

An Insight into the Impact of Socio-Economic Variables on Bhadohi Carpet Industry

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Abstract

The study was conducted in Bhadohi district of Uttar Pradesh which is also known as “Carpet City”. Seventy-two respondents were selected using Snow-ball sampling techniques as there was no clear listing available of Handmade Carpet manufacturing units. A structured interview was used to collect information from the respondents. Statistical analysis was accomplished by means of frequency distribution, percentages, and multiple regression analysis.

The result showed that out of eight explanatory variables used, only four variables were statistically significant at 5% level of significance. These variables are the caste of the manufacturers, an age of manufacturing units, number of looms, and the location of the units. The coefficient for caste, the number of looms and location is positive, which means that there is a positive association with them, whereas, for starting years of manufacturing units is negative which means there is no impact on years devoted in the carpet manufacturing units. Other variables which did not affect the level of production significantly in the study area are age, sex, educational level of the respondent and amount of capital invested. Based on the finding, it was recommended that more manufacturers should be encouraged to improve their Carpet production techniques to increase their revenue from it and also try to remove the obstacles which are prevailing in this industry. In addition, manufacturers should be assisted in providing the necessary infrastructural facilities, training, etc. for the weavers as well as for manufacturers so that they could have access to improve their methods and technologies for Handmade Carpet Production.

Keywords: Carpet Industry, Carpet Production, Total Revenue, Manufacturers

Introduction

Handmade Carpet Industry is one of the oldest Handicraft Industry. Carpet industry like other handicrafts creates a

great deal of employment opportunities with little capitals and also by using simple tools for contributing towards our economy. It is difficult to pinpoint where and when the first carpet and the art of carpet making originated but in India it was introduced during the regime of Mughal emperor Akbar. Over the period of time the carpet manufacturing flourished more in northern part of India especially at selected centers such as Bhadohi, Mirzapur, Varanasi, Panipat and Jaipur. At present there are many Manufacturing Industries which are booming in our country but the major belts for Indian Handmade Carpet come from Bhadohi-Mirzapur belt which enriches the cultural heritage of our country.

Bhadohi belt in Uttar Pradesh is famous for Carpets related activities (i.e., weaving, dying, finishing, etc.) and because of that Bhadohi is also known as “Carpet City”. This region produces different varieties of carpets, with different designs, colors and techniques of knotting. The success of this industry in terms of export figures has been made possible due to the availability of skilled weavers and collaboration of manufacturers, exporters and government intervention. Many artisans are already involved and many more wants to be included in this sector, providing opportunities to afford domestic economic development and enhance world trade. In fact, this industry is a bread earner for innumerable rural artisans of not only Bhadohi district but also in other parts of the country including many towns and villages in terms of employment (Sinha, 1982; Babel & Choudhary, 2009, 2010; Joy & Kani, 2013; Bano & Fatima, 2014). Due to the importance of this district, Bhadohi Carpet got the Geographical Indication (GI) tag under Geographical Indication of Goods (Registration and Protection) Act in 2010 by Government of India. In this study, the socio-economic characteristics of the manufacturers were used in assessing their impact on Bhadohi Carpet Industry. And

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the following specific objectives to be addressed in this study are:

- To identify the socio-economic characteristics of Carpet manufacturers.
- To evaluate the impact of socio-economic variables on Bhadohi Carpet Industry.
- To determine the factors that affects the Total Revenue of Carpet Industry.

Literature Review

Though the carpet industry has grown extremely fast over the past two decades, in recent years it has shown a tendency to slow down from the market. The Indian industry too has been outcompeted by China and Pakistan. There are some selected literatures which have been reviewed for this paper.

Khan (2017) tries to know the impact of Economic Slowdown on Export and Production of Indian Carpet Industry. The study concludes that Indian Handmade Carpet sector has gone through tremendous pressure on account of the global Economic Slowdown of 2007-08. They have affected export potential, overall productivity and employment generating capability of the industry to a very large extent.

