Techno-socio-economic survey on the living and working conditions of the traditional potter communities of Kerala

Abstract

The project "Techno-socio-economic survey of the living and working conditions of the traditional potter communities of Kerala" was taken up as a joint program of Integrated Rural Technology Centre (IRTC), Palakkad and Regional Research Laboratory (RRL), Trivandrum with the objectives of identifying the traditional potter communities of Kerala, assessing their socio-economic status, evaluating the technological problems faced by them and helping them to improve their productivity and profitability through value addition of their finished products. In order to understand the socio-economic status the investigators have visited the potters' co-operative societies all over Kerala, personal interviews were held with the officials of the various potters' associations and industrial concerns. 83 colonies distributed over all the districts of Kerala were visited. Our survey indicated that around 200 panchayaths of Kerala have pottery activities and around 2500 families are engaged in this work. They belong to 12 different communities viz. Velan, Pandy Velan, Odan, Andhur Nair, Andhra Nair, Adi Andhra, Kumbaran, Tamil kumbaran, Mannudayan, Urali Kumbaran, Kulala and Kusava depending on their origin and migration patterns. They belong to the Other Backward Communities (OBCs), Kumbaran perhaps being the poorest among this group. Professionals or even graduates are rare in any of these communities. Illiteracy is above 50% in the 50+ age group and school dropouts are almost 50%. Even among youngsters only less than 50% reach high school and graduates are just about 2%. Those who earn above Rs. 2000/- per month constitute only 2.13% and those who earn less than Rs. 500/- per month make up 13.3%. In order to understand the technological problems faced by the potters a study was made of the raw material that they use, type of the processing they adopt and the process of shaping and firing of the finished products.

The physical property evaluation viz. percentage of coarse and fine particles, plasticity, shrinkage, cold crushing strength and mineralogical assay of more than 60 samples from

all over Kerala indicated that the clay body prepared by different potters vary significantly and there is no quality assurance for raw materials and no standards with which they could compare their products. They employ manual processes like leg and hand pugging of clay which involves too much of physical labour and drudgery. The present investigation of the technological status indicated that modernization like introduction of pugging machines and motorized potter's wheel can reduce drudgery, increase the quality and production rate of the finished products. With the idea of upgrading their skill a motorized potter's wheel was installed at Pulinelly and training was given to the potters of this colony to work on motorized potter's wheel. A baby pug mill was installed at Integrated Rural Technology Centre, Palakkad, under this program for demonstration and also for preparing pugged clay to be supplied to the beneficiaries. Workshops and training programmes were conducted for different sets of potters and Kudumbasree members in the value-addition of terracotta materials by way of introducing artistic products. Training was also given for decorating pots by decopache and painting techniques. Some of our trainees have taken up these techniques quite seriously as it can definitely improve their earnings. IRTC has prepared 'model projects' on the use of motorized potter's wheel and also on raw material preparations which can be implemented by the Local Self Government Institutions.

The project has helped to develop a clear understanding of the status of the potter communities, their working conditions and the scope for improving their productivity and living conditions through simple mechanization and value-addition to their products.

Chapter I

1. SOCIO-ECONOMIC STATUS OF POTTERS IN KERALA

1. 1. Introduction

Potters were probably the first engineers in the history of human civilisation, the first group to be withdrawn from food production and to be engaged in a full time profession. This was necessitated because the production of earthen vessels for cooking and storage was a specialized task needing a lot of skill and long training. The potter's wheel was a momentous invention, ranking along with the mastery over fire, as one of those which most influenced the course of human development. Every other invention can be said to be an imitation of nature, but not the continuous rotary motion of the wheel on a bearing.

Yet, the traditional potters constitute some of the poorest sections of the society, in all of India, including Kerala. They live in colonies, but are scattered all over the state. They are organized, but are a few in numbers and cannot exert any political leverage. They are skilled, but their skills are outdated and lack relevance to meet the current demands. There have been tremendous advances in ceramic and studio pottery, but the traditional potters have hardly benefited from these.

No reliable studies are available about their socio-economic status or the technical problems faced by them in their production work. They collect their raw material (red clay) from all over the place. Even though it is ubiquitous, its quality varies a lot and no scientific evaluation or mapping of this resource has been done.

The present study was taken up as a joint project of IRTC, Palakkad and RRL Trivandrum, to fill this gap, with the support of the KRPLLD, CDS, Trivandrum.

1.2. Objectives

The project was envisaged in 3 phases.

The objectives during phase 1 were:

1. To identify the traditional potter communities of Kerala and to make an assessment of their socio-economic status.
2. To make an evaluation of the raw materials used by them, the technologies employed by them and to identify the technical problems faced by them and their possible solutions.

The objectives of the second phase were:

1 To address the problems faced by the potter groups

2 To help them acquire skills on value addition to the finished products.

Phase Three was envisaged as a follow up activity and the objective during this phase was to evolve group activities among the potters, through workers' cooperatives or other formations.

1.3. Methodology

Personal interviews and group discussions were the chief methods followed to gather information regarding the socio-economic condition of the potter communities. Secondary data were also collected from several government, private and co-operative institutions related to pottery. A socio-economic sample survey was also conducted among potters.

Several personal interviews were also conducted with the leaders of state level as well as district level potter's associations. The list of the officials interviewed are indicated in Annexure 1.

These interviews helped us to identify the potter groups all over Kerala and also to get an idea of the general problems faced by the potter community.

Group interviews were conducted with several potter groups in each district. In total, 83 groups were interviewed all over Kerala. (Annexure-2).

Some groups were interviewed two or more times to get a clear idea about the techniques they adopted. These interviews helped us to identify the location specific problems and also the region wise living and working conditions of potters, their production methods, products developed and marketing practice. There is considerable difference in their production methods and also in the raw material quality.

Secondary data were collected from a few government institutions and also from several co-operative societies related to pottery which are functioning at present and also from some non functional societies (Annexure-3). Offices of the Potters' association of state and district levels were also contacted. Not much data were available from these offices, except a general idea about the locations of potter groups and also the population of the potter community. We tried to collect data from some private/government institutions engaged in this trade as well. Some information were obtained interviewing the Heads of these institutions and also the employees. (Annexure-4).

Sample survey was conducted in 224 households from 58 potter groups in 14 districts (A typical datasheet is presented in Annexure-2.1). The potter groups were selected by stratified random sampling. The community (caste), the technology adopted and the products marketed were the criteria used to categorise the samples. Through this survey, certain problems identified in the interviews were confirmed and also the socio-economic and educational conditions of the potter communities were ascertained.

1.4. Habitation

In Kerala, potters usually live in settlements in interior villages. Each settlement is related to a particular potter community (caste). Members of two or more communities were never found to be sharing the same settlement. Most of these potter settlements are

located in river basins or near to paddy fields. This is obviously related to raw material availability. In each settlement there will be a few kilns, which are used by all of them irrespective of its ownership. The work area is mostly located adjacent to the homes. In several places the interior of the houses are also used to keep the pots either baked or raw (for drying). In certain places, a few potters were found living in their kiln shed itself. They use the same place as the work area as well.

Most of the settlements have a shrine or temple, which is common to all the families. Most of the potters worship Maariamma or Karuppuswamy. A male member from within their own community functions as the temple priest also.

Potters keep their raw material and fuel in the courtyard or nearby places where space is available. In almost all houses there will be an extension area from the main house / building. This place is used for pottery production work.

During investigation, we have located potter groups in all the 14 districts of Kerala. Palakkad district has the maximum number of potter colonies and Idukki the least. All the grama panchayaths where the potters are found have been listed. In several panchayaths there are two or more potter groups. Leaders of potters' associations claim that their population is in lakhs, but it is not true. The population of these communities may be 20 to 25 times higher than the number of persons engaged in pottery work because in several villages only less than 5% households of potter communities are engaged in pottery. For example, in Kasaragod district, there are 1000 Kulala (Mulya) families residing in Manjeswaram taluk. But none of these people is making pots. We couldn't find any single potter from this taluk to collect clay sample. The following table shows the number of panchayaths in the different districts of Kerala where pottery work is carried out and also the number of families engaged in pottery in each district.

Table 1.1

Number of Panchayaths and the number of households engaged in Pottery.

Sl. No.	District	No. of Panchayaths	No. of households engaged in pottery
1	Trivandrum	15	350
2	Kollam	5	19
3	Alappuzha	3	51
4	Pathanamthitta	3	12
5	Kottayam	7	74
6	Idukki	2	5
7	Ernakulam	24	184
8	Thrissur	33	387
9	Palakkad	40	646
10	Malappuram	13	106
11	Kozhikode	17	157
12	Wynad	17	235
13	Kannur	13	137
14	Kasaragod	7	120
	Total	**199**	**2483**

1.5. Communities

Earlier it has been mentioned that potters live all over Kerala as settlements. These potter settlements belong to various communities. They are known by different caste names in different places.

Kumbaran, Kusavan, Adi Andhra, Tamil cultured Kumbaran, Mannudayan, Kulala, Andhur Nair, Andhra Nair, Velan, Pandy Velan, Odan, and Urali Kurumban are the 12 communities engaged in pottery occupation in Kerala. (Table-1.2) Out of these 12 communities, Kumbaran community is found in Palakkad, Trissur, Kozhikode, Wynad and Malappuram districts. Odans are concentrated in Trichur district and Velans are concentrated in Trivandrum, Kollam, Alappuzha, Kottayam Ernakulam and

Pathanamthitta disricts and also found in Wynad district. Kusavan, Andhra Nair, Andhur Nair, and Adi Andhra (some Kumbarans are known as Adi Andhra and Kusavan) are living in Kozhikode. In Kannur and Kasaragod districts, the potter community known as Kulala. In Kasaragod district the Tulu speaking Kulala community has another name-Mulya. This community has completely given up their traditional occupation in Kerala. But it still exists in Mangalore area of Karnataka. Two ethnic groups of Velan are found in Kollam and two Kumbaran groups in Palakkad district. In Kollam district, Pandy Velan and Malayan Velan appear to be of two different ethnic groups. These two groups were endogamous until recent years. Tamil cultured Kumbarans are living as separate group in the eastern part of the Palakkad district, bordering Tamil Nadu. They have no inter marital relationship with other Kumbarans.. In some places Tamil cultured Kumbarans are known as Mannudayan.

Among the above communities the nomenclature of Kulala, Andhur Nair and Andhra Nair are almost synonymous with each other. In Palakkad district one group of potters, though they call themselves as Andhur Nair, they are mentioned as Kulala in the Government Gazette. But according to a well-known anthropologist, these people belong to the Andhur Nair groups. During the investigation, a potter woman of this community agreed that they belong to Andhur Nair. But they said that there is no difference between both the communities, viz. Andhur Nair and Kulala. Similarly, in Kozhikode district, potters belonging to the Andhur Nair community said that they belong to the Andhra Nair community and there is no difference between these two communities. A few persons of Adi Andhra community participated in Kumbaran association workers convention held at Shornur in the month of June 2000. One of them argued that the Adi Andhras originally belonged to the Kumbaran community, and so they have to be merged with Kumbaran association. But in government list, for reservation in state government services, Adi Andhra community is indicated as Scheduled caste and the Kumbaran, Kulalan etc. are classified among the OBC (other Backward Communities). In Kozhikode district some Potter groups are known as Kusava. Potters of the colony we visited complained that the revenue authorities do not issue caste certificate as Kumbaran. Instead, the authorities

issue caste certificate as Kusava. So they have accepted 'Kusava' as their caste name. They still believe that there is no caste called Kusava.

