Economics of Eco-friendly Terracotta Products in Bankura District of West Bengal

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Abstract

Bankura district of West Bengal has great potential for expansion of activity in medium small scale & cottage industry. The structure of the cluster (production unit) of terracotta is very unique, highly concentrated and most of the units work single handedly with the help of all family members including young boys and girls. The study reveals that net economic returns of terracotta production are markedly high for the marginal workers during the current year of study and labour cost works out to be the major contribution. But due to shrinkage of the market, presence of market middleman and some important constraints the income of the households are not regular and economic conditions are very low in the present economic perspective. There should be more encouragement from the Government or from the State Craft's council to promote the Craft at National Level. More Exhibitions and Sales outlet should be done so that common people get to know more about the Terracotta Craft. Also a good Network should be build at National Level to bring out the Terracotta crafts to the tourists. The Craftsmen should be given exposition to the outer world so that they know what people like and what they should add more to their crafts.

Keywords: Terracotta, potter, craftsmen, constraints

Introduction

Bankura, the fourth largest district of West Bengal, is located in the western part of the state, which is popularly known as 'Rarh' from time immemorial. Total area of this district is 688200 hectares out of which forest area is 148930 hectares, high land and medium land are 176915 and 150611 hectares respectively.

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Therefore, there is a limited scope for traditional cultivation in the remaining area of land (only 2130 hectares in 2011). The economy of Bankura district is predominantly agrarian. Above 90 percent of the total population is rural population. Marginal and small holding size class together 90% of the total land holding. Unconductive topography, very small size of the land holding, low fertility and resultant low productivity etc. offer limited scope for farm mechanization. Though there are large chunks of barren land that could been utilized for setting up industrial units and there are traditional crafts and skilled workforce that could have been consolidated for drawing larger economic returns and tapping export potential, the district witnessed low rate of expansion of industrial sector.

Bankura district has great potential for expansion of activity in medium small scale & cottage industry. The district is rich in minerals like coal, fire clay, china clay, silica etc. and there is a scope to establish industries using the available minerals as the raw material. Already a few medium industries have come up but there lies much greater scope, especially for cottage and small-scale industries. The cottage and village industries are of considerable importance in improving the economic condition of the rural population, as they play an important role in the rural economy and its reconstruction. The district is famous for some unique traditional crafts; terracotta (pottery) work of Panchmura, Baluchari silk sarees of Bishnupur, Dokra work of Bikna, Patrasayer and Gopalpur, stone craft of Susunia are unique in the state. There are large pockets in the district where the people have endogenous skills in manufacturing fishing hook, fishing net, bamboo craft and manufacturing of babui rope.

Broadly Bengal clay pottery can be divided into two segments-Bankura Clay Pottery and Krishnanagar Clay Pottery. Bankura's art form is an ancient form than the art form of Krishnanagar. Terracotta of Bishnupur (Bankura) forms began under the Malla dynasty, during the late medieval period.Bankura is famous for its Terracotta Temples of Bishnupur and many other places in the district. For centuries together the artisans of this area have developed this art. The most famous product of this district in terracotta handicrafts is the famous 'Bankura Horse'.

It was the Kumbhokars or potters of Panchmura, 16 miles away from Bishnupur, who started to make the famous Bankura horses. The 'Bankura Horse' has now come to be regarded as a symbol of the artistic excellence of Indian rural handicrafts - a fact which finds confirmation in its use as the official crest-motif of the All India Handicrafts Board.

At present above 50000 numbers of persons are employed (primary occupation) in the some important cottage industries in Bankura district. Among this near 4000 of persons are employed (primary occupation) only in pottery activities. The Terracotta industry in Bankura district is still dependent on family labour. This present centre of terracotta consists of 120-130 families of Panchmura village whose primary occupation is pottery. The potters of Panchmura fall in the category of OBC (Other Backward Classes). A large number of families of this potter's society are inconceivably poor. Many of them do possess BPL cards. This industry faced some important problems at presents. Thus the intensive economic analysis of the terracotta industry workers and the problems faced this industry in the area Bankura District is expected to provide a synoptic view of the economics of production, social conditions of the workers and thereby contribute to higher employment potential and greater value addition in rural development.

