

REPORT
ON
MORBI – WANKANER
CLUSTER

DIGNOSIS STUDY OF MORBI-WANKANER CERAMIC CLUSTER REPORT

This report is prepared jointly by Mr. R. M. Savsani technical officer CGCRI Naroda center Ahmedabad & Mr. C. D. Patel. Project assistance [CDA] OF CGCRI Naroda center at Morbi- Wankaner cluster as per the part fulfillment of the training programme. This report has no relation with the report prepared by CGCRI, Naroda center, Ahmedabad and approved by the Industries commissioner at Government of Gujarat for the technological up gradation programme at Morbi-Wankaner & Thangadh ceramic in Gujarat state.

Brief History of Ceramic Activities In-Morbi

Morbi formerly was an agricultural place due to inadequate monsoon the desire crop production had become scare and hence the dashing entrepreneurs started to export market of such product which will give them livelihood.

Morbi at that was ruled by late Shri Lukhdirji Bapu in 1925-26 a gentleman from Maharastra came with a vision to start a ceramic unit (roofing tiles) the man was none other than the great pioneer Shri Parshuram Canpule and with the help of the state started roofing tiles industry after this the group never looked back and started stone ware pipe pickle unit, sanitary ware crockery, glaze tiles and refectories located at than, wankaner, Morbi and sihor and the brand name “Parshuram” has become a household name not only in India but also in abroad now today’s Morbi still remembers this create man and pays high tributes to him for his handwork in up lifting of Morbi, Than & Wankaner without aim and his clear vision Morbi would have never become a big cluster of smes especially in roofing tiles, glazed tiles, sanitary ware & mosaic industries as Morbi flourished the diversification side also continued and today Ajanta & Samay are big names in clock industries today Morbi deals with almost all type of products starting from nail to top quality ceramic product.

Today Morbi proudly owns approximately 150 mosaic industries/200 roofing tiles/100 glazed tiles/50 sanitary wares/6 ceramic cluster units/5 frit units/2 big clock industries/one big home appliance unit/big cosmetic unit and lots of ancillary units depending upon above Morbi annual turnover is reported to be around 800-900 crores and that in an area of 25 kms x 25 kms the above facts clearly indicate the positive thinking of dashing entrepreneurs.

1. Description of Cluster Ceramic :

The small and medium scale industries play a very important role in the Indian economy as they provide employment to about 14 million persons and contribute to 40% of the industrial production equivalent to 7% of the gross national product besides, the sector generate 35% of the direct exports.

One of the mechanizing to promote SME development that become popular world over is idea of industrial clustering A cluster is sectoral and geographical concentration of enterprises in particular SMF, employing similar process scale of operation and producing similar products but faced with common opportunities and threat.

It is estimated that 350 modern SME clusters exist in India and in addition to this about 2000 artisans based rural clusters are also in existence.

The ceramic industries can be categorized in to 3 categories.

1. Heavy clay industries comprising of stone ware pipes bricks, roofing tiles & refractories.
2. White ware pottery industries comprising of crockery, ceramic tile, sanitary ware etc.
3. Industrial ceramic comprising of electrical insulator, high alumina & special ceramic.

The rough estimate suggest that there are approx 900 units manufacturing ceramics in Gujarat and most of them are in SMES sectors where as hardly to units are in organized sector.

There are four major force ceramic cluster in Gujarat. They are as under.

S_No	Name of cluster	Type of Units	Units
1	Ahmedabad Cluster :	Crockery & Table ware	25
		L. T. Insulator	04
		Wall tile	01
		Refractory	02
		Stone ware	01
2	Himatnagar Cluster	Crockery & Table	40
		Wall Tiles	13
		Sanitary ware	1
		L.T. Insulator	1
3	Thangarh Cluster	Pruechu Crockery	2
		Sanitary ware	102

		Wall tile	11
		Stone ware	8
		L.T. Insulator	15
4	Morbi-Wankaner	Sanitary ware	48
		Glaze Tiles	86
		Floor Tiles	11
		Bone china ware	2
		Refractory	14
		Misc (f rits, ceramic Stain & Grinding edia etc.)	9

MORBI-WANKANER CERAMIC CLUSTER

1. Sanitary ware Units

Morbi is about 230 km. From the Ahmedabad and about 65 km. From Rajkot The 25 km. Morbi-Wankaner belt in Rajkot district alone accounts for about 60% production of ceramic tiles in the country the total investment of glazed tiles is around 300 crore of weight 10.5 kg. The total production is around 50 lakhs box per month (one box contained 11 Nos of tiles of size 12x8" to neighboring) about 10% of total production are exported in nabor countries like Bangladesh, Pakistan, Sri Lanka, South Africa.

