



AN EXPLORATORY STUDY OF CERAMIC PRODUCTION AND ASSOCIATED PROBLEMS WITH SPECIAL REFERENCE TO CERAMIC INDUSTRY OF GUJARAT

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❖ ABSTRACT:

Ceramic Tiles today have become an integral part of home improvement. It can make a huge difference to the way your interiors and outdoors look and express, though the ceramic industry is facing many challenges and problems associated with production and many other related problems ceramic industry, despite an overall slowdown of the economy continues to grow at a healthy 15% per annum. However, the most important centres of modern and organized ceramic industries in India are Kolkatta, Mumbai, Thane, Chennai, Gwalior, Khuija, Chunar, Nizamabad, Morbi, Thangadh, Dharwad, Hubli, Mangalore and Bangalore. Gujarat now occupies second position among the Indian states as far as the ceramic units are concerned. Roofing tiles, sanitary wares, Glazed tiles, crockery and pottery, electric porcelain, other ceramic and art ware units together account for 671 industries in Gujarat. With regard to sanitary wares units Gujarat accounts for 97 percent of the total small scale units and 33 percent of the large scale units of India

KEY WORDS: CERAMIC, INDUSTRY, PRODUCTION, ENVIRONMENT, HEALTH, OCCUPATIONAL HAZARDS

❖ INTRODUCTION:

The ceramic industry of Gujarat faces certain problems related to production, which can be specified as managerial, financial, marketing and production inputs. The ceramic production also creates certain environmental problems and some health and environmental hazards. Among the problems of production inputs the problem of raw material is the most important one.

Raw Material:

Raw material and fuel are the two important inputs of ceramic industry which account for greater share in the total cost of production. However, majority of the manufacturers are in the small scale sector, who try to economize on the purchase of raw material by going for inferior quality raw material, thus affecting the quality of the final product and the margin of profit. This also happens due to the lack of

effective methods or instruments to measure the quality of raw material. The brokers, agents and manufacturers of various ceramic products should collectively aim at developing the industry by improving the quality of the products and enhancing the margin of profit.

Fuel:

Coal is one of the major sources of fuel for ceramic industry in Gujarat which is met by importing coal from West Bengal, Jharkhand and Chhattisgarh. However, the industry often faces shortage of coal, affecting the production of goods. While importing coal from the above mentioned states, the industry pays tax to government, brokerage, railway freight, etc. which makes coal very expensive. When poor quality coal is received the quantity required increases and results into more imports and more transport costs.

The kilns of coal are more in the units of crockery, sanitary wares, insulator, etc. Several times, the coal supplied to the industry is of lower grade and is either rocky or dusty and powdery. Permission for required quantity is frequently obtained from the Commissioner of Industries but as against this only 25 to 30 percent of the required quantity is supplied.

Natural Gas:

Natural gas is a proven source of fuel for ceramic industry in Gujarat. Although there are many advantages associated with this source of fuel (no wastage in transit, reliable clean and pollution free), the required quantity is not available and also the prices frequently fluctuate.

Therefore, during the field survey it has been observed that most of the units have empty gas containers in Morbi and Thangadh.

Skilled Worker:

The industry faces the shortage of skilled workers. In most of the units, it has been observed that there are no experienced and trained workers and officers in required number. Thus, with traditional approach and unskilled and untrained workers, the development of the industry cannot be achieved.

Quality control:

The production process is one of the important aspect of this industry. There are no trained workers to work and supervise on kilns. In some units owner himself supervises and manages technical aspects. Machines, tools, kilns, electric power equipments should be of good quality. Since the size of kilns is small, after the completion of one cycle it needs to be rested and in the process kiln becomes cool and loses energy. Kerosene is an initial and a fair need of quality control. With the help of kerosene, crack or other defect could be found out. Thus kerosene test is one and the only method in quality control. However, this test is also followed in few units only. The defects in the products occur during the procedures such as dust visage, polish, etc. due to the imperfect cleanliness of mould and waste product.

Excise Duty and Sales Tax:

As per the government rule, the industry has to pay excise duty if it exceeds the stipulated turnover. This government rule discourages industry rather than promotes growth and development. However, this also encourages manufacturers to adopt illegal means such as under billing in order to avoid sales tax and excise duty. The production of certain units exceed the prescribed limit of exemption but they show additional production in the name of another unit.

Marketing:

Some of the units are marketing their products through local agencies as they do not have direction, knowledge and transporting facility. In the process, brokers, agents and traders take undue advantage of the helplessness of the manufacturers. Therefore, some of the manufacturers, market their products in their own way with limitations.

