Business Studies (UGC - CARE Listed Journal Group I, ISSN 0970-9657)
Volume – XLIV, No. 1, January, 2023

Prospects of Ceramic Industry in West Bengal: An Empirical Study

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Abstract

The Indian ceramic industry is expanding and has the potential for expansion on both the domestic and foreign markets. A world-class contemporary industry that is inclined to compete on a worldwide scale has emerged in this sector over the years as a consequence of the sector's quick modernization process and new innovations that have improved the product profile, quality, and design. However, as compared to other states, the industry in West Bengal is still far behind. The study focused to determine empirically the prospects in this sector in West Bengal. The present research work is rooted on primary survey, conducted in West Bengal in the districts of Paschim Bardhaman, North 24 Parganas and Kolkata. The survey data has been analysed using various statistical tools and ordinal logistic regression. The present study has identified a number of significant variables that are leading to sustainability and growth prospects of this industry.

Keywords: Ceramics, Prospects, Primary Survey, Export, MSME.

1. Introduction

The Indian ceramics sector, through the export of high-quality ceramic products, which account for 7% of the world's production, has become a key manufacturer, supplier, and competitor in the home market as well as a major player in the international market. Both organised and unorganised industries in India create ceramic goods, with Micro, Small and Medium Enterprises (MSMEs) dominating both sectors (Ceramics Industry –Tiles and Sanitary ware (2020) Industry Research, CARE Ratings).

Over centuries, the ceramics industry has depicted a magnificent growth backed by the increasing demand for ceramics products, for home décor, real estate industry and industrial purpose. Increasing demand for sanitary ware and tiles due to large scale commercialization has made this industry more attractive, both for domestic and export market. In the international ceramics market, China and India are in a leading in terms of competitive strength. India lags significantly behind China in terms of trade volume, but ceramic products of India are on par with China and have huge potential based on its growing demand in domestic and international market (Gupta and Biswas, 2020).

China is currently the world's top producer of ceramic tiles, with India coming in second. During the period of 2013 to 2017, the organized sector, which makes up over 50% of the ceramics industry, expanded at a compound average annual rate (CAGR) of 7.7%. However, the road ahead is difficult and problematic for the unorganized sector. Ceramic tile imports fell by 15% from USD 47.8 million in FY 2019 to USD 40.5 million in FY 2020, while exports of ceramic tile reached to USD 1,414 million in FY 2020, a growth of

31% from USD 1,078 million in FY 2019 (Status Quo and Outlook 2022: Indian Ceramics Industry, 2018, MesseMuenchen India & EAC International Consulting).

The Department of Micro, Small and Medium Enterprises and Textiles, Government of West Bengal, has identified 31 clay and ceramics clusters that are operational in West Bengal. Apart from the clusters, there are numerous individual ceramics manufacturing units scattered throughout the states, especially the micro units, which remains unaccounted.

2. Review of Literature

Future production quantities will demonstrate the ceramic industry's potential, and internationalization will enable sustainability (Amendola, et al., 2010). Imported ceramics and pottery have emerged as urgent concerns on regional markets.

Minimal foreign interference and the implementation of structural and societal reforms in business practices are necessary to lessen the negative effects of international competition on the domestic ceramic market (Almamari, 2017). Locally sourced raw materials combined with global knowledge learned or obtained through activities in other countries in the context of this sector is the fundamental requirement to successfully compete in both home and international markets (Oliver et al., 2008).

Gujarat has become a significant producer of ceramics in the Indian context as a result of the industry's and the government's combined efforts in upgrading technology, diversification in products, and global outlook (Das, 2019). Based on the ceramic clusters' increasing Returns to Scale (IRS), it can be inferred that applying more advanced technologies will greatly boost productivity, which will then increase the cluster's output (Mukherjee, 2015, Biswas & Pandey, 2016, Biswas, 2019).

Modernization of technology in the established ceramics sectors, with a focus on innovative approaches is the need of the hour for the cluster development program in India's MSMEs. To become a sustainable manufacturer, the sector requires targeted reorganization and the use of new technologies (Maiti, 2014 and Maiti, 2003).

In West Bengal’s perspective, the factors that led to the pottery industry's demise and were identified by them include low market demand, a rigid approach to implementing new technologies, a lack of creativity in structure and design, a lack of marketing opportunities, insufficient training and limited market reach (Hazra & Barman, 2018, Dutta, 2018 and Paul, 2018).