Sanitary ware based glaze wall tiles are the traditional porch bodies for the production of glazed tiles basically these bodies consist of low grade days like ball clay and chincady batter like, colite, dolomite, wollestonite, biscuit grog etc. in body.

In Morbi-Wankaner ceramic cluster units which are manufacturing sanitary ware. In sanitary ware of various items likes Washbasin, Orissapan, Europeanpan, P-trap, and of various size & color are manufactured in Morbi.

Production of sanitary ware and ceramic wall tiles are major in Morbi-Wankaner cluster.

The are of ceramic has increased both for domestic and industrial purpose with increase the howring construction industries, the are of ceramic products has increased over the years.

Ceramic glazed wall tile : glazed wall tiles for the surface of wall afcor where cleanliness in an important Factor, Hospital, Kitchen, Bathroom, Chemical laboratory are some of the important place where these glazed tiles the total units of manufacturing of wall tiles are about 150 nos. around 100 units of in Morbi-Wankaner.

Body composition consists raw material (ballclay, chinaclay) and 40% non plastic raw material (dolomite, talc, grog, wallestonite etc.)

2 Manufacturing Process Glaze Tiles :

All the raw materials according to the batch composition are weighed in dry state after giving allowance for the moisture content of the components. This weighed batch altogether is then fed into the blunger slurry is pumped out from the blunger to a operator or screen filter with so to 100 mesh sieve for sieving the slurry to removing coarse grit material. The slurry is passed through a channel magnet to arrest the free iron particularly and then to the filter press compressed air to a filter press for dewatering of slurry to obtain filter cakes having moisture in the range of 20-25 % The filter cake formed are dried in naturally semidry and then sent to the cakes to be used for granulator and granulates as specific requirement for 6 to 7 moisture.

The filter pressed cakes are mentioned above of the requisite moisture content are brought in to a suitable granulator from (10 to 12 mesh) by feeding directly in to a pan mill with perforated bollomb.

The granular powder thus prepared is aged for 36 Hrs and then pressing of this powder is carried out by a process known as dust pressing or semi-dry pressing for shaping of required size of tile.

The tiles are pressed and are sent to the conveyor belt where facing of all the four sides of the tiles take place in sequence. After fettling the tiles are stacked manually one above the other each stack being consisted of 150-200 tiles. These stacks are then dried in the dryer and then loaded in the tunnel kiln for biscuit firing at the temperature range of 1080-1100 C Generally kerosene used a fuel for firing the tiles and thus fired tiles turner as biscuit tile. The biscuit tile sent to the sorting department where cracked and shipped chipped tile are rejected and good tiles are sent to the glazing department.

The glazing of biscuit tiles is carried out by water fall method where biscuit tiles are passed on conveyor belt one by one under the curtain of glaze which falls from the container installed above the conveyor. The glazed tiles are then loaded in cassettes which are subsequently loaded in the kiln for glaze-firing The glaze firing is carried out generally in tunnel kiln using kerosene a fuel. The temperature of firing which varies from factory to 1025-1040 C Some units are using roller kiln for glaze firing of luster decorated tiles.

The glaze fired tiles are then unloaded checks for quality, appearance etc. and then sorted and packed. As per order the materials are dispatched to destinations.