Managerial Skill:

It has been observed during the field survey that majority of the industrialists who have joined in this industry have no sound educational background. Therefore, with their traditional knowledge and experience they are managing the units with a little success. They are not aware of the modern machineries, scientific and technological methods of production and management practices. Thus, there is no enhancement in the quantity of production, quality of products, expansion of market and the margin of profit.

Financial Issues:

In the ceramic industry, the working capital gets accumulated by way of storage of coal, raw material, installation of new machineries and in some situation, by way of non sale of produced goods resulting into financial crisis. This in turn forces producers to seek loan or advances from brokers and consequently to sell the goods at much lower prices. This is one kind of exploitation of the industrialists by the brokers or financiers.

Environmental Issues:

Production, pollution and protection terms are inter-related. The ceramic industry is no exception to this nexus. It has been observed during the field survey that some of the units have poor, unhygienic conditions both within their premises and outside their premises. In most of the units, dusty working environment was found and also unbearable thermal condition in the kiln department. In color, dyes and paint section hazardous chemical spray particles in the air affected the workers health and working condition. Plant design including exhaust system, sanitary facilities and overall maintenance of cleanliness was far below the standards set by the industrial safety, security, health, hygiene and environment regulation acts.

Dust Exposure:

Airborne dust concentration at various sections of the units is found to be higher than the recommended TLV in both urban and rural factories. In urban ceramic

units the dust concentrations were higher than the rural units. Apparently, very high dust concentrations were found in the grinding and glaze spray department. Airborne dust constitute 25 percent free silica particles which indicate very high exposure risk affecting the respiratory system of the workers. About 80 percent of the particles in the airborne composition were of irrespirable size. However, the workers in the glaze section showed more absorption of lead compared to the workers of other sections.

Thermal Exposure:

The workers of rural and small town ceramic units showed lower thermal stress compared to the workers of urban ceramic units. During summer and monsoon seasons almost all the NBGT observations exceeded 32° Celsius which is the permissible level and recommended by OSHA (1974). In urban and rural units WBGT levels were observed up to 54.4° C and 48.8° Celsius respectively. This clearly shows that Kiln section is found to be very hot and workers over there are exposed to severe heat and showed low physiological strain.

Lead Exposure:

The glaze used in ceramic units contains lead but the levels of it were found to be low (average lead content - 31.3 hg/gram). The workers in the glaze spray section showed the absorption of lead compared to the workers of other section.

Some Occupational Health Hazards:

The workers engaged in various activities of the ceramic units are prone to certain health hazards. Among them the most common health hazard is silicosis leading to tuberculosis which is related to the irrespirable dust content and free silica content and the workers are prone to high risk of developing silicosis and silico tuberculosis during their working life span.

Some Environmental Hazards:

Various types of environmental pollutions are generated by ceramic industry resulting into environmental degradation. Among them land pollution and air pollution are most hazardous. The quarrying of various raw materials of ceramic industry in and around Morbi and Thangadh has produced bad land topography with numerous depressions of different shapes and depths. Some of them are filled with environmentally unfriendly and non-degradable ceramic waste materials and some of them to collect rain water and await for accidents to happen and remain mosquito breeding pockets all over. Another misuse or abuse of land resource is the open storage of raw material creating unhygienic dusty environment.

Air pollution arising out of ceramic production is in the form of suspended dust particles, aerosol particles, smoke and un burnt particles of fossil fuels, paint and glaze spray particles and hot air. This kind of air pollution not only affects more severely the health of ceramic workers but also the other citizens of the town as well as micro urban climate.

Thus, the health hazards of ceramic workers is due to the nature of raw material, the method of its handling and storage, methods and techniques of

production system, nature of energy resource and micro-environmental degradation.

❖ **Some Recommendations for Better functioning of the Units:**

Although certain recommendations appear to be general and obvious, they are borne out of field observations, discussions and analysis. Therefore, they are significant and worth execution.

Work Environment:

1. Through proper redesigning of the factory, the working area be properly made ventilated to have free air movements.
2. Necessary effective exhaust draft machines, elevators and conveyers be installed to improve work atmosphere.
3. The place marked for glaze spray, dry grinding, dry finishing of wares, should also be provided with effective exhaust system. This will eliminate the spread of dust and control contaminates at the source.
4. The dusty processes with higher dustiness of tone department be isolated from other departments. Similarly, the clay grinding process be isolated from the rest of the departments as it is the main source of dust. Cleaning of dry wares be carried out by vacuum process and not by blowers. Manual cleaning of the floor benches and equipments be carried out either before the work session or after the work session or use the industrial vacuum cleaners.
5. Zinc and zirconium compounds which are less toxic be substituted to lead compounds, in glaze preparation.
6. Periodical testing of environmental dust and thermal conditions be carried out and a record of this be maintained properly.
7. Workers be made aware of the potential hazards and dangers arising out of dust, glaze and heat and also simultaneously educate them through vocational programmes.
8. The workers engaged in grinding, casting, spraying and glaze dipping processes be provided with safety wares such as gloves, gumboots, heat protective clothes and respirators. Workers be advised to take ample water to avoid electrolyte imbalance and dehydration.

