CHAPTER 4

RESULTS

The present chapter contains the results of the analysis of the data collected through primary survey of as per the objectives of the study. The chapter is divided into two sections.

I.   In the **first section**, socio economic profile, challenges, value chain analysis and prospects of rural micro enterprises of Assam is presented in four sub sections:

4.1. Socio economic profile of the sample micro enterprise

4.2. Challenges of the micro enterprise sector in Assam

4.3. Value chain analysis of micro enterprise sector in Assam

4.4. Prospects of micro enterprise sector in Assam

II. In the **second section**, pattern, determinants and relationship of micro enterprise growth and performance is presented in four sub sections:

4.5. Status of growth of rural micro enterprises in Assam

4.6. Growth of micro enterprise: determinants and relationship

4.7. Status of performance of rural micro enterprises in Assam

4.8. Growth and performance of rural micro enterprises: determinants and relationship

Section-I: Socio Economic Profile, Challenges, Value Chain Analysis and Prospects of Rural Micro enterprises of Assam

Based on the primary data collected, a comprehensive socio-economic status of the sample micro enterprises has been examined in terms of its social category, gender, education attainment, religion, age, marital status, family size, production, investment, employment, raw materials and marketing status of the rural manufacturing micro enterprises. This section also contains the motivational factors contributing towards promotion of rural micro enterprises. In sub-section 4.2, an analysis of the gaps and challenges of micro enterprises is presented. In sub-section

4.3, sectoral value chain analysis of the sample micro enterprises is outlined. In sub-section 4.4, the study explores the prospects and scope of the rural micro enterprise sector in the State.

4.1. Socio Economic Profile of the Sample Micro enterprises

4.1.1. Profile of Proprietors of Rural Micro enterprises based on Social Category

The social composition of the proprietors of rural micro enterprises has been analysed and the outcome of the same is presented in *Table 4.1*. The study reveals that majority of the proprietors are from the general category of population (70 per cent) followed by other backward classes (16 per cent), ST (8 per cent) and SC (6 per cent) respectively. The entrepreneurs belonging to the OBC category are found to be the highest in Sibsagar district and the lowest in Cachar district. The majority of the entrepreneurs belonging to the ST category are from the Cachar district.

At the level of sample districts also, the dominance of the general group is consistent. The OBC which is the second largest category at the aggregate level is the lowest in Cachar with the remaining three districts having a consistent percentage. The second largest group in Cachar is the ST. As against this, the presence of ST marks absence in the two districts of Kamrup and Sibsagar with a mere presence in Barpeta district. The SC representation though is lowest in aggregate, its representation is found in three out of the four sample districts with no representation in the Barpeta district.

The pattern when analysed across the sample districts, the same dominance of the general group is exhibited except in Cachar where ST stands second to the general group (*Table 4.2).* The same when viewed across the micro enterprise sectors, the proprietors belonging to the general group once again maintain the same dominance. In respect of the other three social groups, there are deviations and exceptions. The absence of the SC and ST proprietors in the cane and bamboo sector is an exception and the ST group having the record largest proprietors in respect of the handloom sector is a deviation.

Table 4.1: District wise Number of Proprietors by Social Group

| Social Category	Districts				Total	Percentage
	Barpeta	Cachar	Kamrup	Sibsagar		
General	16	12	15	13	56	70
OBC	3	1	4	5	13	16
SC	-	2	1	2	5	6
ST	1	5	-	-	6	8
Total	20	20	20	20	80	100

Source: Field Survey, 2015

Table 4.2: Social Category wise Distribution of Proprietors across Micro entreprise Category

| Social Category	Micro enterprise sectors				Total
	Cane & Bamboo	Carpentry	Food Processing	Handloom	
General	17	14	16	9	56
OBC	3	3	2	5	13
SC	-	3	2	-	5
ST	-	-	-	6	6
Total	20	20	20	20	80

Source: Field Survey, 2015

Figure 4.1: Social Category wise Distribution of Proprietors across Micro entreprise Category
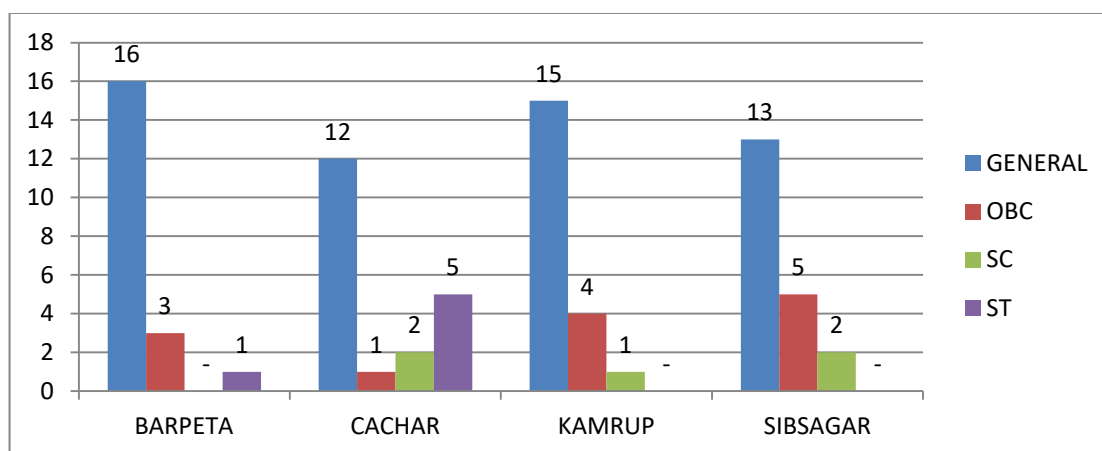
Source: Field Survey, 2015

Figure 4.2: Social Category wise Distribution of Proprietors across Sample Districts
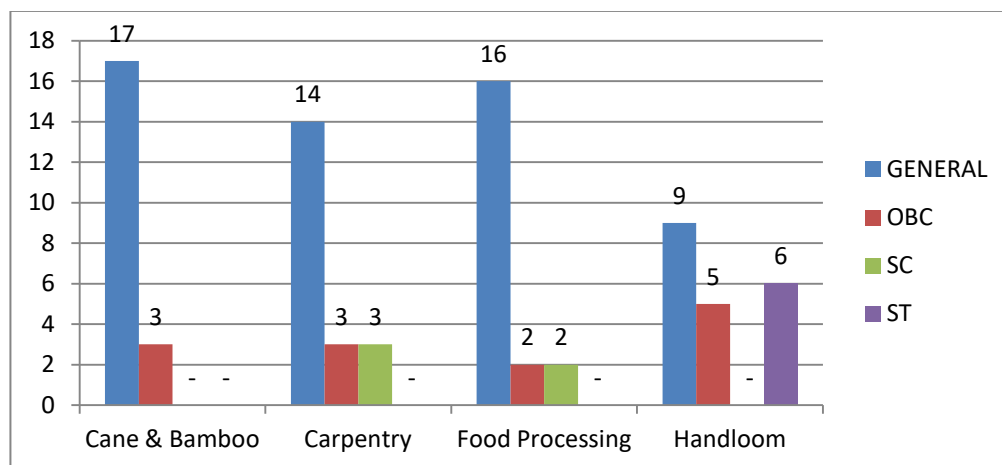
Source: Field Survey, 2015

4.1.2. Profile of Proprietors of Sample Micro enterprises by Gender

The distribution of proprietors of the rural micro enterprises in terms of gender composition across sample micro enterprise sectors and sample districts respectively is shown in *Table 4.3 & 4.4*. A look into the distribution of the proprietors of the micro enterprises by gender shows that around two third (63.75 per cent) of the entrepreneurs are male while only 36.25 per cent are female. The pattern prevails across districts also (*Table 4.3).* On analysis, it is observed that there is alteration in male dominance in the handloom and food processing sectors. With less than 25 per cent of female participation, the carpentry and cane and bamboo sectors are mostly male dominated with majority of the entrepreneurs being male.

Table 4.3.: Distribution of Proprietors across Micro enterprise Sectors by Gender

Gender	Micro enterprise Sectors				Total	Percentage
	Cane & Bamboo	Carpentry	Food Processing	Handloom		
Male	17	19	8	7	51	63.75
Female	3	1	12	13	29	36.25

Source: Field Survey, 2015

Table 4.4.: Distribution of Proprietors across Sample Districts by Gender

Gender	Districts				Total
	Barpeta	Cachar	Kamrup	Sibsagar	
Male	16	11	13	11	51
Female	4	9	7	9	29

Source: Field Survey, 2015

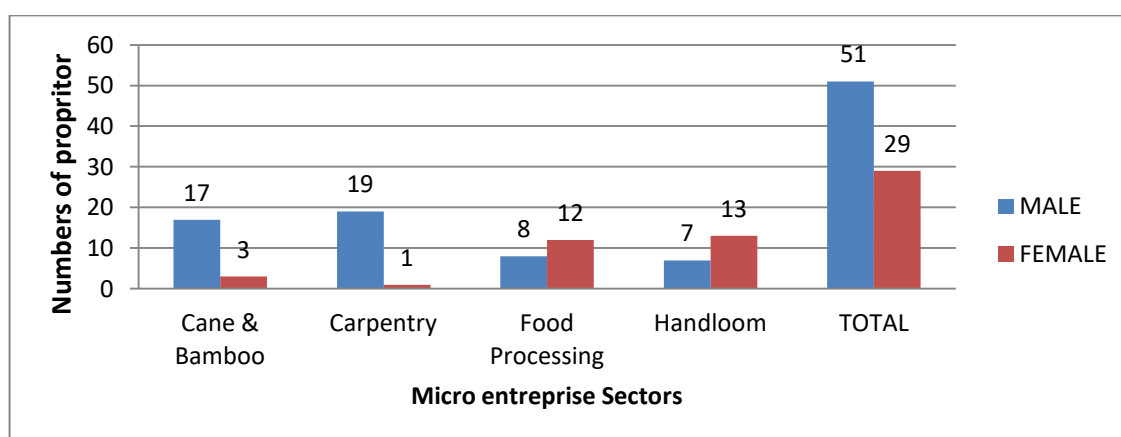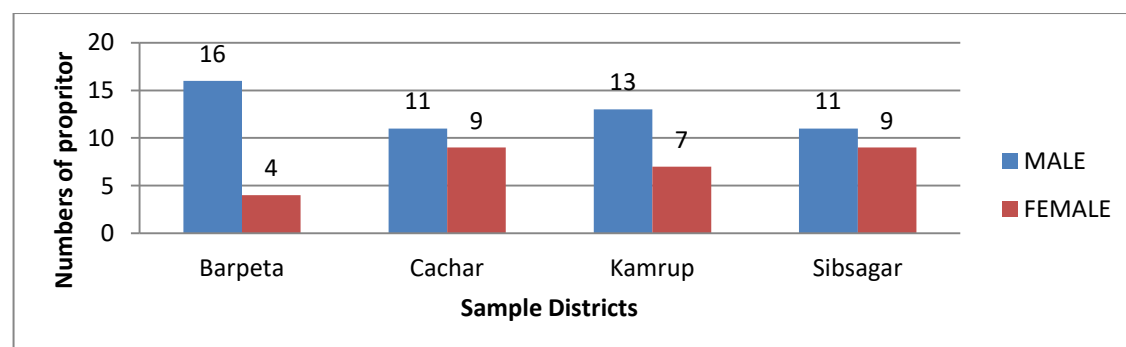**Figure 4.3: Distribution of Proprietors of Sample Micro enterprises by Gender**

Figure 4.4.: Distribution of Proprietors of Sample Districts by Gender

4.1.3. Distribution of Rural Micro enterprises based on Education Attainment of Proprietors

An analysis of attainment of education by the proprietors is given in *Table 4.5 & 4.6* respectively. Across the sample districts, Sibsagar district is found to have the largest number of graduates who have taken up self ventures.

A look into the distribution of the micro enterprises in terms of attainment of education by the proprietors of the units across sectors show that a little over half of

them (52.5 per cent) have studied up to the Higher Secondary level with 26.25 per cent having read up to class X. The remaining 21.25 per cent have either completed graduation or post graduation studies. It is interesting to note that none of the proprietors among those surveyed possess any technical qualification or degree. Across the sample micro enterprise sectors, the level of education attainment exhibits a few characteristics. The handloom sector marks less number of proprietors who have attained graduation. The food processing sector has the maximum number of proprietors who have either completed higher secondary or graduation. As against this, the cane and bamboo sector resembles the aggregate pattern.

Table 4.5: Distribution of Rural Micro enterprises based on Education Attainment of Proprietors across Micro enterprise Sectors

Education	Micro enterprise Sectors				Total	Percentage
	Cane & Bamboo	Carpentry	Food Processing	Handloom		
V to X	6	5	2	8	21	26.25
Upto HS	12	11	12	7	42	52.5
Upto Graduate	1	4	5	5	15	18.75
Upto Post - graduate	1	-	1	-	2	2.5
Total	**20**	**20**	**20**	**20**	**80**	**100**

Source: Field Survey, 2015

Table 4.6: Distribution of Rural Micro enterprises based on Education Attainment of Proprietors across Sample Districts

Education	Districts				Total
	Barpeta	Cachar	Kamrup	Sibsagar	
V to X	6	6	6	3	21
Upto HS	10	10	11	11	42
Upto Graduate	4	3	2	6	15
Upto Post – graduate	-	1	1	-	2
Total	**20**	**20**	**20**	**20**	**80**