Saikia (2017) tries to examine the structure and diversification of informal manufacturing sector across Indian states. The study concluded that most of the states have a narrow industrial base and diversification does not appear to be very wide across states. In addition, it provide strong evidences for significant positive correlation between the diversification of informal manufacturing sector and level of industrial development, and the presence of co-location of informal manufacturing enterprises across states.

Kaur (2017) stated that the MSMEs have not only create huge employment opportunities but also address other challenges faced by the economy like poverty and removing regional imbalances.

Chalotra (2015) tries to assess the ranking of variables impacting supply chain network of 44 small scale industries operating of Jammu & Kashmir. The study found that the main variables which impacts supply chain

network were clarity of goals, customer satisfaction, long term relationships, clear accountabilities, internal congruity, and opportunities for self-engagement.

Soni (2014) concludes that Child Labor is a socio-economic problem; it has to be removed within a reasonable timeframe from this industry, if one wants to increase the share of Carpet exports and earn foreign exchange.

Bano and Fatima (2014)'s study tries to highlight the significance, importance and various problem of carpet industry in employment generation, especially related to women participation, their income level and also their educational level. They conclude that women participation in the economic activities will improved their financial condition in particular and socio economic condition in general. It also states that Carpet industry not only gives employment opportunity to the literate and skilled women but also to the semi-skilled women. It not only provides employment for the women but also empowers the women.

Jain, Sharma, and Batta (2015) the study reveals that India's Carpet and rug sector has high level of export competitiveness and competitive advantage, validating its high potential to earn foreign exchange. India also holds strong position in international framework relative to major exporters at both two-digit level and four digit level.

Din (2015) the study concludes that holding national, international trade fairs, buyer-seller meets, and interface with the overseas markets will help in this behalf.

Ouyang et al. (2015) found that International Market potentials can encourage exports but on an average it has a negative impact on the firm's profit. He further explores that domestic market is the main contributor to the firms profit. He cautiously concludes that small firms are more vulnerable to trade liberalization while large firms can survive them.

Olagunju, Adesiyan, and Ezekiel (2007)'s the study concluded that production of cat fish is highly profitable. On one hand it is related to the size of the enterprise and on the other hand other variables which contribute to profitability are the age, educational status and the number of labor used.

Srivastava and Goswami (2007) emphasizes on whether handmade carpets has a potential for socio-economic growth or not. Socio-economic means analyzing both the aspect (i.e., the social impacts of economic activity and economic consequences of social activity). Conclusion of the study is that the country with a population backed by skilled and trained workers engaging in craft activity has strong potentials for growth and will create employment resulting in socio-economic growth. Thus, the handmade carpet industry has a potential of socio-economic growth for a country and the world.

Methodology and Data Source

The study was carried out in Bhadohi district of Uttar Pradesh. The present study uses non probability sampling, under which Snow-ball sampling techniques have been used as there is no clear listing available of Handmade Carpet manufacturing units. A total of seventy-two respondents were selected for interview and the information was collected from the respondents (manufacturers) with the aid of structured interview.

The data collected from the respondents include the socio-economic variable such as age, sex, caste, educational level of the manufacturers, age of manufacturing units, amount of capital invested by the manufacturers, number of loom, location of the units as well as total revenue of Carpet Industry. Descriptive statistics was used to analyze the socio-economic variables of the respondents, while regression analysis was used to analyze the impact of the socio-economic variables of the respondents on the Total revenue from Carpet production.