Districtwise distribution of potter clusters in Kerala

(Number within brackets indicates the number of households)

Thiruvananthapuram

Thiruvananthapuram (23), Neyyattinkara (20), Nedumangad (50), Attingal (40), Nemom (10), Pallichal (2), Kilimanur (50), Pulimath (10), Kazhakoottam (15), Vattiyurkkavu (5), Vembayam (50), Nandiyode (10), Aryanad (10), Amboori (5), Parassala (50).

Kollam

Velinallur (10), Ilamad (1), Poruvazhi (3), Mailam (1), Kulakkada (4)

Pathanamthitta

Kadambanad (3), Ezhamkulam (8), Kadapra (1)

Alappuzha

Thiruvanvandur (9), Muttar (40), Thalavadi (2)

Kottayam

Ettumanur (15), Aarpookara (9), Thalayolaparambu (5), Vellur (17), Udayanapuram (16), Thalayazham (3), Thiruvarppu (9)

Idukki

Thodupuzha (4), Manarkkad (1)

Eranakulam

Thrippunithura (20), Kochi (2), Kothamangalam (3), Kaladi (3), Manjapra (5), Sreemoolanagaram (10), Neeleswaram (4), Karumallur (15), Varappuzha (5), Mazhuvannur (4), Vadavukode-puthenkurisu (8), Aikkaranad (4), Valakom (7), Aayavana (10), Kizhmad (35), Vazhakkulam (12), Cheranallur (2), Kottuvalli (10), Nedumbasseri (4), Parakkadavu (1), Ramamangalam (5), Piravam (2), Thiruvankulam (6), Mudakkuzha (7)

Thrissur

Velur (23), Erumapetty (19), Mundathikode (2), Varavur (6), Mullurkkara (10), Kondazhi (28), Pazhayannur (16), Panjal (14), Vallatholnagar (13), Chelakkara (3), Nadathara (20), Madakkathara (12), Vilvattam (15), Nenmanikkara (50), Kodakara (20), Puthukkad (8), Choondal (4), Kandanisseri (3), Aarthat (5), Aalur (20), Kolazhi (20), Cherppu (10), Ayinisseri (4), Thanniam (20), Manalur (10), Venkidangu (1), Vellangallur (4), Thrissur (3), Nattika (7), Vadanapalli (2), Porathisseri (6), Kadukutti (5), Mala (4).

Palakkad

Kavasseri (80), Puthukkode (30), Vadakkancheri (13), Tharur (21), Kizhakkencheri (10), Vandazhi (20), Erimayur (5), Kottayi (40), Mathur (1), Kuzhalmannam (25), Peringottukurissi (25), Kuthanur (10), Thenkurussi (10), Peruvemba (3), Akathethara (18), Puthusseri (4), Malampuzha (3), Kozhinjampara (15), Eruthempathi (1), Nalleppilli (3), Pattancheri (3), Perumatti (3), Melarkode (22), Nenmara (3), Elavancheri (11), Muthalamada (1), Puthunagaram (2), Pattancheri (3), Perumatti (3), Melarkode (22), Nenmara (30),Elavancheri (11), Muthalamada (1), Puthunagaram (2), Koduvayur (10), Kollankode (15), Shornur (55), Ottappalam (7), Chittur (4), Pirayiri (18), Parali (50), Koppam (8), Kanjirappuzha (10), Mannarkkad (10), Lakkidiperur (22), Mankara (6), Pattambi (10).

Malappuram

Areekode (25), Cheekode (7), Kavannur (2), Vazhakkad (10), Vazhayur (4), Elamkulam (8), Melattur (8), Irumbliam (14), Nilambur (25), Edavanna (17), Manjeri (2), Pulamanthol (12), Alipparamba (8),

Kozhikkode

Kozhikode (3), Vadakara (12), Peruvayal (10), Karasseri (5), Mavur (4), Kunnamangalam (13), Chathamangalam (18), Ramanattukara (20), Olavanna (20), Koduvalli (6), Puthuppadi (4), Koothali (3), Changaroth (2), Perambra (2), Ulliyeri (5), Panangad (2), Kakkodi (30).

Wynad

Meenangadi (15), Pulpalli (6), Sulthanbatheri (50), Nenmeni (12), Noolpuzha (3), Ambalavayal (13), Muttil (7), Meppadi (22), Kaniambatta (7), Thariode (30), Padinjarethara (10), Vellamunda (10), Thavinjal (10), Thondarnad (2), Thiruvelli (2), Panamaram (36), Kalpetta (4).

Kannur

Kannapuram (40), Narath (3), Cherukunnu (40), Pattam (6), Pariyaram (4), Payam (4), Kizhur-Chavasseri (7), Kizhallur (9), Kolayad (4), Chittariparambu (2), Ezhom (3), Thaliparambu (13), Koothuparambu (2)

Kasaragod

Madikkai (60), Pullurperia (10), Kodombelur (7), Pallikkara (10), Bendadukka (10), Muliar (10), Chenkala (13)

Fig. 1.1 Districtwise distribution of potter clusters in Kerala.

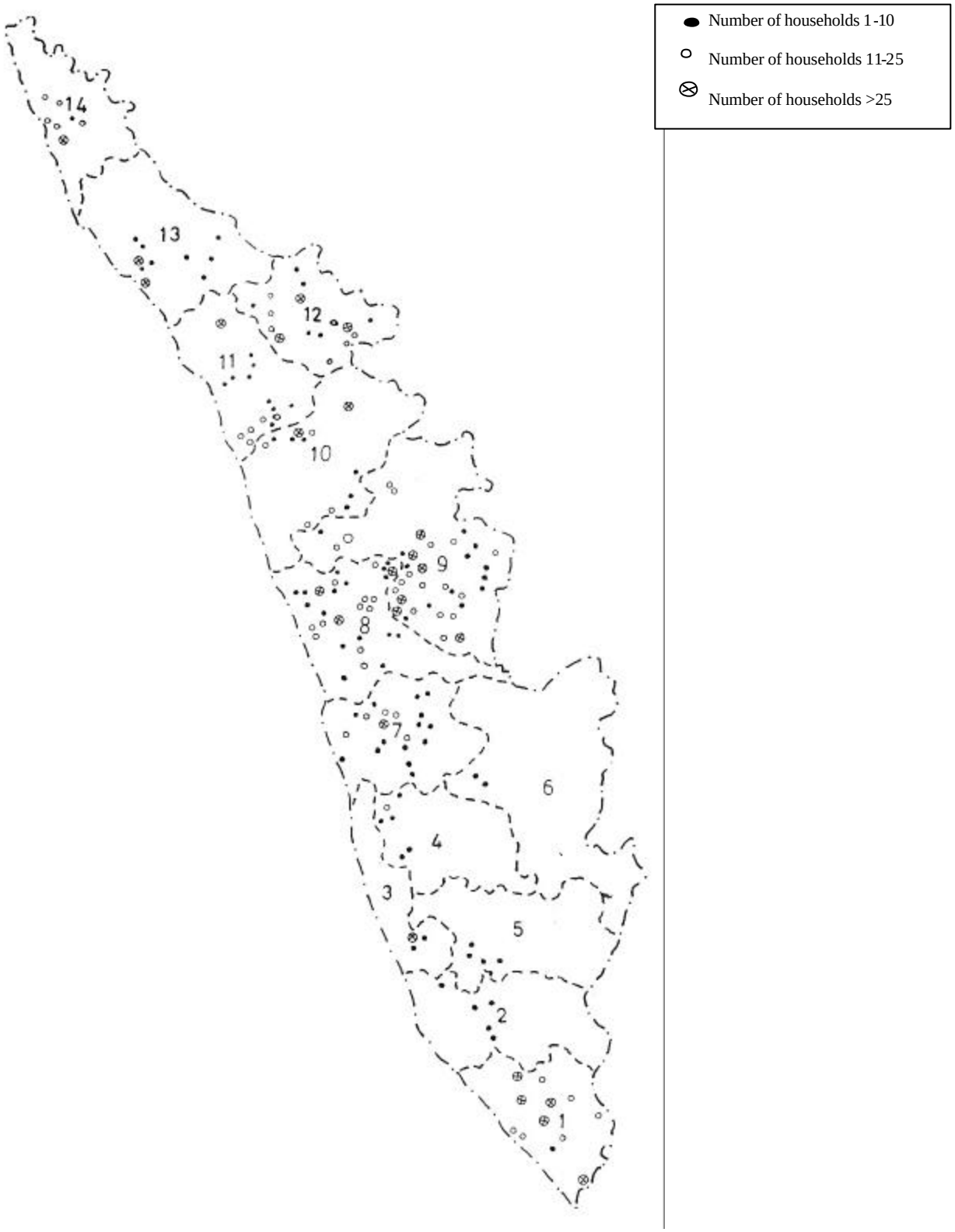

Table-1.2

Potter Communities found in the different districts of Kerala

Districts	Community
Trivandrum	Velan
Kollam	Velan
Pathanamthitta	Velan
Alappuzha	Velan
Kottayam	Velan
Idukki	Velan
Ernakulam	Velan, Kumbaran
Trichur	Kumbaran, Odan
Palakkad	Kumbaran, TamilKumbaran, Kulala/Anthur Nair, Velan
Malappuram	Kumbaran, Andhur Nair
Kozhikode	Kumbaran/Kusavan/Adi Andhra, Andhur Nair/Andhra Nair
Wynad	Kumbaran, Urali Kurumban, Velan.
Kannur	Aadi Andhra/Kumbaran/Kusavan, Kulala/Andhur Nair/Kusava
Kasaragod	Kulala/Anthur Nair/Kusava

1.6. Educational Status

It is noticed that the potters are educationally and economically backward irrespective of the place of residence. They are considered more backward among the 'Other Backward Communities'. One of the reasons for their educational backwardness is said to be child labour that prevailed in their community. We couldn't find much evidence of it now in the colonies. But in early days children used to help their parents in their traditional occupation and it resulted in their dropping out from school. Our survey shows that in

the 50 to 60 age group, 36.7% are illiterates, 51.7% dropped out in primary classes, and only 6.7% reached high school. Among females, 72% are illiterates, 22.8% dropped out in primary classes, and only less than 1% reached high school. The trend has changed among the youngsters in the 20 to 30 age group. 49.29% reached high school and 9.15% reached PDC and 2.11% got graduated. Among females 41.86% reached high school and 19.38% reached PDC and 1.55% became graduates.

In the age group of above 60, 44.26% are illiterates and among female, 70.59% are illiterates. These illiterates or formal literates cannot help in their children's education and that may be one of the reasons for the educational backwardness of their children also. In the age group of 16 to 25, the drop out trend has considerably reduced.

The potter parents encourage their children to help them in their traditional occupation, but on the other hand they have neither the time nor the capability to help their children in their study. Even the female members of the potter family are usually busy with assisting their men folk in their occupation.

Our sample survey of Trivandrum Velan community showed that 8 persons have completed graduation in 100 households. But among the Kumbarans of Palakkad, the number is only one. Among Velans, 27 persons have passed SSLC in 100 households, but the number is only 5 in the case of Kumbarans.