Source: Field Survey, 2015

Figure 4.5: Distribution of Rural Micro enterprises based on Education Attainment of Proprietors across Micro enterprise Sectors
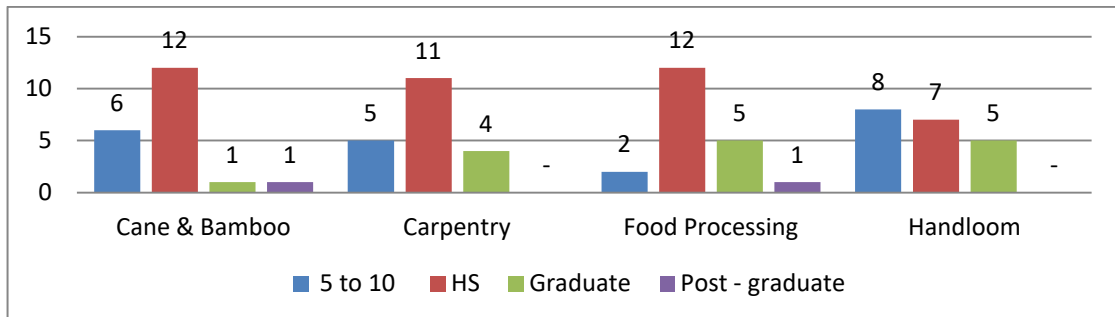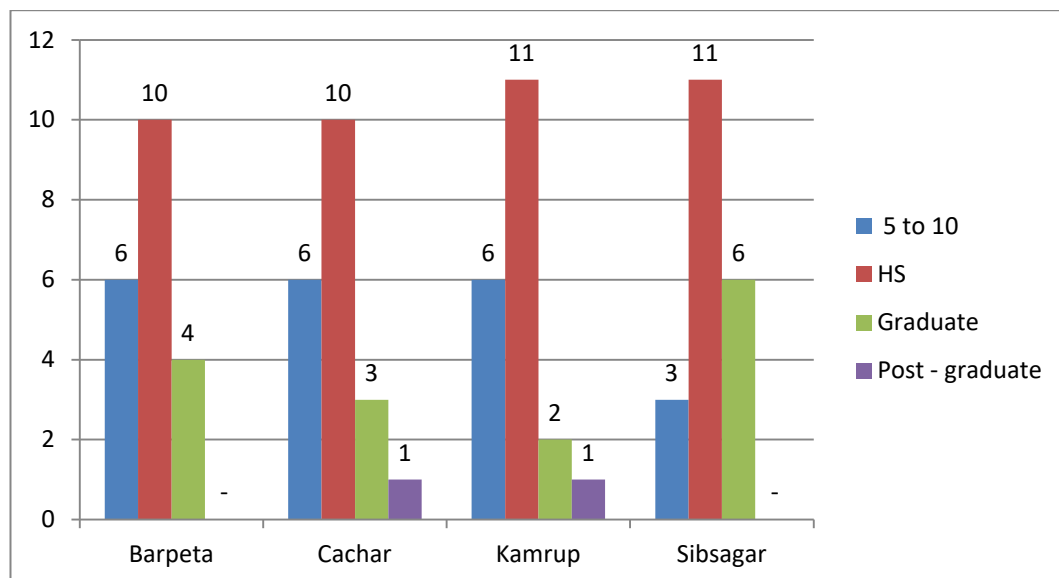

Figure 4.6: Distribution of Districts based on Education Attainment of Proprietors

4.1.4. Distribution of Rural Micro enterprises based on Religion of Proprietors

Religion wise spatial and sectoral distribution of the proprietors of the rural micro enterprises is shown in *Table 4.7 & 4.8* respectively. At the aggregate level, the proprietors across districts belong to two religious faiths – Hindu and Muslim, with the former constituting nearly two third of the total. Spatially, though there is alteration in the Hindu majority status in the Barpeta district with proprietors belonging to the Muslim faith being the majority, sectorally, the dominance of Hindu proprietors is observed across all four sectors. Across sectors, around two-third of the entrepreneurs are Hindus by faith and the rest are Muslims.

Table 4.7: Distribution of Rural Micro enterprises based on Religion of Proprietors across Micro enterprise Sectors

| Religion	Micro enterprise Sectors				Total	Percentage
	Cane & Bamboo	Carpentry	Food Processing	Handloom		
Hindu	14	11	13	18	56	65
Muslim	6	9	7	2	24	35

Source: Field Survey, 2015

Table 4.8: District wise Distribution of Rural Micro enterprises based on Religion of Proprietors

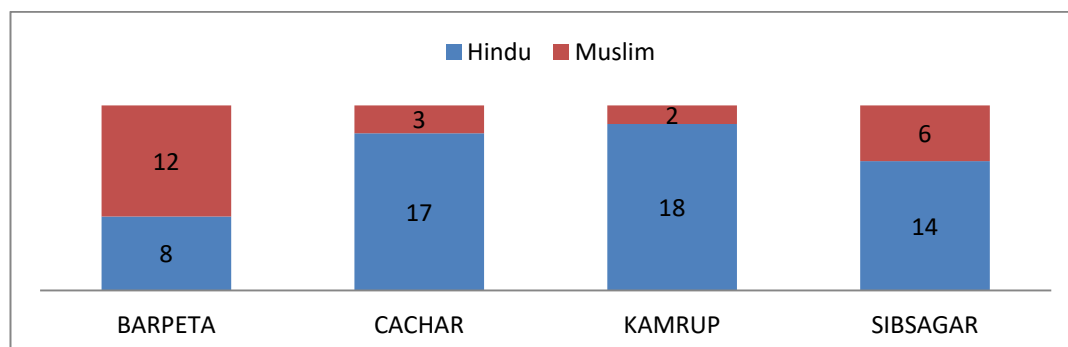| Religion	Districts				Total
	Barpeta	Cachar	Kamrup	Sibsagar	
Hindu	8	17	18	14	57
Muslim	12	3	2	6	23

Source: Field Survey, 2015

Figure 4.7: Distribution of Rural Micro enterprises based on Religion of Proprietors across Micro enterprise Sectors
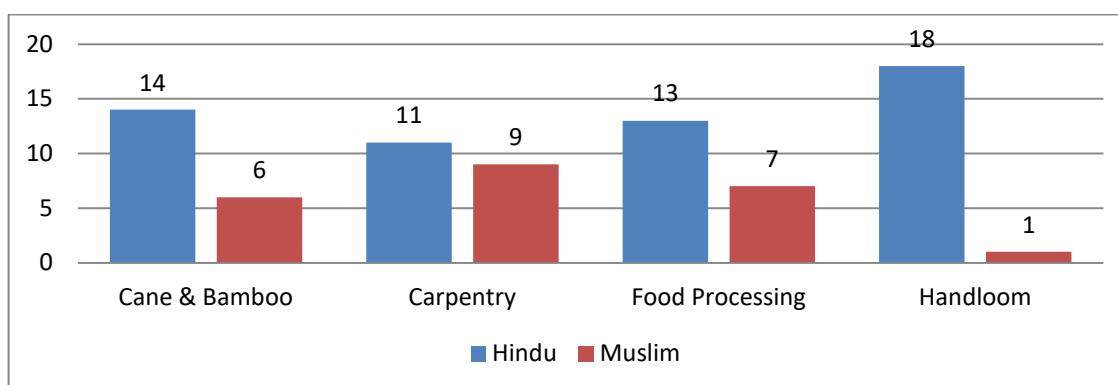
Source: Field Survey, 2015

Figure 4.8: District wise Distribution of Rural Micro enterprises based on Religion of Proprietors

4.1.5. Distribution of Rural Micro enterprises based on Age of Proprietors

An analysis of the age composition of the proprietors of the rural micro enterprises is provided in *Table 4.9 & 4.10* respectively. As seen in the *Tables,* as high as 92.50 per cent of the proprietors are in three age groups of 26-35, 36-45 and 55 years and above respectively. The proprietors representing the age group of 25 and below and 55 years and above are only 3.75 per cent each. The pattern is by and large similar across the four sample districts. The sector wise distribution of the enterprises based on age of the proprietors also show similar trends.

Table 4.9: District wise Distribution of Sample Micro entreprises in terms of Age of Proprietors

Age Group (Yrs.)	Districts				Total	Percentage
	Barpeta	Cachar	Kamrup	Sibsagar		
Upto 25	1	-	1	1	3	3.75
26 to 35	5	3	6	6	20	25
36 to 45	7	7	10	10	34	42.5
46 to 55	5	10	2	3	20	25
above 55	2	-	1	-	3	3.75
	20	20	20	20	80	100

Table 4.10: Distribution of Sample Rural Micro enterprises in terms of Age across Micro enterprise Sectors

| Age Group (Yrs.) | Micro enterprise Sectors | | | | Total |
	Cane & Bamboo	Carpentry	Food Processing	Handloom	
Upto 25	1	-	2	-	3
26 to 35	2	4	6	8	20
36 to 45	11	9	10	4	34
46 to 55	6	4	2	8	20
above 55	-	3	-	-	3
Total	20	20	20	20	80

Source: Field Survey, 2015

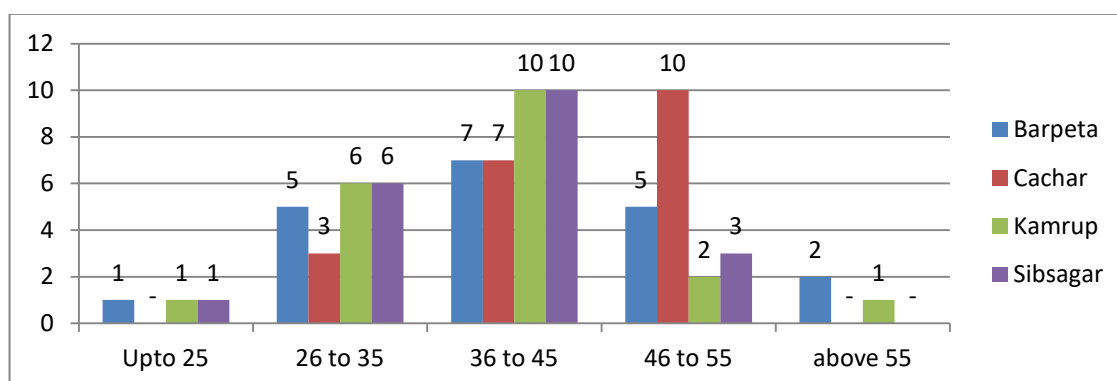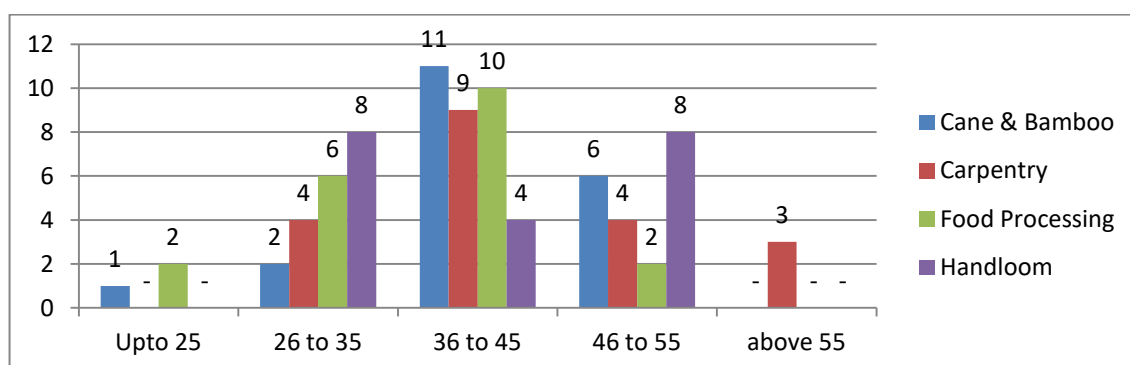**Figure 4.9: District wise Distribution of Sample Micro entreprises in terms of Age of Proprietors**

Source: Field Survey, 2015

Table 4.10: Distribution of Sample Rural Micro enterprises in terms of Age across Micro enterprise Sectors

Source: Field Survey, 2015

4.1.6. Distribution of Rural Micro enterprises in terms of Marital Status

The marital status of the proprietors of the rural micro enterprises both spatially and sectorally is presented in *Table 4.11 & 4.12* respectively. The distribution of the proprietors in terms of marital status across both districts and micro enterprise sectors exhibit uniform patterns. The majority of the proprietors across the micro enterprise sectors are married with only 16.25 per cent of them being unmarried.

Table 4.11: Distribution of Proprietors of Sample Rural Micro enterprises in terms of Marital status across Micro enterprise Sectors

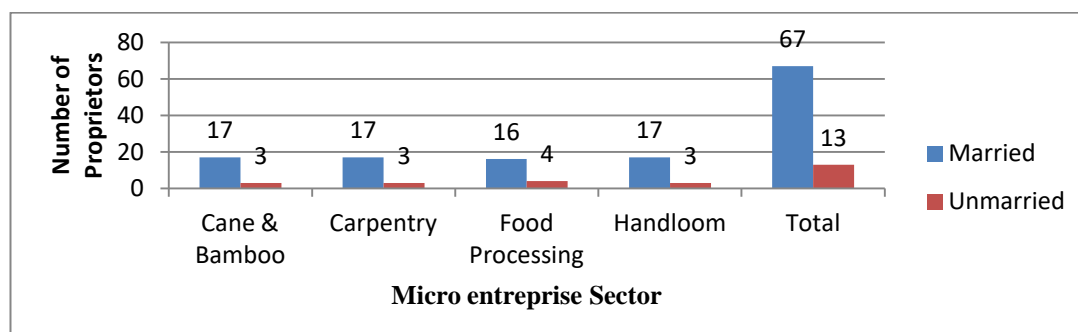| Marital Status	Micro enterprise Sectors				Total	Percentage
	Cane & Bamboo	Carpentry	Food Processing	Handloom		
Married	17	17	16	17	67	83.75
Unmarried	3	3	4	3	13	16.25
Total	20	20	20	20	80	100

Source: Field Survey, 2015

Table 4.12: District wise Distribution of Proprietors of Sample Micro entreprises in terms of Marital Status

| Marital Status	Districts				Total
	Barpeta	Cachar	Kamrup	Sibsagar	
Married	17	17	16	17	67
Unmarried	3	3	4	3	13
Total	20	20	20	20	80

Source: Field Survey, 2015

Figure 4.11: Distribution of Proprietors of Sample Rural Micro enterprises in terms of Marital Status across Micro enterprise Sectors

Source: Field Survey, 2015

Figure 4.12: District wise Distribution of Proprietors of Sample Micro entreprises in terms of Marital Status
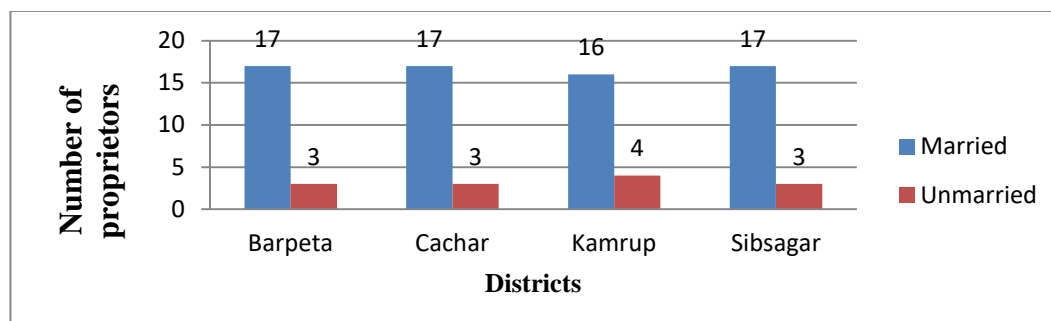
4.1.7. Distribution of Rural Micro enterprises in terms Family Size of Proprietors

Family size in terms of average number of family members across sample districts and micro enterprise sectors is given in *Table 4.13 & 4.14* respectively. The *Tables* show that the proprietors belong to small families averaging 4.16 persons per family. There is however, variation in family size both spatially and sectorally. A district wise distribution of sample rural micro enterprises in terms of family size of the proprietors show that the average family size of proprietors in the Barpeta district is the highest, while, it is less than four persons in Kamrup and Sibsagar districts respectively. Across sectors, the average family size in the handloom sector is found to be the highest with the carpentry sector having the lowest family size of less than four members.