Explicitly, regression model is expressed thus,

$$\text{Ln } Q = \alpha + \beta X_1 + \beta X_2 + \beta X_3 + \beta X_4 + \beta X_5 + \beta X_6 + \beta X_7 + \beta X_8 + U_t$$

Where,

Q = Total Revenue (Output per square inch x Price per square inch)

X_1 = Age of Manufacturers (in years)

X_2 = Sex of the manufacturers (Male=0, Female=1)

X_3 = Caste of the manufacturers (Reserved=1; Unreserved=0)

X_4 = Education level of the manufacturers (in years)

X_5 = Age of manufacturing units (in years)

X_6 = Amount of Capital invested by the manufacturers

X_7 = Number of looms used in a manufacturing units

X_8 = Location of the units (i.e., Urban areas=1; Rural areas=0)

U_t = Error Term assume to have a zero mean and constant

Results and Discussion

Before proceeding towards regression analysis, it is equally important to check the normality test for the Total Revenue of Carpet production (Output x Price). An assessment of the normality of data is a prerequisite for many statistical tests because normal data is an underlying assumption in parametric testing. When testing for normality, we are mainly interested in the test of Normality table-1 and the figure-1 Normal Q-Q Plots, our numerical and graphical methods to test for the normality of data, respectively.

Table 1: Descriptive Statistics: Ln Q

	Statistic	Std. Error
Mean	14.2117	.08763
Median	14.4033	
Variance	.553	
Standard Deviation	.74353	
Range	3.34	
Inter quartile Range	1.10	
Skewness	-.341	.283
Kurtosis	-.613	.559

Table 2: Shapiro-Wilk Test of Normality for Carpet Output (Ln Q)

Shapiro-Wilk			
	Statistic	Degree of freedom	Significant
Ln Q	.968	72	.060

The above table 1 and table 2 present the result of Descriptive statistics as well as Shapiro-Wilk of Normality test for Total revenue from Carpet production. This test is more appropriate for small sample sizes (<50 samples), but can also handle sample sizes as large as 2000. For this reason, we used the Shapiro-Wilk test as our numerical means of assessing normality. It is well known that the significant value of the Shapiro-Wilk test is greater than 0.05, the data is normal whereas, if it is below 0.05, the data significantly deviate from a normal distribution. It is clear from table 2 that the data for Total revenue of Carpet production is normally distributed.

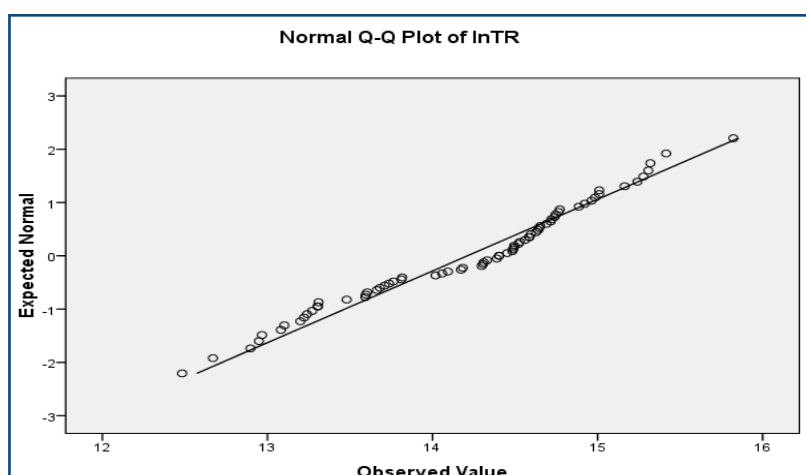


Fig. 1: Normal Q-Q Plot

In order to determine normality graphically, we can use the output of a normal Q-Q plot. If the data are normally distributed, the data points will be close to the diagonal line. If the data points stray from the line in an obvious

non-linear fashion, the data are not normally distributed. It is clear from the above Fig. 1 Normal Q-Q Plots that the data is normally distributed.

