PROJECT REPORT

AMBUJA CERAMIC

THANGADH



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1. Introduction – Thangadh Ceramic Cluster:

Thangadh is an industrial town and a municipality located southwest of Surendranagar in Surendranagar district in the Indian state of Gujarat. A large number of small-scale Ceramic manufacturing units are located around Thangadh. Thangadh, Wankaner and Morbi form the Ceramic triangle. Chief products are Sanitaryware (Wash Basins, Water Closets etc.) and Glazed Wall Tiles. These units also cater to lower-end overseas market (Middle East, African Countries, Sri Lanka, Bangladesh, etc.)

The ceramic units employ several thousand unskilled workers in the region.

2. Description of Cluster:

2.1 History & background of cluster

Thangadh is quite known for its quality ceramics products. This industry not only caters the local market demand, but also contributes in exports to international markets. For years the manufacturers of this area have built their un-matched skills in design, aesthetics and quality. Their products speak for themselves and set higher standards of quality and excellence.

Thangadh region has contributed to the development of the trend/style, expertise about manufacturing of different products and in technology transfer. Over the years this industry has expanded and resulted in a long chain of ceramics factories in this area and still they are growing.

2.2 Description of Products

Ceramics are defined as products made from inorganic materials having non-metallic properties usually processed at a high temperature at some time during their manufacture. The word "ceramics" comes from the Greek word "Keramos" meaning "Pottery," "Potter's Clay," or "a Potter" - primarily used to mean "burnt stuff."

The technical definition of ceramics encompasses a much greater variety of products than is normally realized. To most people, the word ceramics means dinnerware, figurines, vases, and other objects of ceramic art. The majority of ceramic products is not generally recognized, as such is much more recent in development and in general is utilitarian rather than aesthetic. Examples are bathtubs, washbowls, sinks, electrical insulating devices, water and sewerage pipes, bricks, hollow tile, glazed building tile, floor and wall tile, earthenware, porcelain enamel and glass. Variety of products is directly proportional to variety in clays being used in their manufacturing.

2.2.1 Ceramics Sanitary Ware:

In Thangadh sanitary fitting was always a famous industry which continuous the demands for Ceramics Sanitary ware. Presently there are more or less 100 units, which are producing ceramics products in the following areas:

i. Sanitary ware

ii. Pottery

iii. Tiles

iv. Refractories / Firebricks

Amongst these product lines, sanitary ware is the major player. All these segments have approximately same raw material needs and in fact their suppliers are same too. Ceramics sanitary ware has great potential in local as well as in export market, therefore a large number of pottery units have shifted to towards this industry.

Currently the Ceramic sanitary ware industry, Thangadh is manufacturing the following products in various designs, sizes and specifications:

2.3 Core Cluster Actors

1. Bathtub incl. legs
2. Shower tray
3. Washbasin
4. Wash stand
5. Toilet combination
6. Wall toilet
7. Bidet
8. Urinal
9. One piece toilet

Total market size of Thangadh Ceramics Sanitary ware Products:

S. No.	Description	Figures
1	Status	Organised – Unorganised
2	No. of Units	102
3	Technology Level	Labour Intensive
4	Automation Level	Low Automation

2.3.1 Sanitary Ware Manufacturers:

There are around 100 major manufacturers in this sector. They have developed contacts with the dealers in all over the India and market their products through these outlets. They are also exporting their products in Middle East, Africa and Central Asia.

2.3.2 Machinery Suppliers:

Spray booth, Glaze Containers, drums and kilns are the machinery used for ceramics sanitary ware factory. Kilns are designed by ceramics engineers and manufactured by the kiln makers. There are about 8 kiln makers which are experts and fulfilling the need of industry. Glaze containers, spray both and drums are prepared by the engineering sector of the Thangadh.