Table 4.13: District wise Distribution of Sample Rural Micro enterprises in terms of Family Size of Proprietors

Family Size	Districts			
	Barpeta	Cachar	Kamrup	Sibsagar
Average Family Size	4.6	4.15	3.95	3.95

Table 4.14: Distribution of Sample Rural Micro enterprises in terms of Family Size of proprietors across Micro enterprise Sectors

Family Size	Micro enterprise category			
	Cane & Bamboo	Carpentry	Food Processing	Handloom
Average Family Size	4.05	3.85	4.25	4.5

Figure 4.13: District wise Distribution of Sample Rural Micro enterprises in terms of Family Size of Proprietors
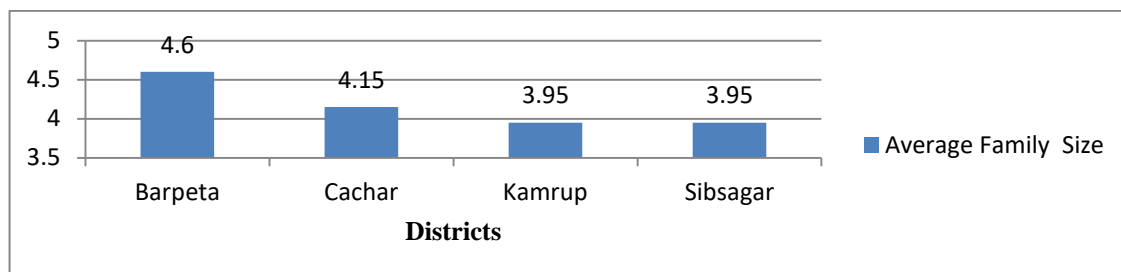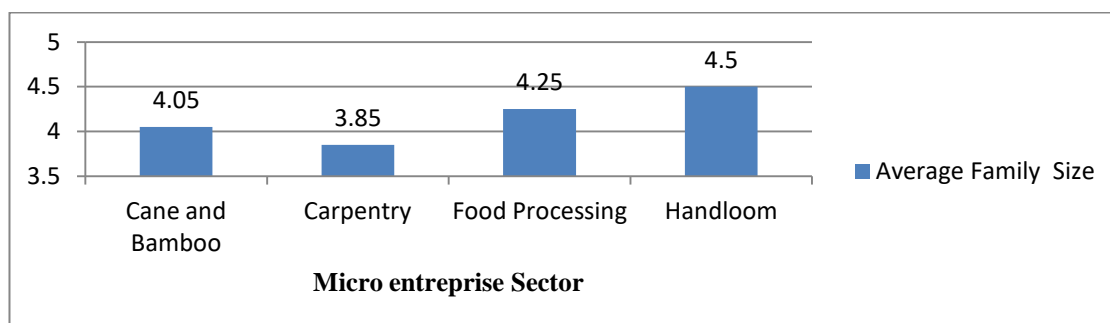

Source: Field Survey, 2015

Figure 4.14: Distribution of Sample Rural Micro enterprises in terms of Family Size of proprietors across Micro enterprise Sectors

Source: Field Survey, 2015

4.1.8. Employment Generation across Micro enterprise Sectors

The employment status by skill level analysed across the rural micro enterprise sectors is presented in *Table 4.15*. A look into the *Table* shows that a total of 80 sample micro enterprises across the sectors have generated employment capacity for 316 persons, the average per unit being 3.96 persons. Across sectors, the variation in absorption per unit is from a minimum of 3.1 person to a maximum of 5.05 persons. The handloom sector with 5.05 persons per unit exhibits higher absorption capacity as compared to the other three sectors. While the carpentry sector has a capacity of more than 4.3 persons, the same is less than 4.0 persons in cane and bamboo and food processing sectors respectively. An analysis of the skill level of the persons employed shows that the employment scenario of the rural micro enterprises is primarily a field

of skilled (69.31 per cent) and semi-skilled (23.42 per cent) persons. The lowly skilled and unskilled have no place at all.

Table 4.15: Employment Generation across Micro enterprise Sectors

Type of Employment	Cane & Bamboo	Carpentry	Food Processing	Handloom	Total	Percentage
Semi-skilled	21	17	21	15	74	23.42
Skilled	42	54	38	78	212	67.09
Low skilled/Unskilled	2	15	-	6	23	7.28
No external manpower	2	-	3	2	7	2.22
Total	**67**	**86**	**62**	**101**	**316**	**100**
Average employment	**3.35**	**4.3**	**3.1**	**5.05**	**3.95**	

Source: Field Survey, 2015

**Figure4.15: Employment Generation across Micro enterprise Sectors**
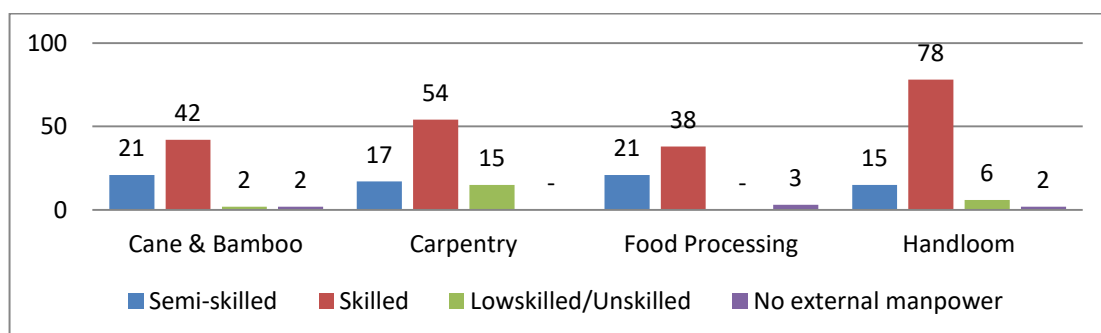
Source: Field Survey, 2015

4.1.9. Average Monthly Production across Micro enterprise Sectors

The production of micro enterprises per unit per month in money value has been analysed across the four sectors of rural micro enterprises. The production value per micro enterprise per month stands at Rs. 54,309.05 at the aggregate level. A comparison of the status of the aggregate level with that of the sectoral level shows that there is a variation in production of higher nature ranging from a minimum of Rs. 37,208.08 to a maximum of Rs. 82,829.79 per month. The monthly average value is highest in the carpentry sector and lowest in the food processing sector. While in the handloom sector, it is closer to the value at the aggregate level.

Figure 4.16: Average Monthly Production (in Rs.) by Micro enterprise Categories
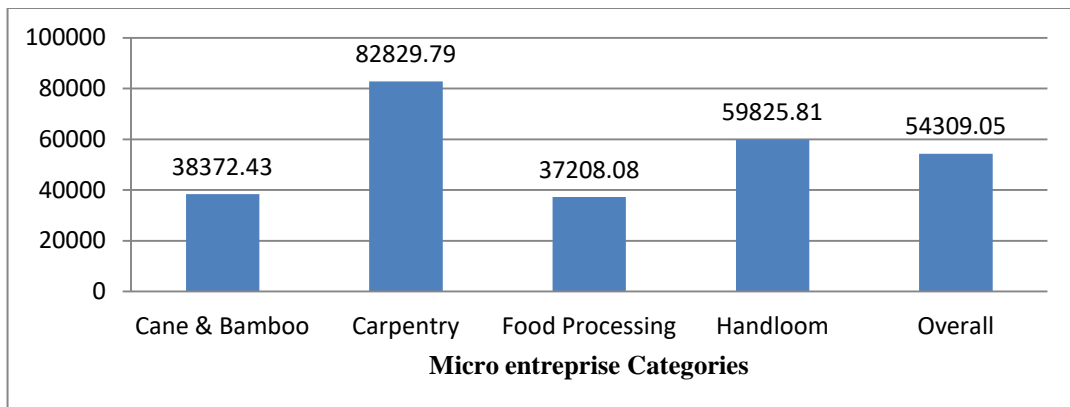
Source: Field Survey, 2015

4.1.10. Average Monthly Income across Micro enterprise Sectors

The income from the rural micro enterprises on per month per unit count further has been analysed here. The average income stands at Rs. 8145 at the aggregate level for all rural micro enterprises. As compared to the aggregate level of income, there is wide variation of income across sectors ranging from a minimum of Rs. 5250.00 to a maximum of Rs. 11805.56 per month. Among the sectors, food processing and handloom sectors have registered low level of average income as compared to the cane and bamboo and carpentry sectors.

Figure 4.17: Average Monthly Income (in Rs.) across Micro enterprise Categories
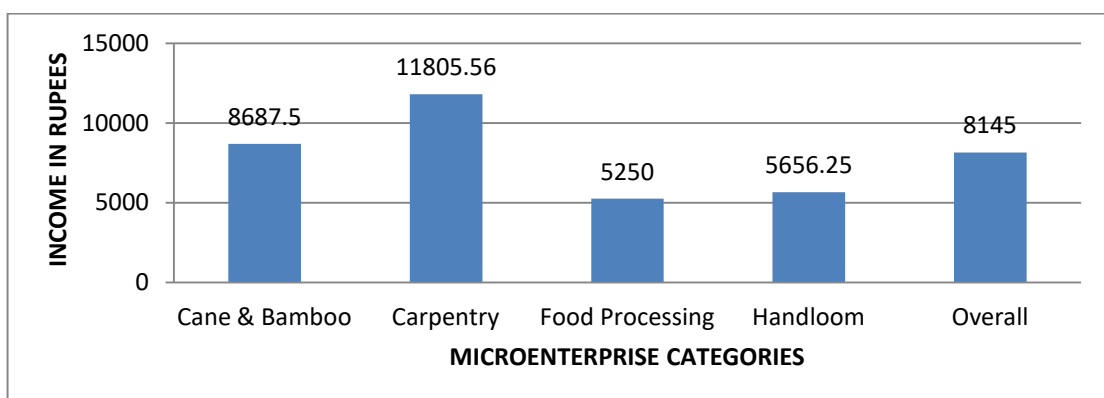
Source: Field Survey, 2015

4.1.11. Investment Status of Rural Micro enterprises of Assam across Sectors

The investment made in rural micro enterprises is analysed across sectors here. The analysis takes into account the investment on plant and machineries over a period of five years preceding the year of survey i.e. 2015-16. The average investment per unit over the five year period stands at Rs. 65,427.80. But, variations across sectors are highly discernible. A sector specific analysis of average investment in plants and machineries shows that the average investment in the carpentry sector has been the highest while it is lowest in the handloom sector. In three sectors, viz., cane and bamboo, food processing and handloom sector, the investment is in the range of about Rs. 42,000-50,000. The same for the carpentry sector is found to be more than double at Rs. 1,23,593.

A look into the sources of finance reveals that most of the units across sectors are self-financed (76.40 per cent) with only 15.43 per cent of the units availing institutional finance. It is also found that a few units have availed finance from non-institutional sources. An analysis across sectors reveals that access to institutional finance is highest in the carpentry sector (30.21 per cent) while it is lowest in the food processing sector (5.81 per cent). Investments from own sources is found to be more prevailing in the cane and bamboo and handloom sectors respectively.

Table 5.16: Investment Status of the Rural Micro Entrepreneurs of Assam

| Sector	Average Investment in Last Five Years (Rs.)	Source of Investment (%)			Total
		Self-Finance	Institutional Finance	Non-institutional Finance	
Cane & bamboo	49641	75.65	14.11	10.24	100
Carpentry	123593	58.73	30.21	11.06	100
Food processing	46549	90	5.81	4.19	100
Handloom	41928	81.23	11.6	7.17	100
Overall	**65427.8**	**76.40**	**15.43**	**8.17**	**100**

Source: Field Survey, 2015

4.1.12. Raw Material Status of Rural Micro enterprises of Assam

The raw material status across micro enterprise sectors has been analysed in terms of cost, price, availability and sources of the raw materials used. The availability of raw material and distance of the raw material source play an important role in determining the price of raw materials as well as the price of the goods produced.

The availability status of raw materials has been categorised into three broad groups – (i) available throughout the year, (ii) available seasonally, and (iii) scarce. It is found that around 80 per cent of the rural micro enterprises get the raw material throughout the year. For atleast 18 per cent, the raw materials are seasonally available and for the remaining two per cent, it is scarce.

Figure 4.18: Availability Status of Raw Materials of Rural Micro enterprises of Assam
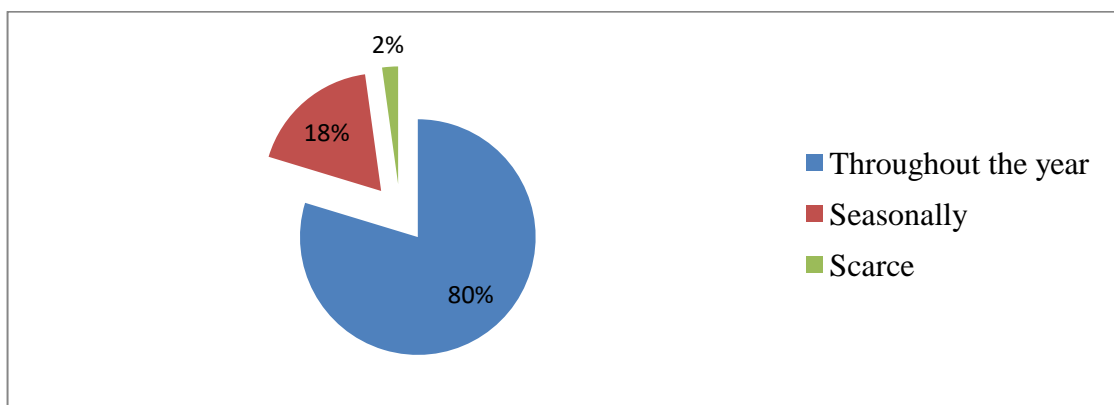
Source: Field Survey, 2015

An examination of the sectoral status further shows that except for the food processing sector, the raw material for other sectors is available throughout the year. The raw material required in respect of the food processing sector is seasonal in nature as reported by 45.6 per cent of the enterprises.