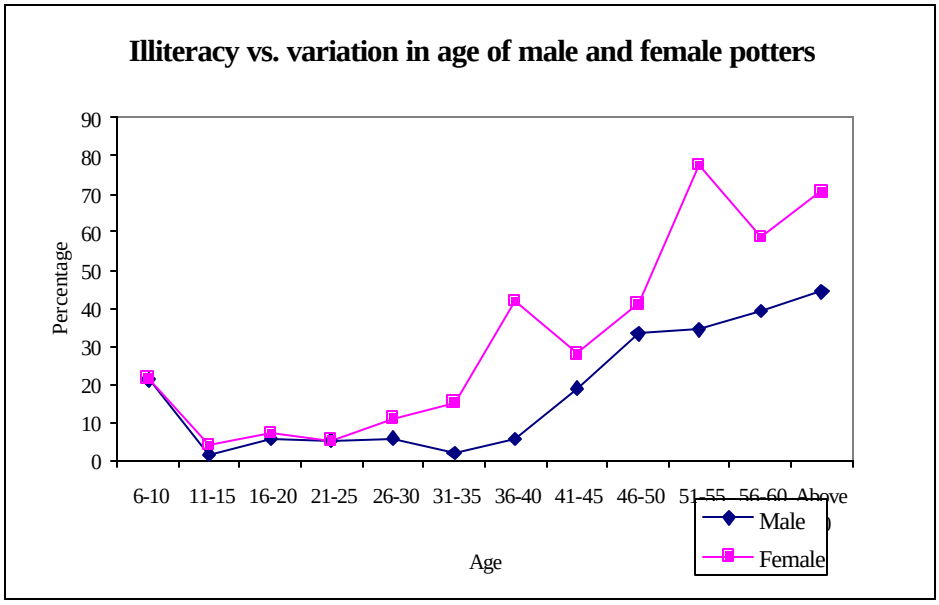

Figure 1.2

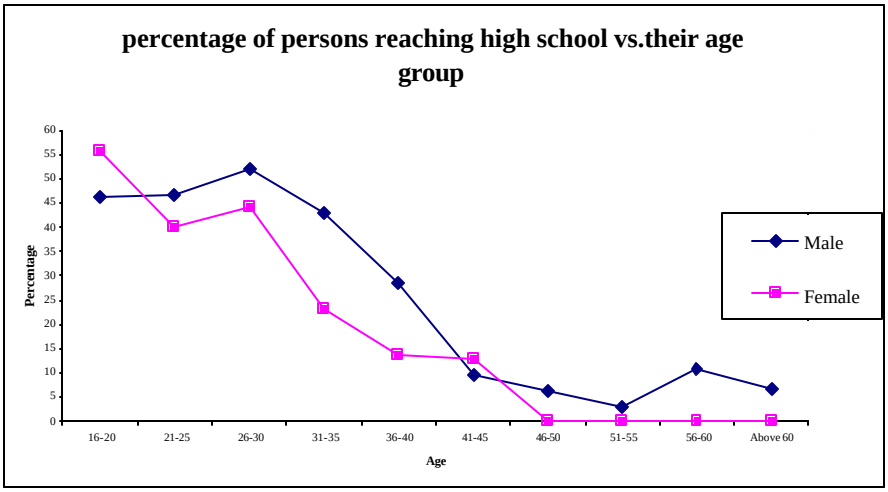

Figure 1.3

1.7. Social Status

The Social status of potter communities is very low in comparison with other backward communities. Representation in constitutional machinery- Legislature, Judiciary and Executive-positions etc. is almost nil. They can boast of only one MLA (who is locally known as a member of Nair community), a few Grama Panchayath ward members and very few municipal councillors are hailing from their own community. Professionals are rare in any of these communities. Persons employed in government sector, or even organized private sector, are very few. Most of the dropouts from their traditional occupation are engaged in manual labour, agricultural labour, masonry work, construction work etc, and some of them are engaged in low paid menial jobs in shops and other institutions. Among the children, only very few students have reached higher education or professional courses. Very few persons belonging to these communities are living in reasonably good living conditions and have reasonable economic status (eg. a

few Odans of Trichur are running tile factories.) Many persons belonging to these communities live in thatched houses. Most of them live in tiled houses, but they are not well furnished. Terraced roofs are rarely found among these communities.

Among the potter communities, Kumbaran community is the most backward one, educationally and economically. We could not find any professionally qualified person in this community. Graduates are very rare in this community. Most of the students from this community stop their studies at the primary level.

The living conditions of these people are also poor. Some Kumbaran families live under their kiln roof and they have no separate shelter for living. In the case of electricity and toilet facility also, there is significant difference between the conditions of Velans and Kumbarans.

Out of 100 houses of Velans in Trivandrum Dist., 90 are electrified and 82 are toileted, but it is 19 and 16 respectively in the case of the Kumbaran community in Palakkad Dist.

Most of these families depend on public wells, public taps and neighbour's well for drinking water. Alcoholism among the male members of the Kumbaran community is one of the reasons for the poor living conditions. The situation is similar in all the communities and all the colonies we visited. We met some inebriated persons in the morning itself, during our field visits. In some places a few persons belonging to this community were engaged in illicit liquor brewing and sales, according to the locals. Even though the communities are included in the OBC list for public services, their share in the government jobs is very poor. Only 2 persons are employed in government sector among the 100 Kumbaran families in Palakkad. It is 5 in the case of Velans of Trivandrum. This is a very low figure compared to some other backward communities, which are included in the OBC list.

Deviation from the traditional occupation is very high in the Velan community. Only 3 out of 100 Velan households are engaged in the traditional occupation but it is 78 in the case of Kumbarans of Palakkad. Modernisation has not yet reached this artisan

community. Very few Velan potters use motorised wheel. In the case of kiln, most of them are using traditional kilns. We also found the round shaped improved kiln, but its fuel consumption is very high in comparison with traditional kiln. No individual potter uses the pug mill. They pug the clay using their foot and hand, which needs considerable physical effort. In Trichur district, some Odan potters, engaged in tile making, use round shaped and square shaped improved kilns. They have no technology at hand to test the clay quality, temperature of the kiln, etc. They adopt traditional methods in colouring and polishing Kumbarans use red earth for colouring the products, and cloth pieces for polishing them.

1.8 Dropouts and Reasons

During the investigation it was found that potter communities are prevalent in all the districts of Kerala. It was also noticed that drop out from this profession is also high in all these districts. Investigation revealed that in several villages, especially in southern districts of Kerala, many potters have completely abandoned their traditional occupation. In Kasaragod district a potter community, the Tulu speaking Kulalas, have completely discontinued the pottery occupation. Drop out is comparatively less in Central Kerala. Taking Trivandrum and Palakkad as examples, around 75% of Velans have given up pottery profession but only around 25% Kumbarans have dropped out traditional occupation. Most of the dropouts are engaged in manual labour, construction work, masonry work, etc. Odan community members have started to produce tiles or are engaged as tile factory workers. In Kozhikode Andhur Nair community members rarely make pots, but some persons hire Kumbarans to do the work.

Following are the main reasons for drop out from one's traditional profession according to the informants:

* *High drudgery in the work*
* *High cost of production, cost of clay and fire wood*
* *Lack of sufficient demand for products*
* *Lack of proper remuneration*
* *Lack of daily earnings*
* *Scarcity of clay*

* *Perceived inferior status of their profession.*
* *Inflow of pots from neighbouring state causing reduction in quantity of sales and profit*

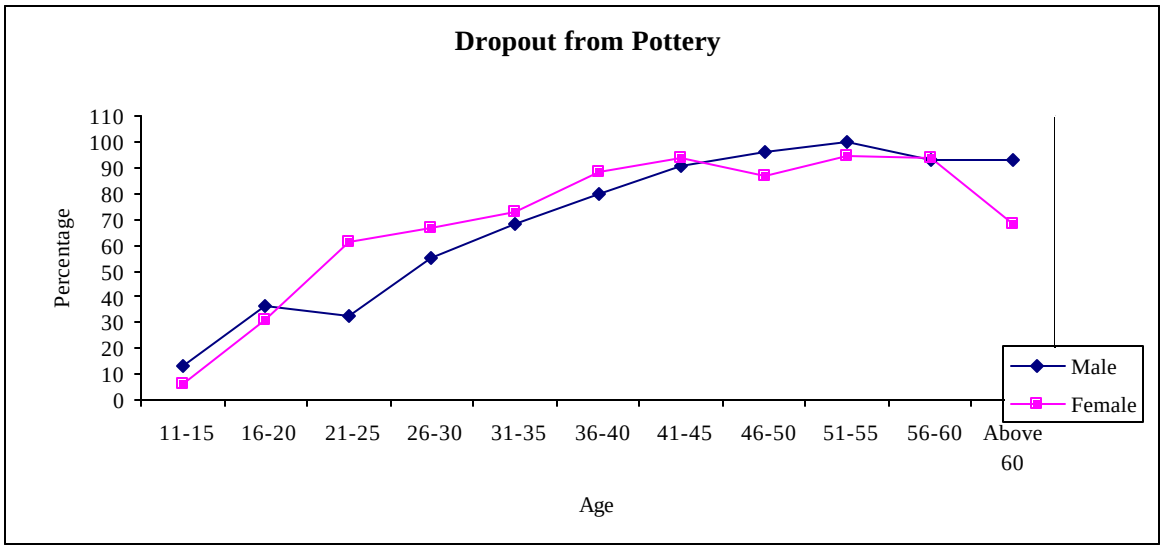

Fig. 1.4

1.9. Alternatives

We cannot say that the dropouts are engaged in any particular occupation, from the information collected. Occupation of these dropouts vary from village to village. In one village most of the dropouts are engaged in small trade and vending but in another village it is masonry work and helping in masonry work. One thing we can say for sure is that even those who have switched over to other professions were not faring well in their new occupations. The only exception is on Odans of Trichur. Some of the potters in one or two villages have switched over to making ceiling tiles, which is related to their clay work and they are faring reasonably well.

Major alternate Occupations:

Manual labour	Masonry work
Construction work	Agricultural work

Brick and tile factory work Other skilled works

Other menial works.

In a few places potters have started to change their traditional techniques although they are only a handful. But it is noticeable and will be inspiring to the other potters who are engaged in traditional pot making.

1.10. Economic Status

Potters are mainly dependent on their traditional occupation for their income. Very few have other sources of income like government or private employment. Among the 231 households surveyed 160 families are engaged only in pottery. Out of this, 170 males and 133 females are engaged in pottery work. None of these potter families is happy with the earnings from the pottery profession.

Tables 1.3 and 1.4 indicate the income pattern and occupational status of the potter community.