2.3.3 Raw Material Suppliers: **(Schedule – II)**

Supply chain is crucial to this field and without proper raw material supply these units cannot keep up with the production. There are about 10 to 12 companies supplying raw material to ceramics industry in Thangadh. These suppliers procure clay from mine owners and import barium carbonate and china clay from china and zirconium from England, USA, Italy, and Malaysia for fulfilling the raw material requirement of Ceramics Sanitary ware industry. Annexure – 1 enlists the details of major raw material suppliers in domestic market.

2.4 Geographical Location

Ceramics products are manufactured in many areas of Thangadh. However the major cluster of sanitary ware products is on Navagam Road, Tarnetar Road and Amrapar Village. The biggest cluster of ceramics is on Tarnetar Road. It is approachable by metalled road.

2.5 Current Cluster Scenario

Growth trend of Ceramics sanitary ware industry has been increasing every year. The industry has not only fulfilling the domestic needs but also exporting small quantities of ceramics sanitary ware goods over the last few years. Though the exports trend in the past two decades has been insignificant volume wise and erratic, the capability of the sector for export exists keeping in mind the technology & know-how available with the manufacturers. The main reason for not achieving the significant break through in exports by this industry is the uncompetitive cost structure of domestic products due to ever increasing utilities prices coupled with the high tariffs on imported materials

3. Analysis of Business Operations

3.1 Production Operations

3.1.1 Raw Material:

Raw materials for body include Quarts, Feldspar, China clays and Ball clay. Raw materials for glaze include Quartz, Feldspar, Limestone, Zinc-oxide, Barium oxide, Zirconium and ceramic colors. Plaster of the Paris is the material that is used for modeling and moulding of the Ceramics sanitary ware.

3.1.2 Slip Preparation and Glaze Making:

For the slip preparation the raw materials are mixed with water as per the requirement. Proper composition along with the sufficient amount of water then gets loaded to the ball mills for grinding.

Glaze is a glasslike, multi-ingredient, silicate thin layer, which adheres to the surface of ceramic body. It is usually sprayed upon dry body by manual or automatic spraying method, which after firing produces smooth, glossy, and surface with beautiful color and luster. So properties of glaze have large influence on quality of products. Generally ball milling is used to prepare glaze.

3.1.3 Casting and Drying:

Slip is cast into plaster moulds. Due to the absorption and water character of porous moulds, an even thin layer gets formed on the surface which becomes thicker with time. When a desired thickness is arrived, surplus slip is poured out. Finally the layer continues to retract by de-watering resulting in the gross body. Before next process, all products need to be dried to a low water content to increase the strength of body, which is called drying.

3.1.4 Glazing:

There are many glazing methods such as spraying glaze, dipping glaze, pouring glaze, brushing glaze etc. Sanitary wares are mostly adopted spraying glaze method because large volume complicated shape, low strength of body. Spraying glaze may be manual glazing or automatic glazing. Manual glazing is done in a booth with sufficient de-dust installation, and automatic glaze spraying is done on the conveying belt.

3.1.5 Firing:

These sprayed clay wares are then taken to the kiln for firing. As a result the bodies will take place a series of physical and chemical reactions, and will take a fixed shape.

The bodies are put in the entrance of tunnel and the products are pushed out from the exit. Fuel is burnt in the resisting firewall on both sides of tunnel. The tunnel kiln is consisting of three zones.

i. Preheating zone

ii. Heating zone

iii. Cooling zone

The heating zone has burners on the both sides, in the third section the product cools down by exhausting. The temperature of every section is strictly controlled by automatic ventilation equipment and the temperature-controlling facilities called thermo couples to ensure to fire every product evenly. Continuous kilns are classified as roller kilns and tunnel kilns, the roller kilns support and convey products by high temperature resistance ceramic rolling stick. In the tunnel Kiln, kiln cars are used that are made from steel frame wheels on which low mass refectories, silicon carbide board etc. are built to support products. These cars are pushed by hydraulic Pusher.

3.1.6 Inspection, Repairing, Re-firing and Packing:

This is the last process of production. Finished products are determined according to stipulated standards to select passed products and un-passed parts by repairing and re-firing. Passed products are carefully packed and then send to customers.