Table 4.17: Percentage wise Availability of Raw Materials across Micro enterprise Sectors

Sectors	Availability of raw material used (Percentage)			
	Throughout the year	Seasonally	Scarce	Total
Cane & Bamboo	84	14.5	1.5	100
Carpentry	90.88	6.55	2.56	100
Food Processing	51.3	45.6	3.1	100
Handloom	92.58	5.82	1.59	100

Source: Field Survey, 2015

The nature of access to the sources of raw materials has been analysed under three categories – (i) locally within the village, (ii) nearby markets, and (ii) distant market places. The figure below reveals that 62 per cent of the rural micro enterprises get their required raw material from the nearby markets and 32 per cent locally from within the village. Only seven per cent get the raw materials from distant markets.

Figure 4.19: Raw Material Sources of Rural Micro enterprises of Assam
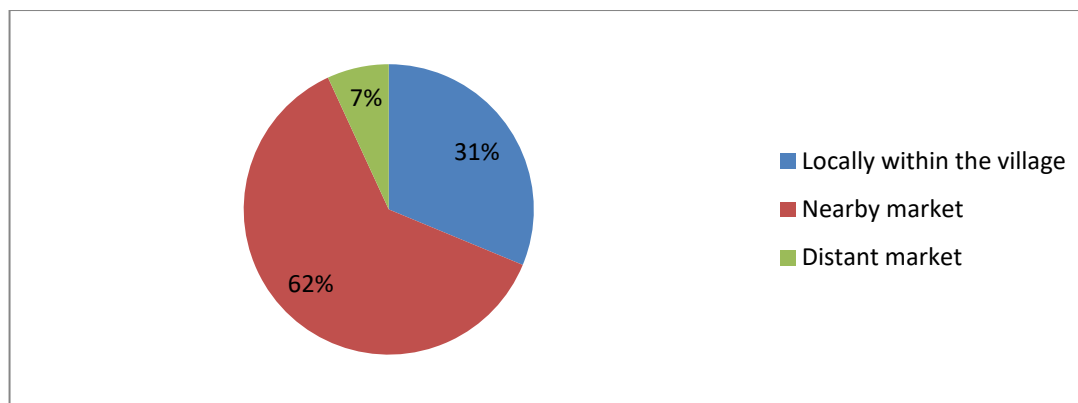
Source: Field Survey, 2015

An analysis of raw material sources across micro enterprise sectors shows that the cane and bamboo and food processing sectors depend on the locally available sources while the carpentry and handloom sectors depend on the nearby markets for procurement of raw material.

Table 4.18: Source of Raw Materials across Micro enterprise Sectors

Sectors	Sources of Raw Material (%)			
	Locally within the Village	Nearby Market	Distant Market	Total
Cane & bamboo	51.25	40	8.75	100
Carpentry	10	77.5	12.5	100
Food processing	46.25	48.75	5	100
Handloom	17.5	81.25	1.25	100

Source: Field Survey, 2015

4.1.13. Marketing across Micro enterprise Sectors

The status of marketing activities of the rural micro enterprises has been explored in terms of (i) present market access, (ii) marketing channels, (iii) exhibition participation, and (iv) receiving customer feedback. An analysis of market access reveals that a majority of the micro enterprises (52.5 per cent) have access to nearby local markets only while 31.25 per cent market their products within the State of Assam. A mere 16.25 per cent of the micro enterprises have access to national markets whereas none of them have access to the export market. Across sectors, it is observed that the cane and bamboo and handloom sectors respectively have somewhat a higher exposure to the national market than the carpentry and food processing sectors.

Table 4.19: Present Market access of Rural Micro enterprises across Categories

Sl. No.	Present Market	Cane & Bamboo	Carpentry	Food Processing	Handloom	Total	Percentage
1	Local	9	14	11	8	42	52.5
2	Within the State	6	4	8	7	25	31.25
3	National	5	2	1	5	13	16.25
4	International	-	-	-	-	-	-
	Total	20	20	20	20	80	100

Source: Field Survey, 2015

A look into the marketing channels reveals that majority of the micro enterprises market their products on their own in open markets and retail outlets. However, a significant section (34 per cent) also sells their products through marketing agents or hawkers. The role of government and private institutional buyers is limited as both accounts for only five per cent of the existing market channels.

Figure 4.20: Marketing Channels of Rural Micro enterprises of Assam
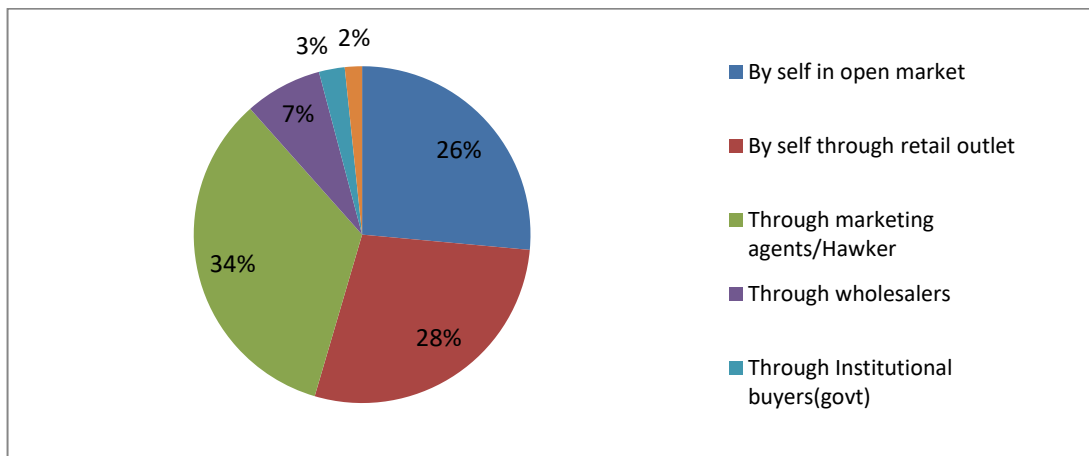
Source: Field Survey, 2015

An analysis of the use of marketing channels across micro enterprise categories has been done here. It reveals that each of the four sectors of sample micro enterprises use multiple marketing channels to sell their products. The hawkers or marketing agents are found to be the largest marketing channels for the cane and bamboo, food processing and handloom sectors. For the carpentry sector, marketing through own retail outlet is the major marketing channel. A majority of the entrepreneurs in the handloom sector sell their products themselves in the open market. Only the handloom sector is found to have some access to the institutional buyers in the government.

Figure 4.21: Marketing Channels across Micro enterprise Categories

	Self in open market	Self through retail outlet	Through marketing agents/ Hawker	Through wholesalers	Through Institutional buyers (Govt.)	Through Institutional buyers (Pvt.)
■ Cane & Bamboo	6	5	11	3		2
■ Carpentry	6	17	2			
■ Food Processing	6	8	16			
■ Handloom	14	4	12	6	3	
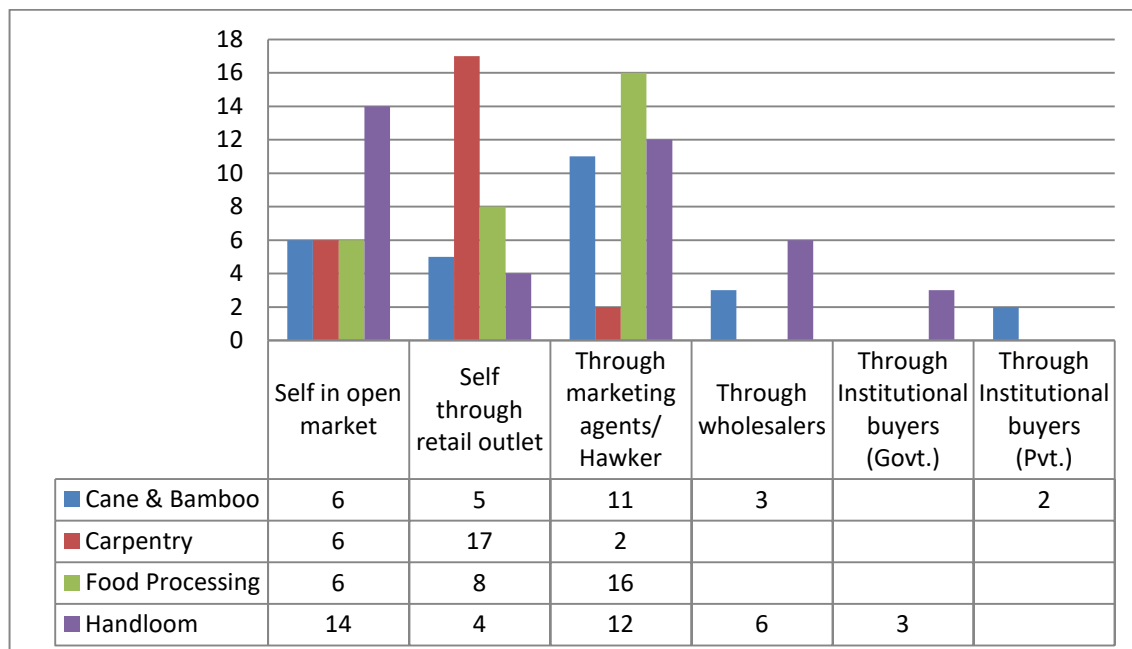
Source: Field Survey, 2015

Exhibition participation has been analysed in *Table 4.20.* It is observed that 63.75 per cent of the entrepreneurs have participated in exhibitions and fares, while the rest 36.25 per cent are yet to participate in any such event. Across sectors, it is found that exhibition participation is highest in the handloom sector and is lowest in the carpentry sector.

Table 4.20: Exhibition Participation Status of Rural Micro enterprises across Categories

Sectors	Exhibition Participation (%)			
	Within State	Outside State	Not Participated	Total
Cane & bamboo	40	25	35	100
Carpentry	15	10	75	100
Food processing	60	15	25	100
Handloom	60	30	10	100
Overall	43.75	20	36.25	100

Source: Field Survey, 2015

4.1.14. Motivational Factors Contributing towards Promotion of Rural Micro enterprises

An attempt has been made to identify and understand the factors influencing the entrepreneurs in starting their entrepreneurial venture. Based on the responses received, the motivational factors have been broadly categorised into (i) Pull Factors, and (ii) Push Factors. The pull factors identified are again broadly classified into four categories – (a) in search of better income, (b) visibility of better future prospects, (c) autonomy, and (d) starting enterprises based on the acquired skill. The push factors have been categorised as - (a) unemployment or no other alternative, (b) job dissatisfaction, (c) limited income from primary sector, and (d) limited physical assets like scarcity of lands.

Table 4.21: Identified Motivational Factors for First Generation Entrepreneurs

Factor categories	Motivational Factors	Entrepreneurs Motivated (in %)
Pull factors	Higher income	33.75
	Better future prospect	17.5
	Autonomy / independent functioning	7.5
	Acquired skill and experience in the same arena	5
Push factors	Unemployment	16.25
	Job dissatisfaction	6.25
	Limited income from primary sector	7.5
	Limited physical assets	6.25

Source: Field Survey, 2015

In respect of pull factors, the search for better income is found to be the major accounting factor (33.75 per cent). The second pull factor is prospect for better future accounting for 17.5 per cent of the total entrepreneurs. Around 7.5 per cent of the entrepreneurs feel that entrepreneurship would provide them the scope of independent functioning and decision making. On the other hand, five per cent have expressed that they can put into practice their previous skills and experiences of working in the same or similar sectors.

Among the push factors, lack of gainful employment is found to have compelled nearly 16.25 per cent of the entrepreneurs to engage themselves in entrepreneurial activities. About 7.5 per cent of the entrepreneurs have shifted from their previous occupation in agriculture to enterprises due to limited income from the primary sector. Similarly, limited availability of physical resources and job dissatisfaction are the other two push factors influencing six to eight per cent of the entrepreneurs towards starting their own venture.

## 4.2. Challenges of the Micro enterprise Sector in Assam

Based on the responses received from the entrepreneurs, the problems experienced by the rural micro enterprises have been broadly classified into seven broad areas, viz., finance, production, technology, raw materials, marketing, energy/power supply and product development. The responses in terms of percentage are given in *Table 4.22*.

Table 4.22: Entrepreneurs' Response for Identified Problems (in %)

Sl. no.	Problems	Entrepreneur's Response (in %)
1	Finance	72.5
2	Production	71.25
3	Raw Materials	61.25
4	Marketing	53.75
5	Technology	50
6	Product Development	33.75
7	Energy/Power Supply	30

Source: Field Survey, 2015

Figure 4.22: Entrepreneurs' Response towards Identified Problems (in %)
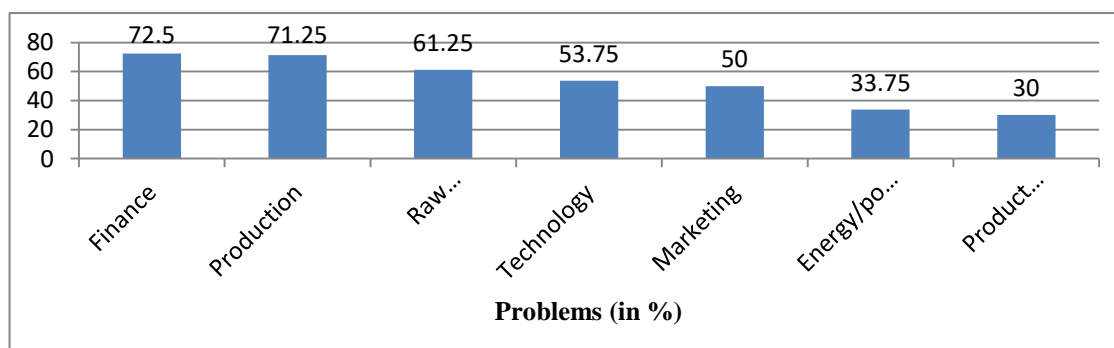
Source: Field Survey, 2015

The *Table 4.22* reveals that it is the finance related problems which is the most reported problem among the sample micro enterprises (72.5 per cent) followed by production related problems (71.25 per cent) and raw material related problems (1.25 per cent). The energy/power supply is the least perceived problem among all with 30 per cent reporting for it.

4.2.1. Analysis of Sector Specific Problems of Rural Micro enterprises

The responses received against the seven problems are grouped into three response categories – (i) High Response Category (HRC), (ii) Middle Response Category (MRC), and (iii) Low Response Category (LRC). A particular problem is considered under HRC if more than or equal to two-third of the total respondents express it as a problem (HRC ≥ 2/3 positive responses out of the total respondents). Similarly, if expressed by more than or equal to one third but less than two third of the total respondents, then the problem is classified as MRC (1/3 ≤ MRC < 2/3 of the total respondents). The problem falls under LRC, if the total positive responses do not exceed one-third of the total responses (< 1/3 of the total respondents). Based on this classification, the problems of the rural micro enterprises across the four sectors are analysed and sector wise results are discussed below.