Production Environment:

The following are some of the recommendation to improve production environment, based on observation and facts.

1. For the progress and development of the industry, the concerned brokers, agents and manufacturers should concentrate on quality of raw materials and quality of produced goods by installing modern machineries.
2. Gujarat has abundant reserves of natural gas and ONGC of Mehsana may think of laying the pipeline (about 100 to 150 km) to Thangadh and Morbi to reduce the cost of ceramic production as well as to improve the quality of products.
3. Manufacturers of ceramic products should make their own co-operative bank and state cooperative bank to promote the development of small scale ceramic units.
4. In order to improve the managerial skill, workshops and training programmes be arranged by different organizations specializing in technical, finance, marketing

fields.

Natural Environment:

Based on some of the observations and facts related to the impact of ceramic industries on the surrounding environment are presented below:

1. The most important environmental hazard of the industry is in terms of waste disposal. Since, the material is hardened by intense heat they are non-degradable. However, by using modern technology, the waste material be recycled to produce some useful consumer goods.
2. The resultant bad land topography after the exploitation of raw material be filled with biodegradable waste so as to reclaim land for future use. This process not only helps in reclaiming land resource but also contains the possible health hazards arising out of stagnant waters in the bad land topography.
3. The production units should use the abundantly and cheaply available natural gas of Gujarat in order to minimize or contain air pollution. The assured and continuous supply of gas through pipeline enables industrial units to produce quality goods and maintain environmental quality.
4. As the advanced technology is used to improve the quality of production and work environment, in the same way advanced technology be used for the conservation of resources and environmental quality.

❖ **FINDINGS:**

The present research study brings out the significant aspects of ceramic industry in Gujarat in terms of their location inertia, geographical advantages, royal patronage, enterprising community, marketing skills and regional economic development. The significant findings of the study are as follows:

1. 85 percent of the total ceramic units of Gujarat are concentrated in two districts namely - Rajkot and Surendranagar districts. Again within these two districts, the two places namely Morbi (40 percent) and Thangadh (30 percent) account for 70 percent out of 85 percent of the districts. This shows high degree of locational inertia.
2. Morbi has the concentration of Ceramic Tiles units (99 percent of Gujarat) and Thangadh has the concentration of Sanitary ware units (88 percent of Gujarat) of Gujarat.
3. Due to the initiative and patronage of Morbi ruler the pottery work was established in the early part of 20th century.
4. The industry is highly raw material oriented and hence the spatial concentration. China clay is available in Amarpur, Bagagela, Than, Rajpur, Talavadi, Kankavati, Dholi, Kuntalpur in Surendranagar district.
5. Cheap and skilled labour force is another factor for its localization. However, the labour is relatively cheap but not skilled in the modern sense of development.
6. During the last four years the number of ceramic units have increased in both Morbi and Thangadh. Self owned units are more followed by partnership units. Morbi units have larger per unit land area compared to Thangadh units and this is

mainly due to the type of ceramic units, (i.e. Ceramic Tiles units in Morbi and Sanitary ware units in Than.)

7. Female participation in work is at the level of unskilled and semi-skilled work and at higher level of supervisory and managerial nature of work there is no female participation.
8. Electricity, oil and coal as sources of energy consume more of the working capital. In order to reduce the cost on fuel and in turn the cost of production, the units in Gujarat should change over to natural gas which is abundantly available.
9. About 90 to 95 percent of the goods manufactured here are marketed in the regional and national level and only about 5 to 10 percent of the goods enter the international market.
10. The ceramic units of Thangadh (Sanitary wares) (a small town industrial concentration) earn more profit compared to the ceramic tiles units of Morbi (industrially more developed and closer to Rajkot).
11. At present the production wastage dumped in the open is creating environmental imbalance. Wastage is not eco-friendly. New scientific investigation is needed for the recycling of the ceramic waste without damaging the environmental quality.

❖ **CONCLUSION:**

Thus, the present study brings out the importance of ceramic industry of Gujarat in the regional and national economic development. The work will be useful to industrialists, administrators, planners and academicians.

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