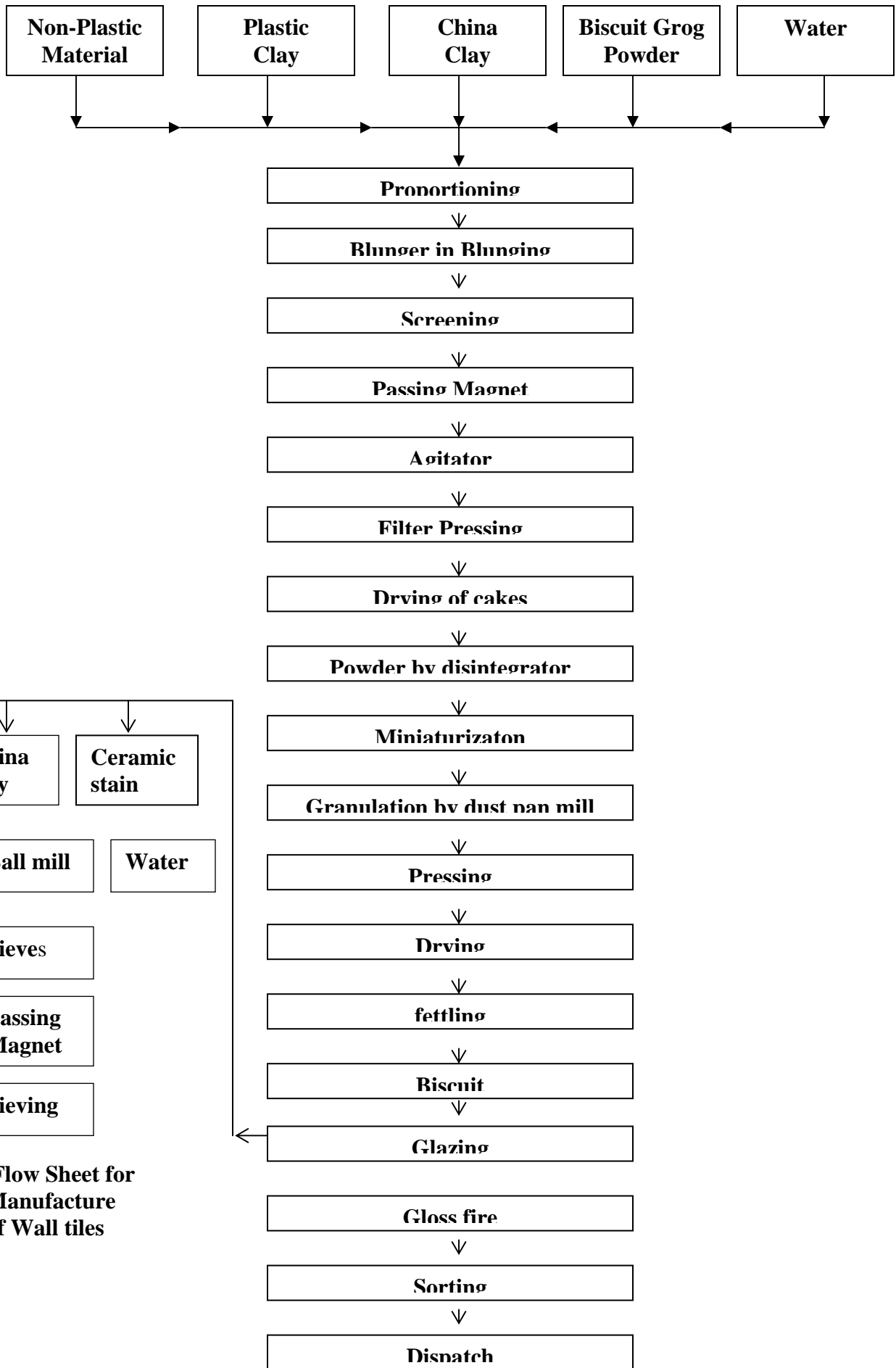


Fig1: Flow Sheet for Manufacture of Wall tiles

Manufacturing process Sanitary wares :- In small scale sector all the raw materials according to the batch composition are weighed in the dry state after giving allowance for the moisture content of the components this weighted batch altogether is then fed into the ball mill grons with some electrolyte (sodium carborate & sodium silicate) & water in stipulated proportion Grinding time is about 7 to 8 Hrs. the fineness of ground materials is maintained to about 300 mesh and should have a residue of about 2% on 300 bs mesh. The ground material (casting slip) from the ball mill is unloaded in to agitator (storage tank) before storing in agitator, body is sieved through 80-100 mesh sieve and than passed through a channel magnet. The slip is than checked for the Rheological properties like tilrew weight, humidity viscosity and thixotropy etc.