4.2.1.1.*Analysis of Problems of Cane and Bamboo Sector*

In case of the cane and bamboo sector, the HRC problems are in the areas related to finance, raw material and production. The nature of financial problems includes lack of access to institutional credit, inadequate loan amount, delay for lengthy loan sanction procedure and problems related to collateral security etc. The raw material in the sector is a problem because of high price and non availability of raw materials. Production, on the other hand, suffers from the problems like irregularity of the workers, scarcity of skilled manpower and the inadequacy in storing and display facilities. These constitute the higher level of challenges for the entrepreneurs of the cane and bamboo sector. A detail of the responses received on the different identified problems is outlined in *Table 4.23*.

Table 4.23: Problems and their Nature in the Cane & Bamboo Sector

Problem	Entrepreneur's Response (in %)	Response Category	Nature of Problem
Finance	85	High	1. Lack of access to institutional credit 2. Inadequate loan amount 3. Delay in loan sanction procedure 4. Problem of collateral requirements
Raw material	75		1. High raw material price 2.Availability constraint of raw materials
Production	70		1.Irregular working staff 2. Lack of required skill level 3.Inadequate storing as well as display facilities of products
Technology	55	Middle	1.Time consuming manual operation 2.Available tools are out dated with low productivity 3. High cost of sophisticated tools with little knowledge of their operation
Marketing	45		1. Fails to compete with other machine made products. 2. Lack of proper marketing knowledge
Product Development	30	Low	1. Items with traditional design 2. Lack of exposure to product diversification
Energy/Power supply	15		1. Frequent power cuts

Source: Field Survey, 2015

On the technology front, inadequate access to sophisticated tools make the production process time consuming as well a costly affair and therefore, the products fail to receive a good market response like the other machine made ones. Limited market access with its confinement only to the local areas has adverse influence on receiving a better price of the product. As reported, the traditional designs with poor finish fail to attract buyers in many cases.

4.2.1.2. *Analysis of Problems of Food Processing Sector*

The results of the analysis carried out (*Table 4.24)* show that production, marketing and finance related issues are the HRC problems in the food processing sector. The production related problems of the sector are spread over four more specific areas like lack of proper storage facilities, preservation knowledge, poor

quality management and licensing constraints. On the marketing front, the processed food products of the entrepreneurs suffer from two specific problems, viz., competition from established brands and inadequate publicity. The lack of access to institutional credit and cumbersome process of availing loans are the finance related problems in the food processing sector.

The MRC problems are found to be linked with the raw material and technology. The raw materials of the food processing sector are seasonal in nature leading to wide price fluctuations and variations over the season. A limited number of entrepreneurs are found to be using sophisticated tools in the production process in the sector and most of the works related to packaging and labelling are done manually.

Table 4.24: Problems and their Nature in the Food Processing Sector

Problems	Respondents' Response (%)	Response Category	Nature of Problem
Production	75	High	1.Lack of adequate storage facilities 2.Insufficient knowledge of preservation 3.Poor quality management along with improper presentation of the produce 4. Licensing constraint
Marketing	75		1. Fail to compete with other branded products both in flavour and presentation 2.Inadequate advertisement facilities
Finance	70		1.Lack of access to institutional credit 2.Hurdle in loan availing process
Raw material	60	Middle	1. Seasonal Cost variation and along with availability constraint
Technology	60		1. Manual operation with low end technology
Energy/ power supply	30	Low	1.Frequent power cut off

Source: Field Survey, 2015

4.2.1.3.*Analysis of Problems of Carpentry Sector*

As found in the cane and bamboo and food processing sectors analysed above, finance and production remains the HRC problems in respect of the carpentry sector

also. Along with finance and production, energy is the third HRC problem of the carpentry sector. The enterprises in the sector experience frequent power cuts and low voltage hampering production and productivity of the sector. The MRC problems of the sector are related to technology as most of the carpentry units do not make use of advanced tools and equipments. Raw material, marketing and product development related problems are the LRC problems of the sector.

Table 4.25: Problems and their Nature in Carpentry Sector

Problems	Respondents' Response (%)	Response Category	Nature of Problem
Energy	75	High	1.Frequent power failure 2.Low voltage
Finance	75		1. Lack of both Working and fixed capital 2.Lack of access to institutional credit 3. Collateral Requirements as well as lengthy loan sanction procedure 4.High rate of interest
Production	70		1.Lack of skilled man power 2. Retention of work force
Technology	55	Middle	1. Lack of Improved modern equipment 2.High cost of sophisticated tools as well as lack of required manpower for the operation
Raw material	30	Low	1. High Cost and scarcity of raw material 2. High transportation cost 3.Low raw material quality
Marketing	20		1.Competition from large units 2.Slackness in demand 3.Limited exposure facilities
Product Development	15		1.Traditional design 2.Lack of awareness about market demand

Source: Field Survey, 2015

4.2.1.4. Analysis of Problems of Handloom Sector

The order of the problems in the handloom sector as can be seen from *Table 4.26*, are by and large different from the other three sectors. The HRC problems of the sector are raw material, production and product development. The high cost of raw material and lack of product development are found to be the major hurdles of the sector. Lack of quality monitoring facility both for raw material and final product is

another major hurdle in the sector. A significant number of the handloom units being seasonal, the retention of the workers is a challenge which disrupts the production process. At the same time, the entrepreneurs find it hard to continue their production throughout the year due to lack of adequate market demand. Marketing, finance and technology are the MRC problems of the sector. As the weavers are not aware about the modern market requirements, their traditional designs fail to attract customers. Energy and power supply are the LRC problems in the sector. The energy related problem is stated by a small number of the entrepreneurs owing to traditional manual operation of most of the handloom units.

Table 4.26: Problems and their Nature in the Handloom Sector

Problems	Respondents' Response (%)	Response Category	Nature of Problem
Raw material	80	High	1.High cost and scarcity of raw material 2.Low quality of raw material
Production	80		1.Retention of work force 2.Under utilisation of the capacity of the units
Product Development	75		1.Traditional design limiting market access 2.Lack of product diversification
Marketing	60	Middle	1.Conventional way of marketing 2.Competition from large units 3. Slackness in demand
Finance	55		1.Shortage of working and fixed capita 2.Procedural stagnation in government agencies 3.Meagre assistance from government agencies 4.Lack of access to institutional credit and hurdle in loan sanction process
Technology	45		1.Deficient in modern equipments 2.Lack of skill workers to operate the new equipments
Energy/power supply	15	Low	1. Frequent power failure 2.Low voltage

Source: Field Survey, 2015

4.3. Value Chain Analysis of Micro enterprise Sector in Assam

A value chain is the entire chain of activities of an enterprise through which it adds value to a product or service to make it worthy for the customer. The more the value created, the more customers will be prepared to pay a good price for any product or services. Porter, M. E. (1985) was first to introduce the concept and analysis of value chain in terms of primary activities and support activities. The primary activities includes inbound logistics (getting the material in for adding value), operations (the production/ manufacturing processes), outbound logistics (includes storing and distribution to the points of sale), marketing and sales and post sales service. The support activities include infrastructure, human resource, procurement and technology that are essential for supporting and sustaining the primary activities. Value chain analysis provides vital insights indicating performance and gaps of an enterprise or sector, based on which, an enterprise or sector can develop strategies for making its product or services competitive.

In the study, an attempt has been made to document the value chains of each enterprise surveyed. Subsequently, the enterprise level data have been combined to obtain the sectoral value chains for the four sample micro enterprise sectors. The value chain analyses of the cane and bamboo, food processing, handloom and carpentry sector are presented here.

4.3.1. *Value Chain Analysis of Cane and Bamboo Sector*

The value chain analysis has been carried out using combined market value of the produce of the cane and bamboo sector and then deducing it in proportion to Rs.100. The analysis reveals that the total production cost of the cane and bamboo sector is around 80 per cent of the market value of the produce and the profit margin is around 20 per cent. The average person hour required for producing products of Rs.100 weighted by market value is 1 hour 47 minutes. In terms of primary activities, inbound logistics (46.04 per cent) and operation activities (40.12 per cent) are responsible for about 86 per cent of the total production cost. The expenditure on

outbound logistics (7.63 per cent) and marketing and sales (6.21 per cent) is limited. As regard to the support activities, 72 per cent of the production cost is incurred on procurement of raw materials (38.85 per cent) and human resource (32.88 per cent). The cost of use of technology is 20.64 per cent of the market value of the produce. The detail of the analysis is given in the *Table* below.

Table 4.27: Value Chain Analysis of Cane and Bamboo Sector

Primary Activities	Secondary Activities				Total (Rs.)	Person Hour Required
	Infrastructure	Procurement	Human Resource	Technology		
A. Inbound Logistics	**3.2**	29.67	1.9	2.04	**36.81**	
B. Operation	2.9	1.4	19.14	8.64	**32.08**	
C. Outbound Logistics			3.6	2.5	**6.1**	1 hour 47 minutes
D. Marketing & Sales			1.65	3.32	**4.97**	
E. Total Production Cost (A+B+C+D)	**6.1**	**31.07**	**26.29**	**16.5**	**79.96**	
F. Profit Margin					**20.04**	

Source: Field Survey, 2015

4.3.2. *Value Chain Analysis of Food Processing Sector*

The method used in respect of value chain analysis for the cane and bamboo sector has been used in respect of the food processing sector also (*Table 4.28*). The analysis reveals that the total production cost of the sector is 78.67 per cent of the market value of the produce. The average time required in the sector to produce any product worth market value of Rs. 100 is two hours and four minutes. The profit margin is 21.33 per cent for the sector. Out of the total expenditure incurred on primary activities, inbound logistics (43.24 per cent) and operation activities (41.58 per cent) account for 84 per cent of the total. In case of support activities, 74 per cent of the production cost is due to procurement (38.50 per cent) and on human resource

(37.32 per cent) expenditures. The use of technology accounts for 14.63 per cent and infrastructure 9.54 per cent.

Table 4.28: Value Chain Analysis of Food Processing Sector

Primary Activities	Secondary Activities				Total (Rs.)	Person Hour Required
	Infrastructure	Procurement	Human Resource	Technology		
A. Inbound Logistics	**4.41**	26.49	1.08	2.04	**34.02**	
B. Operation	3.1	1.4	24.56	3.65	**32.71**	
C. Outbound Logistics		2.4	2.07	2.5	**6.97**	2 hours 04 minutes
D. Marketing & Sales			1.65	3.32	**4.97**	
E. Total Production cost (A+B+C+D)	**7.51**	**30.29**	**29.36**	**11.51**	**78.67**	
E. Profit Margin					**21.33**	

Source: Field Survey, 2015

4.3.3. *Value Chain Analysis of Handloom Sector*

In case of the handloom sector too, the value chain analysis has been carried out using the same method as has been applied in the previous two sectors (*Table 4.29*). The value chain of the handloom sector reveals that the profit margin of the sector is the lowest in comparison to the other three sectors (18.37 per cent). On the other hand, the time required to produce products with market value worth Rs 100 is also two hours and 16 minutes, the highest among the four sectors. Also, the cost of procurement of raw material in the sector too is the highest (35.23 per cent) among the four sectors. In fact, among the primary activities, inbound logistics and operation together account for about 90 per cent of the total production cost. On the other hand, expenditures on marketing and technology are quite limited.

Table 4.29: Value Chain Analysis of Handloom Sector

Primary Activities	Secondary Activities				Total (Rs.)	Person Hour Required
	Infrastructure	Procurement	Human Resource	Technology		
A. Inbound logistics	**2.3**	35.23	1.7	1.06	**40.29**	
B. Operation	2.42	1.4	21.6	7	**32.42**	
C. Outbound logistics			2.3	1.65	**3.95**	2 hours16 minutes
D. Marketing & sales			1.65	3.32	**4.97**	
E. Total production cost (A+B+C+D)	**4.72**	**36.63**	**27.25**	**13.03**	**81.63**	
E. Profit margin					**18.37**	

Source: Field Survey, 2015

4.3.4. *Value Chain Analysis of Carpentry Sector*

As in the case of the other sectors, the value chain for the carpentry sector has also been performed. The results are given in *Table 4.30.* It is found from the *Table* that the total production cost (76.54 per cent) as well as production time (1 hour 23 minutes) is the lowest in the carpentry sector. Thus, the profit margin in the sector is the highest amongst the four micro enterprise sectors. Notably, the technology cost is the highest among the four sectors (27. 34 per cent). Among the secondary activities, the cost on inbound logistics and operation together account for about 83 per cent of the total cost of production in the sector.

Table 4.30: Value Chain Analysis of Carpentry Sector

Primary Activities	Secondary Activities				Total (Rs.)	Person Hour Required
	Infrastructure	Procurement	Human Resource	Technology		
A. Inbound logistics	**4.08**	22.6	2.76	2.6	**32.04**	
B. Operation	4.2	1.05	14.14	12.8	**32.19**	1 hour 23 minutes
C. Outbound logistics			2.43	4.5	**6.93**	
D. Marketing &	2.7		1.65	1.03	**5.38**	

sales						
E. Total production cost (A+B+C+D)	10.98	23.65	20.98	20.93	76.54	
E. Profit margin					23.46	

Source: Field Survey, 2015

4.4. Prospects of Rural Micro enterprise Sector in the Light of Common Felt Needs

It is regarded that the prospects of the rural micro enterprise sector is immense provided the needs and requirements of the entrepreneurs are adequately addressed. An attempt has been made to understand the common felt needs of the entrepreneurs during the survey. An account of the scope of the micro enterprise sectors based on sector specific requirements is enlisted in *Table 4.31*.

Table 4.31: Strategy for Enhancing Prospects of Micro enterprises sectors

Sl. No.	Micro enterprises Sectors	Specific Requirements	Strategy for Enhancing Prospects
1	**Cane and bamboo**	Facilitation of access to credit	• Dedicated venture capital fund • Collateral free time bound credit delivery from banks and other financial institutions • Imparting knowledge on financial literacy among the entrepreneurs
		Facilitating availability of cheap raw material	• Establishment of raw material depots
2	**Food processing**	Regulatory clearance and compliance issues	• Single window regulatory clearance system
		Raw material storage	• Common storage facility for raw materials
		Quality control	• Facilitating FASSI licences • Training on use of preservatives • Scientific packaging facility
3	**Handloom**	Provision for quality raw material	• Raw material banks managed by the weavers' federation
		Development of market oriented quality products	• Market tie ups • Product and design development
4	**Carpentry**	Availability of skilled manpower	• Focused skill development initiatives

		Regular power supply	• Dedicated power supply
		Technology up gradation	• Technology Incubation facility

Source: Field Survey, 2015

In case of the cane and bamboo sector, based on the empirical evidence from the study, it is observed that immediate facilitation of access to credit needs to be ensured for the development of the sector. Initiatives like promotion of dedicated venture capital fund, collateral free time bound credit delivery from banks and other financial institutions, and imparting knowledge on financial literacy among the entrepreneurs are the need of the hour. There is also the need for intervention in facilitating availability of cheap raw material by establishing raw material depots. Skill development of the existing workforce on diversified products, designs and use of modern tools is also necessary for ensuring better productivity in the sector.