Data set and Methodology

During November, 2013 a sample survey was carried out among pottery workers at Panchmura village in Bankura district of West Bengal in India. Only the 'Kumbhakar' community of the village Panchmura is still struggling to keep this traditional craft alive with sincere efforts and dedication. A total 60 households were randomly selected and interviewed. Details of the respondents are male workers – 117, female workers- 103. Due to poor agriculture and dismal situation in terracotta business large number of people in the village lives below poverty line (nearly49.89% as per Human Development Index Study of district by UNDP).

The estimation of cost of production is an important item of the information necessary for evolving rational price policy and development strategies of eco-friendly Teracotta production. The cost of production covers both the variable cost and fixed cost.

Variable cost includes soil, fuel, colour, gad, family labour and fixed cost includes interest on own capital assets and rental value of own house.

Most popular Terracotta products in this village are terracotta horse, tiles, manasajhar and other decorative items. We take those products which has more market demand.

The Variable Costs (in Rs.) Include

Labour cost –Family labour is the important constituents of terracotta production. The value of hired labour is evaluated from the money wage (in Rs.) paid households. The valuation of family labour is a controversial issue among farm economists. It was imputed at the prevailing market wage rate of casual labour in the selected villages.

Miscellaneous expenses: This includes the expenditure on soil, colour, bonak & gad etc.

Fixed Cost (in Rs.) Includes

Interest on capital: Interest on capital with depreciation is evaluated at the rate of 10% per annum on the present value of fixed assets.

Deprecation = (Original cost - Junk value) / Life of the asset. (Varghese P.K., 2007)

Rental value of own land: The rental value of owned land is estimated on the basis of prevailing rents in the village for identical type of land.

Consideration has been given to some of the interaction of the factors affecting production of terracotta. It seems to be important to answer the question like: what are the determinants of output and their extent of influence on output? Which inputs are significant in explaining variation in output? In order to ascertain the contribution of relevant inputs in terracotta production, the multiple regression analysis of OLS type has been carried out. Cobb – Douglas type model is used which have been specified in log-linear form. However, before doing so, zero - order correlation matrices are worked out and correlation coefficients are examined for testing the problem of multicollinearity.

Result Analysis

The structure of the cluster (production unit) is very unique, highly concentrated and most of the units work single handedly with the help of all family members including young boys and girls. Clay preparation and throwing in wheel (skilled work) are most done by senior male members of the family.

Drying, decorations, motive and painting works are mainly done by female members. There is no introduction of any modern equipment like electric potter's wheel, pug mills, ball mills etc.

In the sample households, in terms of primary household occupation, most householders primary occupation is terracotta work (85%) while about 8.33% are engaged in cultivation, 30% were agricultural labours, and only 1.66% are service holders. For secondary occupation, 51.66% household's secondary occupation is cultivation and only 6.66% household's secondary occupation is terracotta work. This result reveals that traditionally maximum households are engaged in terracotta work in terms of Primary occupation.

Terracotta horse, terracotta tiles and manasachali are the most important products for local or national market. Table-1 represents the average costs of different sizes terracotta horse in the sample village. The important observations appearing from Table-1 are:

(i) The variable cost constitutes the significant major contribution (89.74% to 98%) of total cost for all sizes of terracotta horse. ii) Out of total variable cost, labour cost (80% to 85%) is the major cost component for all sizes of terracotta horse. iii) Men labour (57.12%) occupies the highest contribution, next female workers (22.51%) for micro size horse. iv) For 12 inch to 42 inch horse male labour cost contributes 48.61% - 58.69%) and female labour contributes 27.34%-34.72%. iv) Similarly, out of fixed cost component, interest on capital has the major contribution for all sizes of terracotta horse except micro size.

