CHAPTER-II

Employment and Income Generation in the Bell-Metal Industry of Sarthebari

2.1. Introduction

Assam, with a population of 3.12 crores as per 2011 population census with a decadal growth rate of 16.93 per cent, has been experiencing a very slow rate of development. The average annual growth rate of per capita Net State Domestic Product (NSDP) at 2011-12 constant prices during 2001-12 to 2021-2022 was estimated at only 6.45 per cent[1]. Assam's rate of unemployment is higher than the national average. The rate of unemployment in Assam in 2019-20 is 8.3 percent against the national average of 5.2 percent[2]. The unemployment rate among the males in Assam is little less at 7.1 percent against the national rate of 5.2 percent. Total number of unemployment in Assam as per live registration in Employment Exchanges was over 16.77 Lakhs in 2013[3], which increased to 20.8 Lakhs in 2020. In 2020, only 231 vacancies were notified through the Employment Exchanges and against them only 84 placements were done[4]. This shows that the Employment Exchange system of Assam has not been able to meet the expectations and hence it is natural for many unemployed youths not registering in Employment Exchanges. Therefore, the situation of unemployment in the State of Assam is more severe as all the unemployed persons do not register their names in the office of Employment Exchanges of the state. It is thus necessary to have alternative avenues that can immediately provide some viable scopes for employment to the increasing unemployed labour force. The position of the district of Barpeta is not an exceptional one. The contribution of the agricultural sector to the GSDP of Assam is still

[1]Directorate of Economics and Statistics, Government of Assam (2022), *Economic Survey:Assam*, P-46.
[2] Directorate of Economics and Statistics, Government of Assam (2022). *Economic Survey, Assam*, 2021-22. P-251
[3]Directorate of Economics and Statistics, Government of Assam (2015), *Economic Survey of Assam 2014-15*, P-201.

[4] Directorate of Economics and Statistics, Government of Assam (2022). *Economic Survey, Assam*, 2021-22. P-255.

very high. The provisional estimates for the year 2020-21 at current prices show that the contribution of Agriculture to the GSDP is 22.31% while the contribution of the secondary sector to the same is 17.95%. The contribution of the manufacturing sector is very low at 0.99%[5]. High growth of population which was 21.40% during 2001-2011 in one hand and slow pace of development of agriculture and industrial sector on the other, have worsened the position of unemployment in the district.

The Bell Metal Industry of Sarthebari can play a leading role in this regard. Bell metal products like *Kahi, Bati, Bata, Baanbati* and *Maihang* are very popular and the artisans of Sarthebari are unable to meet the demand for these products. Bell metal manufacturing, being a highly labour intensive activity, has been acting as antidotes to the problem of unemployment in Barpeta district of Assam for a long period of time. It can generate employment opportunity to hundreds of unemployed people in its various stages from the supply of raw materials like scraped metal, charcoal etc. making of different kinds of utensils, marketing of bell metal utensils, etc and ultimately, marketing of the finished products.

No study of an industry is complete without analyzing the income and employment generated by it. In this chapter, we have studied the income and employment of the industry with the objective to study the income and employment of the artisans generated from trade of bell metal production and the role played by the bell metal industry in generating income and employment in the study area.

2.2 Review of Literature

Governments as well as the economists across the world, particularly those of the developing nations have given utmost importance to the MSME sector. This sector is now considered as the vehicle of growth in the generation of income and employment. There have been many significant studies regarding this sector all over the world.

Tadesse (2010) in the work "The Role of Micro and Small Enterprises in Employment Creation and Income Generation" studied the employment and income generation by the Small and Micro Enterprises in Ethiopia. This survey of 123 MSEs (Micro

[5] Directorate of Economics and Statistics, Government of Assam (2022). *Statistical Handbook of Assam,* 2021 Pp 30-35, Table 2.01

and Small Enterprises) in the Mekelle city examines whether the MSE sector created jobs and lays down that 23.7 percent of the employed people were employed through MSEs. This study also concludes that majority of the owners of MSEs are between the age group of 24-29 and earned an average annual income between 30,000-60,000 birr. The study recommended access to finance, provision of work place and marketing assistance for development of these MSEs. Cook (1984) discussed the structure and role of small scale industry in Mexican Capitalist Industry. This paper examines the role of industrial policies in the development of rural industries. Katongole *et al.* (2014) analysed the women owned small scale enterprises in Uganda and found out the relation between the personality trait of the owner and the success of the enterprise. This paper establishes that the personnel qualities of the owner are directly related to the level of income generation in the industry.

Narayana (2006) made a case study on the awareness of the concerned people regarding the various government policies and programmes, introduced for development of the sector. This survey of 373 manufacturing units of Karnataka, lays down the need for proper awareness programmes regarding these policies.

During the first three decades of Indian planning, the sectors of manufacturing, construction, mining and infrastructure had developed very rapidly. Rangachar (1983) in the paper "Employment Generation and Income Distribution through Village and Small Industry in India: an Analytical Study" analysed the income distribution and employment generation generated by the village and small scale industry of India. This paper gave importance to small scale village industries including handicrafts, handlooms and sericulture which is tiny in size and artisan based rather than capital based. It concludes that 58% of the household manufacture comes from the rural areas and recommended that proper planning should be undertaken by the government for the development of these sectors.

Zarra-Nezhad *et al.* (2003) in their work "The Role of Small Industries in Employment Generation and Economic Development in Maharashtra and Khuzestan" made a comparative study of the role of small scale industries in income and employment generation in Maharashtra and Khuzestan of Iran. Based on primary as well as secondary data this analytical paper studies factors like distance of the industrial workshop from the city, average age of the units, mode of ownership, demographic profile of the workers, percentage of permanent employees, level of education and amount of investment in

industry, of various industrial firms in the small scale industrial cluster in Pune and Ahvaz and concludes that this highly demanded sector needs proper financial help and develop R&D department in these firms for development.

Small scale industries sector is very important in India. This sector accounts for almost one fourths of total exports from India. In terms of employments also, this sector is second only to agriculture. This sector also contributes about 40% of the total Value added by the manufacturing sector to India's national income. Kaveri (1990) in the work "Development of Small Scale Industries – Some Issues" discusses the role of small scale industries in the economic development of India. In this macro analysis of the sector, it studies the performance of the small scale industries sector in terms of employment, investment, profitability, Govt. schemes etc. Based on secondary data, this paper lays down the performance of the sector in detail. Mounika (2017) in the work "A Study on Small Scale Industries and Its Impact in India" studies the role of small scale industries in India in terms of gross industrial value added. Based on secondary data, this study of industrial trends for the last 60 years concludes that the SSI sector holds the key to economic success in India, particularly in case of employment generation, as most of the small scale industries are labour intensive in nature. This study also concludes that the small scale industries will help in removing the regional disparities in India through equitable distribution of income. Wahab (1994) in the paper "Employment and Income Enhancement for the Working Poor: a Review of Rural Industries" reviewed the rural industry of India in terms of employment and income enhancements. This paper studied three types of linkages – Product-Technology-Market, Institutional- Environmental and Vertical linkages'. This comparative study examines four areas of two countries- Beed and Balasore in India and Kandy and Hambantola in Sri Lanka. According to this study, as the products in these industries have a local market along with a more diverse one, the efficiency can be increased by reducing some costs like cost of transportation or cost of advertisement. Singh (2005) has done a case study on rural non-farm sector of Gujarat which consists of 95 different types of industries. The handicraft sector is a very important component of this sector. This study identifies the problems of this sector and suggests strategies for better organisation of production and marketing.