Table 1.3. Monthly Income of Potters

Sl. No.	Income group	No. of Households	Percentage
1	<500	25	13.29
2	500-1000	72	38.30
3	1000-1500	46	24.47
4	1500-2000	41	21.80
5	>2000	4	2.13
Total		**188**	**100**

Table 1.4. Occupational Status (Percentage)

Sl. No.	Occupation	Male	Female	Total
1	Pottery	54.7	55	54.8
2	Masonry work	1.1	0.2	0.7
3	Manual labour	4.3	1.2	2.9
4	Brick &tile work	1.3	0.3	0.8
5	Sales person	1.1	0.2	0.7
6	Maid servant	0	0.2	0.01
7	State govt. employees	0.1	0.2	0.2
8	Central govt. employees	0.3	0	0.2
9	Working in pvt. Concerns	1.1	0.7	0.9
10	Other skilled labours	2.4	0.7	1.6
11	Employed abroad	1.6	0.2	0.9
12	Agriculture	0	0.2	0.1

The living condition of the potters is not generally good. In certain villages some potters are living under the kiln roof. Even though some of them are living under the tiled roofs, these facilities are very poor. In certain areas 30 % houses have thatched roofs. In both cases the potters are working in the area attached to the houses. Concreted houses (RCC) and double storied or well-furnished tiled houses were very few. (Table 1.5)

Table 1.5. Type of houses of the surveyed households

Sl. No.	Type of house	Nos.	Percentage
1	Thatched	25	11.16
2	Tiled	184	82.14
3	Terraced	15	6.69
Total		**224**	**100**

It is noticed that there is hardly any other mode of supplementary income to these communities. Few possess domestic animals like cows, buffaloes or goats. Land holding of members of these communities is also very small. Most of them have less than 10 cents of land. Only very few families are holding agricultural land. In lean seasons they depend on manual labour for living. A few of them opined that they do not know agricultural work, so the landowners do not like to employ them, otherwise they could have gone for agricultural work in the lean seasons. Most of them complained that they have to depend on money lenders for money to purchase clay and fire wood. Now a days these potters have to pay for clay to the land owners. The amount varies from place to place. In olden days they did not have to pay for clay. Cost of clay is Rs 500 to 2500 per lorry load in different places. Along with this they have to pay for transportation charge. Most of them collect 2 lorry loads of clay per year. 6 to 10 labours are required to collect the clay. It varies according to the depth of clay source and quality of clay. Total cost of clay may be up to Rs 8000 per load, according to the distance of the clay source. During production they have to spend a considerable amount of money for firewood, husk and hay. More than 85% of these potters are using traditional kiln so the fuel consumption is very high. In olden days firewood was collected from various places free of cost but now a days its cost has gone up considerably. That has resulted in the hike of production cost. Apart from these, another problem is the high damage of the products in the kiln during firing. The damage happens when most of the work is completed and the damage is 5 to 50 percent at certain times. In such cases, potters lose up to 50 % of the products before the completion of the manufacturing process. They have to work for 10 to 30 days to prepare the pottery articles for a kiln firing. It varies according to the size of the kiln and the number of workers. Most of them fire the kiln twice a month. In the case of usage and mechanisation of equipments, most of them adopt the traditional body preparation methods. Minor mechanisation has happened in the case of wheels. A few of them have changed their traditional wheel, from stone to ball bearings. The use of this type of primitive technology is a major reason for their poor plight. These problems compel them to accept other occupations, which are inferior in social status to pottery, like agricultural labour, and unskilled labour etc. Table 1.6 indicates a rough calculation of the income of

a typical four member potter family (man and wife and two children) A typical cost calculation for terra cotta production is indicated below.

Table 1.6. Cost calculation of pottery production

Clay quantity required for a year	2 Tractor loads
Cost of clay at source (2X100)	Rs. 200/-
Transportation (2X450)	Rs. 900/-
Labour (6 man days)	Rs. 600/-
Other expenses	Rs. 200/-
Fire wood per year (2100kg)	Rs. 3150/-
Husk (2800 Nos.)	Rs. 840/-
Hay (280 bundles)	Rs. 560/-
Transportation (for sales)(350X14loads)	Rs. 4900/-
Food expenses (Rs 30X10daysX14 Trips)	Rs. 4200/-
Total expenses	Rs. 15,550/-
Production per day	25 pots
Interval of each kiln firing:	25 days
Total no of kiln firing per year	14 Nos.
No. of pots per kiln	350 Nos
Damage during firing	10%
Total pots per year	4410 Nos
Average rate per pot	Rs.10/-
Total cost of 4410 pots @ Rs.10/-	Rs. 44100/-
Income after expenditure	Rs. 28,550/-
Based on this cost calculation the average income per day per family	Rs. 78/-

The major works, pugging, making of pots on wheel, finishing of the pots, placing of pots in kiln, and kiln firing are the Potter men's work. In pottery work irrespective of the communities and colonies, women participation is higher than in the other traditional jobs. The work of women varies from place to place. But in all places and all

communities, women dominate in marketing and also in collecting clay. Among Palakkad Kumbarans, women make hand made pots, and do the finishing (polishing, colouring and drying) of the wheel made pots. In Trivandrum area potter women make hand made pots rarely and do the finishing of the bottom part of the pots. Polishing, drying and helping to place the pots in kiln are women's work, irrespective of community. Among Palakkad Kulala community, potter women help to make moulded products. Kumbaran women collect the fuel- firewood and coconut husk- from villages.

All over Kerala, children's participation in the pottery work has come down considerably, of late. The children's participation is found only in very few Kumbaran colonies which are in very poor condition. Their help is in drying the products - taking the products to the sunlight and then to the shelter. Now a days the potter parents do not like to engage the children in their traditional occupation. The children also dislike it.

1. 11. Products and Processes

a. Products

In olden days potters used to make earthen wares for cooking and also for storage of grains and other items. Pots were also used for rituals in temples by all communities. These products were used commonly in all villages.

Vessels used for cooking, pots used for gardening and, mattoms used for toddy drawing are the major products currently in this field. Water storing pots, different types of stoves and chulah moulds, tiles, irrigation pipes, products for indoor and out door decoration and fancy products are also produced by the potters. In Palakkad and Trichur districts, Kumbarans are making kitchen vessels, flowerpots, and some studio pottery items. Kulala community makes flower pots, irrigation pipes, stoves, corner tiles etc., which are made by moulds. In Trivandrum and Ernakulam, Velan communities mainly concentrate in toddy pots manufacturing. Some of them are making kitchen vessels, flower pots, studio pottery items etc. In Trichur district some of the potters are engaged in ceiling tile manufacturing. Some institutions in Trivandrum, Ernakulam and Palakkad are manufacturing flowerpots and other studio pottery items. Qualities of the products vary from place to place. Even the colour of the products of Kumbaran and Velan are

different. Kumbaran's pots are red in colour, and it is very thin (it varies according to the type of the products). Velan's pots are pale red in colour and are thick. In parts of Kannur and Kasaragod it is found that the outside of the pots are coloured (usually red earth). Outside 'finishing' (polishing and colouring) is also different in these two groups' products. But in North Kerala the outer sides of pots are rough. Some of the institutions use modern techniques in manufacturing processes. They use motorised wheels, pug mills and chemicals for colouring the products-etc.

b. Techniques

There are three types of pottery items currently made in Kerala. They are: Wheel made pottery, Hand made pottery and Mould made pottery.

In all the districts the potters are using these three methods, but there is some difference in the tools or equipment, in different areas and in different communities. The Kumbaran communities of Palakkad, Trichur and Kozhikode are using 'spoked wheel'. But the Velan community of Trivandrum, Kollam and Ernakulam are using 'spokeless wheel'. In Trichur district, Odan community diversified their products to ceiling tiles. Only very few people are manufacturing pots these days. For ceiling tile manufacturing, these people use dies and machines, which can be operated by hand. In Palakkad, Kulala community members are mostly making moulded pots. For this they are using wooden moulds. The polishing and colouring tools are traditional. In all these cases specially made stones are used for finishing and polishing of pots and red mud is used for colouring. In institutions, pug mill, motorised wheel and moulds are widely used. Motorised wheels are rarely used by individual potters.

Table 1.7. Types of products prepared in different methods

1. Wheel made	2. Mould made	3. Hand made
Kitchen vessels, Flower pots Studio pottery, Fancy products Smokeless chulha mould Toddy drawing pots	Irrigation pipes, Flower pots Corner tiles, Fancy products Stoves	Kitchen vessels Flower pots Water storing pots Fancy products Stoves

The potters collect clay from the paddy fields. Good quality clay is often found at 1 to 4 metre depth. They usually dig a trial pit to check the clay quality. If the clay is good, they make it as balls and get it to their work place by head load or vehicles. Potters collect clay in summer seasons, and usually use it for a year. According to the type and quality of clay they mix two or three types of clay to get the required plasticity. Potters keep the required clay in water for a night to make it soft and the next morning they add sand manually and stamp with feet, then slice the clay with a knife or specially shaped stick to remove the stony matter. After that the mixture is once again pugged. Then the required quantity of clay is placed on the wheel, according to the wheel's capacity and efficiency. Usually spoked wheel can accommodate more clay than the spokeless wheel. After attaining optimum speed, the clay is shaped to the required shape and size. When the required specifications are attained the object is cut from the wheel with the help of a thin stick or a wire and separated by hand. After sun drying they finish the bottom side of the pot with small quantity of clay by using specially designed stone and a wooden tool. Then they keep it for drying again and polish it with cloth pieces and colour with red mud. In mould made pottery, the potters make sheets of pugged clay and rap it on to the moulds and make it into the required shape. In hand made pottery, potter women use the pugged clay to make pots with their traditional skill, drying and firing are done as usual.

After enough drying they place the pots in kiln for baking. Most of the potters use the traditional type of kiln. They place the raw pots (kaccha pots) in the kiln systematically with firewood and husk (in some places) which need very good skill. After that they cover the pots using hay and mud. Then they keep the wooden pieces inside of the kiln and after that the kiln is heated by light firing. After attaining a certain temperature, wooden pieces are burned in the kiln. At that time the wooden pieces and the firewood and husk kept in the kiln starts burning. A few hours after completion of burning they remove the products from the kiln. This entire process takes 2 to 3 days totally. Some of the Kumbaran families in Palakkad bake their products in the courtyard, as they have no kiln, traditional or improved. But this is an absolutely miniaturised form of a country kiln. In Trichur district some potters use round shaped or square type brick lined kiln. Most of the Pot makers use traditional round kilns only. In Ernakulam, one

entrepreneur person had built a round shaped kiln, but it is not in use now. According to him the breakage and fuel consumption are more in that type of kiln.

Table 1.8 Status of modernisation

Item	Traditional	Improved	Both
Kiln	86.61	10.71	2.68
Wheel	61.16	32.14	5.36
Colour	87.05	1.34	-
Polishing	84.37	0.89	-
Body preparation	80.36	1.34	17.41
Raw material	100	-	-

Table 1.9 Kiln status of the surveyed households

Sl. No.	Kiln status	Nos.	Percentage
1	Own Kiln	150	66.96
2	Neighbour's kiln	50	22.32
3	Common kiln	24	10.71
Total		**224**	**100**

The evaluation of the socio-economic status of the potters of Kerala invariably shows that in spite of their skills and ability to work hard they are economically, educationally and socially at the lower strata of the society.

Chapter 2

2. TECHNOLOGICAL EVALUATION

Clays are formed by the weathering of feldspathic rocks. This process is known as kaolinization. Feldspar is represented by the molecular formula $K_2O.\ Al_2O_3.6SiO_2$ and the Kaolinization reaction can be represented as follows.

