Chapter III

Tile Factories in Kerala
—An Overview
CHAPTER III
TILE FACTORIES IN KERALA – AN OVERVIEW

3.1 HISTORY OF TILE FACTORIES IN KERALA

Kerala is the home of tile industry in India. The first tile factory in Kerala was started by the German Basel Mission in the year 1873 at Kozhikode. Sir George Plebst is considered as the father of tile industry in India. He started the pioneer factory in 1865 at Mangalore. The name of the first Indian tile factory was ‘Basel Mission Unit’. It commenced its operation with a daily production of 500 roofing tiles, employing 12 workers. The mills were driven by bullocks and the pressing of tiles was carried out by hand press, which was replaced by steam power machine in 1881. The success of the first Indian tile factory, started in 1865 at Mangalore was an inspiration to the Basel Mission to start more factories in other areas. Accordingly, factories were set up in different states like Kerala, Gujarat, Karnataka, Orissa, Maharashtra, Madhya Pradesh, Andhra Pradesh etc. The first factory was set up in Kozhikode (erstwhile Calicut) in the year 1873 and the second unit in Palakkad in 1874. Later factories were set up in Feroke (1905) and Codakal (1906).

Development Stages of the Industry

First Stage: While examining the different stages of the industry from the inception, it is seen that it passed through three distinct stages. The first stage was Pre World War I period. A good number of factories were set up at Feroke and Kollam (erstwhile Quilon) regions. The availability of high quality clay, well connected railways, backwaters, high demand for tiles both in internal and external markets were the chief factors contributed to the setting up of tile units in these areas. Besides roofing tiles, the factories manufactured wire cut bricks also. The tiles produced in the Feroke areas were mostly exported to foreign countries. Most of the factories set up in this period were fully mechanized and the machineries were all imported and of high performance. The international fame of Feroke tiles was a boost to set up tile factories in Kollam also during the Pre World War I period. The first tile factory at Kollam was established by a foreigner, an English man named Cameron in 1880. Tiles manufactured at Kollam during this period were also exported. There was very high demand for the tiles manufactured in Feroke and Kollam in local and international markets mainly due to its high quality.
Second Stage: The second stage of development of industry witnessed the setting up of a large number of tile factories in Thrissur district because of the availability of raw materials in plenty. Another reason for the setting of tile factories in Thrissur (erstwhile Trichur) was that the factories at Kozhikode, Feroke and Kollam were mainly export oriented and so the supply of tile in the home market was inadequate.

Moreover the Post World War environment resulted in heavy demand for tiles in civil and defence sector. It was with the intention of meeting mainly the internal requirements, tile units were being set up in Thrissur district at Chalakudy, Irinjalakuda, Pudukkad, Ollur, Thrissur, Vadakkananchery etc. In addition to the availability of clay and cheap labour, firewood also available in the nearby areas. The profit motive business people of Thrissur district paved the formation of a number of tile factories. The first tile factory in Thrissur district was started by a business man named Chakola Kunju Vareed Devasy at Manali. The success of this unit attracted businessmen to tile industry.

The high profit potential led to the setting up of a large number of units, of during 1966, 53 per cent of the tile factories in Kerala were located in Thrissur district, providing employment to 9130 workers accounting for 38 per cent of the total employment provided by the industry. The average investment per tile factory at Thrissur was less than Rs. One lakh. The wages paid to workers of tile units in Thrissur district was the lowest as compared to Kozhikode and Kollam.

Third Stage: The third stage in the development of tile industry in Kerala was witnessed by quality consciousness. The entry of profit motivated business people in this field led to the over crowding of factories in Thrissur district, resulting in unfair competition and rivalry among the manufactures. Gradually, the export of tile began to decline. The manufactures felt the urgent need for the modernization of the industry, so that the quality of product could be improved and the cost of production reduced.

Raw materials for Bricks and Tile Production

Clay: The basic raw material involved in the production of bricks and tile is clay. Production of tile and brick are nothing other than conversion of this basic raw material i.e., clay. The strength, colour, shape, appearance and quality of tiles and bricks ultimately depend on the quality of clay used in their manufacture. Based on the chemical
compositions, physical properties and industrial uses clays are basically classified into four type china clay, ball clay, fire and refractory clay and building brick and tile clay. Clay suitable for the manufacture of bricks and tile are available in different districts, such as Thiruvananthpuram, Kollam, Trichur, Kozhikode, Kannur etc.