Rheological :

Litre wt to slip 1750 gm/cc

Fluidity 250⁰ C

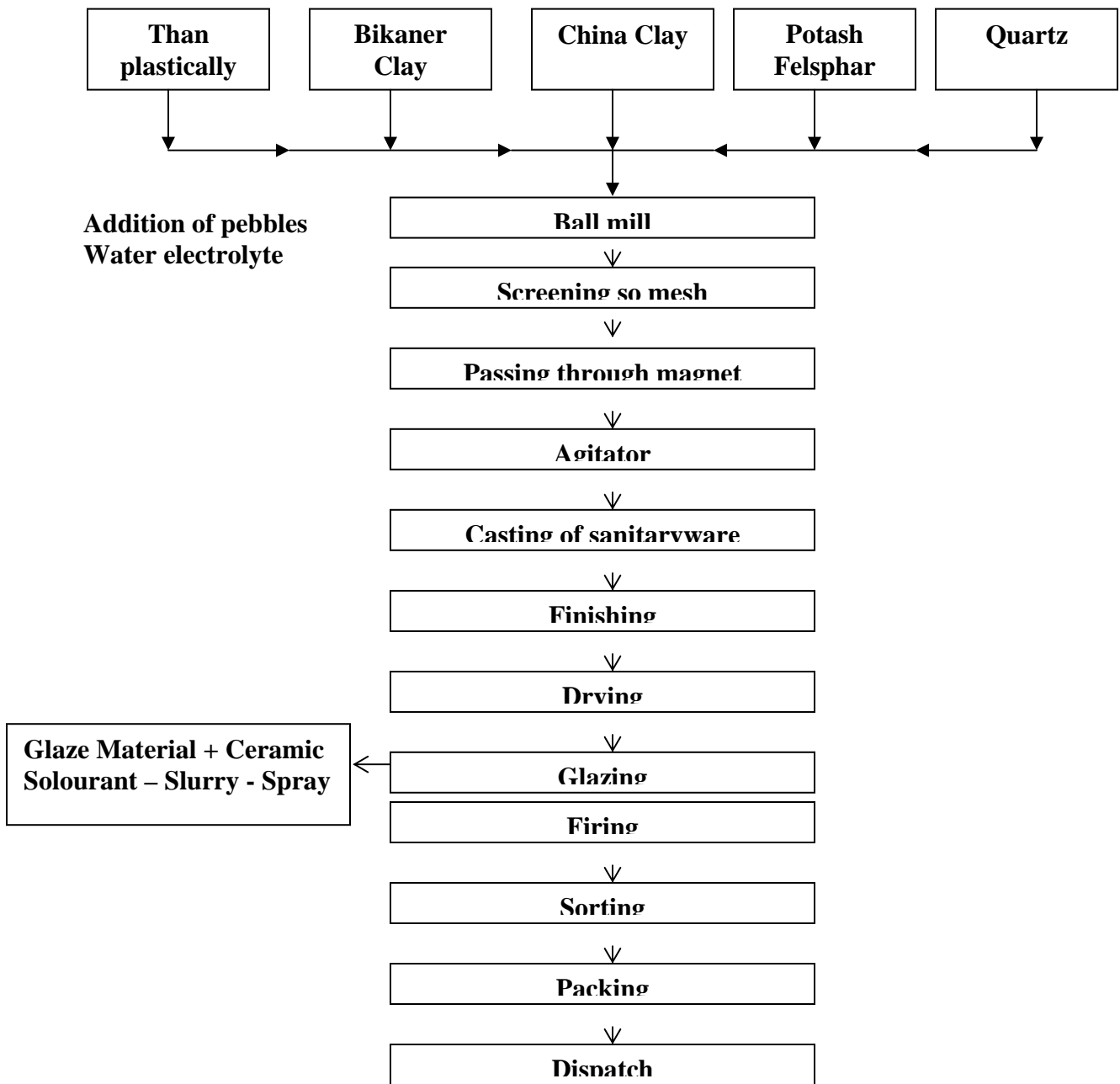
Thixotrothy (90 sec) = 45

Then slip is poured in the plaster mould slowly kept for aduration 2-3 hrs. duration untie requirement thickness of cast is developed. After words rest of slip is drained off. The wares were released from the plaster mould in leather hard the cast ware are hard finished and kept in open racks or benches for drying.