$K_2O.\ Al_2O_3.6SiO_2$ ----------> $Al_2O_3.2SiO_2.2H_2O)$ + $4SiO_2$ + K_2CO_3

(Feldspar) *(Kaolinite)* *(Silica)* *(Pot. Carbonate)*

Potassium carbonate (K_2CO_3) is leached out by rainwater and the silica (quartz) formed remains along with the clay. Kaolinite clay is hence usually associated with impurities like quartz grains and under composed feldspar. Apart from these, clay contains iron in different forms (oxides, hydroxides and oxyhydroxides), organic matter (humus) and mica. The colour of kaolin varies from white to cream to pale black. When kaolin is contaminated with illite, feldspar, quartz and ferric oxide the colour remains brown and the clay is termed red clay or red mud. This type of clay is usually found in riverbeds and low-lying areas like paddy fields and ponds. They have high plasticity and characteristic shrinkage. Some details regarding these properties are discussed.

2.1. Clay Source/Raw materials

During investigation it was noticed that there are clay sources in all districts except Idukki. But the potters collect clay from different locations, some times near, and some times far of. Even the potters from the same colony collect clay from different places. And also potters may change clay source year by year according to their convenience. For example, Potters from Idukki collect clay from Palakkad and Potters from Kozhikode and Malappuram may collect clay from Wynad. Clay is usually collected from the paddy fields where good quality material is available. All communities in all the districts prefer to collect clay from sources known to them traditionally. They check the quality of clay before collecting. In olden days they used to collect it from the neighbouring paddy fields, without paying any money, but now a days they have to make payment to the landowners. And they have to transport the clay to their places using vehicles because now there is no clay source in their neighbouring fields. Because of the scarcity of good quality clay they started using available clay, which resulted in increased breakage of

products during baking. In Trichur district some of the potters making ceiling tiles collect flooring tiles (unbaked) from the tile factory and use it for making ceiling tiles. This way they get pugged clay on payment. The potters of a few colonies in Ernakulam and Trichur district also collect pugged clay from the tile factories of Trichur district. Most of the potters have started using more than one type of clay due to lack of a single good quality clay, which has all the required properties.

Table 2.1 Reported clay sources in each district

District	Clay Source	District	Clay Source
1. Trivandrum	Amaravila, Nemom	8. Palakkad	Alur, Kavasseri, Yakkara, Shornur, Akathethara, Parali, Alathur, Thrithala, Peringottukurissi, Puthunagaram, Nenmara, Melarkode, Pirayiri, Vadakkencheri, Athalur
2. Kollam	Oyur, Kulakkada, Poruvazhi	9. Malappuram	Edavanna, Cheekode
3. Pathanamthitta	Enath-Ilangamangalam, Thuvayur-Kadambanad	10. Kozhikode	Mavur, Olavanna, Vadakara
4. Alappuzha	Thalavadi	11. Wynad	Kalpetta, Meppadi, Maikkad- Mananthavadi
5. Kottayam	Thiruvarppu, Kidangur, Vaikkaprayar	12. Kannur	Munderi, Thaliparambu, Kannapuram
6. Ernakulam	Kizhmad, Karumallur, Alangad, Vaikkom, Angamali, Chengamanad, Paravur	13. Kasaragod	Pullurperiya, Erikkulam, Manya
7. Thrissur	Kondazhi, Thirumattakkode, Venkidangu, Thanniam, Chittisseri, Oorakam, Painkulam, Kanjani		

The details of the physical properties and their experimental procedures are presented below.

2.1.1. Plasticity and its significance

Plasticity is that property which enables materials to be deformed without rupture during the application of force which exceeds the yield value of materials. In clay there should be enough moisture to obtain this property. There are two types of approaches concerning plasticity.

1. Fundamental influence of molecular attraction and surface tension
2. Secondary influences
    a. Due to colloidal condition and bacterial action.
    b. Due to specific shape and size distribution of the non clay materials.

Not only that the plasticity of a clay depends on the kind of clay, but it is also effected by fineness of grinding, amount of water added, degree of electrolytes present, thoroughness with which it is mixed with water, aging and temperature of the mix.

It has been established that the chemically combined water in clay structure ($Al_2O_3.2SiO_2.2H_2O$) is responsible for the plasticity because clay loses its power to become plastic after it has been heated to a dull red heat, ie. the same temperature at which the chemically combined water is driven off.

The plasticity of clay is also at least partly due to the extreme fineness of clay grains. This enables sliding of one particle over the other in presence of water. This is because clays are composed of a number of small plates. These plates are assumed to act as two pieces of glass when wet and it is very easy to slide one plate over the other, but almost impossible to pull them directly apart.

The plasticity, the strength obtained during drying and the properties of a fired piece are greatly affected by the size and shape of clay grains. In other words the properties are affected by the texture of a clay. More grinding the clay undergoes, the more fine its texture becomes.

2.1.2. Shrinkage

During drying the water is driven off from a clay body. The removal of water film and absorbed water results in shrinkage. The last traces of mechanically combined water in clay can be removed by heating the clay above the boiling point of water ($_{100}{}^{o}C$).

Clays differ greatly in their shrinkage. The degree of variation of drying shrinkage of clays is similar to the variation in the amount of water necessary to develop their plasticity. Greater the plasticity of clay, greater will be the water absorbed and greater will be the thickness of water film and greater will be the shrinkage when it is dried.

Likewise, clays which contain more clayey substance and less non-plastic clays will show high shrinkage. Because of high shrinkage some clays are difficult to get dried without undergoing cracking. The outside of a bigger and larger piece tends to shrink faster than the inside and this is the reason how surface cracks take place.

Non-plastic and non-shrinking material addition can decrease the magnitude of shrinkage and also the tendency to crack. Sand is usually added to a plastic clay to reduce shrinkage in the manufacture of bricks. Lesser the shrinkage of a clay better it is for the pottery, of course the required plasticity has to be maintained for workability.

2.2. Effect of heat on clays

Since pottery articles are produced by burning clay, the effect of heat on clays is of great significance. Upon heating clay above 100^0C, all the mechanically combined or absorbed/asorbed water is converted into steam and escapes. Above this temperature clay is free from adsorbed or uncombined water. From this dehydrated stage, clay can be brought back to a plastic material by adding water. But when the hydrous aluminosilicate is heated above 400^0C, the clay mineral breaks down and the chemically combined water gets removed. In other words the clay gets dehydroxylated.

The firing stages of clay are

a) dehydration (20-150^0C)

b) dehydroxylation (150-600^{0}C)

c) Oxidation (350-950^{0}C)

d) Vitrification (above 900^{0}C)

During the last stage i.e, vitrification, the most fusible ingredients melt, the molten material attacks the unfused material and takes it into solution, the liquid formed flows in to the pores making a denser piece, permitting shrinkage. As the clay is vitrified, the glassy bond increases. The strength of this material can be measured by finding out the crushing strength of the piece.

From what has been explained earlier it is clear that the properties like the amount of non clay materials in a clay, the plasticity, and shrinkage of the clay body as well as the strength of the material after firing are very characteristic properties which are to be understood for preparation of clay bodies. Hence the clays collected from different locations or clusters (Table – 1) have been evaluated for the following characteristics.

2.3 Characteristics/properties investigated

a) Amount of coarse material in a clay (grit content)

b) Plasticity

c) Green shrinkage or dry shrinkage

d) Fired shrinkage

e) Water absorption of the fired body

f) Cold crushing strength of the fired samples

g) Mineralogical analysis (The procedures of the above techniques are explained below).

2.4. Details of the experimental procedures

2.4.1 Grit analysis (coarse particles/grit content)

About 100g of dry clay was weighed accurately. To this one litre of water was added, followed by 50 ml of 1% tetra sodium pyrophosphate (TSP). It was agitated briefly for

complete deflocculation. The slurry was then poured through a 350 mesh BS sieve. The residue retained on the sieve has been reported as grit (minus 45 microns).

2.4.2. Determination of water of plasticity

Principle

The water content of the clay at the point of maximum workability is determined.

Procedure

Dry thoroughly about 500g of clay at a temperature of 70^0C and crush to pass through 250 mesh IS sieve. Work up the sieved clay with water, by adding small quantities from the burette, to a soft plastic consistency and thoroughly wedge and knead it by hand. Allow it to age for 24 hours, keeping it covered by a wet cloth during the period. After 24 hours, knead the plastic mass again and pug it well by further small additions of water until proper working consistency for either extrusion or moulding into bars is obtained. Take three equal portions of this clay mass from different portions, the edges and corners rounded to avoid any handling loss, and weigh immediately to the nearest 0.01g.

Dry the three portions of the clay at 110 ± 5^0C to constant weight. Cool them in a desiccators and weigh to the nearest 0.01g.

Calculation

$$\text{Water of plasticity (\%)} = \frac{(A - B) \times 100}{B}$$

Where A = weight in g of the plastic clay mass, and

B = weight in g of the dried clay mass

2.4.3. Determination of dry linear shrinkage

Principle

The dry shrinkage of a clay is determined by measuring the decrease in one dimension of a clay mass, when the water content is reduced from the plastic state to the dry state at 110^0C.

A collapsible brass mould with internal dimension of 2.5 x 2.5 x 12 cm was used to make the test specimens. The clay sample was kneaded thoroughly. The inside of the brass mould was smeared with petroleum jelly or oil. Clay mass was pressed into the mould avoiding entrapping of air. Excess clay was removed. The surface was smoothened and 2 points were marked approximately 10 cm apart. The distance between these points were measured accurately. The test specimens were dried slowly under a wet cloth for 48 hours. Then samples were oven dried at 110$\pm$5^{o}C for 24 hours and cooled in a desiccator. The distance between the reference points were measured for 5 different specimens and the average of the dry linear shrinkage was calculated.

$$\% \text{ of dry linear shrinkage} = \frac{(A-B)x100}{B}$$

A is the length of the bar before drying

B is the length of the bar after drying at 100^{o}C

2.4.4. Determination of fired Linear Shrinkage

The samples after dry shrinkage measurement were loaded in a muffle furnace. The temperature was raised at a rate of 100^{0}C per hour to 900^{0}C. The samples were soaked at this temperature for one hour and the distance between the marks (made for dry shrinkage measurements) is measured accurately. The percentage shrinkage was calculated.

$$\% \text{ of fired shrinkage} = \frac{(A-B)x100}{B}$$

A is the length of the dry bar

B is the length of the bar after drying at 900^{o}C

2.4.5. Determination of water absorption of the fired body

Buttons of 1” diameter and 1” height have been prepared. These samples have been dried at room temperature and then at 100^{o}C. On heating at 100^{o}C the moisture content, both adsorbed and absorbed will be removed. These samples are sintered at 900^{o}C at heating rate of 100^{o}C per hour with soaking period of 1 hour at 900^{o}C.

2.4.6. Measurement of Cold Crushing Strength

The ability of the material to retain the shape when subjected to compression is the cold crushing strength. Hydraulic press is required to perform this test. Dry test pieces (cubical 5 x 5 x 5 cm) were used for the above tests. Cold crushing strength (CCS) is reported in ($kg/cm^{2)}$ is calculated from the ratio W/A.

Where W – total maximum load in kg applied to break the sample using a universal testing machine.

A – average of the gross areas of top and bottom in cm^2

2.4.7. Mineralogical investigation

X-ray analysis is the finger print technique for the identification of mineral constituents. -45 micron sample was subjected to X-ray analysis using Ni filtered CuKα radiation. Figures 1.5 and 1.6 represent the X-ray patterns of the clay samples from Trivandrum and Thrichur Districts.