Due to the constant exploitation, the reserves of clay deteriorated considerably, and for quality production of brick and tile, a proper mixing and combination of different types of clay is essential. A special type of blue clay is mainly used for quality brick making. Yellow clay is also needed and they can also be mixed. Both the physical and chemical properties of clay are to be tested to ensure the quality of output. For example, physical property such as plasticity, sand content etc.

**Firewood**

Firewood is the chief fuel used for kiln firing. Presently rubber wood, cashew shell, wood of coconut tree etc. are being useful for kiln firing. The main three types of kilns used are drogh kiln, semi-continuous kiln and Hoffman’s continuous kiln. The increasing price of firewood is a concern for the industry.

**Labour**

The industry provides employment to the poor and weaker sections of the people in rural areas. No formal education is needed to work in tile or brick manufacturing units. The industry provides direct and indirect employment. Indirect employment include the mining and transportation of clay and firewood. The industry provides employment to unskilled, skilled and semi skilled workers. The unskilled workers category includes head load workers, drying yard stackers, firing helpers, and other raw material handling workers. The semi-skilled section consists of clay mixers and slicers moulder helpers, workmen spreading wet brick in drying yard rectifiers etc. The skilled workers engaged in tile and brick industry are moulders and kiln burners. The employment in tile and brick industry is seasonal. During the rainy season, from June to September the factories can’t work in full swing due to drying problem of tiles and bricks. During the summer season also, the factories can’t work in full capacity due to cut in supply of electricity.
Kerala is the only state in India which pays the highest amount of wages to the tile and brick workers. The minimum wages Act is prevailing in this industry. There was regional disparity in wage payment as per the Minimum Wages Act also. The wages paid in Trichur region was the least as compared to the wages of Kozhikode and Kannur.

**Tile and Brick Manufacturing Process**

All the steps whether manual or mechanical involved in converting clay into tiles or bricks constitute the manufacturing process. Certain basic machinery and equipments are also needed in the process of manufacture. The important ones are pugmill, pan mill, tile press and kiln for firing. The various stages of manufacturing process include the preparation and processing of clay and making blocks and slabs, pressing/cutting, drying, kiln and firing and sorting/grading.

1. **Preparation and Processing of Clay:** Different types of clay are required for the production of high quality tiles and bricks. The quality of products finally depends on the type and grade of clay used for its manufacture. The clay extracted from the farm can’t be used as such immediately; it requires proper weathering and souring so that the ideal properties of clay may be maintained.

2. **Weathering:** Weathering is the processing of keeping the clay in the open, so that by the action of the natural agencies like sun, wind, air, rain, frost etc, the impurities in the clay will be oxidized. Weathering improves the plasticity of clay so that it may be moulded to the required shape. Weathering also helps for getting the conventional red colour of tiles and bricks uniformly.

3. **Souring:** The properly weathered clay should be removed from the clay yard to the souring pit. While storing the clay in the souring pits, it should be ensured that each type of clay is formed into separate layer one above the other. The clay thus, formed is allowed to sour for about two weeks. When one pit is emptied, the other pit can be filled in; spared clay is dug out vertically from the souring pit so that it represents all the varieties of clay mixed in right proportion.

4. **Mixing, Grinding and Pugging:** The clay kept in the souring pit for two weeks period required proper mixing, grinding and pugging. The appearance, shape and
strength of tile and brick depend on these processes. Types of machines used for mixing, grinding and pugging are Box feeders. Double roller croster-cumpug mill, high speed rollers, dearing pug mill, pan mills and mouth piece or Pugmill and Cutting table.

5. **Box feeder:** - For mixing of clay a box feeder or a double shafted trough mixer is used. The mixer will have two shafts with a number of blades attached. The blades affect shaving, cutting and mixing of the clay properly. The clay from the souring pit is fed into the mixer either manually or mechanically.

6. **Double Roller Crusher-cum-Pugmill:** - From the mixer the clay is taken to the crusher. Two pairs of differential rollers of 3mm gap are arranged in such a way that clay which is ground and squeezed out by the first pair falls in the middle of the second pair of differential rollers (1mm gap) which are more closely placed to effect finer grinding. From the second pair of rollers, the clay falls into the pugmill where it is again cut, kneaded and properly mixed and extruded in the form of blocks sliced into slabs.