3.2 Raw Materials Availability

Raw material used in sanitary ware manufacturing is quite cheap. Raw materials are used in huge volumes and this makes their supply-chain an all important factor. Majority of the raw materials are imported and are supplied by the few raw material suppliers based in the local market.

Zirconium is one of the costly raw materials used in glazing of ceramics sanitary ware products and is imported from England, U.S.A., Italy and Malaysia. Zirconium from England and U.S.A is considered of High Quality and also more costly than zirconium from Italy and Malaysia.

Distributors/dealers are importing China clay, Zinc Oxide and Barium Carbonate from China.

Quartz, Feldspar, Lime Stone, Kerosene oil and local clay are available in local market.

3.3 Quality Assurance

Supply chain is crucial to this field and without proper raw material supply these units cannot keep up with the production but there is one thing that is more important than any other thing and that is quality of the products and price competitiveness.

Currently the local market is being invaded by the cheap and better quality Chinese ceramics products. This invasion along with strong friction from other international manufacturers, local manufactured products are suffering from huge losses. Their biggest concern is the quality which requires high manufacturing cost and over whelming rejection rates (7 to 8 % scrap rate is common to this industry and sometimes it crosses this threshold too). One of the main causes of this problem is the low and inconsistent quality standards. There is no standards conformance control at the source (mines) from where the clay is excavated and manufacturers don't have any facility where this raw material can be pre-processed before being used in production line. The results are as follows:

(**i**) Finished products show cracks after whole process of casting and baking has been undertaken which cause loss of man hours, machine hours and finance.

(**ii**) Inconsistency of material causes pin holes and cracks which result into an extra fragile product which can rupture during use causing a fatal loss of customer satisfaction and further market penetration.

(**iii**) Few manufacturers are setting up their own pre-processing setups which do not provide required material refinement and add to extra burden of pre-processing cost resulting in higher cost of production.

(iv) Manufacturers can import preprocessed material from china and other countries but it would cost them more than double.

3.4 Technology Status

The technology employed by this cluster is traditional and old. In sanitary ware products Heating cost makes up of 40% of the total manufacturing cost, due to the inappropriate design of Kiln and kiln furniture. Following are the common flaws in locally manufactured kiln:

i - Excessive heat leakage from the walls and ceilings

ii- Exhausting flue gases at very high temperature.

iii- Incomplete combustion due to flaws in burner design.

iv- Presence of excess/low level of air than required from optimum combustion of the kiln.

By recycling the heat and kiln modification or use of imported kiln Gas consumption can be reduced.

3.5 Marketing & Sales

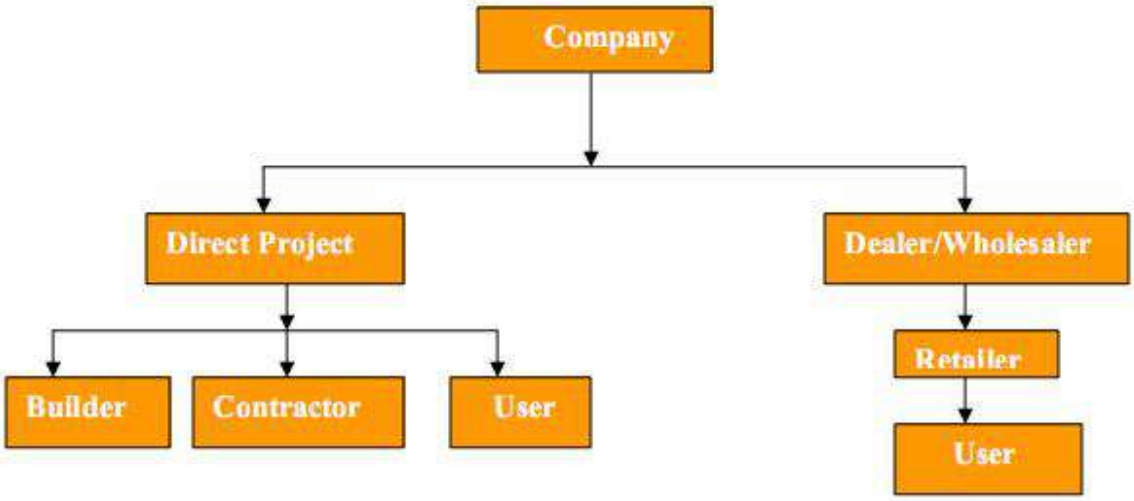
Manufacturers have developed contacts with the distributors in all over the country and place their product on the market through these outlets. Major distributors of Ceramics sanitary ware products are in the cities like Delhi, Mumbai, Hyderabad and Patna.