According to Pal & Pal, 2015, Kasemi, 2014, and Lahiri, 2014, the MSMEs in the state confront a number of significant issues, including an unstructured financial support system, significant middlemen margins, unpredictable raw material supply, weak negotiating strength, and inadequate management. Redefining the function of state institutions is necessary, as there is a significant financial support gap between districts that are considered backward and those that are not. To strengthen MSMEs in West Bengal, government schemes need to be implemented correctly and there needs to be coordination between the various levels (Kanrar, 2013 and Ganguly, 2013).

3. Research Gap

Following a thorough analysis of the literature, it seems that scholars and researchers have studied MSMEs over the years, including the ceramics and pottery industry. The majority of research focus on identifying the general issues and difficulties faced by these MSMEs and including financial aspects.

However, no such seminal study that tries to identify and analyse the future prospects of the ceramic clusters or the individual ceramic units operating in West Bengal. Therefore, it is anticipated that the

proposed study will draw attention to this understudied sector, that is noteworthy from a socioeconomic standpoint.

4. Objective of the Study

The objective of the present research work is to examine the prospects and potential of the ceramic industry in West Bengal. The study also tries to identify the factors responsible for sustainability of the sector and evaluate the relationship of it with the variables for potential of the ceramic industry.

5. Hypothesis of the Study

The present study includes the following research hypothesis:

1. H_1 =There exist no variation in the growth potentials of the units with respect to the selected districts.
2. H_2 =There exists no significant correlation among the factors affecting the growth potentials of the ceramic industry in West Bengal.
3. H_3 =The regression model does not provide good prediction of the outcomes.

4. Methodology and Database

The present study is empirical in nature, based on both secondary and primary data. The primary data has been collected through direct interaction with the owners and employees of the ceramic units using structured questionnaires in the districts of Paschim Bardhaman, North 24 Parganas, and Kolkata of West Bengal. The researcher finalised the questionnaire after making the required adjustments in light of the feedback that received from the pilot survey. The convenient sampling process was used to select the units surveyed.

The sample consists of 104 distinct ceramics units. In this study 7-point likert scale has been used. Cronbach's Alpha is used to determine the internal consistency of the questionnaire. Kruskal-Wallis test, Friedman's test, Spearman's Correlation test are employed in this study. Further to understand the factors responsible for sustainability of the sector and its relation with the growth potentials, Principal Component Analysis (PCA), as well as Ordinal Logistic Regressions is used. These tests are utilised to comprehend, analyse, and extrapolate the potentials of the ceramic businesses operating in West Bengal.

5. Data Presentation and Analysis

Data was gathered by the researcher from 104 different ceramic product manufacturing units. Through the use of a structured questionnaire, information is gathered from three districts in the state of West Bengal: Paschim Bardhaman (51 units), North 24 Parganas (29 units) and Kolkata (24 units). The Cronbach's Alpha rating of 0.883 is more than 0.80 and is therefore regarded as being good. As a result, it can be said that the questionnaire's scale and measurements are consistent and dependable.

In context of market penetration and scalability, the industry is anticipated to have enormous growth potential in the next years. In order to better determine the prospects of the ceramic manufacturing units in the Paschim Bardhaman, North 24 Parganas, and Kolkata districts, the following questions were surveyed:

The owners of the units think they have tremendous growth potential in the future, regardless of the operating districts. For the ceramic sector of West Bengal, there are opportunities for growth, opportunities for entry into global markets, and opportunities for competition with the major manufacturers. With the rise in the level of living, there is a considerable growth in demand for ceramic items, and the sector might grow in the domestic market as well.

Table 1: Potentials of Ceramic Industry in West Bengal

Factors / Responses	Very Strongly Disagreed	Strongly Disagreed	Disagreed	Neutral	Agreed	Strongly Agreed	Very Strongly Agreed
Improvements in standard of living will result in significant growth of this industry	0	0	0	13	35	33	23
The demand for the ceramics products is significantly increasing	0	4	5	12	30	27	26
Potentials to compete with the large cap industries	0	0	0	11	37	27	29
Potential for expansion	0	0	0	5	39	29	31
Potentials to cater foreign demand	0	4	5	12	30	27	26

Source: Compiled by the researcher

It is obvious that as people's standards of living rise, they are seeking more opulent goods, whether it is tiling for their homes, workplaces, and chambers, exquisite sanitary ware for their bathrooms, or tableware for their dining areas. The demand for ceramic goods will undoubtedly rise as a consequence in the coming years. The units must sell their products at a cheaper price in order to maintain their market share because they lag considerably behind the large producer in terms of pricing and turnover.