In the study "Can unemployment be answered by Micro Small and Medium Enterprises? Evidences from Assam", Sarmah. *et al.* (2021) studied a large sample of 320

MSME entrepreneurs from Kamrup Rural and Kamrup Metro district of Assam. It used Chi Square and Cramer's V test to test the null hypothesis that there is no association between the MSMEs and employment creation. It also used the tool of Mann-Whiteny U test to test the second null hypothesis that there is no significant difference between male and female owned MSMEs in creation of employment. The study concluded that there is positive relation between employment creation and capital investment in MSMEs. It also concludes that male owned MSMEs are generating more employment than female owned MSMEs (67.8% to 32.2%). This study suggests that women entrepreneurship in MSME should be promoted to generate more employment. However, the suggestions are inconsistent with the findings.

Not many studies have been done on the income and employment generation of handicraft industry in Assam. Das *et al.* (2016) discussed the employment and income generation of the bell metal industry. Based on data collected from the production units and the traders selling bell metal products, this study established the importance of bell metal products in income and employment generation in the district of Barpeta as well as the state of Assam. Das *et al.* (2012) discussed the socio economic aspects of the artisans involved in the production of bell metal products in Sarthebari Town Area. Deka (2012) discussed various aspects of Bell Metal and Brass Metal Industries of Sarthebari area; they studied the present status and future prospects for development of the Industry. Choudhury (2015) discussed the role played by bell metal industry of Sarthebari in employment generation in Barpeta district and concluded that the industry has been contributing significantly in generation of employment of household industry sector in the district.

It can be seen that most of the studies regarding the income and employment generation of the handicraft or micro level Industries are macro level studies. There are very few studies which concentrate on a particular type of industry. As this study concentrates on the bell metal industry of Sarthebari alone, it will bridge the research gap in this regard.

2.3 Data Collection and Methodology

The study is primarily based on primary data collected from the production units of the bell metal in and around Sarthebari. Data were also collected from the different shops selling bell metal products exclusively.

For collection of primary data from the production sector, a sample survey was conducted using a combination of purposive and proportionate sampling methods during the

months of May to September 2016. As the size of the population is already known[6], sample size was determined by using the Slovins' formula[7] for known population, which is given as –

$$n = \frac{N}{(1+Ne^2)}$$

Where, *n*: Size of the Sample

N: Population Size

e: Margin of Error.

As there are 303 production units or *Garhshalls* our population (N) is 303. The confidence level of the study is fixed at 95%, therefore the Margin of Error (1-0.95) stands at 0.05. Based on this data, the ideal size of the sample is calculated at 172.44. Rounding up in accordance with the Slovins' formula, the rounded up sample stands at 172. Thus primary data were collected from a sample of 172 respondents or production units and their owner *i.e.* the *Kohars*.

Data were collected from a sample of 172 Production Units or *Garhshall*. Out of 127 revenue villages of Sarthebari Revenue Circle, bell metal production units can be found in Sarthebari Town Committee and its adjourning nine villages. Table-2.1 gives the breakup of 303 bell metal production units or *Garhshalls* in the area.

Table-2.1: List of Villages and Number of *Garhshalls*

Sl.No.	Village Name	Unit No.
1	Sarthebari	133
2	Namshala	46
3	Gomurah	60
4	Karakuchi	22
5	Kamarpara	2
6	Lachima	12
7	Hilepara	1
8	Batia	4
9	Amrikhawa	20
10	Palla	3
Total		303

Source: DES, Govt. of Assam. (2014)

[6] There are 303 production units of bell metal products in and around Sarthebari.

[7] Tejada, Jeffry.J. and Punzalan, Joyce RaymondB. (2012), "On the Misuse of Slovin's Formula", *The Phillipine Statistician* Vol.61, No.1 (129-136)

Out of these 303 units, 172 units were selected in the sample. The sample was selected using both Purposive and Proportionate Random Sampling. Among the revenue villages, Sarthebari has the highest number of units i.e. 133. On the other hand, Hilepara, Kamarpara, Batia and Palla have only 1, 2, 4 and 3 production units respectively. Purposively these four villages are not considered for collection of data, because the number of *Garhshalls* in these villages is very low. The required sample data is collected from the remaining six villages on the basis of Proportionate Sampling. The survey area is composed of six clusters or revenue villages. Table 2.2 gives the number of sampling units that are consulted for collection of data from each of these clusters.

Table- 2.2: Number of Sampling Units from Different Clusters

Strata No.	Village/ Cluster	No. of Production Units	Percentage of Population	Number of Sampling Units	Percentage of Sample size
1	Sarthebari	133	43.89	77	44.77
2	Namshala	46	15.18	28	16.28
3	Gomurah	60	19.8	35	20.35
4	Karakuchi	22	7.26	13	7.56
5	Lachima	12	3.96	7	4.06
6	Amrikhawa	20	6.6	12	6.98
Total		293	96.69	172	100

Source: Field Survey

The bell metal production units operate in a partnership business model. The units earn on the basis of their amount of production per kilogram of products produced. Each type of product has a different making charge, locally known as *Gorhoni*. Table 2.3 gives the different making charges for different type of bell metal products and market price of the product at Sarthebari.

It was learnt from the discussions with the Officials of the Assam Cooperative Bell metal Society that this system of wage distribution was devised by Late Kohiram Das, an educationist and the founder of the Assam Cooperative Bell Metal Utensils Manufacturing Society (*Axom Samabay Kohar Sangha Ltd*) in 1933. It is one of the oldest surviving cooperative societies of Assam and popularly known as Cooperative in Sarthebari and among the *Kohars*. This system is based on *Anna*[8] system of old Indian Rupee. According to this

[8] One rupee consists of Sixteen *Annas*.

system, the *Kohar* collects the *Gorhoni* or making charge from the *Mohajon* or the Cooperative after depositing the finished product. Then they deduct the cost of charcoal and other maintenance cost from the total amount and distribute the rest amongst them. The *Kohar* receives one and half rupees i.e. twenty four *Annas*. On the other hand, the *Aidha*s receives One rupee each which is sixteen *Annas*. In other words, we can say that the *Kohar* receives one extra part of *Gorhoni* for two reasons-

a) Token of appreciations being the master craftsman, and
b) Rent for using his premises and instruments.

The depreciations and other maintenance costs in this industry have to be borne by the *Kohar*.