The dried wares are once again finished and inspected for any cracker or other defects. The wares glazed by spraying method after glazing the wares are loaded on the refractory setters for firing in tunnel kilns. The ware is fired at temperatures in the range lost 1200 c the fired products are then in inspected packed and dispatched.

Preparation of glaze : Powdered material like quart, feldspar, calcite, barium, zinc, china clay, zirconium, pacifiers and ceramic stain (for color glaze) are charge in ball mill material pebbles & water ratio is kept 1:1.5 : 0.4 and are finely ground to 300 mesh for about 20 Hrs. the ground glaze slwry is unloaded from the ball mill, sieved through 120 mesh sieve and passed through

A permanent magnet for the removal of unwanted iron particles. The glaze is stored in storage tank and used for glazing.



Flow Chart for manufacturing sanitary in SMES

Core Cluster actors & other Actors

Core cluster :

The core cluster actors are as under.

Glazed wall tile manufacture:

In Morbi about 100 units are manufacturing glazed wall tiles. About 2000 boxes (11 Nos of glaze tile of sized 12x8") per day day production factory. About 100 workers working in each unit, working under contract system. Most of workers and super visors stay in quarter in factory premise and they are carring wages satisfactory by.

Sanitary ware manufacture :

There are 48 units of sanitary wares and they produce white & colored sanitary ware of various type & site about 75 worker work in each unit on contract base. Production of one unit is 500 to 1000 bundles per day.

Other cluster actors:

There are a number of the persons who contribute to activities of cluster and this play an important role. They can be classified as under.

Frit manufactures :

There are 5 nos of frit manufactures in Morbi and are supplying the opaque and transparent frit to wall tile manufacture which is used in glaze making. Average production of frit will be around 25 mt. Per day. They are making frit by using various raw material lake, quartz, felspar, china clay, borax, boric acid, etc. The frit are melted in rotary furnace and quenched in water tank.

Ceramic stain (color pigment) manufacture :

There are 6 Nos of color manufacturer in Morbi and are producing various ceramic colors by using various (ceramic) and by mixing & firing various metallic oxide, and than washing grinding etc. The production capacity of each is approximately 3 Tons/ month.

Production they are supplying the stain to glaze wall tile & sanitary ware manufacture.

Refractories

At Morbi-Wankaner they are manufacture refractory kiln furniture's, likes setters cassette for glaze tiles, deck pillars support, trolley base etc. for sanitary ware units. For preparation of kiln furniture the raw materials are used like cal. Bauxite, silimanite fire clay

china grog. etc. the mixed body material is pressed and fire in shuttle or tunnel kiln at high temperature about 1250 C.

Grinding media-manufacture :

There are about two units are making grinding media and are supplying to wall tile and sanitary ware manufacture for grinding of body as well as glaze. The production capacity is about 2 mt.

Plaster of Paris-manufacturer :

There are about 3 units who are making plaster of Paris From gypsum-The quality of plaster of paris are supplied to cassette maters and sanitary ware mould manufacture.

China clay washing plant :

About 5 china clay washing plants are locates in Morbi-Wankaner ceramic cluster. They purchase raw china clay and beneficiate. The clay is used in bodies of sanitary ware & tiles. The quality of china clay is not up to the mark so the manufactures are not using in glaze and misted then use in bodies mostly.

Support service Provider

Raw material supplier

There are about 6 Nos of supplier who procure ceramic stain, raw materials like china clay, quartz, felspar and other materials related to glazed tile & sanitary ware industries and supply than.

Suppliers of miscellaneous items

There are many firm who supplying miscellaneous items required for sanitary wares & wall tiles unit, like ceramic fibre blankets, sponges, hardware items ceramic stairs etc.

Importers of old machineries

There are three numbers of importers who import old machineries for ceramic glaze tiles unit like, second hand press, roller kiln glazed line etc. from Italy.

Packing materials manufacture

About 5 Nos of unit are making the packing materials for tiles.

CURRENT INSTITUTE :

Central glass and ceramic research institute (CGCRI), Naroda center, Ahmedabad.

