack of adequate transportation facilities to the markets or brought from distant places (III rank), use of pesticides in the nearby tea gardens is a serious problem for the rearing of MUGA silkworms for their survival (IV rank) and Struggling to handle the greater number of moths for examination with the stipulated period (V rank).

The other problems faced by the respondents were poor quality and non-availability of seed cocoons in time (VI rank) followed by lack of access to the latest

technological information about the Muga rearing activities (VII rank), the high price of seed cocoons (VIII rank), lack of adequate knowledge regarding cultivation practices of host plants and rearing practices of Muga silkworms (IX rank), less interest and non-availability of the extension workers (X rank), poor quality of storage facilities and other facilities (XI rank) and Lack of awareness on training programmes related to scientific rearing practices (XII rank).

Table 4.4.1.1: Problems faced by the respondents in silkworm rearing activities in Assam

Sl. No.	Problems Faced by the respondents	F	%	Rank
1	Lack of access to the latest technological information about the Muga rearing activities	35	58.33	VII
2	Lack of adequate knowledge regarding cultivation practices of host plants and rearing practices of MUGA silkworms	21	35	IX
3	Lack of awareness on training programmes related to scientific rearing practices	10	16.66	XII
4	High labour wages and high input cost	56	93.33	II
5	The use of pesticides in the nearby tea gardens is a serious problem for the rearing of MUGA silkworms for their survival	46	76.66	IV
6	Lack of adequate transportation facilities to the markets or brought from the distant places	48	80	III
7	Less interest and non-availability of the extension workers	17	28.33	X
8	Poor quality of storage facilities and other facilities	15	25	XI
9	High price of seed cocoons	29	48.33	VIII
10	Struggling to handle the greater number of months for examination with the stipulated period	45	75	V
11	Continues fluctuations in the weather conditions and floods	57	95	I
12	Poor quality and nonavailability of seed cocoons in time	40	66.66	VI

Table 4.4.1.2: Problems faced by the respondents in silkworm rearing activities in Karnataka

Sl. No.	Problems Faced by the respondents	F	%	Rank
1	Lack of knowledge regarding control and management practices of uzi fly, ants, and other diseases	60	100	I
2	High cost of establishing the scientific rearing house	58	96.66	IV
3	Inadequate training programmes related to the scientific method of silkworm rearing practices	40	66.66	VIII
4	Lack of support from the Department of Sericulture, Central Silk Board, and Government of India	55	91.66	V
5	Lack of market facilities, fluctuations in the cocoon price, and exploitation of farmers at the market by the middleman	59	98.33	III
6	Non-availability and high cost of equipment which was needed to the sericulture farmers	35	58.33	IX
7	Lack of awareness regarding the concentration of disinfectants in silkworm rearing practices	60	100	II
8	Lack of knowledge regarding the training and pruning in mulberry plants	30	50	X
9	Lack of knowledge regarding effective utilization of bio-fertilizers, VAM, and vermin-compost	48	80	VII
10	Lack of awareness regarding the newly released crossbreed races of the mulberry silkworm	52	86.66	VI
11	High cost of manures, fertilizers, insecticides, and fungicides	28	46.66	XI
12	The complex procedure to get the credit facilities from the nationalized banks	25	41.66	XII

In the present study, an attempt was made to find out the problems faced by the silkworm rearers in Karnataka Table 4.4.1.2 revealed that lack of knowledge regarding control and management practices of uzi fly, ants, and other diseases was reported by the respondents as a major problem (I rank) followed by lack of awareness regarding the

concentration of disinfectants in silkworm rearing practices (II rank), lack of market facilities, fluctuations in the cocoon price and exploitation of farmers at the market by the middleman (III rank), high cost of establishing the scientific rearing house (IV rank), lack of support from the Department of Sericulture, Central Silk Board, and Government of India (V rank).

The rest of the problems faced by the respondent was lack of awareness regarding the newly released crossbreed races of mulberry silkworm (VI rank) followed by lack of knowledge regarding effective utilization of biofertilizers, VAM, and vermicompost (VII rank), inadequate training programmes related to the scientific method of silkworm rearing practices (VIII rank), non-availability and high cost of equipment which were needed to the sericulture farmers (IX rank), lack of knowledge regarding the training and pruning in mulberry plants (XI rank) and complex procedure to get the credit facilities from the nationalized banks (XII rank).

4.4.2 Suggestions to overcome the constraints in Assam and Karnataka

4.4.2.1: Suggestions to overcome the constraints in silkworm rearing activities in Assam

1. Provision of the accessibility and awareness campaign about the latest technologies in silkworm rearing
2. Provision of training related to host plant cultivation and silkworm rearing practices
3. Provision of training programmes on scientific rearing practices in Muga silkworm rearing
4. Reduction of input costs and labour wages
5. Provision of good quality seed cocoons on time
6. Provision of good transportation facilities to the remote areas
7. Frequent visits by the extension personnel to the farmer's field
8. Provision of good storage facilities for string of cocoons
9. Reduction in the seed cocoon price or give subsidies on seed cocoons
10. Provision of good quality chawki worm directly so that they can save their time
11. Rearing of silkworm according to the climatic conditions

12. Growing of border crops and covering the green shade net around the border of the field

4.4.2.2: Suggestions to overcome the constraints in silkworm rearing activities in Karnataka

1. Provision of practical knowledge regarding plant protection and fertilizer application at the proper time
2. Reduction in the cost of construction of silkworm rearing houses
3. Provision of adequate training programmes related to scientific rearing practices
4. Government should support the farmers from the department of sericulture by fulfilling their needs
5. Provision of information about the market price of different markets and reduce the middleman activities
6. Reduction in the cost of machinery
7. Provision of information regarding calculation of the concentration of chemicals or disinfectants in silkworm rearing practices
8. Provision of awareness regarding training and pruning in mulberry plants
9. Training programme about the utilization of bio-pesticides, VAM, and vermicompost
10. Provision of information about crossbreed races of newly released silkworm breeds and their utilization
11. Reduction in the cost of manures, fertilizers, insecticides, and fungicides
12. Reduction in the procedure to get the credits from the banks