The wage distribution system of Bell metal Artisans can be explained with the help of the following example. Let us assume a *Garhshall* with one *Kohar* and Six *Aidhas* produces *Kahi*, and has the capacity to process 20 Kg of scrap metal. In the previous evening the *Kohar* of the *Garhshall* takes 20 Kg of scrap metal from the Cooperative or a *Mohajon* and brings it home. Early next morning they start production and complete the production by the evening and take the finished products to the cooperative or *Mohajon*. There he receives the making charge of 20 Kgs of *Kahi* at the rate of Rs 290 per Kg. That is, he receives Rs5800.00 from the *Mohajon* or from the Cooperative. Now let us further assume that his expenditure for the day is Rs.1500.00 which includes cost of Charcoal and refreshments. Thus the net income of the *Garhshall* will be Rs.4300.00. This net income will be distributed among the artisans working in the *Garhshall.* As there are total seven artisans in the *Garhshall* this net income will be divided into fifteen parts i.e. Rs 287 each part. As the master craftsman the *Kohar* will receive three parts i.e. Rs. 860.00 and the *Aidhas* will receive two parts i.e. Rs. 573.00 each.

From each cluster, the sample units were selected randomly using lottery method. Data were collected from the sample using a schedule. Data regarding average daily hours of operation, number of labourers in a *Garhshall*, *Gorhoni* or making charge per kilogram of each product, price of each product in Sarthebari Town, cost of capital equipments, cost of the other raw materials like *Bogorir Angaar*[9] etc are collected. Then gross income of the

[9] Charcoal from Indian Jujube (Ziziphus mauritiana) tree.

Garhshall is derived by multiplying the *Gorhoni* of each product with the amount of average product produced by each *Garhshall* in the past fortnight. The money value of each firms produce is calculated by multiplying the produce of the firm by the market value of the product. Variable cost of production is derived by multiplying the amount of scrap metal used per day by the present market price of scrap metal.

All the artisans in a *Garhshall* bear the running cost of the production unit. This includes cost of raw materials like *Bogorir Angar*, refreshments, medical expenses, rolling mill charges etc. Thus the net income of the *Garhshall* is derived by subtracting the average expenses of the *Garhshall* from its gross income.

The various products have different making charges. The making charges are fixed by the cooperative[10] in its triennial general meeting with its members. This *Gorhoni* or making charge is accepted by all including the private traders or *Mohajons*. Table 2.3 gives the *Gorhoni* or making charge of different bell metal products and the market price per kilogram in the local Sarthebari market in the 1st week of May 2017.

Table- 2.3: Making Charge of Different Bell metal Products

SL. No.	Product	Making Charge (*Gorhoni*) Per kg (In Rs.)	Market Price at Sarthebari (In Rs.)
1	*Kahi*	290	1150
2	*Taal*	345	1400
3	*Bata*	300	1600
4	*Bati*	240	1150
5	*Baan Bati*	370	1900
6	*Lota*	410	2500
7	*Maihang*	410	1600
8	Bell/ Others	230	1450

Source: Field Survey

To derive the income earned by the *Kohars* as well as by the *Aidhas,* first the gross income of each production unit is calculated by multiplying the amount of production with the making charge. Then net income is calculated by subtracting the daily cost from the gross income. Then this net income is divided into (2n+1) parts, where n is the total number of artisans involved in the unit. Then the income of the *Kohar* is derived by multiplying it

[10] The Assam Cooperative Bell Metal Utensils Manufacturing Society

by three times and those of the *Aidhas* are calculated by multiplying it by two times. This can be explained by the following equation.

$$X = \frac{Y}{(2n+1)}$$

Where,

X= Part of Income

Y= Total daily income of the Production Unit.

n= Number of Artisans in the unit.

` *Kohar* gets an amount of 3X and the *Aidhas* get an amount equal to 2*X*. (Das, *et al.,* 2016).

Bell metal production units operate on all days of the week. But due to various reasons, they cannot operate all year round. In times of festivals like *Bihu*, *Holi*, and the *Annual Sabha Mahotsav*[11] of Sarthebari the *Garhshalls* are kept closed. In all kinds of festivities 20-25 days of production are lost. Again one of the main problems faced by the *Kohars* is lack of raw materials. Raw materials, particularly scrap metal and charcoal are in short supply, hence *Kohars* cannot get those in all days. For this reason also, the production units have to be shut down for many days in a year. On an average, the production units remain closed due to shortage of raw materials for 30-35 days in a year. Thus in total 55-60 days of production are lost in a year. This means the production units operate on an average around 305 days in a year. Thus the average annual income of the artisan is derived by multiplying average daily income by a factor of 305.

The data were then analyzed for Non Parametric Correlation between the type of product and average annual income of the *Kohars* by taking the Spearman's Rank Correlation which is given as

$$\rho = 1 - \frac{6\Sigma d^2}{n(n^2-1)}$$

Where,

[11] The Annual Seven Day festival of Sarthebari is held in the months of January-February.

ρ = Spearman's Rank Correlation coefficient

d = Difference in Ranks of Variable X and Y

n= Number of Variables.

The Kendell's Tau-b Correlation Coefficient for Non Parametric Correlation is also considered which is defined as –

$$t_b = \frac{P-Q}{\sqrt{(P+Q+X_0)-(P+Q+Y_0)}}$$

Where,

t_b = Kendell's Tau b Correlation Coefficient.

P = Number of Concordant pairs

Q= Number of Discordant Pairs.

X_0 and Y_0 are Number of Pairs in Variable X and Y respectively.

Here Variable X is defined as the type of product, which is ranked according to the number of *Garhshalls* or production units. Variable *Y* is defined as the average annual income of the *Kohar*.

Again to test the variability of income distribution, the measures of dispersion *viz*. Range and Karl Pearson's Correlation Coefficient were considered. These are defined as-

Range: A-B

Where,

A is the greatest value.

B is the smallest value.

Standard Deviation:

$$\sigma_X = \sqrt{\frac{1}{n}\Sigma(X-\bar{X})^2}$$

Where, Variable X denotes Average Net Daily Income

And *n* denotes number of sampling units.

To compare the consistency of income earned by the *Kohars* as well as the *Aidhas*, the Coefficient of variation was considered which is given as

$$CV(X) = \frac{\sigma_x}{\bar{x}} \text{ X } 100$$

Where,

σ_X is the Standard Deviation of X

$\bar{X}$ is the Average of X

Variable X denotes daily net income of the artisans.

Directorate of Economics and Statistics (2014) in their study has estimated the Average annual income of the *Kohars* at Rs. 2,80,379.00. We have verified our results through the two tailed test of Hypothesis using the't' distribution. Thus, the following Null and Alternative hypothesis are formed.

H_0: μ=280379

H_1: $\mu \neq 280379$

2.3.1 Collection of Data From the Marketing Sector

Bell metal Industry of Sarthebari is instrumental in generating income not only through the production sector, but also through the marketing sector. There are 41 shops selling bell metal products in Sarthebari market area along with two sell points of The Assam Cooperative Bell Metal Utensils Manufacturing Society. Apart from that there are 30 *Arabdaris* or visiting salesmen who sell the bell metal products of Sarthebari in different towns of Assam. Data was collected from all the sellers of bell metal products of Sarthebari Bazaar area and the *Arabdaris*.