The distribution channel moves goods from producer to consumer.

Producers ⟶ **Distributors** ⟶ **Dealers** ⟶ **Consumers**

There is large export potential for ceramics sanitary ware in Middle East, Africa and Central Asia. But unfortunately only 10 – 12 sanitary ware manufacturers are involved in Exports

Distribution System:



3.6 Financing

Almost all the PSU have their branches in the Thangadh and providing the financing at competitive rates. But most of stakeholders depend upon their own financial equity based resources. It is also observed that the entrepreneurs normally prefer obtaining loan from the informal sources. Due to unawareness, ineffective information flow and paper work these entrepreneurs are reluctant to go to the financial institutions.

3.7 Human Resources

Human resource is present in abundance and skills are traditionally inherited. The owner usually deals with management issues and marketing related activities. Most of the labor is semi skilled and are trained on job. There is no specialized marketing or accounts department. They facilitate their sales only on the basis of personal contacts and no proper accounts are maintained therefore certain problems related to tax return, monitoring and evaluation are faced. Only primary or intermediate level employees are handling accounts. Glazing supervisor, Body supervisor, Kiln supervisor, Designing or molding in-charge and accountant are considered middle level management that are ceramics diploma holders or experienced persons and also easily available in the market.

4. Institutional Setup

4.1 Government & Semi-government Organizations

Central Glass and Ceramic Research Institute (CGCRI), The Indian Council of Ceramic Tiles and Sanitaryware (ICCTAS) are the organizations which are providing facilitation to this cluster at the government level. CGCRI has a regional business centre in Naroda (Ahmedabad) which provides Research and Development in Ceramic technology and other business development services.

5. SWOT Analysis

5.1 Strengths

1. Abundance of Low cost Labor
2. Local base for machinery manufacturers
3. Extensive supplier industry
4. Strong linkages with other key regional clusters
5. Entrepreneurial culture directed towards exports.

5.2 Weaknesses

1. Large unorganized existence.
2. Low R&D for product innovation.
3. Preference of informal credit.

5.3 Opportunities

1. Rising domestic demand for tile, sanitary ware and table ware.
2. Large export potential in sanitary ware in Middle East, Africa and Central Asia.
3. Exploit local expertise in related sectors, clusters technologies.
4. Facilitate supply chain collaboration.
5. Availability of LNG as fuel has reduced the production cost significantly thus enabling the Ceramic Industry to compete in International Market.