As a result, the units' profitability has decreased, raising concerns about their continued availability on the market. However, they continue to think that they could succeed with the right assistance. The proprietors of the ceramic units also made a point of highlighting how, should ceramic clusters be created by the government, their output might be integrated to generate a substantial presence in the market in terms of pricing and quality. They acknowledge that the business has room for growth given the rise in living standards, rising urbanisation, and industrialization.

Large-scale production in this industry is mostly dependent on finance and technology. Few people opposed this motion, and the data collected shows that only 11.54 percent of respondents said they were neutral. Because they are uncertain about their ability to scale and the calibre of their products, the reactions differ. To further investigate whether there are any differences between the growth potentials of the units and the chosen districts the following analysis are presented:

Hypothesis - 1

Null Hypothesis = There is no variation in the growth potentials of the units with respect to the selected districts.

Alternative Hypothesis = There is variation in the growth potentials of the units with respect to the selected districts.

Table 2: Kruskal Wallis Test

	Improvements in standard of living will result in significant growth of this sector	**The demand for the ceramics products are significantly increasing**	**Potentials to compete with the large cap industries**	**Potential for expansion**	**Potentials to cater foreign demand**
Chi-Square	6.499	1.415	1.851	.114	.358
df	2	2	2	2	2
Asymp. Sig.	.069	.493	.396	.945	.836
Grouping Variable: District					

Source: Compiled by the researcher

From the table it is witnessed that there is no variation in the growth potentials of the units with respect to the selected districts, hence the Null Hypothesis is accepted at 5% level of significance. The survey results show that irrespective of the districts of operation, the owners of the units believe that they have significant growth potentials. It is measured with respect to potentials for expansion, potential to enter into foreign markets; potentials to compete with the large manufacturers exist for the ceramic industry of West Bengal. Moreover, the test result also confirms that the demand for the ceramic products is significantly increasing and industry has the potential to expand in the domestic market as well, with the substantial increase in the standard of living. Further to analyse the correlations among the growth potentials of the ceramic industry Spearman's rho is used.

Hypothesis - 2

Null Hypothesis = There exist no significant correlation between the factors affecting the growth potentials of the ceramic industry in West Bengal.
Alternative Hypothesis =There exist significant correlation between the factors affecting the growth potentials of the ceramic industry in West Bengal.

Table 3: Spearman's Correlations

		Increase in standard of living will result in significant growth of this sector	**The demand for the ceramics products is significantly increasing**	**Potentials to compete with the large cap industries**	**Potential for expansion**	**Potentials to cater foreign demand**
Increase in standard of living will result in significant growth of this sector	Correlation Coefficient	1.000	.192	.023	-.002	.170
	Sig. (2-tailed)	.	**.001**	.813	.982	.085
	N	104	104	104	104	104
The demand for the ceramics	Correlation Coefficient	.192	1.000	.538**	.402**	.434**

products are significantly increasing	Sig. (2-tailed)	.051	.	**.000**	**.000**	**.000**
	N	104	104	104	104	104
Potentials to compete with the large cap industries	Correlation Coefficient	.023	.538**	1.000	.487**	.357**
	Sig. (2-tailed)	.813	**.000**		**.000**	**.000**
	N	104	104	104	104	104
Potential for expansion	Correlation Coefficient	-.002	.402**	.487**	1.000	.376**
	Sig. (2-tailed)	.982	**.000**	**.000**		**.000**
	N	104	104	104	104	104
Potentials to cater foreign demand	Correlation Coefficient	.170	.434**	.357**	.376**	1.000
	Sig. (2-tailed)	.085	**.000**	**.000**	**.000**	
	N	104	104	104	104	104
**. Correlation is significant at the 0.01 level (2-tailed).						

Source: Compiled by the researcher

From the above table depicting Spearman's correlation, it is evident that increase in the standard of living is significantly correlated ($p = 0.001 < 0.05$) with the considerable increase in demand for the ceramic products in the persisting situation. Further the correlation matrix confirms that there lies significant correlation between increase in demand for the ceramic products and potentials to compete with large cap manufacturers, growth potentials and potential to export.

Hypothesis – 3

To further identify the factors responsible for the development and sustainability of this industry in the state of West Bengal Principal Component Analysis is used.