2.4 Results and Discussions

The *Garhshalls* operate on everyday of the week. They start their production process in early morning from around 6.00 AM. They keep working in the *Garhshall* till all the raw materials are processed. Sometimes, the artisans in a *Garhshall* have to work for 12 to 13 hours depending on the amount of production. Usually the working hour of a *Garhshall* ranges from 6 to 12 hours with Range six (6.00) and Standard Deviation of 1.48. However, the average working hours of all the *Garhshalls* in the sample was calculated to be 10.39 hours. Each *Garhshall* contain one *Kohar* and Five to Seven *Aidhas* depending on the type of the product. Table 2.4 gives the number of *Kohars* engaged in the production. It can be seen

that the production of *Kahi* has maximum number of *Kohars*, whereas only one *Kohar* is engaged in the production of *Maihang* and two are engaged in the production of Bells. This discrepancy is because of the fact that *Kahi* is the most demanded of all the bell metal products. Most of the Assamese household prefers bell metal *Kahi* as dinner plate rather than Bone China and stainless steel. Bell metal *Kahi* is also the most popular gift item in case of *Annaprasanna*[12] of an Assamese Child, Marriage[13], and *Aathmangala*[14] etc. On the other hand, *Maihang* is less popular item because now a day's people do not use *Maihang* to dine in. Moreover, as compared to *Kahi*, *Maihangs* are a lot heavier, which is not easy to clean. The Average weight of a normal *Kahi* is around 1 kilogram. On the other hand, the average weight of a *Maihang* is at least 2 to 3 kilograms. Because of this also, the cost of a single unit of *Maihang* costs more. Another reason of *Maihang* losing popularity is that it is convenient to dine in a *Maihang* while the person is sitting on the floor. Because of the elevated position of the plate people loved to use *Maihangs* for dining. But now a day's most of the people dine in dining tables, and it is very inconvenient to dine on a *Maihang* while sitting on a dining chair. Due to this reason also, use of *Maihangs* are restricted to ceremonial use only. Now days it is primarily used in *Annaprasanna* and *Aathmangala*.

If we see the cluster wise distribution of *Garhshalls*, all the 28 producers of *Taal* are from Sarthebari. Again out of the 74 producers of *Kahi* 32.43% are from Sarthebari. Among the producers of *Kahi*, Namshala occupies the second spot with 29.73% of the *Garhshalls* producing *Kahi*. *Kohars* of Karakuchi enjoys the third spot among the producers of *Kahi* with 17.57% of the *Garhshalls*. Thus we can see that production of *Kahi* is concentrated in three clusters with 79.73% of all the *Garhshalls* producing *Kahi*. The production of *Bata* is also concentrated in two clusters i.e. Sarthebari and Gomurah with 18 out of total 20 producers. On the other hand, the production of *Bati* s concentrated in Gomurah with 29 out of the total 37 producers (78.38%).

[12] Elaborate Ceremony where an Infant is fed with rice and solid food for the first time. Also known as, *Bhat Mukhot Dia* in Local society.

[13] In Traditional Assamese Marriage the Family of the Bride gives Bell metal Utensils, Particularly *Kahi, Bati* or *Baanbati, Bata*, and *Lota* to the Groom. Again Relatives of the Bride also gifts *Kahi* to the groom.

[14] The ceremony where the Groom visits the in laws house for the first time. Usually Five or Seven (Odd Number) friends and relatives accompany the Groom and the family of the bride invites all the close relatives to meet the groom formally.

Table 2.4: Number of *Kohars* Engaged in Different Clusters and Product

Product	Cluster						Total
	Sarthebari	Namshala	Gomurah	Karakuchi	Lachima	Amrikhawa	
Kahi	24(32.43)	22(29.73)	1(1.35)	13(17.57)	6(8.11)	8(10.81)	74(100)
Taal	28(100)	0	0	0	0	0	28(100)
Bata	13(65.00)	0	5(25.00)	0	1(5.00)	1(5.00)	20(100)
Bati	2(5.41)	3(8.11)	29(78.38)	0	0	3(8.11)	37(100)
Baan Bati	7(87.5)	1(12.5)	0	0	0	0	8(100)
Lota	0	2(100)	0	0	0	0	2(100)
Maihang	1(100)	0	0	0	0	0	1(100)
Bell/ Others	2(100)	0	0	0	0	0	2(100)
Total	77(44.77)	28(16.28)	35(20.35)	13(7.56)	7(4.07)	12(6.98)	172(100)

Source: Field Survey
Note: Figures in parentheses indicate percentage of total value

Table–2.5 gives a break up number of supporting artisans engaged in bell metal production Units in each cluster. Sarthebari employs the highest number of supporting artisans or *Aidhas* at 429 followed by Gomurah and Namshala. Least number of *Aidha*s is from Lachima where 42 are engaged in seven *Garhshalls.* Again products wise most number of *Aidhas* is engaged in the production of *Kahi* which is 437. The total number of *Aidhas* engaged in bell metal production in the selected sample stands at 953.

Table-2.5: Distribution of Supporting Artisans of Bell Metal Industry

Sl.No.	Product	Cluster						Total
		Sarthebari	Namshala	Gomurah	Karakuchi	Lachima	Amrikhawa	
1	*Kahi*	136	140	6	69	36	50	437
2	*Taal*	167	0	0	0	0	0	167
3	*Bata*	71	0	28	0	6	4	109
4	*Bati*	9	12	148	0	0	13	182
5	*Baan Bati*	30	3	0	0	0	0	33
6	*Lota*	0	9	0	0	0	0	9
7	*Maihang*	6	0	0	0	0	0	6
8	Bell/ Others	10	0	0	0	0	0	10
Total		429	164	182	69	42	67	953

Source: Field Survey

If we consider the number of *Kohars* in the selected sample, the number of people engaged in production increases to 1125. Table 2.6 gives a breakup of total number of people

engaged in the production units of the selected sample. It should be noted that one artisan of a particular cluster do not get himself engaged in the production unit of another village. Again in most of the cases all the artisans in a *Garhshall* are relatives or members of the extended family.