5.4 Threats

1. Low priced import from china.
2. Changing consumer preferences.

6. Investment Opportunities:

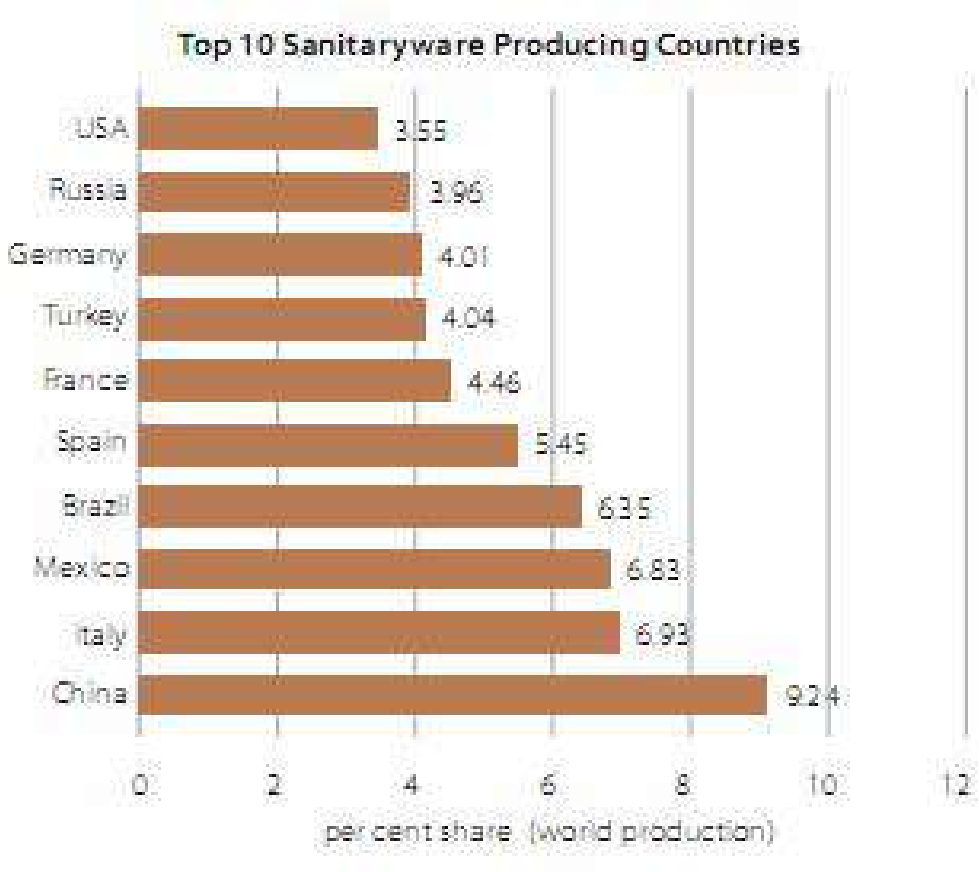
The need for following projects as potential investment opportunities in Ceramics Sanitary Ware Cluster Thangadh has been identified on the basis of the key strengths of this cluster:

1. Processed Imported Raw Material Depot
2. Processing Plant for Raw Material
3. Trading (Relevant Machinery etc)
4. Modern Kiln Designers
5. Export marketing Consultancy
6. Warehousing
7. Local Machinery Manufacturing

7. Industry Overview (Annexure)

7.1 Global Ceramic Industry

The global sanitary ware industry is estimated to be 187 million pieces and growing at about 7 per cent Y-o-Y. The main sanitaryware producing countries in the world are China, Italy, Mexico, Brazil and Spain, which together account for about 35 per cent of global production India, with a size of 6.7 million pieces, accounts for about 3.3 per cent of global production. Penetration of sanitaryware in India-about 30 percent is much lower than even neighboring Asian countries, indicating significant growth potential for this sector in the Indian market. The Indian sanitaryware market has been growing at about 10 per cent a year, as compared to the global average growth of about 7 per cent.



7.2 Indian Ceramic Industry

Demand drivers:

The demand for value-added and designer sanitary outpaced that of the plainer variants, thanks to two important realities: rising incomes and growing urbanisation, catalysing housing demand.

7.2.1. Market Potential for Sanitary Ware Manufacturers

Large numbers of rural households who remain unserved provide a significant opportunity for alternate delivery system, which can be tapped with appropriately priced models. The TSC is running in 350 districts of the country and has the following physical objectives.

- To provide Individual latrines to 280 lakh BPL households
- To provide individual latrines to corresponding 560 lakh APL households without subsidy through IEC
- To provide sanitation blocks to 3.07 lakh rural schools in India
- To provide baby friendly toilets in 35,080 anganwadis in India
- To provide 23,106 women sanitation complexes.