Fig. 2.1. X-ray pattern of clay from Trivandrum District (Thozhukkal)

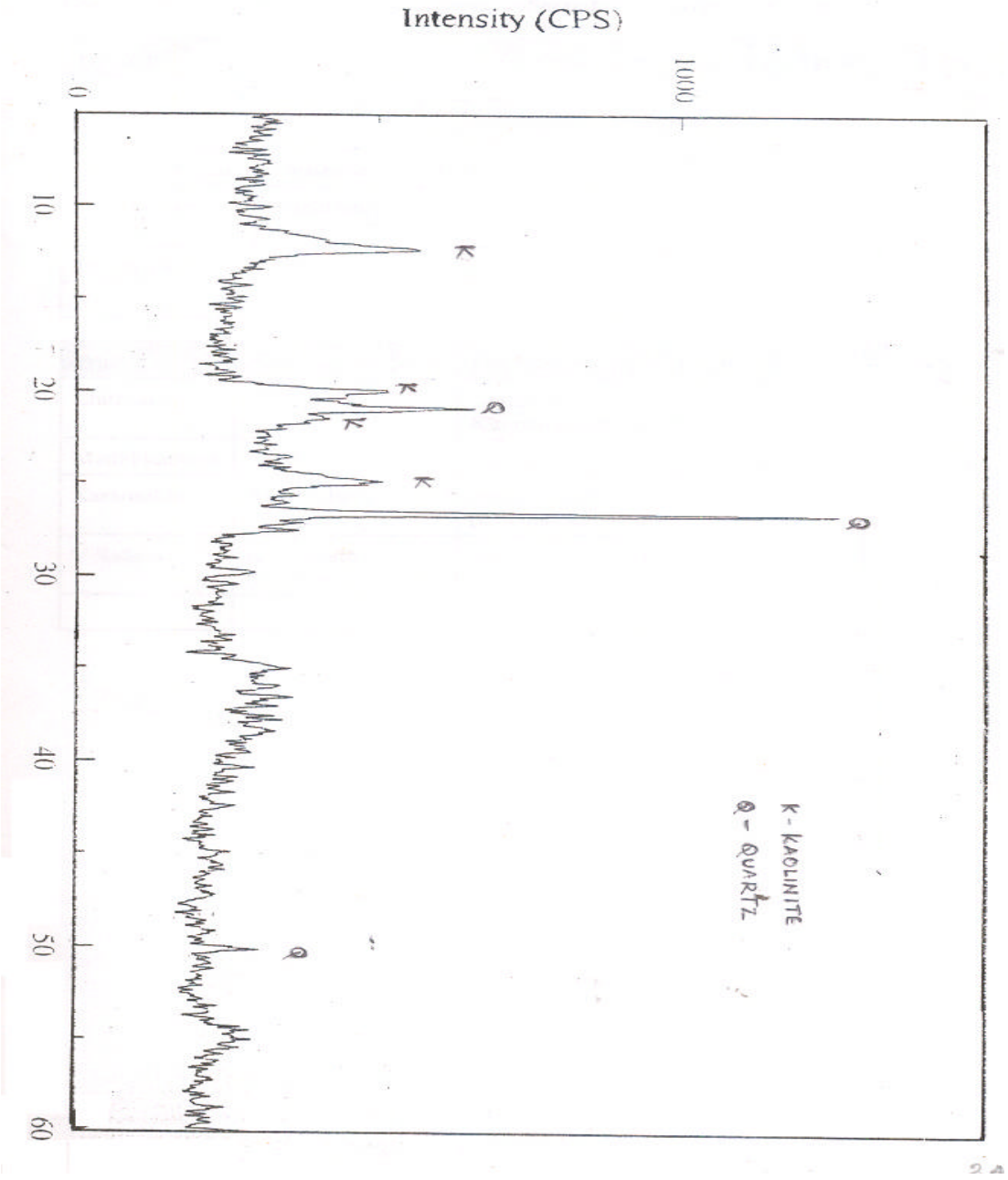

Fig. 2.2. X-ray pattern of clay from Trissur District (Villadom)

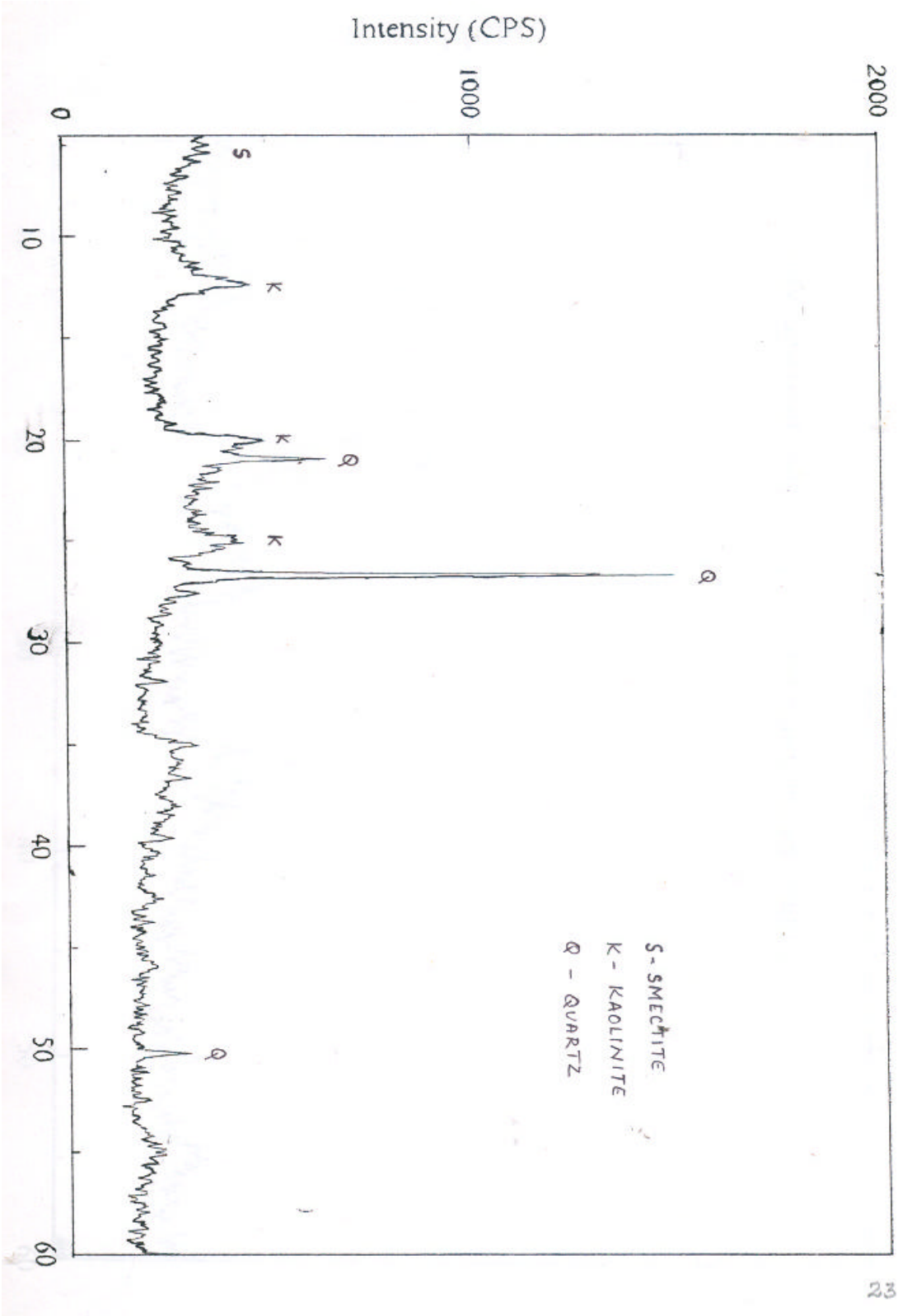

Table 2.2 Clusters from where samples have been collected

Trivandrum	**Kollam**	**Pathanamthitta**	**Alleppey**	**Kottayam**	**Ernakulam**	**Trichur**
Pamamcode	Kalavayal		Thalavadi	Chegalam	Karumallur	Chittissery
Pullamala	Poruvazhi	Valanjavattom	Kallissery	Kattachira	Eroor	Madakkathara
Mudavanmugal	Anthaman	Thuvayur (South)	Thiramallikara	Vaikaprayar	Enathu	Karamukku
Melamcode					Muthirakkad	Vilpadam
Thozhukkal Amaravila					Ezhipram	Nadathara, Panjal, Villadam
Palakkad	**Kozhikkode**	**Malappuram**	**Wynad**	**Kasargode**	**Kannur**	
Pulinelli		Elamkulam	Alamkandi	Paika	Moothammal	
Parli-Thenur		Aruvakkodu 1	Kanacheri	Punnapalam	Paravur	
Akathethara	AKG Colony	Aruvakkode 11	Madiyur Kuni	Erikkulam	Thricham baram	
Kodakkattu Parambu	Olavanna	Melettoor	Nadavayyal	Kayakulam		
Melarcode	Nandiyar Kunnu (Koothali)	Mavoor	Attakandi			
Kuzhalmannam						
Pilappally						
Padoor						
Thirunellay						
Nadathara						
Kondazhi						

Tables 2.3 to 2.15 present the physical characteristics of clays from different districts.

Table 2.3. Physical characteristics of clays from Thiruvananthapuram District.

Sl. No.	Sample location	Grit content (%)	Fines (%)	Plasticity (%)	Green / dry shrinkage (%)	Fired Shrinkage (%)	Water absorption after firing (%)	Cold crushing strength (kg/cm^2)
1	Pamamcode I	19.1	79.9	40.6	8.66	10.33	17.5	215.61
2	Mudavan mugal	24.2	75.8	31.6	6.66	8.5	21.2	188.28
3	Melamcode	22.2	77.8	39.4	7.33	9.18	22.3	157.03
4	Pamamcode II	22.9	77.1	31.9	7	8.88	16.5	232.44
5	Thozhukkal	14.5	85.5	34.5	6.83	9.1	15.42	203.54
6	Amaravila	23.4	76.6	26.14	7.62	8.5	15.82	196.42

Observation: Of the seven samples analysed the sample from Thozhukkal looks to be the best. This contains a grit percentage of only around 15%. The percentage of fines is around 85, which indicates that the clay is very good for high quality terracotta materials.

Table 2.4. Physical characteristics of clays from Kollam district

Sl. No.	Sample location	Grit content (%)	Fines (%)	Plasticity (%)	Green shrinkage (%)	Fired Shrinkage (%)	Water absorption after firing (%)	Cold crushing strength (kg/cm^2)
1	Anthaman	3.68	96.32	34.34	8.91	2.16	20.96	309.46
2	Poruvazhi	13.2	86.8	12.48	8.54	1.1	14.92	169.43
3	Kalavayal	24.2	75.8	33.55	6.54	8.66	12.50	335.43

Observation: clay collected from Anthaman has more than 95% of fines. It has good plasticity, low-fired shrinkage and high cold crushing strength. The properties indicate that the clay is suitable for fine red clay products.