Table-2.6: Total number of Artisans Involved in Bell Metal Units

Product	Cluster						Total
	Sarthebari	Namshala	Gomurah	Karakuchi	Lachima	Amrikhawa	
Kahi	160 (14.22)	162(14.4)	7(0.62)	82(7.29)	42(3.73)	58(5.16)	511 (45.42)
Taal	195 (17.33)	0	0	0	0	0	195 (17.33)
Bata	84(7.47)	0	33(2.93)	0	7(0.62)	5(0.44)	129 (11.47)
Bati	11(0.98)	15(1.33)	177 (15.73)	0	0	16(1.42)	219 (19.47)
Baan Bati	37(3.29)	4(0.36)	0	0	0	0	41 (3.64)
Lota	0	11(0.98)	0	0	0	0	11 (0.98)
Maihang	7(0.62)	0	0	0	0	0	7(0.62)
Bell/ Others	12(1.07)	0	0	0	0	0	12 (1.07)
Total	506 (44.98)	192 (17.07)	217 (19.29)	82(7.29)	49(4.36)	79(7.02)	1125 (100)

Source: Field Survey
Note: Figures in parentheses indicate percentage of total value

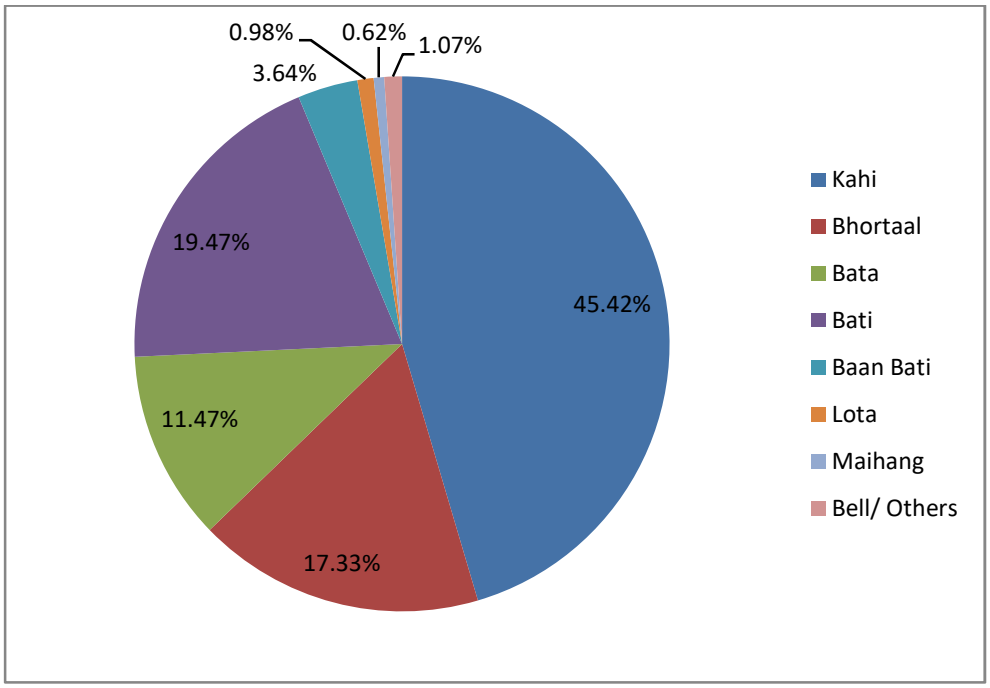
It can be seen from the Table-2.6 that clusters wise Sarthebari employs the highest number of artisans at 506 which is 44.98% of the total artisans in the sample. Again Lachima has the lowest number of artisans at 49 which are 4.36% of the total artisans. Among the products, *Kahi* plays the most important part with 511 persons engaged in the production of it which is 45.42% of the total number of artisans. In terms of production also, *Kahi* plays the most important part which accounts for 52.61% of the total daily product.

Again it can be seen that *Kahi, Taal* and *Maihang* need highest number of artisans per unit which is around 7 (6.91, 6.96 and 7 respectively). On the other hand, *Baanbati* needs least number of artisans which is only 5.12 on an average. On an average, each production unit employs 6.54 artisans including the *Kohar*. But the production units of Lachima employ

7 artisans per unit and those of Namshala employees 6.85 artisans. The *Garhshalls* of Gomurah seem to be the most efficient because they employ an average of 6.2 artisans per unit. This is because most of the production units of the village produce *Bati*, which requires 5.91 artisans per production unit or *Garhshall*.

Figure 2.1 Displays Percentage of Artisans engaged in the production of various products.

Figure 2.1: Percentage of Artisans Involved in the Production of Different Bell Metal Products

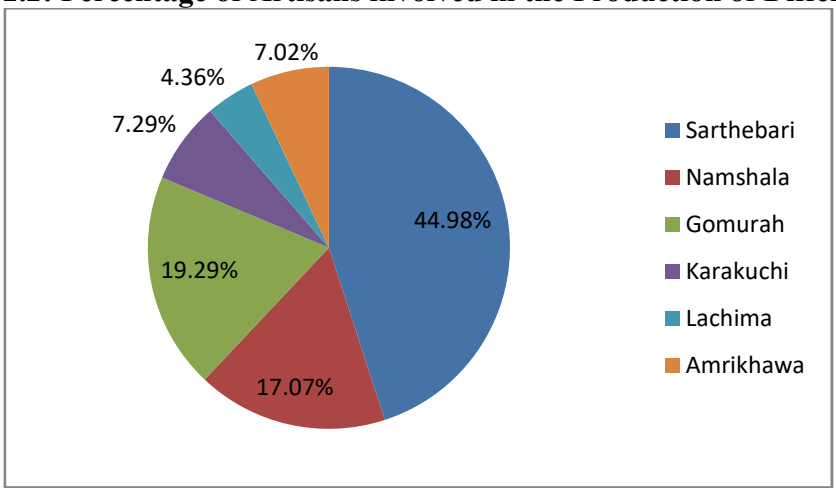


Source: Field Survey.

The figure 2.1 shows that 45.42% artisans in the selected Sample are engaged in production of *Kahi*. On the other hand, artisans involved in the production of *Bati* are at second place with 19.47% .and only 0.62% is involved in production of *Maihang*.

It can be seen in the figure 2.2 that 44.98% of the artisans in the selected sample are from Sarthebari town area. Gomurah occupies second position with 19.29% of the artisans. Namshala occupies the third position with 17.07% of the artisans from that cluster, whereas only 4.36% are from Lachima.

Figure 2.2: Percentage of Artisans involved in the Production of Different Clusters



Source: Field Survey

2.4.1 Income Generated by Bell Metal Production Units

Table-2.7 gives the total gross and net income generated by the production units. The share of *Kahi* is the highest at Rs 3,68,010.00 which is 51.85% of the total gross income. The contribution of *Lota*, *Maihang* and Bells are very insignificant at less than one percent each. *Taal* and *Bati* occupies the second and third position, but daily income generated by producers of *Taal* are much higher (Rs.1,60,080.00) than that of those producing *Bati* (Rs. 101520.00).

Table-2.7: Gross and Net Income Generated By the Production Units

Product	Total Product Per Day (In Kg)	Making Charge Per Kg	Gross Income Generated Per Day (In Rs)	Percentage of Total Gross Income	Net Income Generated per Day	Percentage of Total Net Income
Kahi	1269	290.00	368010.00	51.85	270876.00	53.48
Taal	464	345.00	160080.00	22.55	111275.00	21.97
Bati	423	240.00	101520.00	14.3	74728.00	14.75
Maihang	10	410.00	4100.00	0.58	3220.00	0.64
Bata	182	300.00	54600.00	7.69	33585.00	6.63
Baan Bati	38	370.00	14060.00	1.98	8340.00	1.65
Bell/ Others	18	230.00	4140.00	0.59	2460.00	0.48
Lota	8	410.00	3280.00	0.46	2020.00	0.4
Total Production	2412		709790.00	100.00	506504.00	100.00

Source: Field Survey

The Table-2.8 gives us an idea about the average daily income generated by the *Kohar* of different clusters.