Table 3: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.863
Bartlett's Test of Sphericity	Approx. Chi-Square	2.689E3
	Df	406
	Sig.	.000

The Kaiser-Meyer-Olkin measure of sample adequacy varies from 0 to 1. In the present study the KMO statistic value is 0.863 which is more than 0.8 and is considered to be good, and hence PCA can be undertaken.

The Bartlett's test examines the null hypothesis whether the correlation matrix is significantly different from an identity matrix where an identity matrix is a matrix which has the diagonal elements as 1 and the off-diagonal elements as 0. The computed Bartlett's test result in the current investigation is.000, indicating that the correlation matrix is not the identity matrix and that the null hypothesis is thus rejected. Consequently, the PCA can be started. Below is a representation of the PCA result as a rotated component matrix:

Table 4: Rotated Component Matrix[a]

	Component					
	1	2	3	4	5	6
Quality constraints		.459	.101		.075	**.615**
Price constraints			.126		.109	**.617**
Skilled Labour Availability		**.502**			.392	.025
Semi-Skilled Labour Availability		**.545**		.488	.478	
Unskilled Labour Availability	.093	**.946**			.093	
Supplier Related Constrains	.201					**.615**
Labour management		**.833**				
Use of advance technology and modern machinery	.370	.204		**.752**		
Adequate knowledge and know how about the usage of technology			.126	**.626**		.120
Proper management of waste is a major constraint	**.866**	.229		.157	.075	
Arrangement of required financing is difficult		.478	**.752**			
Difficulties in getting bank loans		.247	**.853**			.018
Documentation related challenges for bank financing		.243	**.817**	.104		
Mortgage related challenges for bank financing		.291	**.803**	.249		
Getting financial support through various schemes of government is difficult			**.578**	.211		
Lower profit margins for manufacturers	.382				**.992**	.101
Difficulties in arrangement of working capital			**.558**	.299		
Difficulties in arrangement of funds for expansion		.049	**.585**			
Research and development in production process	.344			**.608**		
Product innovation				**.643**		.036
Excessive intervention of middlemen in selling of your products					**.779**	
Difficulties in establishing direct link with the customers					**.866**	.087
Competition from large cap industries in terms of marketing	.181				**.762**	
Difficulties in advertising your products					**.616**	.082
Using online platform for selling your products is difficult	.230	.740			**.772**	.044
Inventory storage problem especially in monsoon season	**.873**					
Government policies regarding waste management is followed	**.919**					
Support from local government is available for treatment of waste	**.918**				-.030	
Investment in technology is required for proper waste management	**.906**				.115	
Proper waste management could generate revenue	**.916**	.101				
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.						
a. Rotation converged in 9 iterations.						

The Rotated Component Matrix shows the matrix of the factor loadings for each of the variable to each factor after rotation. Since the correlations between the variables and the components are represented in this matrix the possible value ranges between -1 to +1. The component pattern and component structure matrices are same for orthogonal rotations such as varimax. Therefore, from the PCA only six components are considered significant which as follows:

There are six variables in the first component which are (a) Inventory storage problem especially in monsoon season (with loading .873), (b) One of the main obstacles is waste management (with loading .866), (c) Government policies regarding management of waste is followed (with loading .919), (d) Support from local government is available for treatment of waste (with loading .918), (e) Investment in technology is necessary for proper management of waste (with loading .906) and (f) Proper management of waste could generate revenue (with loading .916). The first derived component clearly reflects the 'Waste management' factor representing the challenge of the ceramic industry in selected districts.

The second derived component has four variables, (a) Skilled Labour Availability (with loading .502), (b) Semi-Skilled Labour Availability (with loading .545), (c) Unskilled Labour Availability (with loading .946) and (d) Labour management (with loading .833). The second derived component depicts the 'Labour Availability' factor representing the challenge of the ceramic industry in selected districts.

There are seven variables in the third component i.e. (a) Arrangement of required financing is difficult (with loading .752), (b) Difficulties in getting bank loans (with loading .853), (c) Documentation related challenges for bank financing (with loading .817), (d) Mortgage related challenges for bank financing (with loading .803), (e) Getting financial support through various schemes of government is difficult (with loading .578), (f) Difficulties in arrangement of working capital (with loading .558) and (g) Difficulties in arrangement of funds for expansion (with loading 585). The third component clearly reflects the 'Financing' factor representing the unique challenge of the ceramic industry in selected districts.

The fourth component has four variables, (a) Use of the advance technology and modern machinery (with loading .752), (b) Adequate knowledge and knows how about the usage of technology (with loading .626), (c) Research and development in production process (with loading .608) and (d) Product Innovation (with loading .643). The fourth component clearly reflects the 'Technology and Innovation' factor representing the challenge of the ceramic industry in selected districts.