Table 2.5. Physical charecteristics of clays for Alappuzha

Sl. No	Sample location	Coarse fraction	Fine fraction (%)	Water of Plasticity (%)	Dry linear Shrinkage(%)	Fired linear Shrinkage (%)	Water absorption after firing (%)	Cold crushing strength (kg/cm^2)
1	Thalavadi	30.62	69.38	29.80	8.88	1.19	20.89	226.60

Sl. No	Sample location	Coarse fraction	Fine fraction (%)	Water of Plasticity (%)	Dry linear Shrinkage(%)	Fired linear Shrinkage (%)	Water absorption after firing (%)	Cold crushing strength (kg/cm^2)
2	Kallissery	13.20	86.80	39.01	10.93	1.13	19.56	155.95

Observation : The clay bearing area is very limited in Alappuzha. The sample from Thalavadi was found to be quite gritty. However strength wise the products show satisfactory results.

Table 2.6. Physical characteristics of clays from Pathanmthitta District

Sl. No.	Sample location	Grit content (%)	Fines (%)	Plasticity (%)	Green shrinkage (%)	Fired Shrinkage (%)	Water absorption after firing (%)	Cold crushing strength (kg/cm^2)
1	Thiruvayoor	21.2	78.8	28.32	7.88	1.14	19.85	261.8
2	Valanjavattom	14.7	85.3	47.66	1.04	1.05	17.47	255.63

Observation: Valanjavattom Sample shows some speciality. It has very high water of plasticity and at the same time very low dry linear shrinkage and fired linear shrinkage.

Table 2.7. Physical characteristics of clays from Kottayam District

Sl. No.	Sample location	Grit content (%)	Fines (%)	Plasticity (%)	Green shrinkage (%)	Fired Shrinkage (%)	Water absorption after firing (%)	Cold crushing strength (kg/cm^2)
1	Vaika prayar	12.65	87.35	29.30	10.89	1.10	18.85	228.10
2	Chengalam	14.7	85.3	39.18	5.23	0.94	21.23	181.30
3	Kattachira	5.35	94.15	54.59	11.48	1.12	15.04	136.83

Observation: The sample from Vaika prayar indicated maximum cold crushing strength. Water of plasticity of the raw clay is very high (54.59 %). One would naturally expect higher fired shrinkage in this case. However this value is quite low. May be the body might have developed micro cracks during drying which resulted in a low CCS.

Table 2.8. Physical characteristics of clays from Ernakulam

Sl.No.	Sample location	Grit (%)	Fines (%)	Water of Plasticity (%)	Dry linear shrinkage	Fired linear Shrinkage (%)	Water absorption after firing	Cold crushing strength (kg/cm^2)
1	Karumalloor 1	20	80	39.42	3.27	8.01	15.8	69.3
2	Karumalloor- 11	11.1	88.9	42.34	4.01	8.07	14.91	18.88
3	Eroor	14.1	85.9	38.45	3.55	8.32	13.45	191.5
4	Enath	10.9	91.1	40.68	6.42	10.4	18.3	180.1
5	Muthirakkad	8.3	91.7	45.21	10.91	2.16	20.41	173.5
6	Ezhipram	7.2	92.8	37.71	1	0.73	28.41	166.3
7	Nedumbassery	9.9	90.1	42.48	1.04	2.05	26.82	143.2

Observation: The samples which show higher values for water absorption of the fired samples (samples 5, 6 and 7) have lower crushing strength. Fired linear shrinkage varies from 2-10.5%. This is an indication that the fine silica content (which does not contribute for shrinkage) in these clays varies to some extent. Higher the amount of silica content, lower will be the sinterability and lower will be the crushing strength.

Table 2.9. Physical characteristics of clays from Trichur District

Sl. No.	Sample location	Grit content (%)	Fines (%)	Plasticity (%)	Green shrinkage (%)	Fired Shrinkage (%)	Water absorption after firing (%)	Cold crushing strength (kg/cm^2)
1	Chittissery	36.50	63.50	28.10	8.80	2.28	15.38	163.32
2	Madakkathara	13.10	86.90	29.67	5.62	6.80	5.52	189.82
3	Villadam	18.50	81.50	37.58	8.53	4.44	14.27	152.13
4	Karamukku	32.20	67.80	44.32	6.58	7.15	12.41	153.31
5	Nadathara	20.16	79.84	38.38	8.54	1.08	13.10	152.53
6	Panjal	11.15	88.85	41.56	10.23	1.12	16.43	255.14
7	Kondazhi	20.15	79.85	51.68	9.96	1.12	8.73	171.67

Observation: The sample from Panjal contains the least amount of coarse fraction (11.15%). Incidentally this samples also shows the maximum cold crushing strength

(255.14 kg/cm^2). Other factors being more or less comparable, higher finer fraction in the sample has shown to give a better product.

Table 2.10. Physical characteristics of clays from Palakkad District

Sl. No.	Sample location	Grit (%)	Fines (%)	Water of Plasticity (%)	Dry linear shrinkage	Fired linear Shrinkage (%)	Water absorption after firing	Cold crushing strength (kg/cm^2)
1	Pulinelli	4.1	95.9	37.39	11.62	1.14	14.14	225.80
2	Parali	11.4	88.6	34.78	11.0	12.75	17.80	180.17
3	Akathethara	26.2	73.8	38.40	8.16	10.84	20.80	237.30
4	Vadakkenchery	11.7	88.3	53.94	11.39	1.09	25.03	252.01
5	Melarcode	17.4	82.67	29.88	9.73	1.07	12.20	234.65
6	Kuzhamannam	11.75	88.25	36.45	11.39	1.07	14.43	197.27
7	Pilapally	11.82	88.18	32.55	9.72	1.10	12.12	146.81
8	Padoor	17.28	82.72	27.19	12.17	1.16	16.78	218.50
9	Tirunellay	9.88	90.12	34.71	9.73	0.98	6.89	272.22

Observation: The grit content varies significantly. The grit content of the sample from Pulinelli is quite low (4.1%), whereas, the clay used in Akathethara Panchayath contained a high amount of grit. This indicates the inconsistency of the raw material used. Further, sample from Vadakkenchery indicated a plasticity of 53.94%, which was the highest among the samples of various Panchayaths of Palakkad District. The water absorption after firing showed very low value which indicated the good sinterability of the products. CCS which is a measure of the strength of the products also was quite high.

Table 2.11. Physical characteristics of clays from Malappuram District

Sl. No.	Sample location	Grit content (%)	Fines (%)	Plasticity (%)	Green shrinkage (%)	Fired Shrinkage (%)	Water absorption after firing (%)	Cold crushing strength (kg/cm^2)
1	Elamkulam	4.94	95.06	44.32	8.61	1.79	12.41	287.33
2	Aruvakkodu 1	11.68	88.32	50.13	9.68	1.42	16.09	239.49
3	Aruvakkodu 11	10.68	89.32	39.35	9.82	1.92	5.52	151.03
4	Melattoor	11.82	88.18	29.97	9.04	3.12	16.37	155.13

Sl. No.	Sample location	Grit content (%)	Fines (%)	Plasticity (%)	Green shrinkage (%)	Fired Shrinkage (%)	Water absorption after firing (%)	Cold crushing strength (kg/cm^2)
5	Mavoor	21.20	78.80	27.82	9.35	1.12	19.88	182.79

Observation : The values show a direct relationship between the % of fires and cold crushing strength. The samples from Elamkulam and Aruvakkodu are excellent for fine terracotta wares. The shrinkage percentage on firing is within limits and the water absorption after firing also fall below 20 %.

Table 2.12. Physical characteristics of clays from Kozhikkode District

Sl.No	Sample Location	Grit (%)	Fines (%)	Water of Plasticity (%)	Dry Linear Shrinkage (%)	Fired Linear Shrinkage (%)	Water absorption after firing	Cold crushing strength (kg/cm^2)
1	A. K. G colony	11.2	88.8	27.2	8.83	2.32	15.32	169.3
2	Olavanna	9.88	90.12	48.8	2.17	3.37	18.13	164.88
3	Nandiar Kunnu	14.69	85.31	32.92	7.73	4.47	10.82	188.21

Observation: Olavanna clay has lowest dry linear shrinkage. This indicates the presence of higher silica percentage in this sample. The same sample is showing higher water absorption of fired samples and also the lowest cold crushing strength.

Table 2.13. Physical characteristics of clays from Wynad District

Sl. No.	Sample location	Grit content (%)	Fines (%)	Plasticity (%)	Green shrinkage (%)	Fired Shrinkage (%)	Water absorption after firing (%)	Cold crushing strength (kg/cm^2)
1	Nadavayal	11.10	88.90	35.88	7.37	1.08	14.36	251.04
2	Kananchery	6.40	93.60	38.01	9.79	1.04	15.01	329.85
3	Alankandi	20.70	79.30	32.85	9.72	1.18	15.25	351.85
4	Madiyurkuni	20.88	79.12	29.23	8.53	2.21	12.61	282.87

Observation: The samples show good water of plasticity and good cold crushing strength. Water absorption after firing is well within limits. The properties indicate that they are good for studio pottery.

Table 2.14. Physical characteristics of clays from Kannur District

Sl. No	Sample Location	Coarse fraction (%)	Fines fraction (%)	Water of Plasticity (%)	Dry Linear Shrinkage (%)	Fired Linear Shrinkage (%)	Water absorption after firing	Cold crushing strength (kg/cm^2)
1	Mottammal	15.30	84.78	29.26	9.88	0.06	18.88	180.33
2	Peravur	10.20	89.80	28.82	9.86	0.12	16.01	241.94
3	Thricham baram	17.52	82.40	49.39	9.01	1.10	11.98	137.06

Observation: Sample from Thrichambaram shows good water of plasticity. However the fired strength of the material manifested by the cold crushing strength shows lower value compared to the other two samples. One will certainly expect a higher value for this as the fired shrinkage is low and also water absorption of the fired sample is minimum. One possibility is that it contained calcarious or carbonaceous impurities, which resulted in the low CCS.

Table 2.15 Physical characteristics of clays from Kasaragod District

Sl. No.	Sample location	Grit content (%)	Fines (%)	Plasticity (%)	Green shrinkage (%)	Fired Shrinkage (%)	Water absorption after firing (%)	Cold crushing strength (kg/cm^2)
1	Paika	9.6	80.4	36.3	8.60	2.11	19.20	252.8
2	Punnappalam	3.72	86.28	38.6	9.30	1.08	15.81	248.6
3	Erikkulam	9.68	90.32	38.6	9.67	0.14	17.60	236.6
4	Kayakulam	7.20	82.80	42.8	10.20	1.02	20.20	233.4

Observation: The cold crushing strength above 220 kg/cm^2 is quite good. In this respect all the above clay samples are good for pottery applications including studio pottery. The coarse fractions are found low and the fired shrinkage values are also minimal. These observations indicate that the possibility of deformation during firing is very low.

The Percentage recovery of the standard sample ie sample collected from Thozhukkal Trivandrum District indicated that the coarse fraction is in the range 14-15 %. When we compare the grit content of clays of various districts there is a wide variation in the coarse fraction. This indicates the non-uniformity of the non plastic materials present in the clay sample.

A close examination of the plastic property again indicates that the water of plasticity of the samples collected, varied in the range 22 to 40 %. This clearly shows that there is variation in the non plastic material as well as in the montromorillonite content present the clay samples. A slight change in the percentage of montmorillonite can vary the plasticity of clay significantly.