The problems identified by CGCRI through various technology needs assessment (TNA) surveys conducted at this cluster and needed urgent attention. They are grouped in to two categories (A) technology issue and (B) infrastructure issue. The technological issue consisted of quality assessment of major body and glaze raw material and fixation standardization and enforcement of stringent process and quality control measures in production of sanitary ware and ceramic tiles development singular blended day for sanitary ware and table ware production for improvement in quality and consistency in development of fast fired body and glaze for sanitary ware & ceramic tiles. Modernization of the manufacturing process through employment of entry efficient equipment's and machines including the latest tunnel & roller kilns. Development of bodies for sanitary ware ceramic tiles and tableware's utilizing fired ceramic seraph technical man power training and human resources development and finally taking some units under the technical consultancy CGCRI as well as demonstration of the result.

CGCRI Naroda Centre, Ahmedabad has been carrying out the activities for the last one year and the achievements in brief are described here under CGCRI Carried out physic-chemical properties of raw materials based on the investigation report and availability of raw materials in the region a realistic quality specification of raw materials and chemicals was prepared in English & Gujarat Languages suitable for production of sanitary ware & tiles tableware and provide to each manufacture report of are techniques similarly problem of firing of ceramic wares and are prepared and provided to each Manufacture as training aim demonstration programme on above subject was also carried out at Morbi-Wankaner ceramic cluster.

Thiu the benefits expected are self sustainable development in form of improvement in green and fired ware production through reducing rejects from 20 to a targeted 5% Substantial dires in seraph production 20% for targeted reduction of factory labour cost by at least 30% reduction of cost by at least 20% and serufi waste minimization reduction of cost of production improvement in producing improvement in quality (should conform to 15 & EN) better completion in the domestic and international market to lower cost & improved quality result.

Like is Nos of sanitary ware & tiles unit at Morbi got ISO-9002 and 5 units got gof Bls certification and about 15 are in process to get ISO-9002 & pri" certification after CGCRI T&D programme.

2 L.E. Engineering collage Morbi

Last year about 20 students of the collage conductor the course of diploma in ceramic technology and about 15 student passes the examination and service in the ceramic unit every year.

3 Morbi-Dhurva glaze tiles manufactures Association, Morbi.

4 Sanitary ware manufactures Association, Morbi.

5 Chamber of commerce, Morbi.

6 District Industries center, Rajkot

7 Raw material traders

8 Exporters

9 Import of machinery

10 Bankings Services Like SBS, BOB, OBC, PNB.

Current Institute Matrix :

	CGCRI	LE	TA	SA	CC	DIC	RMT	E	IM	SBS	S	T
CGCRI	X	3	9	9	3	1	9	3	3	2	9	9
LE	3	X	5	5	3	1	3	1	1	1	5	5
TA	9	3	X	9	9	4	9	4	6	3	9	9
SA	9	3	9	X	9	3	9	4	-	3	9	5
CC	1	1	9	9	X	6	1	1	1	3	9	9
DIC	1	1	1	1	6	X	1	1	1	1	1	1
RMT	1	1	9	9	1	1	X	1	1	1	9	9
E	1	1	4	4	1	1	1	X	1	1	6	6
IM	1	1	1	1	1	1	1	1	X	4	1	6
SBS	-	-	6	6	6	-	-	3	3	X	8	8
S	9	3	9	9	3	3	9	4	1	9	X	9
T	9	3	9	9	3	3	9	4	4	9	9	X

Legend :

- CGCRI : Central Glass & ceramic research institute.
- LE : L.E. collage- Morbi
- TA : Glaze tiles manufacturer association
- SA : Sanitary ware manufacture's Association, Morbi.
- CC : Chamber of commerce, Morbi.
- DIC : District Industries center, Rajkot
- RMT : 7 Raw material traders
- E : Export
- IM : Import of machinery
- SBS : State Bank of Saurashtra. Branch Morbi.
- S : Sanitary ware unit Morbi
- T : Tile unit.

- 1 – 3 Poor(indicating either absence of any relation ship of negative relationships).
- 4 – 6 Fair
- 4 – 8 Good
- 9 –10 Excollant (Indicating storage and or positive relationship.)

2 Value chain Analysis :

The value chain analysis of sanitary wall and tiles as us under.