The fifth component has six variables, (a) Excessive intervention of middlemen in selling of your products (with loading .779), Lower profit margins for manufacturers (with loading .992), (c) Difficulties in establishing direct link with the customers (with loading .866), (d) Competition from large cap industries in context of marketing (with loading .762), (e) Difficulties in advertising your products (with loading .616) and Using online platform for selling your products is difficult (with loading .772). The fifth component clearly reflects the 'Marketing' factor representing the challenge of the ceramic industry in selected districts.

The sixth component has three variables, (a) Supplier Related Constrains (with loading .615), (b) Quality constraints (with loading .615) and (c) Price constraints (with loading .617). The sixth component clearly reflects the 'Raw Material Constrain' factor representing the challenge of the ceramic industry in selected districts.

Table 5: Summary Results of PCA

Factor Component	Naming the Components	Included Variables
Component 1	Waste Management	V26, V27, V28, V29, V30
Component 2	Labour Availability	V3, V4, V5, V7
Component 3	Financing	V11, V12, V13, V14, V15, V17, V18

Component 4	Technology and Innovation	V8, V9, V19, V20
Component 5	Marketing	V16, V21, V22, V23, V24, V25
Component 6	Raw Material Constrain	V1, V2, V6

Source: Compiled by the researchers

The above table summarises the factors representing the challenges faced and the factors are responsible for the sustainability of the ceramic industry in the selected districts of West Bengal, derived from the PCA. To further analyse relationship among the sustainability potentials of the sector with the factor responsible for sustainability, ordinal logistics regression has been conducted as the given data is in ordinal scale.

To analyse the statistical relationship among the factors responsible for sustainability and the potential for sustainable growth of the ceramics industry in selected districts of West Bengal, ordinal logistic regression models have been applied and framed. Independent variables selected for the development of the model are the variables used in the PCA which are elaborately explained above. The dependent variable is potential for sustainable growth.

Null Hypothesis = The regression model does not provide good prediction of the outcomes.
Alternative Hypothesis = The regression model provides good prediction of the outcomes.

Table 6: Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	103.095			
Final	.000	103.035	66	.000
Link function: Logit.				

Source: Compiled by the researchers

It is observed from above table that P value for Chi-Square statistic is .000 (P<.05) and hence the null hypothesis is rejected. It depicts that the model is consistent in predicting the outcomes, that is, the dependent variable.

Table 7: Goodness-of-Fit & Pseudo R-Square

	Chi-Square	df	Sig.
Pearson	.000	116	.590
Deviance	.000	116	.330
Link function: Logit.			
Cox and Snell			.636
Nagelkerke			.958
McFadden			.926

Source: Compiled by the researchers

From the information shown in the table above it may be derived that both the Chi-Square statistics has been accepted with P= .590 (P>.05) and P= .330 (P>.05) for Pearson and Deviance respectively. It indicates that the model accurately represented the data very well and that the difference between the model's predicted value and the actual values is negligible. The above table also reveals that 95.8 % of the variation in the Potential for sustainable growth can be jointly explained by all the thirty variables compressed by the PCA into six factors for sustainability namely, the Waste Management, Labour Availability, Financing, Technology and Innovation, Marketing and Raw Material Constrain.

Table 8: Test of Parallel Lines[b]

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Null Hypothesis	.000			
General	.000[a]	.000	42	.310
The null hypothesis states that the location parameters (slope coefficients) are the same across response categories.				
a. The log-likelihood value is practically zero. There may be a complete separation in the data. The maximum likelihood estimates do not exist.				
b. Link function: Logit.				

Source: Compiled by the researchers

From the table above, it is witnessed that the null hypothesis got accepted with a high P value of .310 (P>.050). It depicts that the overall predictive capacity of the framed model is very good. Moreover, it also represents that the derived ordered logit coefficients are statistically equal across all the levels of outcome and thus the framed model is sufficient and signifies excellent fitting of the model.

Based on the analysis of the above derived model, it is statistically evident that the variables have a significant relationship with the sustainability factor. The sustainability of the ceramic industry operating in the state of West Bengal in context of both potentials for sustainable growth and potential for exports depends on the variables defined under the study. In the near future, West Bengal's ceramics industry has enormous growth potential. This industry's viability depends on both internal and external factors, from operational effectiveness to government assistance.