With respect to the handloom sector, as facilitation of quality raw material is highly sought for, provision of raw material banks managed by the weavers' federation is the need of the hour. Similarly, initiatives for development of market oriented quality products and market tie ups for achieving price discovery would help in realising the true potential of the sector.

Entrepreneurs in the food processing sector are facing hurdles of multiple agency regulatory clearances and have expressed that time bound single window regulatory clearance system can help in developing the sector. Moreover, providing common storage facility for raw materials, skill development on quality control, use of preservatives and scientific packaging etc can help the sector in realising its true potential.

The carpentry sector being labour intensive generates employment opportunities in rural areas. However, constraints in areas like availability of skilled manpower need to be addressed through focused skill development efforts. Moreover, the entrepreneurs have expressed that regular power supply especially during working hours can benefit the sector immensely. Easy access to institutional credit for the

entrepreneurs can lead to the much needed up-gradation of technology, and expansion of plant and machinery in the sector.

Section-II: Growth and Performance: Pattern, Determinants and Relationship

This section presents an analysis of growth and performance of the rural micro enterprises in Assam. The analysis portrayed here is based on primary data collected through field survey. This section consists four sub-sections. The first sub-section provides an account of the status of growth of rural micro enterprises in Assam. The second sub-section explores the nature and extent of influence the socio-economic and strategic factors have on the growth of rural micro enterprises. The third sub-section discusses the status of performance efficiency of rural micro enterprises in the State of Assam based on enterprise value chain analysis. The fourth sub-section explores the influence of performance efficiency of rural micro enterprises on micro enterprise growth.

4.5. Status of Growth of Rural Micro enterprises

In order to understand and assess the growth of rural micro enterprises, an Enterprise Growth Index (I_{EG}) has been constructed taking into account the growth of investment, employment and sale proceeds of a micro enterprise. The timeframe include three financial years ie FY2010-11 to FY2013-14. The methodology followed for construction of the enterprise growth index has been illustrated in Chapter 3. The growth index scores of sample micro enterprises have been classified into three categories - low with growth with index scores upto 0.2, average growth with index scores ranging from 0.2 to 0.4 and high growth with index scores higher than 0.4. The analysis of the scores of enterprise growth index reveals that more than two third of the sample micro enterprises (70 per cent) fall in the low growth category. Among the rest, with only about 3 per cent of the micro enterprises have high growth index (Figure: 4.23 & 4.24).
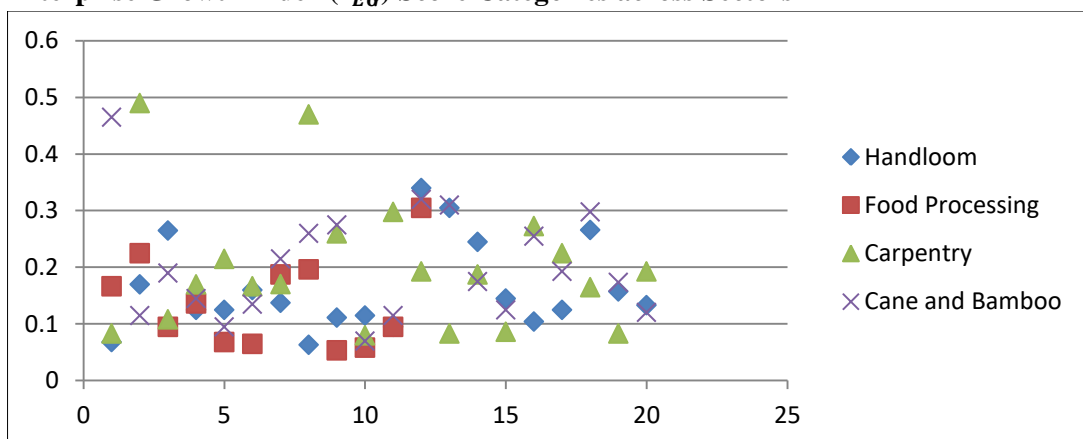
Figure 4.23: Distributions of Micro enterprises based on Enterprise Growth Index (I_{EG}) Score Categories

■ upto 0.2 (low)　　■ >0.2 to 0.4 (average)　　■ >0.4 to 0.6 (high)
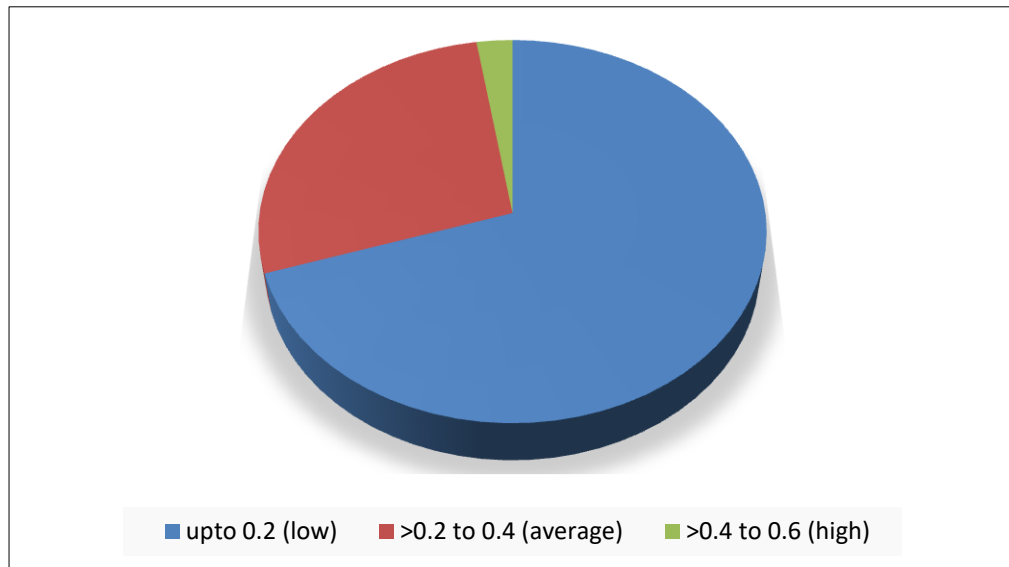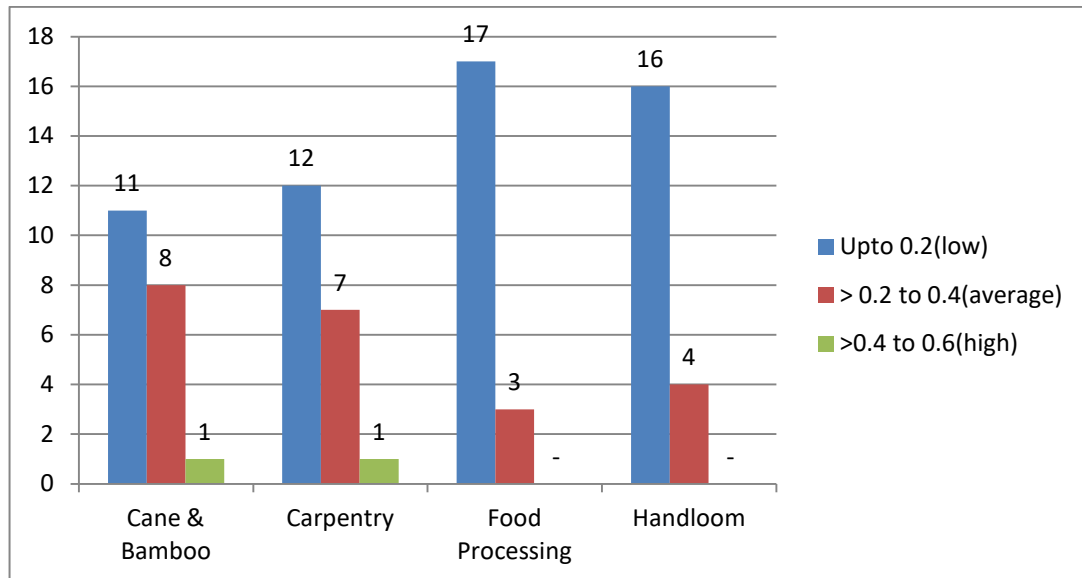
Source: Field Survey

The sectoral analysis of the growth index has been made here. The analysis reveals that the higher incidence of low growth scores is in the food processing sector followed by the handloom sector. While the cane and bamboo sector exhibits higher incidence of average growth scores followed by the carpentry sector. The detail is presented in Figure 4.24 and 4.25.

Figure 4.24: Scatter Diagram Showing Distributions of Micro enterprises based on Enterprise Growth Index (I_{EG}) Score Categories across Sectors

Source: Field Survey

Figure 4.25: Distribution of Micro enterprises based on Growth Index Score Categories across Sectors

Source: Field Survey

4.6.   Growth of Micro enterprise: Determinants and Relationship

In accordance with the objective of the study, two sets of determinants/ factors have been investigated for ascertaining their impact on the growth of rural micro enterprises The socio-economic factors constitute one set and the strategic factors constitute the other set. The findings are presented below.

4.6.1. Growth of Micro enterprises and Socio-economic Factors

As the study attempts to investigate the socio-economic factors helping or hindering growth of rural micro enterprises across the four sectors, a **multiple regression analysis** is carried out taking the scores of Enterprise Growth Index (I_{EG}) as the dependent variable for identifying the socio economic factors which have aided or limited the growth of micro enterprises.

4.6.1.1 Explanatory Variables (Socio-economic Factors) Influencing Growth of Micro enterprises

Nine socio-economic variables have been considered for their probable impacts on micro enterprise growth. These are as follows:

i. *Age of Entrepreneur:* Entrepreneur's age reflect experience and exposure he or she has got over the years and thus age of entrepreneur is expected to influence the growth of micro enterprise. So, entrepreneur's age is considered as an explanatory variable.

ii. *Years of Education:* Education year reflects the human capital of an entrepreneur in terms of knowledge acquired. Such exposure may aid the growth of micro enterprises. Hence, the number of years of access to education by the entrepreneur has been taken into account for its probable impact on the growth of rural micro enterprise.

iii. *Gender:* Yet another important variable that may influence the growth of the micro enterprise is gender. The gender on account of male or female may influence the growth differently and it is on this consideration, gender has been taken as an independent variable in the study.

iv. *Family Size:* Size is a numerical count of the members of a family. The physical, mental and psychological strength of a large size family is considered usually higher than a small size family. It is with this consideration that family size of entrepreneur is taken as an independent variable to measure the likely influence of family size on the growth of micro enterprises

v. *Marital Status:* The entrepreneur's marital status in terms of being married and unmarried is another social variable that may influence the growth of micro enterprises differently and hence it has been considered as an independent variable in the study.

vi. *Religion:* Religious belief is an important social variable that may influence the growth of micro enterprise and thus has been taken into account for the study.

vii. **Social category:** The caste of the entrepreneur, a significant social variable is considered for the study as independent variable.

viii. **Entrepreneur's monthly income:** Income earned by the entrepreneur from all possible sources is an important economic variable that may influence the growth of micro enterprises and thus, it has been taken into account for the present study.

ix. **Entrepreneur's family income:** The family income of the entrepreneur, another economic variable, has been taken into account as an independent variable for the present study to assess its possible influence on growth of micro enterprises.

4.6.1.2. Functional Form of the Model of Regression Analysis

In case of enterprise growth index, the values lie between 0 and 1 and thus the assumption of normality about the error term is questionable (Pope and Prescott, 1980; Weiss and Briglauer, 2002; Mishra et al, 2004). To overcome this problem, a popular transformation method known as logit transformation is often used (Pope and Prescott, 1980; Greene, 1997; Weiss and Briglauer, 2002; Mishra et al, 2004; Shariff et all, 2009). Thus, to identify the socio-economic determinants of micro enterprise growth, a multiple regression model has been used keeping the logit transformation values of Enterprise Growth Index (I_{EG}) as dependent variables and the nine socio-economic variables described above as independent variables. The logit transformation is discussed below:

Let us take a non-linear model of the form

$$I_{EG} = \frac{1}{1 + e^{-z}}$$

--------- (4.1)

Where, I_{EG} = Enterprise Growth Index ($0 \le I_{EG} \le 1$) and,

$$z = \alpha + \sum_{j=1}^{p} \beta_j X_j$$

<div align="right">-------- (4.2)</div>

I_{EG} stands for enterprise growth index $(0 \leq I_{EG} \leq 1)$, $X_j s$ are the factors influencing enterprise growth index $(j = 1,2,...,p)$ and $\alpha, \beta s$ are the parameters to be estimated.

Now a transformation of equation (4.1) can be done as shown below:

$$I_{EG} = \frac{1}{1 + e^{-z}}$$

$$I_{EG} = \frac{1}{1 + \dfrac{1}{e^z}}$$

$$\frac{1}{e^z} = \frac{1 - I_{EG}}{I_{EG}}$$

$$e^z = \frac{I_{EG}}{1 - I_{EG}}$$

<div align="right">-------- (4.3)</div>

Taking logarithm on both sides

$$z = \log\left(\frac{I_{EG}}{1 - I_{EG}}\right)$$

<div align="right">-------- (4.4)</div>

$$\text{Let, } W = \log\left(\frac{I_{EG}}{1 - I_{EG}}\right) = z$$

<div align="right">-------- (4.5)</div>

Where, *W* is a redefined measure of enterprise growth and its value is not restricted between 0 and 1. As the value of I_{EG} increases from 0 to 1, *W* will range between $-\infty$ and ∞.