Table -1: Average Cost of Different Sizes Terracotta Horse in Sample Village

Cost components		Terracotta horse/elephant			
		Micro (Rs/2pc)	12 inch (Rs/2pc)	36 inch (Rs/2pc)	42 inch (Rs/2pc)
Variable cost	1.Soil	0.05 (5.71)	2.00 (4.62)	7.75 (5.21)	12.40 (4.84)
	2. fuel	0.05 (5.71)	2.75 (6.36)	8.25 (5.55)	10.50 (4.10)
	3.colour+gad	0.75 (8.57)	2.45 (5.67)	9.50 (6.39)	13.10 (5.11)
	4. family labour				
	i)men	5 (57.14)	21 (48.61)	78 (52.52)	150 (58.59)
	ii)women	2 (22.85)	15 (34.72)	45 (30.30)	70 (27.34)
A.Total variable cost (1+2+3+4)		8.75 [89.74] (100)	43.20 [95.36] (100)	148.5 [97.37] (100)	256 [98.08] (100)
Fixed cost	5. interest on own capital assets	0.30 (30)	1.00 (47.61)	2.25 (56.25)	3.50 (63.63)
	6. Rental value of own house	0.70 (70)	1.10 (52.38)	1.75 (43.75)	2.00 (36.36)
B. Total fixed cost (5+6)		1.00 [10.25] (100)	2.10 [4.63] (100)	4.00 [2.62] (100)	5.50 [2.10] (100)
Total cost (A+B)		9.75 [100]	45.30 [100]	152.5 [100]	261.50 [100]

Source: Field Survey, 2013

Note: Figures in ( ) represents the percentage value of fixed costs or variable cost.
Figures in [ ] represents the percentage value of total costs.

Table-2 represents the average costs of terracotta tiles in the sample village. The important observations appearing from Table-2 are: i) The variable cost constitutes the significant major contribution (98%) of total cost for all sizes of terracotta tiles. ii) Out of total variable cost, labour cost (80% to 85%) is the major cost component for all sizes of terracotta tiles. iii) Men labour (55.36%) occupies the highest contribution, next female workers (27.68%) for terracotta tiles. iv) Similarly, out of fixed cost component, interest on capital has the major contribution for terracotta tiles.

Table -2: Average Cost of Terracotta tiles in Sample Village

Cost components		Terracotta Tiles (Rs/2pc)
Variable cost	1.Soil	7.25 (5.01)
	2. fuel	8.00 (5.53)
	3.colour+gad	9.25 (6.40)
	4. family labour	
	i)men	80 (55.36)
	ii)women	40 (27.68)
A.Total variable cost (1+2+3+4)		144.50 [97.63]
Fixed cost	5. interest on own capital asset	2.00 (57.14)
	6. Rental value of own house	1.50 (42.85)
B. Total fixed cost (5+6)		3.50 [2.36]
Total cost (A+B)		148.00

Source: Field Survey, 2013

Note: Figures in ( ) represents the percentage value of fixed costs or variable cost. Figures in [ ] represents the percentage value of total costs.

Table-3 represents the average costs of different sizes manasachali in the sample village. The important observations appearing from Table-4 are: (i) the variable cost constitute the significant major contribution (95.42% to 97.72%) of total cost for all sizes of terracotta horse. ii) Out of total variable cost, labour cost (80% to 85%) is the major cost component for all sizes of terracotta manasachali. iii) Men labour (47.97%) occupies the highest contribution, next female workers (35.98%) for small size manasachali. iv) Men labour (55.14%) occupies the highest contribution, next female workers (28.27%) for large size manasachali. iv) Similarly, out of fixed cost component, interest on capital has the major contribution for all sizes of terracotta manasachali.

Table -3: Average Cost of Terracotta Manasa Jhar in Sample Village

Cost components		Manasa Jhar	
		Small (Rs/2pc)	Large (RS/2pc)
Variable cost	1.Soil	1.50 (4.49)	7.20 (5.09)
	2. fuel	1.75 (5.24)	7.75 (5.47)
	3.colour+gad	2.10 (6.29)	8.50 (6.01)
	4. family labour		
	i)men	16 (47.97)	78 (55.14)
	ii)women	12 (35.98)	40 (28.27)
A.Total variable cost (1+2+3+4)		33.35 [95.42]	141.45 [97.72]
Fixed cost	5. interest on own	0.70 (43.75)	2.10 (63.63)
	6. Rental value of d	0.90 (56.25)	1.20 (36.36)
B. Total fixed cost (5+6)		1.60 [4.57]	3.30 [2.27]
Total cost (A+B)		34.95	144.75

Source: Field Survey, 2013

Note: Figures in ( ) represents the percentage value of fixed costs or variable cost. Figures in [ ] represents the percentage value of total costs.