In Table-2.8, it can be seen that the *Kohars* engaged in the production of *Kahi* in Namshala earn an average daily income of Rs. 849.00 whereas those from Gomurah earns Rs.336.00. The *Kohars* of Sarthebari producing *Kahi* earn an average daily income of Rs.642.00. Again *Kohars* of Karakuchi producing *Kahi* earn a daily income of Rs.777.00 which is the nearest to the average daily income of *Kohars* producing *Kahi* at Rs.738.00. The variations in the average daily incomes of the *Kohars* producing *Kahi* are very high with Range of 933 and Standard Deviation of 205.35.

Table-2.8: Average Daily Net Income of *Kohars* (In Rs.) in Different Clusters and Products

Sl.No.	Product	Cluster					
		Sarthebari	Namshala	Gomurah	Karakuchi	Lachima	Amrikhawa
1	*Kahi*	642	849	336	777	592	823
2	*Taal*	776	0	0	0	0	0
3	*Bata*	342	0	389	0	471	315
4	*Bati*	677	285	470	0	0	503
5	*Baan Bati*	267	426	0	0	0	0
6	*Lota*	0	319	0	0	0	0
7	*Maihang*	645	0	0	0	0	0
8	Bell/ Others	237	0	0	0	0	0

Source: Field Survey

The *Kohars* producing *Taal* earn an average daily income of Rs.776.00. As all the *Kohars* producing *Taal* are from Sarthebari, it is the average daily income of all the *Kohars* producing *Taal*. The variations in the average daily incomes of the *Kohars* producing *Taal* are very high with Range of 1905 and Standard Deviation of 368.54

Among the producers of *Bata* those from Lachima earn an average daily income of Rs. 471.00 and those from Amrikhawa earn Rs.315.00. In comparison to *Kahi* the variations in the daily income is less in case of *Bata* with a Range of 537 and Standard Deviation of 151.13.

Among the producers of *Bati* those from Sarthebari earn an average daily income of Rs. 677.00 and those from Namshala earn Rs.285.00. In comparison to *Kahi* the variations in the daily income is less in case of *Bati* with a Range of 1017 and Standard Deviation of 177.74.

Table- 2.9: Variation in Income Distribution of *Kohars* of Various Products

SL. No.	Product	Range	Standard Deviation	Coefficient of Variation
1	*Kahi*	933	205.35	27.83
2	*Taal*	1905	368.54	47.49
3	*Bati*	1017	177.74	37.9
4	*Bata*	537	151.13	42.1
5	*Baan Bati*	456	153.33	53.42

Source: Field Survey

Table- 2.9 shows that the variations in the income distribution of the *Kohars* are the highest in *Baanbati* at 53.42, whereas variations in income distribution of *Taal* occupy the second spot at 47.49. Again it is noted that the variations in income distribution in *Kahi* is the lowest at 27.83. It is interesting that all the *Kohars* use same quality raw material and the same production technique. The *Gorhoni* of a product is also the same for all the *Kohars* producing the same product. Then why there is so much variation in the income distributions among the *Kohars*? One of the possible explanations is that these variations are because of the amount of finished products which they can produce on a single day. The more the *Garhshall* can process, the more will be its income. The production capacity of a *Garhshall* depends on the expertise of the *Kohar* and the *Aidhas* of the *Garhshall*. The more experienced and expert *Kohars* can always produce more.

Table 2.10 gives the Average net income of *Kohars* of various products per day and per year respectively. It is observed that the annual net income of the *Kohars* producing *Taal* is the highest at Rs. 236680.00. On the other hand, the *Kohars* producing *Kahi* earn an average annual net income of Rs. 225090.00. The *Kohars* producing Bell earns the least annual income of Rs. 72285.00. Thus all the *Kohars* involved in the production of bell metal do not earn the same amount of income. It varies with the type of products. *Taal* and *Kahi* give the highest income among different products, while Bell and Others gives the lowest income to the *Kohars*.

Table- 2.10: Average Daily and Annual Net Income of *Kohars* of Various Products

Sl. No.	Product	Net Income Per Day (In Rs.)	Net Income Per Year (In Rs.)
1	*Taal*	776.00	236680.00
2	*Kahi*	738.00	225090.00
3	*Maihang*	645.00	196725.00
4	*Bati*	469.00	143045.00
5	*Bata*	359.00	109495.00
6	*Baan Bati*	287.00	87535.00
7	*Lota*	255.00	77775.00
8	Bell/ Others	237.00	72285.00

Source: Field Survey

Again Table-2.11 gives us the average daily income of the *Aidhas* or supporting artisans.

Table-2.11: Average Daily Net Income (In Rs.) of *Aidhas* of Different Clusters and Products

Product	Cluster					
	Sarthebari	Namshala	Gomurah	Karakuchi	Lachima	Amrikhawa
Kahi	428	566	224	518	395	549
Taal	518	0	0	0	0	0
Bata	228	0	259	0	314	210
Bati	451	190	310	0	0	335
Baan Bati	178	284	0	0	0	0
Lota	0	213	0	0	0	0
Maihang	430	0	0	0	0	0
Bell/ Others	158	0	0	0	0	0

Source: Field Survey

In Table-2.11, it can be seen that the *Aidhas* engaged in the production of *Kahi* in Namshala earn an average daily income of Rs. 566.00 whereas those from Gomurah earn Rs.224.00. The *Aidhas* of Sarthebari producing *Kahi* earn an average daily income of Rs.428.00. Again *Aidhas* of Karakuchi producing *Kahi* earn a daily income of Rs.518.00 which is the nearest to the average daily income of *Aidhas* producing *Kahi* at Rs.518.00. The

variations in the average daily incomes of the *Aidhas* producing *Kahi* are very high with Range of 622 and Standard Deviation of 136.90.

The *Aidhas* producing *Taal* earn an average daily income of Rs.518.00. As all the *Aidhas* producing *Taal* are from Sarthebari, it is the average daily income of all the *Aidhas* producing *Taal*. The variations in the average daily incomes of the *Aidhas* producing *Taal* are very high with Range of 1270 and Standard Deviation of 245.7.

Among the *Aidhas* engaged in the production of *Bata* those from Lachima earn an average daily income of Rs. 314.00 and those from Amrikhawa earn Rs.210.00. In comparison to *Kahi,* the variations in the daily income are less in case of *Bata* with a Range of 358 and Standard Deviation of 100.75.

Among the *Aidhas* of *Bati* those from Sarthebari earn an average daily income of Rs. 451.00 and those from Namshala earn Rs.190.00. In comparison to *Kahi* the variations in the daily income is less in case of *Bati* with a Range of 678 and Standard Deviation of 118.49.