7. **High Speed Rollers:** - It is desirable to change the clay into high-speed rollers after crushing to ensure that the pebbles and lime nodules in the clay are properly ground, otherwise may cause uneven contraction of the surface causing damage to the tiles. The Double Roller Crusher and High Speed Rollers are installed only by small and medium tile and brick units.

8. **Dearing Pugmill:** - Pugmill is the most important equipment used in the tile and brick factories. It helps to eliminate air pockets and prepare a compact and homogeneous clay blocks ready to be pressed into tiles. Wires automatically cut these blocks into slabs of required size for making tile or bricks.

9. **Pan Mill:** - To ensure fine grinding of clay, pan mill may be used in place of crushers. Pan mills are superior to crushers especially for plastic mixing and grinding. The prolonged rubbing and grinding in the pan mill effects better and thorough mixing of water with clay and thus, more homogeneous clay mass is obtained.

10. **Mouthpiece of Pugmill and Cutting Table:** - It is better to have mouth piece of steel frame with brass lining, so that clay in required size for tile and brick can be cut in proper size. Further, the cutting table, on which the extended blocks are allowed to rest, should be arranged in the same level as that of the mouth piece of the pug mill.
11. **Pressing/Cutting:** - The cured or deaired clay slabs will be properly oiled before pressing to get the required smoothness. Pressing may be done manually or mechanically. For manual pressing a hand-operated screw press is used and a power driven revolving press does the work mechanically. Most of the tile factories employ revolving press, as its output will be more than the manual press. After pressing, the excess clay is removed by a process called trimming.

12. **Drying:** - Drying releases the water content or moisture of the pressed tile or brick. Proper drying minimizes breakages and cracks. The drying should be uniform on all parts of tile or brick, it is after drying the tile or brick is sent for kiln firing. The most common method of drying is to build platforms on the top of the kiln where the radiant heat from the kiln dries the tile or brick. Drying can be done by artificial dryers also.

13. **Kiln Firing:** - The colour, hardness, strength and attraction of ceramic products are attained through kiln firing. A kiln is an enclosed chamber where ceramic wares are fixed. It consists of a chamber to hold ceramic products, fireboxes to burn fuel, discharge waste gases and to create drafts. The tiles are baked in the kiln at 800 degree C to 900 degree C temperature. The firing will continue for 18 to 24 hours. For baking tiles and bricks three types of kilns are available viz. Down draught kiln, continuous kiln and semi continuous kiln.

14. **Down Draught Kiln:** - It is the conventional type of kiln, generally used by small tile and brick factories. Down draught kiln will have a number of chambers, but firing can’t be done for all the chambers simultaneously. The installation cost of down draught kiln is comparatively less. But the excess heat of one chamber can’t be diverted to other chambers.

15. **Continuous Kiln:** - This type of kiln is called Hoffinan Kilns, which are the modern kilns employed, by large factories. Fire once started can be regulated and directed towards different sets of chambers. The various activities like, firing, loading and unloading of tiles or bricks can be done in different chambers simultaneously. Heat once generated is used continuously and never wasted.

16. **Semi-continuous Kiln:** - This is another type kiln used for firing tiles and bricks. It is an improvement over down drought kiln. The fuel efficiency of this type is
more than that of down draught kiln, but is less than that of continuous kiln. This type of kiln is generally adopted by medium sized factories. Firing can be done continuously and it can be directed from one chamber to another.

17. **Sorting/Grading of Tiles and Bricks:** - The baked tiles / bricks will be loaded from the chambers after proper cooling. All the tiles and bricks produced may not be equally good with regard to their colour, shape, appearance, strength etc. Some of them may have cracks, damages, breakage, over or under burnt etc, and hence it needs sorting. Sorting of bricks is very easy. Sorting is done using a metallic rod. Generally tiles are graded into five categories, considering the colour, shape and clear sound of the product when tested.

3.2 **PRODUCT DETAILS**

Roofing tiles, ridges, wire cut bricks, desert ceiling tiles, hollow bricks, and hourdies and pottery items, ceiling tiles, flooring tiles, jallies, wall tiles, banister, pottery, perforated bricks, de-aired solid bricks, ordinary solid bricks, hurdies, ventilator bricks.