That is,

$$\lim_{y \to 0} W = -\infty$$

$$\lim_{y \to 0} W = \infty$$

Thus *W* is a monotonically increasing function of I_{EG}. However, it is to be noted that this transformation is possible when values of the original dependent variable, i.e. I_{EG} in equation (4.3), are strictly between zero and one, and none of them is either zero or one. That is,

$$0 < I_{EG} \ 1; \ I_{EG} \neq 0 \ and \ I_{EG} \neq 1$$

Now, substituting the value of *Z* from equation (4.4) and adding a disturbance term, the equation becomes

$$W = \alpha + \sum_{j=1}^{p} \beta_j X_j + u$$

Now, incorporating the relevant explanatory variables mentioned in the section, the explicit final form of the model to be estimated becomes

$$W = log\left(\frac{I_{EG}}{1 - I_{EG}}\right)$$

$$= \alpha + \beta_1 Age + \beta_2 Edu + \beta_3 Gen + \beta_4 FS + \beta_5 MS + \beta_6 R + \beta_7 C$$
$$+ \beta_8 MI + \beta_9 FI + \varepsilon$$

--------- (4.6)

Here, *W* is the new measure of enterprise growth index

Age= Age of entrepreneur

Edu= Years of education

Gen= Gender

FS= Family size

MS= Marital status

R= Religion

C= Social category

MI= Entrepreneur's monthly income

FI= Entrepreneur's family income

α = Intercept or constant term

βs are the parameters to be estimated whereas ε is the disturbance term. The equation (5.6) is linear in both parameters and variables. Therefore, ordinary least square can be used for its estimation, assuming that ε fulfil the classical standard test square assumptions of zero mean, constant variance and zero covariance. That is,

$$E(\varepsilon_i) = 0$$

$$E(\varepsilon_i^2) = \sigma^2$$

$$E\left(\varepsilon_i \varepsilon_j\right) = 0; i \neq j$$

It is clear from the above analysis that the dependent variable enterprise growth index is a continuous variable bounded by 0 and 1.

4.6.1.3. Results and Discussion

The result of the multiple regression analysis is presented in *Table 4.31*.

Table 4.32: Results of Multiple Regression Analysis of Enterprise Growth Index

Variables/Items	Estimated Coefficients/Values
Age of Entrepreneur	-0.003 (.004)
Years of Education	0.005 (.018)
Gender	-0.107 (.075)
Family Size	0.012 (.042)
Marital Status	-0.030 (.103)
Religion	0.053(.083)
Caste	0.004 (.038)
Entrepreneur's Monthly income	5.633E-6 (.000)
Entrepreneur's family income	-1.906E-6 (.000)
R^2	0.090
Adjusted R^2	0.027
F	0.767

Notes: Figures in the parenthesis represents White's heteroscedasticity corrected standard errors of the respective coefficients[1]

As seen in the above *Table*, the adjusted coefficient of determination (Adjusted R^2) for the model is 0.027 which indicates that no significant relationship exists between the dependent and independent variables. From the above results, it is observed that the socio-economic factors do not have significant influence on the enterprise growth index. Thus, the empirical evidence of the study suggests that socio-economic factors do not play a significant role in augmenting or hindering growth of rural micro-enterprises in Assam.

---

[1] White's heteroscedascity-corrected standard errors are also known as robust standard errors (Gujarati, 2004)

4.6.2. Growth of Micro enterprises and Strategic Orientation

In accordance with the objective of the study, the influence of strategic orientation on the growth of rural micro enterprise has been investigated. Enterprises employ various strategies to make its products competitive and sustainable. Among these strategies, product and design development strategy is the most prominent. In this sub-section, status of strategic orientation and influence of strategic orientation towards product and design diversification on growth of rural micro enterprises of Assam has been explored.

4.6.2.1. Status of Strategic Orientation

Strategic orientation is represented by Product Development Index (PDI). PDI is estimated by the inverse of Herfindahl-Hirschman (HH) index i.e. 1-HH. Since HH index is a measure of concentration, its inverse is supposed to indicate the contribution of diversified product in total income of the enterprise. The detail about the methodology adopted has been illustrated in chapter 2.

The Product Diversification Index scores of sample micro enterprises have been classified into three categories - low with PDI scores upto 0.15, average with PDI scores with values higher than 0.15 to 0.3 and high with PDI scores with values higher than 0.4. The analysis of the PDI scores shows that about half of the sample micro enterprises (47%) fall in the low growth category while 39 per cent of the micro enterprises fall in average growth category. Only 14 per

cent of the micro enterprises belong to the high Product Diversification Index score category (Figure 4.26).
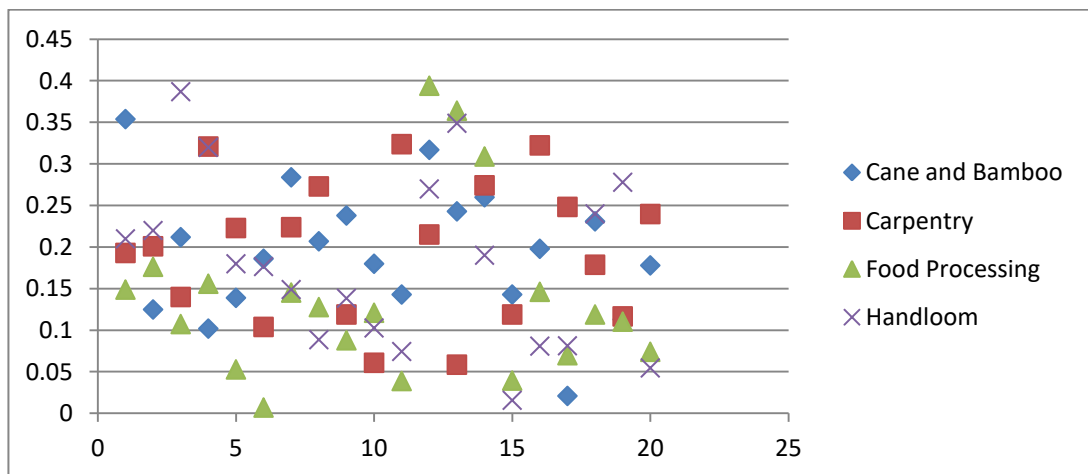
Figure 4.26: Distributions of Micro enterprises based on PDI Score Categories
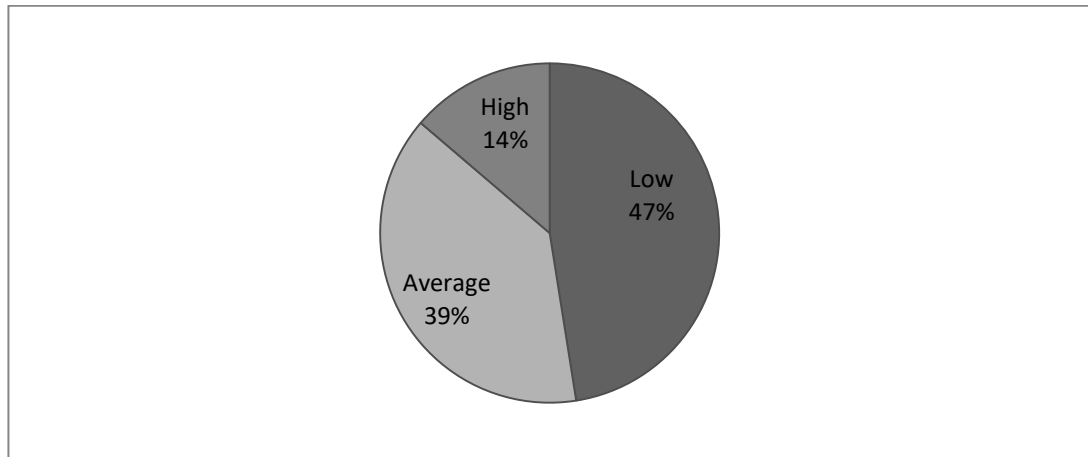
The scatter plot diagram of the Product Diversification Index scores of eighty micro enterprises across the four sample micro enterprise activities is presented in Figure 4.27.

Figure 4.27: Distributions of Product Diversification Index Scores across Sectors
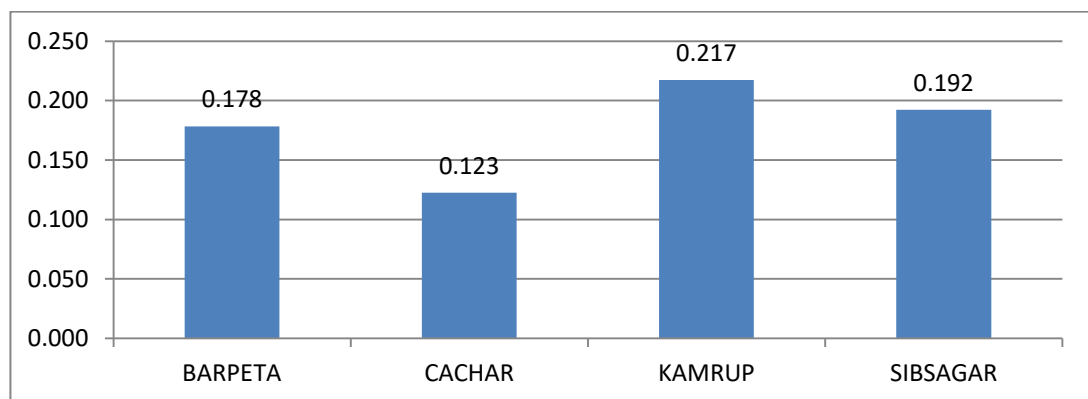
In terms of product diversification strategy across the sample districts, it is seen that the micro enterprises located in Kamrup district have the highest adoption rate for product and design diversification followed by Sibsagar district. The

enterprises in Cachar district are found to be lagging behind in opting for product diversification (Figure 4.28). Analysing the product diversification strategy across sectors, it is found that the carpentry and cane and bamboo sectors are leading in product diversification strategy adoption while the food processing sector is lagging behind the most (Figure 4.29).

Figure 4.28: Product Diversification in Rural Micro enterprises across Four Sample Districts

Source: Field Survey

Figure 4.29: Product Diversification of Rural Micro enterprises across Four Sectors
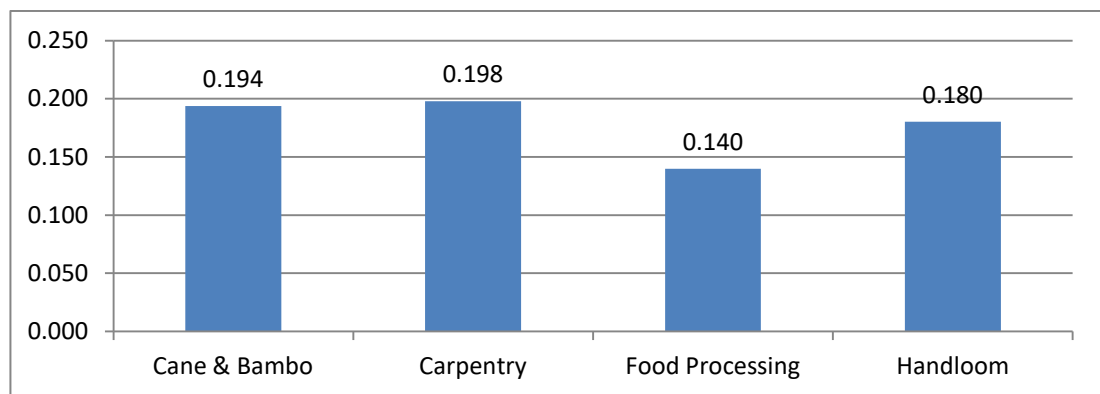
Source: Field Survey

4.6.2.2. Relationship between Growth of Micro enterprises and Strategic Orientation

In order to assess the extent to which strategic orientation of rural micro enterprise has influenced the micro enterprise growth, a linear regression analysis is

carried out with Enterprise Growth Index as the dependent variable and Product Diversification Index representing strategic orientation as the independent variable.

4.6.2.3. Dependent Variable

Enterprise Growth Index (I_{EG})

The Enterprise Growth Index, which has been constructed taking into account the growth of investment, employment and sale proceeds of a rural micro enterprise, represents micro enterprise growth. Logit transformation values of enterprise growth index are used as dependent variable to investigate the influence of product diversification on growth of rural micro enterprises.

4.6.2.4. Independent Variable

Product Diversification Index (PDI)

PDI is estimated by the inverse of Herfindahl-Hirschman (HH) index i.e. 1-HH. Contribution of income from diversified product in the total income of the micro enterprise is expressed in terms of the PDI. The PDI measures the adoption of product diversification strategy by a micro enterprise and thus reflects the strategic orientation. The product diversification strategy is expected to augment competitiveness of rural micro enterprises and thus facilitate growth. Therefore, the influence of strategic orientation on growth of micro enterprise is investigated to determine the probable extent of impact product diversification has on growth of rural micro enterprises in Assam.

4.6.2.5. Functional Form of the Model

As the values of enterprise growth index lies between 0 and 1, logit transformation values of enterprise growth index (I_{EG}) are used as dependent variable. The detail of the methodology involved in logit transformation process of enterprise growth index is illustrated in para 4.6.1.2 of the present chapter. Considering the independent variable i.e. product diversification index (PPI), the

explicit final form of the ordinary least square model (as per equation 4.6) to be estimated becomes

$$W = \log\left(\frac{I_{EG}}{1 - I_{EG}}\right) = \alpha + \beta_1 PDI + \varepsilon$$

--------- (4.7)

Here, W is the new measure of enterprise growth index

PDI= Product Diversification Index

$\alpha =$ Intercept or constant term

$\beta_1 =$ parameter to be estimated

$\varepsilon =$ The disturbance term

4.6.2.6. Results and Discussion

The result of the regression analysis is given below:

Table 4.33: Results of Regression Analysis of Enterprise Growth Index

Variables	Estimated coefficient
PDI	1.618***
	(0.206)
R^2	0.441
Adjusted R^2	0.434
F	61.651***

*** indicates 0.01 level of significance

From the analysis, it is observed that the estimated coefficient of product diversification is positive and significant indicating a positive influence on the enterprise growth index. As seen in the above *Table,* the adjusted coefficient of determination (Adjusted R2) for the model is 0.434. Considering the cross-section nature of the data set used, the model gives a fairly good fit. The F statistic is significant at 1 per cent level which shows the overall significance of the estimated relations.

The above results indicate that micro enterprises with higher degree of product diversification tend to exhibit higher growth in terms of investment, sales proceeds and employment respectively. Thus, the enterprises involved in product diversification, manufacturing market oriented products achieve better growth and competitiveness. Therefore, product diversification acts as an influencing factor for determining the growth of rural micro enterprises involved in manufacturing activities.

4.7. Status of Performance of Rural Micro enterprises

The performance of rural micro enterprises at enterprise level has been explored through the Production Efficiency Index (PEI), which is a combined measure of cost efficiency, manpower efficiency and time efficiency. The methodology of construction of the PEI has been illustrated in chapter 3. The Production Efficiency Index has been constructed based on value chain analysis of the data of individual micro enterprises.