Table- 2.12: Variation in Income Distribution of *Aidhas* of Various Products

SL. No.	Product	Range	Standard Deviation	Coefficient of Variation
1	*Kahi*	622	136.90	27.83
2	*Taal*	1270	245.70	47.43
3	*Bati*	678	118.49	37.98
4	*Bata*	358	100.75	42.16
5	*Baan Bati*	304	102.22	53.24

Source: Field Survey

Table- 2.12 shows that the variations in the income distribution among the *Aidhas* are the highest in *Baanbati* at 53.24, whereas variations in income distribution of the *Aidhas* engaged in the production *Taal* occupies the second spot at 47.43. Again it should be noted that the variations in income distribution in *Kahi* is the lowest at 27.83. A comparison with Table 2.9 reveals that the variations of income distribution of the *Aidhas* are almost same to that of the *Kohars*. This is because the net income of the *Kohars* and *Aidhas* are proportional due to the unique system of wage distribution of the bell metal industry of Sarthebari.

The variations of income distributions could be calculated for only five products. The same could not be calculated for *Maihang*, *Lota* and Bell/ others because the frequency of

them in the sample are only One (1),Two (2) and Two (2) respectively. This is a very low frequency; hence the variations could not be calculated.

Again the Table-2.13 gives us the average daily income of the *Kohars* and *Aidhas* or supporting artisans involved in producing different products. From the above analysis, it can be seen that among all the products *Bhortaal* or *Taal* generates the highest income which is Rs. 776.00 for the *Kohar* and Rs. 518.00 for the *Aidhas*. *Kahi* gets the second place with an average daily income of Rs. 738.00 for *Kohar* and Rs. 492.00 for the *Aidhas.* But other products generate incomes which is considerably lower than these two. The least amount of income is generated by *Baan Bati* and *Bells*.

Table-2.13: Comparison of Average Daily Net Income of *Kohars* and *Aidhas*

SL. No.	Product	Average Daily Income (In Rs)	
		Kohar	*Aidha*
1	*Taal*	776.00	518.00
2	*Kahi*	738.00	492.00
3	*Maihang*	645.00	430.00
4	*Bati*	469.00	312.00
5	*Bata*	359.00	239.00
6	*Lota*	319.00	213.00
7	*Baan Bati*	287.00	192.00
8	Bell/ Others	237.00	158.00
Average Daily Income		479.00	319.00

Source: Field Survey

If we consider the clusters then we can conclude that some clusters attain efficiency in production of one product and can generate income which is higher than the producers of the same product in other clusters. Among the producers of *Kahi*, the *Kohars* of Namshala and Amrikhawa generate considerably higher income of Rs.849.00 and Rs.829.00 respectively. In these clusters, the *Aidhas* of *Kahi* producing units earn an average daily income of Rs.546.00 and Rs.549.00 respectively. This is considerably higher than the income earned by the *Kohar* producing *Kahi* of Gomurah. Likewise in production of *Bata* the *Kohars* of Lachima are the most efficient and earns a higher income than those producing

Bata in other clusters. Again in production of *Bati,* the producers of Sarthebari are most efficient.

This difference of income producing the same product with same quality arises because of the efficiency of the artisans. It is observed that the quality of the products produced by *Kohars* of different clusters is homogeneous. So there is no difference of price. For example, there is no difference of price of a *Kahi* produced by a *Kohar* of Sarthebari or Namshala or any other cluster. Thus the difference of income among the *Kohars* of different clusters producing the same product arises only because of the quantity of the produce. Again there is no difference in technology. All the producers use the same technology. So, the difference in amount of production arises only because of expertise of the artisans.

If we multiply the average daily income of the artisans by 305 working days in a year we can derive the average annual income of the artisans. The Average annual income of a *Kohar* turns out to be Rs. 146095.00 and that of the *Aidhas* is Rs.97295.00.

Table 2.14 gives the average net annual income of *Kohars* and *Aidhas*.

Table-2.14: Average Daily and Annual Income of *Kohars* and *Aidhas*

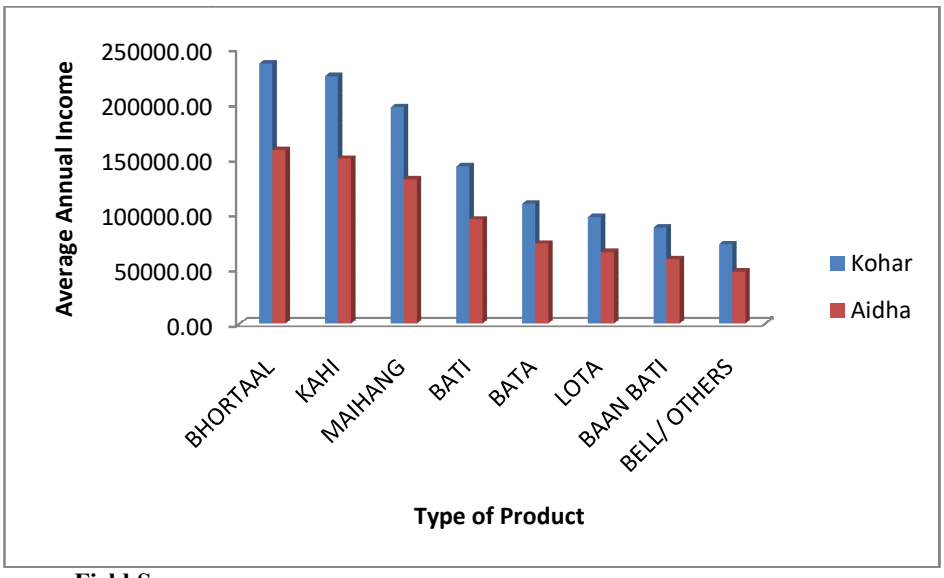
SL. No.	Product	Average Daily Income (In Rs)		Average Annual Income (In Rs)	
		Kohar	*Aidha*	*Kohar*	*Aidha*
1	*Taal*	776.00	518.00	236680.00	157990.00
2	*Kahi*	738.00	492.00	225090.00	150060.00
3	*Maihang*	645.00	430.00	196725.00	131150.00
4	*Bati*	469.00	312.00	143045.00	95160.00
5	*Bata*	359.00	239.00	109495.00	72895.00
6	*Lota*	319.00	213.00	97295.00	64965.00
7	*Baan Bati*	287.00	192.00	87535.00	58560.00
8	Bell/ Others	237.00	158.00	72285.00	48190.00

Source: Field Survey

Table 2.14 shows that *Kohars* and *Aidhas* involved in the production of *Taal* earn on an average an annual income of Rs.2,36,680.00 and Rs. 1,57,990.00 respectively. The *Kohars* and *Aidhas* involved in the production of *Kahi* earn an average annual income of Rs. 2, 25,090.00 and Rs. 1, 50,060.00 respectively. The third highest annual income is earned

by the *Kohars* and *Aidhas* involved in the production of *Maihang*, whereas *Kohar* and *Aidhas* involved in the production of Bell earn the least at Rs. 72,285.00 and Rs. 48,190.00 respectively.