Table-4: Economic Indicators of Teracotta Production on Sample Farm

	Teracotta horse/elephant				Terracotta	Manasa jhar	
	micro	12 inch	36 inch	42 inch		small	Large
Gross returns (Rs./pair)	12	60	200	350	220	50	180
Gross costs (Rs./ pair)	9.75	45.30	152.5	261.5	148	34.95	144.75
Net returns Rs./pair)	2.25	14.7	47.5	88.5	72	15.05	35.25
B-C ratio	1.23	1.32	1.31	1.33	1.48	1.43	1.24
Maximum pair of product per	25	12	5	2	8	12	5
Net return (Rs./day)	56.25	176.4	237.5	177.0	576	180.6	176.3

Source: Field Survey, 2013

While examining the economic issues – cost, return and profitability – of terracotta productions, this study reveals some important phenomena (Table-4).

1) The net benefit of some important terracotta products are Rs. 2.25 for micro horse, Rs. 14.7 for 12 inch horse, Rs. 47.5 for 36 inch horse, Rs. 88.5 for 42 inch horse, Rs. 72 for terracotta tiles, Rs. 15.05 for small manasa jhar and Rs. 35.25 for large manasa jhar.

2) The benefit-cost ratio (BCR) of terracotta production for study year (2013) is 1.23 for micro horse, 1.32 for 12 inch horse, 1.31 for 36 inch horse, 1.33 for 42 inch horse, 1.48 for terracotta tiles, 1.43 for small manasa jhar and 1.24 for large manasa jhar. Therefore, BCR for all important terracotta products are considerably higher than unity. So, the investment for terracotta plantation is highly economically viable in the study area.

3) If all households are engaged in the above maintained terracotta production, per day net income will be Rs. 56.25 for micro horse, Rs. 176.4 for 12 inch horse, Rs. 273.5 for 36 inch horse, Rs. 117 for 42 inch horse, Rs. 576 for terracotta tiles, Rs. 180.6 for small manasa jhar and Rs. 176.3 for large manasa jhar. Therefore, highest earning coming from terracotta tiles is very high, BCR also support this results.

These results indicate that net economic returns of terracotta production are markedly high for the marginal workers during the current year of study (Table 4), and labour cost works out to be the major contribution (Tables 1, 2 & 3). But due to shrinkage of the market, presence of market middleman and some important constraints the income of the households are not regular.

Regression analysis for Terracotta horse Production

The fitted estimated regression equation for terracotta horse production is;

Ln Q = 0.6145 + 0.973 Ln L -0.00238 Ln K
    (35.52)   (60.19)   (-0.12)
    R^2 = 0.9988

The fitted estimated regression equation for terracotta tiles production is;

Ln Q = 2.793 + 0.540 Ln L + 0.003 Ln K
          (35.523)   (60.198)   (-0.122)
           R^2 = 0.781

The fitted estimated regression equation for terracotta manasachali production is;

$$Ln\ Q = 1.147 + 0.828\ Ln\ L + 0.021\ Ln\ K$$
$$(21.463)\quad (17.632)\qquad (0.386)$$
$$R^2 = 0.9967$$

The values of R^2 in all cases are found to be ranges from 0.78 to 0.99 which very close to 1. This implies 78-99% variability of output is explained by these two factors. Therefore the estimated results of the model demonstrate that there is a positive impact of labour input on the production of terracotta horse.

Constraints Analysis

Various constraints being faced by sample households were categorized under mainly two groups: infrastructural & economic constraints and marketing constraints. Terracotta work is labour intensive and time consuming. Since a whole day is sometimes spent in making one item, the cost is high. They use the traditional hand turned potters' wheel and not the semi mechanized ones now used all over the world. Table -5 shows the different constraints faced by households in the terracotta industry.

Table-5: problems Faced by Households in Terracotta Industry

	constraints	No. of respondent hou	% of households
A.	Infrastructural and Economic constraints		
1.	Non-availability of proper soil	60	100
2.	Low performance of co-operative society	49	81.66
3.	Production depends on weather	55	91.66
4.	High cost for modern technology	58	96.66
5.	Low income from this occupation	50	83.33
6.	High cost for fuel	39	65
7.	Next generation less interested	35	58.33
B.	Marketing constraint		
1.	Transportable cost high	52	86.66
2.	High packing cost for large products	47	78.33
3.	Limited market for sale	42	70
4.	Low price for competition	36	60

Source: Field Survey
The important findings are as follows:

Infrastructural and Economic Constraints

1. All households (100%) faced availability of proper soil problems. Alluvial clay soil with appropriate plasticity and composition is very scarce in predominantly red sandy soil rich Panchmura. Soil of cultivable lands which are actually clay material for pottery is becoming very costly day by day.