Despite the rising demand for ceramics products around the world, West Bengal's ceramic plants are having trouble expanding and some of the units are even in danger of going out of business. There are several factors that contribute to the current state of this industry in West Bengal, including a lack of government backing, inadequate infrastructure, lack of accountability, etc.

6. Conclusion and Recommendations

Considering the aforementioned analysis and discussion, it may be said that West Bengal's ceramic units, specifically those in the districts of Paschim Bardhaman, North 24 Parganas, and Kolkata, are strategically competitive in the national ceramic market but are having difficulty growing as a consequence of the difficulties they are currently experiencing. West Bengal lags behind other states in the terms of trade volume, but the quality, durability, and design of the ceramic products made in these districts are on par with those made in other states. These districts have tremendous potential for future expansion due to the increasing demand for Indian ceramic products both domestically and internationally. The information obtained from field research and the analysis of sample data make it evident that West Bengal's ceramic sector has the potential to be sustainable in terms of both serving local demand and expanding internationally.

The increasing levels of urbanization and living standards present enormous opportunities for the sector. It is recommended that the state government become involved in this sector to guarantee its sustainability and support. The government of West Bengal should put in place focused programs and policy measures to secure financial and other support in order to ensure the survival and sustainability of the ceramic industry

in the state. Given the strategic trade barrier that China has created, it is evident that the ceramics industry needs rapid government support in order to compete both locally and internationally. The time has come for policymakers to support West Bengal's ceramic industry swiftly and forcefully so that it may seize the worldwide opportunity and establish itself as a more reputable ceramic supplier.

References

Almamari, B. M. (2017). Imported Traditional Pottery: Methods of Overcoming the Challenges for Traditional Ceramics Industries in Oman. *Humanities and Social Sciences*, *5*(1), 1-4.

Amendola, C., D'Ascenzo, Fabrizio., Iannilli, I., &Ruggieri, R. (2010). Strategies of internationalization in ceramics sector. *Journal of commodity science, technology and quality*, *49*(1), 15-22.

Biswas, B. (2019). The Relation between Capital Structure and Profitability of Some Selected Companies in Indian Ceramic Industry. *IUP Journal of Accounting Research & Audit Practices*, *18*(3), 49-58.

Biswas, I., & Pandey, S. (2016). An empirical analysis to identify the technology adaptation gaps in cluster of Glass Products in West Bengal. *The SIJ Transactions on Industrial, Financial & Business Management (IFBM)*, *4*(7), 91-97.

Das, K. (2019). Upgrading Technology and Space as Collective Strategy: Creation of Jobs and Market Potential in Gujarat's Ceramic Clusters. GRI Working Paper, *Gujarat Institute of Development Research, 258*, 1-34.

Gupta, R. P., & Biswas, B. (2020). Trends and Growth in Ceramics Industry: A Comparative Study between India and China. *Business Studies XLI* (1 & 2), 1-14.

Hazra, K., &Burman, A. (2018). Necessity to nourish the earthen craft industry for employment and economy: A study of earthen doll industry of Krishnagar, Nadia district, West Bengal. *International Journal of Creative Research Thoughts*, *6*(1), 873-879.

Kanrar, S. (2013). Disparity in Institutional Financing in the Development of MSME in West Bengal: A Case Study on West Bengal Financial Corporation. *Management Accountant*, 521-527.

Kasemi, N. (2013): A Multivariate Regression Model for Predicting Productivity in Pottery Industry: Case Study of Jalpaiguri District, West Bengal. *Punjab Geographer*, 9, 75-82.

Krishnan, K. (2018). Indus ceramic industries: complexities, challenges and prospects. *Indian Journal of History of Science*, *53*, 263-270.

Maiti, K. N. (2003). Technological innovations in traditional ceramics with emphasis on production of sanitary wares in the International and Indian scenario. *Transactions of the Indian Ceramic Society*, *62*(4), 229-237.

Mukherjee, A. (2015). Status of Chemical Industry – West Bengal and States of India. *IOSR Journal of Humanities and Social Science*, *20*(10), 91-97.

Pal, B., & Pal, M. (2015). Panchmura-'the heart of Bengal terracotta pottery' problems and prospects. *Journal of International Academic Research for Multidisciplinary*, *3*(11), 117-122.

Paul, P. (2018). Role of income and literacy in the deterioration of the Pottery industry: A study of Tufanganj I block of West Bengal, India. *Research Guru: Online Journal of Multidisciplinary Subjects (Peer Reviewed)*, *12*(2), 682-688.