Figure-2.3: Average Annual Income of *Kohars* and *Aidhas* of Different Bell Metal Products



Source: Field Survey

From the above analysis, it can be seen that market demand determines the number of production units in the industry. Among all the bell metal products *Kahi* has the highest utility among the consumers hence carry a very high demand. On the other hand, the utility of *Maihang* is limited and now being used for ornamental purpose and status symbol. *Taal* has also very high demand as this product can only be produced by *Kohars* of Sarthebari. *Taal* i.e. *Pachang Taal* is an integral part of Buddhist monasteries and prayers. Traders from Bhutan collect *Pachang Taals* from Sarthebari and supply them to many foreign countries including Nepal, Japan, South Korea, China etc. But the *Kohars* as well as the local traders cannot export these items directly because this trade is done through much closed channel and it is nearly impossible to find the trade route and the final consumer.

Thus we have analysed the non parametric correlation of the number of production units and the Average Annual Income of the *Kohars*. We have obtained the following results-

Spearman's Rank Correlation Coefficient = $\rho = 0.603$

Kendall's Tau b Correlation Coefficient = t_b = 0.503

The result of the non parametric correlation reveals that there is a very strong positive correlation between the number of *Garhshalls* producing a particular product and the income earned by the bell metal artisans. The number of *Garhshalls* is an indicator of the demand for the commodity. The number of *Garhshalls* producing *Kahi* is the highest because it is the product with highest demand. Thus, we can say that if the demand for a product increases, the income earned by the *Kohars* producing that particular commodity will also increases.

2.4.2 Test of Hypothesis

The per capita GSDP of Assam at current price for the year 2020-21 is estimated at Rs 95309.00[15] at current prices and Rs. 63,204.00 at (2011-12) constant prices, whereas the average annual income of the *Kohar* is estimated at Rs. 146019.00. Das *et al.* (2014) in a census survey of the bell metal industry estimated the average annual income of the *Kohars* as Rs. 2, 80,379.00. As there is a time lag of three years between the above mentioned census survey and the present study, we have tested the validity of the sample mean, and study whether there is significant change in income level of the *Kohars* with the passage of time, we can form the following Null Hypothesis with the test value as the income estimated in the census survey of the Industry.

Null Hypothesis: The income of the *Kohars* does not change with time i.e.

H_0: μ=280379

Hence the Alternative Hypothesis will be

H_1: $\mu \neq 280379$

As the population variance is not known, we can test the Hypothesis by taking the t test of significance.

The results of the t test are calculates as –

Sample Mean = $\bar{x}$ = 146018.75

Sample Standard Deviation = s= 65045.8

Test Statistics = t = 5.842 at 7 df.

The P Value (two tailed) = 0.001at 95% confidence interval.

[15] *Statistical Handbook of Assam 2021.*

As the absolute value of the t statistic is greater than the critical value of *t*, we reject the null hypothesis and conclude that the income of the *Kohars* does not remain constant with time. It changes along with time depending on the demand for the product, amount of raw materials supplied and amount of production.

2.4.3 Generation of Individual Employment in the Marketing Sector

In the Sarthebari area, there are a number of business establishments engaged in the trade of bell metal products. The total number of business establishments dealing in bell metal product stands at 73 where 243 persons are getting direct employment. Table-2.15 gives the details of employment generated by the marketing sector of bell metal industry in Sarthebari area.

Table-2.15 Employment Generated in Marketing of Bell Metal Products

	No. of Units	Owner	Employees	Total
Co-operative	2		9	9
Shops	41	41	87	128
Arabdari	30	30	76	106
Total	73	71	172	243

Source: Field Study

It is observed from table-2.15 that The Assam Co-Operative Bell-metal Utensils Manufacturing Society Limited has employed total nine (9) persons from Sarthebari area in Sarthebari. In Sarthebari, The Assam Co-Operative Bell-metal Utensils Manufacturing Society Limited has two sell points or showrooms. One is situated in the office premises of the Cooperative and the other is situated in the Sarthebari Bazaar. In these two establishments, there are 8 employees. Again there is one permanent employee at the Co-operative Office. Thus total 9 people are getting direct employment in Sarthebari area from the Cooperative.

In the entire Sarthebari circle, there are 41 permanent business establishments' or shops who primarily deal with bell metal products of Sarthebari. All of them are single ownership business establishments. This means 41 persons of Sarthebari area are engaged directly as individual business owners or *Mohajons.* Again these *Mohajons* employ 87 people as salesman in these shops.

Apart from these, there are 30 *Arabdaris* or visiting traders in Sarthebari. The *Arabdaris* do not have any permanent shop in Sarthebari. They are visiting traders who deliver their products in various places of Assam in wholesale as well as in retail. Apart from themselves, they have also employed 76 individuals.

Employment generation of the bell metal industry through marketing is not limited to Sarthebari only. It is instrumental in generating direct employment through the shops selling bell metal product in entire Assam. The actual number of persons engaged in the trade of bell metal products of Sarthebari is much higher. One can find at least two to three shops dealing with bell metal products in any town of Assam. The Assam Co-operative Bell-metal Utensils Manufacturing Society Limited has nine (9) sell outlets apart from the two in Sarthebari. It has four outlets in Guwahati- Fancy Bazaar, Paan Bazaar, Ganeshguri and Dispur. Apart from these, the Cooperative also has sell outlets in the towns of Tezpur, Lakhimpur, Jorhat, Sibsagar and Golaghat. Thus the number of people engaged in the trade of bell metal is much higher and further detail study is required in order to study the marketing sector of bell metal products of Sarthebari in entire Assam. Again bell metal products are also available in e commerce platform through websites like www.indiamart .com and www.kahibati.com.

2.5 Conclusion

The bell metal industry of Sarthebari has been able to contribute significantly to the income and employment generation in the area. It can be seen from the above analysis that the industry is able to generate income for the *Kohars* which are significantly higher than the State per Capita GDP at current price. The Per capita GSD of Assam at current price for the year 2017-18 is determined as Rs 82203.00[16] whereas the average annual income of the *Kohar* is estimated at Rs. 146095.00. This industry is also plagued by the problem of lack of raw materials and hence the *Garhshalls* are forced to remain close for a considerably longer period of time which may be more than 30 days in a year. If the *Garhshall* are able to operate all year round without any disturbance, it would be able to generate more income for the artisans involved in the trade.

[16] *Statistical Handbook of Assam 2018*.

The industry has not been able to meet the market demand for bell metal products. As a result spurious machine made products have flooded the market particularly in the other areas of the state of Assam. If this industry is protected and expanded so that artisans from other areas also able to learn the trade, it will be able to contribute more to the employment scenario of the State and the Barpeta district particularly.

Thus we can conclude that that the industry has satisfied the first hypothesis of the study that the bell metal industry of Sarthebari has given significant contribution towards the income and employment generation in Sarthebari as well as in the district of Barpeta.

To study the industry extensively, it is important to study its production technique and factor intensity, which is done in the next chapter.