	Sanitary ware	Wall Tiles
Cost of raw material	15%	10%
Cost of fuel	45%	40%
Cost of labour	20%	20%

Cost of packing	03%	02%
Overhead cost	05%	05%
Other misc.	02%	03%
Electricity	10%	20%

Problems Identified :

Technical issue

- Non-availability of highly grade selects raw material non availability's pf beneficiated raw material.
- Obsolescence of technologies adopted coupled with employment of in efficient and out dated equipment's
- Non growth pf machinery industries to need of glazed tiles & sanitary ware industries.
- Non enforcement pf process control measures in the production
- Lack of awareness regarding energy efficient technology and quality.
- Lack of technical skills.
- Failure to develop latest state of art technology.
- Generation of large ceramic wastes and non utilization.
- Diversity and design/product range according to the need of external market.

Infrastructure problems :

- Non-Availability of gas fuel and if you the cart installation & gas cast is exorbitance.
- High electricity charge.
- Improper awareness of export market.
- Common facility conlair.
- Testing laboratory centralized at this cluster and testing facilities should be available at suitable rate (under state central Government).

Other Issue :

- Unorganized nature, lack of mutual frust

ECONOMIC PROBLEMS

Basic Ex. Duty high, local sales taxes vastly differing state to state

CLUSTER VISION

It is envisioned that the cluster would become a center of high quality produces of tile & sanitary ware products in world and it will be high demands product in world market.

STRATEGY

Strategy for intervention will be sustainable activities with business generation. There activities would be conducted through the involvement of the manufacture and traders for technical/quality up gradation for the cluster CGCRI is doing extra ordinary work besides the technological design and marketing intervention with traders welfare activities would also be planned for ensuring the supports. Active interest of the workers while the activities with manufacturer & traders would be planned in a market.

There should be an interest to create infrastructure activities on under.

- 1 Should set up a testing laboratory Morbi.
- 2 Should set up purification plan for water purification treatment.
- 3 Should set up a solid waste of grinding plant.
- 4 Should set up like fighte station.
- 5 Should try to get natural gas as a fuel for firing of ceramic product.
- 6 Should start degree course for ceramic in L.E. College, Morbi.
- 7 Identification of export market & linkage.

ACTION PLAN

To start with activities at the Morbi-Wankaner ceramic cluster will hover arrange creation of ambition technical & marketing issues.

For technical upgradation of the cluster CGCRI Naroda center has made a three years action plan.

Action plan needed for following issues

- 1 Set up a testing laboratory.
- 2 Set up sanitary ware solid waste grinding unit.
- 3 Fuel distribution system.

Marketing Issue

Market survey

Intimacy development between exporter & manufacturer and manufacturer should get export benefits.

Building up the image of Morbi-Wankaner and promotion of this brand Proposed activities for the year.

SWOT ANALYSIS

The SWOT analysis of the cluster will be useful for clear understanding of the capabilities of the cluster to face the challenges ahead.

SWOT OF THE CLUSTER

1 Strength :

High capacity for investment of entrepreneur.
They are hard worker & give more time at factory.
Easy availability of skilled workers.
Existence of more than sufficient product five capacity.
Management with business background.
Exposure to export market.
Technical support of CGCRI for up gradation of quality.
Easy availability of raw material.
Massive support of.
Good banking source.
Export friendly government policies and machineries.
No labour problem.
Easy available electricity & water of affected rates.
Encouraging industries policy of government per SMES.
Easy available of fuel specially gas (natural).
Good transport facilities.
Well-established linkages with manufactory and foreign country.

Weaknesses :

Non availability of standard raw material.
Low level of education.
Low level of modernization and up gradation technology.
Inadequate of training for workers.
Low demand in local market.
Difficulties in testing at local level.
High rejection.

Opportunities :

Up gradation technologies due to involment of CGCRI.
Improvement in quality & decrease rejection.
Product diversification.
Demand for export market due to WTO agreement.

Threats

Entry of multinationals in domestic market.
Competition with china & other countries.
Non-tariff barriers.
Slow improvement in quality to international standard.

ACTORS AND THEIR LINKAGES – A CLUSTER MAP

A cluster map indicating the various linkages and actors that exist in a cluster is pressured in the figure below it can be observed from the cluster map that if mechanism to strengthen these linkage are overlaid the cluster as a whole can become more successful.