Table 3: Socio-Economic Variables of the Respondents

Variable	Frequency	Percentages
Age (years)		
Below 30	18	25.0
31-40	23	31.9
41-50	16	22.2
Above 50	15	20.8
Sex		
Male	70	97.2
Female	2	2.8
Caste		
Unreserved	14	19.4
Reserved	58	80.6
Educational level (years)		
5-9 year complete	20	27.8
10-11 year complete	11	15.3
12 or more year	41	56.9
Age of Manufacturing Units (years)		
0-10	35	48.61
11-20	21	29.17
21-30	8	11.11
31-40	6	8.33
41-50	2	2.78
Amount of Capital		
Below 100000	12	16.67
100001-125000	12	16.67

<i>Variable</i>	<i>Frequency</i>	<i>Percentages</i>
125001-150000	16	22.22
150001-175000	8	11.11
175001-200000	16	22.22
200001-250000	4	5.56
250001-300000	3	4.16
300001-500000	1	1.39
Number of looms		
2	5	6.9
3	11	15.3
4	7	9.7
5	9	12.5
6	10	13.9
7	6	8.3
8	12	16.7
9	5	6.9
10	5	6.9
15	1	1.4
16	1	1.4
Location of the units		
Rural Area	49	68.1
Urban Area	23	31.9

Source: Authors Calculation

Table 3 showed that respondent age bracket 31-40 years had the highest proportion of the respondent (31.9 %). This is closely followed by the respondents with age below 30 years (25%), with 41-50 years and least proportion of 20.8% is by the age bracket above 50 years. The result showed that there was a widespread of respondents among all the age groups. This implies that the Carpet production is embraced by all the age groups of the respondents in the study area.

It is also clear that majority of the respondents 97.2% were males while just few 2.8% were females, showing that majority of Carpet manufacturers in the study area are males. This is so because Carpet manufacturing is a tedious job and requires more strength which female may not be able to provide. In addition, majority of the respondents (80.6%) belongs to reserved category while just few 19.4% were from unreserved.

As regards the educational level of respondents, it could be observed from the table 3 that majority of the respondents (56.9%) have completed 12 or more year of education. This is a good indication that educational status of the respondents is better who were in Carpet production. This

is a good pointer to improved productivity as the level of education is a tool with which an individual could be efficient at whatever endeavor being undertaken by the individual (Oluyole & Usman, 2006). In addition, majority of the respondents (48.61%) belongs to the bracket 0-10 starting years of manufacturing units as compared to other category of manufacturing units. It is observed that majority of respondent have their manufacturing units in rural areas (68.1%) as compared to urban areas (31.9%).

Table 4: Model: Ln TR^b

<i>Model</i>	<i>R</i>	<i>R Square</i>	<i>Adjusted R Square</i>	<i>Standard Error</i>	<i>Durbin-Watson</i>
1.	.863 ^a	.746	.713	.39813	2.039

Note: a. Predictors: (Constant), Age, Sex, Caste, Education level of the manufacturers, Age of manufacturing units, Amount of Capital, Number of looms used in a units, Location of the units
b. Dependent Variable: Ln TR

Table 4 shows the result of the regression analysis where it displays the value of R, R², adjusted R², the standard error and Durbin-Watson. The value of R indicates the correlation between the observed and predicted values of the dependent variable. The value of R ranges from -1 to 1.

The sign of R indicates the direction of the relationship (positive or negative). The absolute value of R indicates the strength, with larger absolute values indicating stronger relationships. R^2 is the proportion of variation in the dependent variable explained by the regression model. The value of R^2 lies between 0 and 1. The closer it is to 1, the better is the fit whereas, small values indicate that the model does not fit the data well. Adjusted R^2 attempts to correct R^2 to more closely reflect the goodness of fit of the model in the population. It is better to use R^2 for determining which model is best.

It is clear from the above table 4 that the value of adjusted R^2 after taking into account a number of regressors, the model explains about 71.3% of the variation in Carpet production (Total Revenue). Further, the Table showed that R^2 is 0.746 meaning that the independent variable can explain 74.6% of the variations in dependent variables. It is well known that the better the linear regression fits the data, the closer the value of R^2 is to one. When the sample size, n , is large, R^2 and adjusted R^2 will usually be identical or very close. Durbin-Watson (DW) of 2.039 (which is approximately 2.0) shows the absence of auto-correlation.