2. Above (90%) of the total respondents faced another two major problems: high cost of modern technology and production depends on weather. Kharagpur IIT set up a huge furnace spending an amount of Rs. 1000000. But it still remains unused because traditional fuel consumption costs only Rs. 400 to bake the clay crafts where as the furnace will cost Rs.1000 for the same task. For their inability bear this huge cost the furnace remains abandoned. Though Panchmura is a village full of poor craftsmen, their designs and artistic renderings of horses and other objects are known widely in the country. The potter families live and work in a cluster, but they neither have a weather proof store to shelter their goods from the monsoon rains, nor any proper working sheds.

3. Another severe problem is low income from this occupation (83.33% households respond this problem). The daily income of the poorest craft-persons of the community is around Rs. 80/100 in average and the comparatively wealthier artisans earn Rs. 300/400 daily on average. It is difficult with such a poor income to maintain their life properly and maintain their children's education. Hence many of them are being compelled to give up this job and take up other occupations for better living. Artisan, Gopal Kumbhakar regrets---"an average income of Rs. 100 daily would have been adequate to remain interested in the craft. But even this is at times irregular."

4. 81.66% of the respondents are not satisfied with their cooperative socity. The 'Panchmura Potters' Society' was set up in around 2005-2006. The aim was to properly organize the craft production and providing a suitable marketing opportunity by the Society. The endeavor of the society for purchasing soil is laudable. It charges the same amount if somebody works more. The fund for the Society is inadequate. Naturally the supervision of preservation and marketing of the crafts gets neglected. The society cannot help the marginal craft-persons.

5. High cost of fuel and less interest of next generation are other important constraints in the terracotta industry.

Inadequacy of capital and steady indifference of the governments are gradually pushing the poor and marginal artisans to extinction.

Marketing Constraints

Dearth of proper marketing strategy is evident. Though some of the artists send their crafts to Kolkata-Delhi through their personal endeavor, most of the people only opt for the local markets of Bishnupur, Bankura, Durgapur, Medinipur etc. Some of the businessmen from Kolkata come with their own interest to buy these crafts. But there is no opportunity of selling from the Society at all. Consequently the crafts men cannot market their products properly and despite the assurance from government no marketing centre has been still set up. In the recent globalised market the demand for clay craft has also declined. Many of the artists are using artificial colour to coat the items though no one of them is from Panchmura. They have no formal training for colouring and it is expensive too. Consequently the art is diverting from its origin, which is an alarming sign for the art.

1. Transportation costs are very high for long distance travel of the products (86% respondents face this problems).
2. 76% households respond that high packing cost for large product.
3. 70% household respond that market for these products is not very large i.e. there is limited market for sale.

They have no dependable means of transport or the material to make damage proof packaging for their fragile wares: dried grass is all they have. To add to all this, the bumpy roads from the village to the highway can cause a lot of damage. All these problems just add to the costs the poor villagers are already incurring. The high quality terracotta items would have been a very lucrative export commodity, but for the fact that, transport-wise, they are just too heavy. The artisans have not mastered the art of light weight terracotta in which their Italian counterparts excel.

Conclusion

These results indicate that net economic returns of terracotta production are markedly high for the marginal workers during the current year of study and labour cost works out to be the major contribution. But due to shrinkage of the market, presence of market middleman and some important constraints the income of the households are not regular.

It indicates that though their monthly income is above poverty line level of income, due to uncertainty in the market and some internal problems, their economic conditions are very low in the present economic perspective. Availability of proper soil, lack of modern technology, lack of proper market, inactiveness of potter's cooperative society etc are the major constraints for terracotta production in Bankura district.

There should be more encouragement from the Government or from the State Craft's council to promote the Craft at National Level. More Exhibitions and Sales outlet should be done so that common people get to know more about the Terracotta Craft. Also a good Network should be build at National Level to bring out the Terracotta crafts to the tourists. The Craftsman should be given liberty to experiment with their crafts so that more new Design/Pattern/ Motifs can be generated. The Craftsmen should be given exposition to the outer world so that they know what people like and what they should add more to their crafts.

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