The requirement of sanitary pans and traps for 350 TSC project districts as well as for the remaining 230 districts in India has been summarised in the table below.

TABLE : REQUIREMNT OF SANITARY PANS AND TRAPS IN RURAL INDIA

Type	Units approved (lakh)	Sanitary Pans and Traps (lakh)	Urinals (lakh)	Business (Rs. in lakh @ 150 per pan)
TSC 350 districts in India				
BPL IHHL in 350 districts	280	280		42,000
APL IHHL in 350 districts	560	560		84,000
School toilets in 350 Districts	3.07	3.07	9.21	1,842
Anganwadis in 350 districts	0.35	0.35		52.5
Women Sanitation Complex @ 5 pan per complex in 350 districts	0.23	1.15		172.5
Total in 350 districts	843.65	844.57	9.21	128,067
Remaining 230 districts				
BPL IHHL in 230 districts		196		29,400
APL IHHL in 230 districts		391		58,650
School toilets in 230 Districts		3.2	9.6	1,920
Anganwadis in 230 districts		3.1		465
Women Sanitation Complex @ 5 pan per complex in 230 districts		0.75		112.5
Total in 230 districts		594.05	9.6	90,547.5
Source: RGNWM internal analysis, 2003				

From the table above it is clear that both in TSC 350 districts as well as remaining 230 districts there is a huge market for sanitary pans and traps. There is a need of 844.57 sanitary pans and traps in 350 districts and approximately 594.04 in the remaining 230 districts which will give them a total business of Rs. 218,614.5 lakhs (even if the pan is sold at a minimum rate of Rs.150 per pan). The private manufacturer can think of tapping this market which will provide them a good business.

7.2.2. Growing affluence:

The average Indian's per capita income increased from Rs. 11,672 in 2003-04 to Rs. 24,321 in 2007-08, and is estimated at Rs. 31,448 by 2010. Annual household incomes between Rs. 90,000 and Rs. 2,00,000 increased from 41.3 million in 2001-02 to 53.3 million in 2005-06, and are expected to rise to 75.3 million by 2010.Families with Rs. 2,01,000 to Rs. 10,00,000 annual income grew from 10.7 million in 2001-02 to 16.4 million in 2005-06, and is expected to reach 28.5 million by 2010. More surprisingly, families whose annual income is above Rs. 10,00,000 grew from a mere 0.8 million in 2001-02 to 1.7 million in 2005-06, and is expected to be 3.8 million by 2010. Interestingly, a majority of this affluent class will stay in cities and create an income pool comparable with the major US cities by 2015 (Source: India Infoline).

7.2.3. Increasing urban demand:

The urban population (28% of the total Indian population) grew 2.77%, higher than the overall population growth of 2.3%. Going forward, the overall population will grow at 1.5%, while the urban population will maintain a 2.27% growth till 2010. As a result, urban population is expected to touch 590 million by 2030 [Source: IBEF], leading to a robust housing demand of over 24.3 million dwelling units in urban India by 2015.

(Source: Housing Skyline of India 2007-08).

8. Conclusion:

The prospect and the future of ceramic sanitary ware industry spread across the country. I would like to produce some of the evidences aligning with this and with this I would like to conclude my project-

- A report, published in June 2008, stated that the growth in demand for ceramic products has been further strengthened by the boom in the Indian real estate sector, which is registering 30 per cent growth per annum, for the last few years. The growth in the hospitality industry and the advent of new malls, commercial complexes and multiplexes also lend support to the growth prospects of this industry.

- The industry can reap the benefit of its low cost of production, which is 25-30 per cent lower compared to the US and Europe, primarily owing to labour costs. Production of ceramics through conversion from coal-fired to gas/oil fired- furnaces is likely to enhance fuel efficiency and reduce cost as well as ensure better quality and reduction of environmental pollution.

References:

- www.icctas.com
- Company websites
- Annual reports
- Previous summer training projects
- Magazines, web-articles and catalogues