Table 5: ANOVA: Ln TR

<i>Model</i>	<i>Sum of Squares</i>	<i>Degree of freedom</i>	<i>Mean Square</i>	<i>F</i>	<i>Sig.</i>
Regression	29.265	8	3.658	23.079	.000 ^a
Residual	9.986	63	.159		
Total	39.251	71			

Note: a. Predictors: (Constant), Age, Sex, Caste, Education level of the manufacturers, Age of manufacturing units, Amount of Capital, Number of looms used in a units, Location of the units b. Dependent Variable: Ln TR

Besides R^2 , we can use ANOVA (Analysis of variance) to check how well the model fits the data. The F statistic is the ratio of Regression mean square (MSR) to by the Residual mean square (MSE). If the significance value of the F statistic is small (smaller than say 0.05) then the independent variables do a good job explaining the variation in the dependent variable. If the significance

value of F is larger than say 0.05 then the independent variables do not explain the variation in the dependent variable, and the null hypothesis that all the population values for the regression coefficients are 0 is accepted. Table 5 indicates F -value of 23.079, meaning that the overall equation is significant at 1% level of significance. Further, the result indicates that the model, as a whole, is a significant fit to the data.

Table 6: Coefficients: Ln TR

<i>Model</i>	<i>Unstandardized Coefficients</i>		<i>Standardized Coefficients</i>	<i>T</i>	<i>Sig.</i>
	<i>B</i>	<i>Std. Error</i>			
(Constant)	12.082	.473		25.536	.000
Age	.015	.010	.233	1.526	.132
Sex	-.193	.302	-.043	-.638	.526
Caste	.316	.130	.170	2.428	.018
Education	.013	.020	.051	.654	.515
Age of manufacturing units	-.021	.010	-.305	-2.056	.044
Amount of Capital	1.011E-6	.000	.071	.787	.434
Number of loom used	.199	.017	.760	11.599	.000
Location	.344	.111	.217	3.107	.003

Source: Authors Calculation

After checking for the model fit, it is important to know the relative importance of each independent variable in predicting dependent variable i.e., Total Revenue from Carpet Production. The constant, or intercept term for the line of best fit, when $x = 0$, is 12.082 (%). The Unstandardized (B) coefficients are the coefficients of the estimated regression model.

Table 6 showed that out of eight explanatory variables used, only four variables were statistically significant at 5% level of significance, these are caste of the manufacturers, Age of manufacturing units, number of looms, and Location of the units. Caste has impact on Bhadohi Carpet production as few particular castes have been prominently indulged in businesses which were later classified as reserved category (OBC, ST, SC) as they lack social rights/status. The upper castes (unreserved) which have traditionally owned land, kingdom, knowledge and higher social status, are reluctant to engage themselves in the field of Carpet. The coefficient for Number of looms and location is positive, which means that there is positive association between the number of looms and carpet production. This is due to the fact that the more number of looms will produce more which in turn will generate more total revenue from the Carpet production. The coefficient is negative for Starting years of manufacturing units which means there is no impact on years devoted in the units on carpet production. Other variables did not affect the level of production significantly in the study area are age, sex, educational level of the respondent and amount of capital invested.

Conclusion

Bhadohi Carpet industry has protected our art, culture, skill, etc. and at the same time earns more foreign exchange, etc. for our country. The result showed that out of eight explanatory variables used, only four variables were statistically significant at 5% level of significance, these are caste of the manufacturers, age of manufacturing units, number of looms, and location of the units. The coefficient for caste, number of looms and location is positive, which means that there is positive association with them, whereas for starting years of manufacturing units is negative which means there is no impact on years devoted in the carpet manufacturing units. Other variables which did not affect the level of production significantly in the study area are age, sex, educational level of the respondent and amount of capital invested.

Based on the finding, it was recommended that more manufactures should be encouraged to improve their production so as to increase their revenue and also try to remove the obstacles. In addition, manufacturers should be assisted in providing the necessary infrastructural facilities, training, etc. for the weavers as well as for manufacturers so that they could have access to improve their methods and technologies for Handmade Carpet Production.

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