The Production Efficiency Index scores of sample micro enterprise have been classified into three categories - low with PEI scores upto 0.15, average with PPI scores ranging from values higher than 0.15 to 0.25 and high with PPI scores with values higher than 0.25. The analysis of the scores of enterprise growth index reveals that more than two third of the sample micro enterprises (51%) fall in the low performance category while only about five per cent of the micro enterprises fall in the high performance category (Figure:4.30)

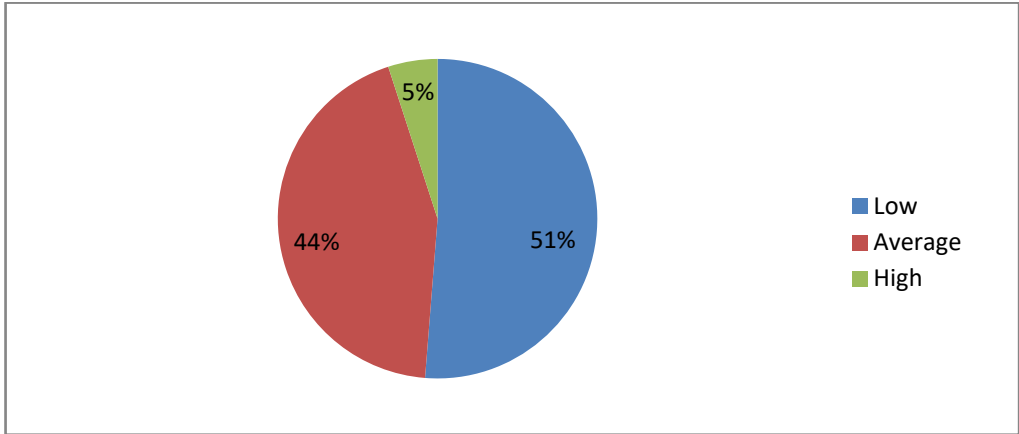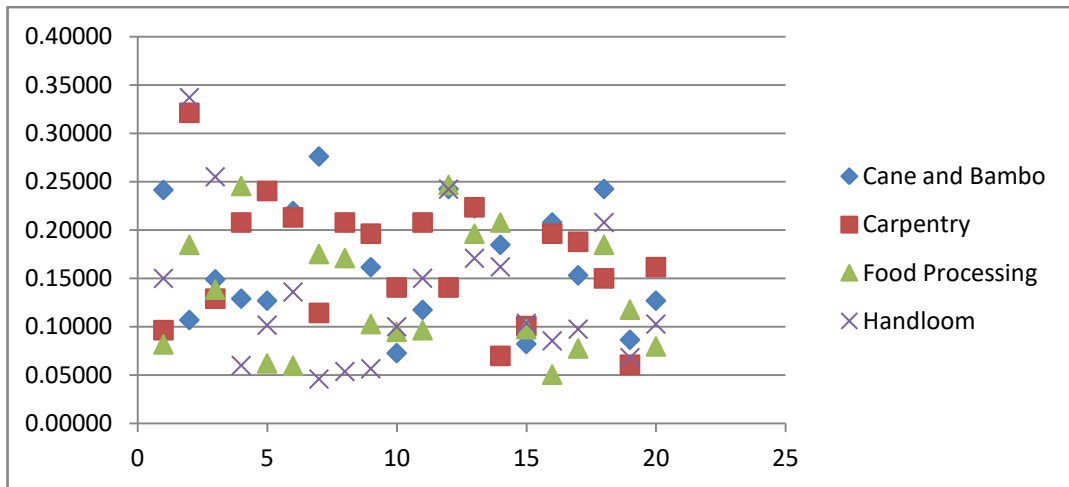**Figure 4.30: Distributions of Micro enterprises based on PEI Score Categories**

Figure 4.31: Distributions of PEI Scores of Rural Micro enterprises across Sectors

Analysing the Production Efficiency Index scores across sectors, it is observed that the carpentry sector is the best performing sector closely followed by the cane and bamboo sector. The performance of the food processing sector is found to be lagging in comparison to the other sectors (Figure 4.32). In case of performance across the sample districts, it is found that performance of the micro enterprises in the Kamrup district is best followed by Barpeta, Sibsagar and Cachar district (Figure 4.33).

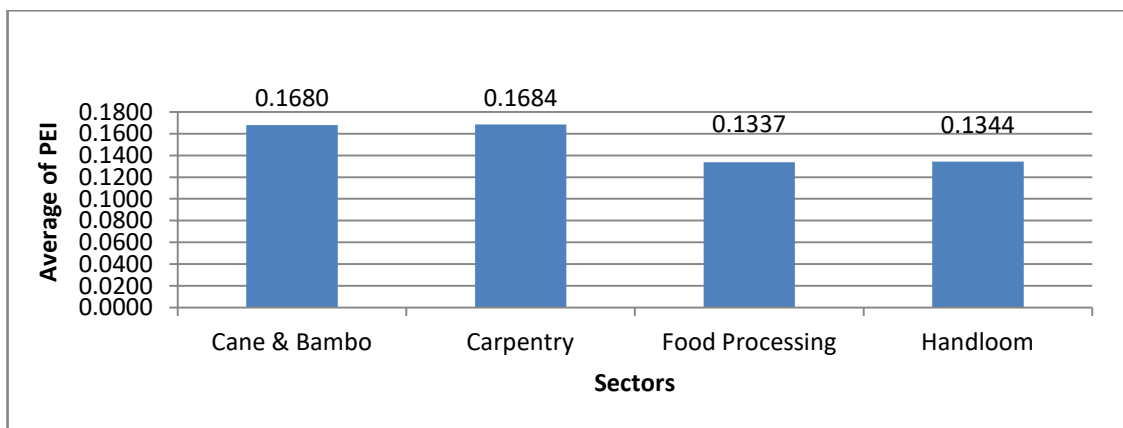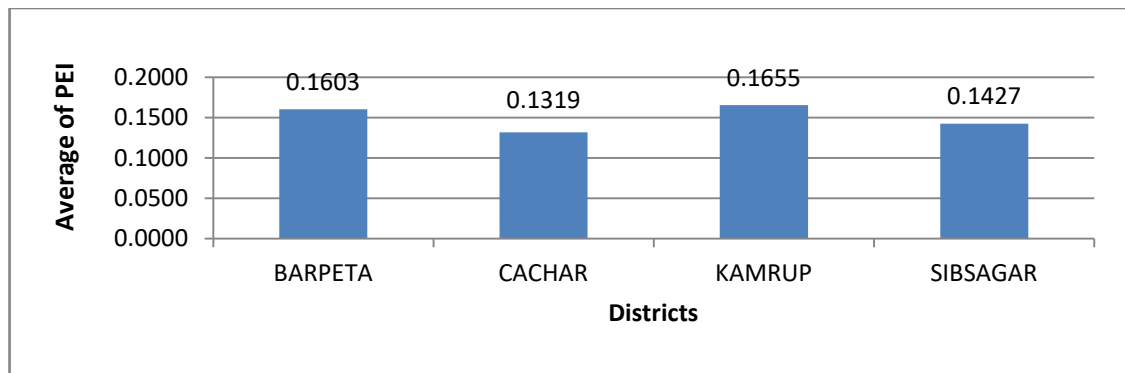**Figure 4.32: Performance of Rural Micro enterprises across Four Sectors**
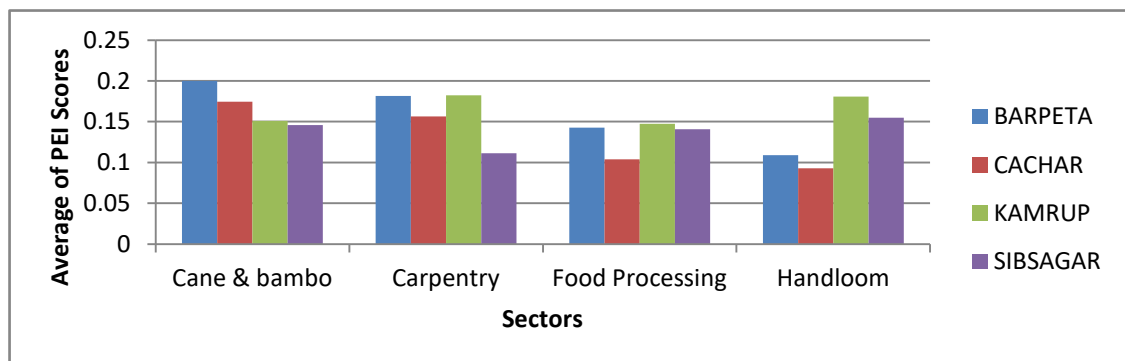
Figure 4.33: Performance of Rural Micro enterprises across Four Sample Districts

An analysis of the performance of the micro enterprise activities across districts reveals that in case of the cane and bamboo sector, average performance of the Barpeta district is highest followed by the Cachar district, Kamrup district and Sibsagar district respectively. In case of carpentry, Kamrup district is the best performing district followed closely by the Barpeta district. Similarly, in case of the food processing and handloom sectors, the performance of Kamrup district is better as compared to the other three districts (Figure 4.34)

Figure 4.34: Performance of Micro enterprise Activities across Four Sample Districts

4.8. Growth and Performance of Rural Micro enterprise: Determinants and Relationship

As has been envisaged in the study, in order to investigate the influence of performance of micro enterprise units on the growth of rural micro enterprise, two analyses have been carried out.

a. Correlation analysis between enterprise growth index representing growth of rural micro enterprises and production efficiency index of the sample micro enterprises.

b. Linear regression analysis keeping logit transformation values of enterprise growth index (I_{EG}) as dependent variable and production efficiency index representing production efficiency of rural micro enterprises as independent variable.

4.8.1. *Nature of Relationship Between Growth and Performance of Rural Micro enterprises*

The correlation analysis is used to explore the nature of association between growth and performance of rural micro enterprises. The correlation analysis has been carried out between enterprise growth index representing growth of rural micro enterprises and production efficiency index of the sample micro enterprises.

The correlation coefficients demonstrates that there is a significant positive relationship between the two variables with a strong correlation coefficient of .792 (Spearman *rho*) and .811 (Pearson correlation coefficient). Thus it can be viewed that performance efficiency of rural micro enterprises has a significant positive influence on growth of the of the rural micro enterprises in Assam

Table 4.34: Correlation Coefficients between Enterprise Growth Index and Production Efficiency Index

Variables	Mean	Std. Deviation	Spearman's *rho*	Pearson Correlation
Enterprise Growth Index	.177734	.0959402	.792*	.811*
Production Efficiency Index	.141267	.0599210		

* Correlation is significant at the 0.01 level (2-tailed)

4.8.2. *Influence of Micro enterprise Performance Efficiency on growth of Rural Micro enterprises*

To assess the extent to which performance efficiency of rural micro enterprises has influenced the micro enterprise growth, a linear regression analysis is carried out with Enterprise Growth Index as the dependent variable and Production Efficiency Index as independent variable.

4.8.2.1 Dependent Variable

Enterprise Growth Index (I_{EG})

The Enterprise Growth Index, which has been constructed taking into account growth of investment, employment and sale proceeds of a rural micro enterprise, represents micro enterprise growth. Logit transformation values of enterprise growth index are used as dependent variable to investigate the influence of performance efficiency on growth of rural micro enterprises.

4.8.2.2. Independent Variable

Production Efficiency Index (PEI)

Efficiency in manufacturing activities in terms of cost, manpower and time enhances performance of the micro enterprise units and thus is expected to facilitate higher production and competitiveness. Therefore, the influence of production efficiency on growth of micro enterprises is explored here to determine the extent of probable impact performance efficiency has on the growth of rural micro enterprises in Assam.

4.8.2.3. Functional Form of the Models

As the enterprise growth index values lie between 0 and 1, the logit transformation values of enterprise growth index (I_{EG}) are used as the dependent variables. The detail of the methodology involved in logit transformation process of enterprise growth index is illustrated in paragraph 4.6.1.2 of the present chapter.

Considering the independent variable i.e. production efficiency index (PPI), the explicit final form of the ordinary least square model (as per equation 4.6) to be estimated becomes

$$W = \ log\left(\frac{I_{EG}}{1 - I_{EG}}\right) = \alpha + \beta_1 PEI + \varepsilon$$

--------- (4.8)

Here, W is the new measure of enterprise growth index

PEI= Production Efficiency Index

$\alpha =$ Intercept or constant term

$\beta_1=$ parameter to be estimated

$\varepsilon =$ The disturbance term

4.8.2.4. Results and Discussion

The result of the linear regression analysis is presented in *Table 4.35*.

Table 4.35: Results of Linear Regression Analysis of Enterprise Growth Index

Variable/Items	Estimated Coefficients/Values
Production Efficiency Index	3.059*** (.262)
R^2	0.635
Adjusted R^2	0.631
F	135.884***

Notes:

a)   Figures in the parenthesis represents standard error of the respective coefficient
b)   *** represent significance at 1% level

As seen in the above table, the adjusted coefficient of determination (Adjusted R^2) for the model is 0.631. It indicates the good fit of the model. The F statistic is

significant at 1 per cent level which demonstrates the overall significance of the estimated relation.

From the above results, it is found that performance efficiency index has significant influence on the enterprise growth index. Therefore, the empirical evidence of the study suggests that performance efficiency of rural micro enterprises in terms of cost, manpower and time efficiency plays significant role in enhancing growth of rural micro enterprises in Assam. Thus, efforts towards increasing production efficiency will assist in accelerating growth of rural micro enterprises. Any strategy for increasing efficiency in enterprise value chain will result in increase growth of rural micro enterprises.

4.9.   Conclusion

Findings of the study show that status of growth of rural micro enterprises in the State of Assam is not encouraging with more than two third of the sample micro enterprises falling in the low growth category. The average growth scores in the cane and bamboo sector is found the highest while the same in the food processing sector is the lowest.

The findings from the multiple linear regression analysis using enterprise growth index as dependent variable and socio-economic indicators as independent variables shows that none of the socio economic indicators have any significant influence in the growth of rural micro enterprises. Another regression model keeping enterprise growth index as dependent variable and product diversification index (representing strategic orientation) as independent variable illustrates that there is significant positive influence of product diversification on growth of rural micro enterprises. Thus, strategy towards product diversification has significant positive influence on growth of rural micro enterprises in the manufacturing sector. Product diversification towards production of market oriented products aids in the growth and competitiveness of rural micro enterprises.

The status of performance efficiency of micro enterprises represented by values of production efficiency index shows that majority of the micro enterprises fall in the low performance efficiency category. Therefore, micro enterprises of the State are lagging behind in performance count too.

The regression analysis of enterprise growth index and production efficiency index reveals a significant positive relationship between the two. Efficiency in terms of production cost, time and manpower can aid in enhancing growth of rural micro enterprises in the State.

The study holds both the alternative hypothesis. With regard to the first hypothesis, strategic factor in the form of product diversification plays a crucial role in aiding the growth of rural micro enterprises though the role of socio-economic factors is found to be insignificant. Similarly, in case of the second hypothesis, it is found that efficiency of production performance of rural micro enterprises plays an important role in the growth of rural micro enterprises.