A standard clay composition should have only a grit content of 10-15% and plasticity can vary in the range of 30-35 %, fired linear shrinkage below 12% and cold crushing strength above 200kg/cm^2. An examination of clay samples from all districts of Kerala indicate that the properties of some of the clays already fall within this range. However there are clays which show physical characteristics not so conducing for direct use. Under these circumstances some amount of processing should be given to the clay for attaining the right physical characteristics.

2.5. Problems faced by potters during production of pots

Preparation of clay requires good skill and high physical effort. Women and children also have to help in this work. The separation of stone from the clay is another drudgery. It consumes considerable time and physical effort of the potter's family. The Kumbarans of Palakkad and Trichur districts use spoked wheel. To rotate these wheels, high physical effort is needed, they have to repeat this for each pot. Velans of Trivandrum use spokeless wheel. In this case they engage one person to rotate the wheel and one person to make the pots. Sometimes the women folk of the household rotate the wheel. In both the cases this work consumes considerable effort. Another problem is the cracking of pots before firing. While drying in the sun the pots may crack due to the poor quality of clay.

Damage to the pots is very high in the traditional kiln. It is 5 to 20 percent in different areas. It varies according to the pot placing skill of potters. Breakage during firing is the main problem faced by some potters. They mentioned some reasons for the breakage.

* ***Lack of proper skill in placing of pots in the traditional kiln.***
* ***Lack of heat control facility - in the kiln***
* ***Lack of uniform heat distribution in the kiln***
* ***Quality of the clay- especially chemical content in the clay causes the damages***
* ***Lack of proper drying of pots***
    - ***Sweating of pots during the kiln firing***
    - ***Weight of the products***

2.6. Breakage of products during firing in Kiln: a practical experience

In our fieldwork and survey all the potters irrespective of community or location, complained that the breakage is severe in baking of the products. Even if they do it very carefully they cannot control it. They are unable to mention the exact reason for this. It was very difficult to quantify the rate of breakage, because every time the percentage of breakage varied according to various reasons. So we decided to get a practical experience in kiln firing and breakage of products. This test was useful to calculate the minimum percentage of breakage because it was conducted under the supervision of experts, using the rural raw material, and good quality firewood, As part of a smokeless chulah making training programme conducted at IRTC in June/July, 2000, the trainees produced some smokeless chulah moulds in IRTC campus. It was done under the supervision of the best experts in Kerala using the raw material of the rural potters. We conducted a test firing of these products in the round shaped kiln available at IRTC campus. Experts who supervised the program were from two colonies in which the pottery work has successfully sustained. Five potters were engaged in this work from Shornur and Pulinelly under the leadership of Mr Chami, a master potter from Shornur. After proper drying of the products they placed the products in the kiln at 3 PM on 18-08-2000. They used 300 kilograms of firewood and 25 coconut husks, and 0.5 litres of diesel, a few bundles of hay and one bag of saw dust for firing.

46 sets of smokeless chulah were placed in the kiln. Total number of products placed was 286 (46 x 6+10=286). At 5 pm on the same day they started to give smoke to dry the products. For this they put a light fire at the mouth of the kiln. On 19.8.2000 at 9 AM they started slow firing, and at 11 am the full scale firing. At 12.45 pm they started closing the holes on the sides of the kiln. Firing stopped at 2 pm. The products were removed from the kiln after three days. 32 big pieces and 4 centre parts are found damaged. In this test, the big pieces were placed in bottom side of the kiln and there was no damage found in the products placed in top portion of the kiln.

The above experience was indicative that uncontrolled rate of heating could have been the reason for the high breakage.

Based on the Technical Evaluation of Several clays samples from all districts of Kerala the following observations could be made

1 The clay body prepared by different Potters vary significantly
2 There is no quality assurance for the raw materials.
3 There are no standards with which they compare the raw material
4 There are no simple test methods with them to have a preliminary evaluation before buying the raw material.
5 Most of the products lack finish and strength
6 Temperature inside a country kiln is difficult to control. If the grit content which is mainly sand, is more than 20% and if their particle size is high, there is every chance that the body many break.

2.7. Some tips for improving the terracotta production technique

Raw material collection

Grit content has to be estimated by the simple technique suggested in appendix A of the report. Apart from the grit content the size of the grit also is important. The grit can be

ground to minus 60 mesh ie 350 microns (0.3 mm) and this can be added to the clay to reduce fired shrinkage.

Preparation of Raw material

Washing the clay to collect minus 60 mesh (minus 300 microns) can be used to give finish and strength to the body.

Pugging the clay to required fineness is an alternative for washing which is time consuming.

Shaping of raw material

Shaping with a motorised potters wheel reduces drudgery

Output per person will increase and this will results in better in income generation

Firing Schedule

Since the silica in a clay body undergoes change from alpha to beta phase with a volume change, the heating schedule in the range 500-600^{o}C has to be very slow. If this is not achieved invariably there will be breakage.

Even firing in country kiln has to be monitored with a thermocouple arrangement and also slow firing has to be practiced in the vulnerable range to bring down the breakage losses.

Chapter 3

3. POTTERY SECTOR: AN OVERVIEW OF THE PRESENT STATUS

3.1.Marketing Strategies

Most of the members of the Kumbaran colonies market their products by head load vending. Usually potter women take the products to the houses of neighbouring areas in the early morning. Till recently they exchanged their products for rice. But now they prefer payment in cash. Potters of some places take their products to distant places, mostly to other districts, by vehicles. From there they take the products to the neighbouring houses to sell. For this purpose these people stay in those areas for a few days. But in Trivandrum district Velan community members sell their products in the nearest markets. They take the products to the markets by vehicles. They usually stay in the markets for weeks in the rooms hired by them from Panchayath, or private parties. Here also women are dominant in marketing. In certain places of Palakkad district the potters sell their products at site. In these areas agents or merchants from distant places come and purchase the products. Mostly these agents or merchants give advance money to the potters. It is up to 50 % of the product cost. These people purchase all the pots the potters produce. In Ernakulam and Trivandrum districts potters make toddy-drawing pots against orders from the merchants or agents. In this case also potters get advance money from the buyer. In institutions, the products- mainly flower pots- are sold to other firms in government and private sector, and to individual buyers. Some of the institutions sell the damaged products and broken pieces at reduce rates to fill the floor before concreting. Studio pottery manufacturing institutions sell their products to institutions like interior decorators and individual buyers. Some times they get export orders, for which they depend on other firms which hold export licence. Most of the potters complained that there is no demand for their products. According to them the fall in demand is due to the introduction of aluminium and plastic vessels. But surprisingly, we noticed in our field study, that in Kollam and Trivandrum districts the Velan potters bring kitchen vessels from Tamilnadu and sell it to the locals. Some members of this potter community are

engaged in pottery trading only. In one co-operative society at Kollam district we found the stock of kitchen vessels procured from Tamilnadu, but the society is not functioning now. One old potter told us that there is good demand for these pots. In Trivandrum district most of the potters are making toddy drawing pots. For this the buyers place order to them with upto 50% advance money. Similarly in Shornur, Palakkad district, merchants come from different districts and give advance money to the potters. After one month or so they come again and collect all the products and give the balance amount. In both cases the purchase price is controlled by buyer through bargaining. Potters of the Shornur Kumbaran colony told us that there is enough demand for their products. In the Studio pottery manufacturing units we visited, we were told that there is sufficient demand for their products. But in the colonies of interior villages, potters are facing lack of demand for their products.

3.1. Present marketing strategies

Sl. No.	Method of sales	No of Potters	Percentage
1	Selling at site	58	25.89
2	Sell at the market	45	20.08
3	Head load vending	83	37.05
4	Selling at site and at the market	4	1.78
5	Selling at the market and head load vending	10	4.46
6	Selling to the co-operative society	8	3.57
7	Selling at site, market and head load vending	2	0.89
8	Selling to society and head load vending	13	5.80
9	Others	1	0.45
Total		**224**	**100**

3.2. A survey of the demand of pottery products in Kerala

All the potters contacted during investigation, have repeatedly opined that there is a decreasing demand for pottery products in Kerala. In olden days most of the community members were engaged in pottery work. Most of them dropped out from this profession

due to lack of demand. The existing potters are struggling to sell their products. Among kitchen vessels, the vessels used for cooking meat and fish are the most in demand. The toddy contractors purchase 'Mattam' in large number. Another product which is in constant demand is the Flower pot. Mattam and flowerpots are sold mostly at site. But in the case of kitchen vessels the potters adopt traditional head load vending method. They carry it to distant places by vehicles and then take it as head load to houses. Contrary to the potters' opinion, during field work, it was noticed that Tamilnadu pots are selling all over Kerala. In several places, potter community members of Kerala purchase the Tamilnadu pots and market it in local areas. It was found that these type of products are stored in the potters' co-operative society at Oyur. Some individual potters opined that these traders from Tamilnadu are selling pots at cheaper rates, so there is no demand for the local pots. One pot vendor from Kanyakumari- Tamilnadu, selling these products in a street in Kalpetta of Wynad district said that there are around 1000 traders from Kanyakumari engaged in sales all over Kerala. The traders' number mentioned may not be correct, but it is a fact the Tamilnadu pots are found all over Kerala, Trivandrum to Kasaragod. At the same time, Potters from Palakkad are also selling their products in different districts. Considering all these facts, we can arrive at a conclusion that the demand for traditional pottery products continues to be significant in Kerala. But owing to lower wages cost of living, and availability of cheaper firewood and low material costs, the Tamilnadu potters manage to undersell the products creating marketing problems for the local potters.

All over Kerala only very small number of institutions and a few trained persons are engaged in studio pottery production. Among these only three institutions dominate the production of studio pottery and production of modern products. Terra Craft, Trivandrum, Terra Craft, Ernakulam and Kumbham, Nilambur, Malappuram are these three institutions. Along with these Potters Co-operative society in Shornur, Palakkad, a few tile factories like Kap India, Trichur Raja Tiles, Trichur and Potters' co operative society at Kattachira, and another private concern of Kottayam are also engaged in this work. The first three institutions are engaged in studio pottery production only. According to them there is enough demand for their products. They employ more than 10

workers in each firm. These institutions sell their products both in India and abroad. Other institutions are not major producers of studio pottery .The Co-operative societies are producing them it along with flowerpots and other traditional items. In tile factories only 1 or 2 trained persons are employed for studio pottery work. According to the tile factory owners, these type of products do not have much demand. They are selling their products through their dealers in tiles. They are also exporting these products along with ceiling tiles. Export is difficult because of the size of these products according to the spokesperson of Kap India, who export these products to South East Asian countries. He said that freight charge per container is very high, so they are exporting these products along with ceiling tiles. While exporting ceiling tiles there will be some free space in the container. This space is utilised to export studio pottery products. According to the expert from the Raja Tiles, Trichur, the best option for the sale of studio pottery is highway side outlets. According to him the buyers prefer the products which have appearance of plastic and raw material must be pure clay. Considering the present condition, one or two potter groups from each district can be engaged in the studio pottery production. There are so many star hotels and resorts in each district who are using studio pottery products for their interior decoration as well as out door/garden decoration. According to the manager of Ashoka Beach Resort, Trivandrum District, one of the major star hotels in Kerala, they are purchasing these types of products every four years. The amount will be 20 to 40 thousand rupees. He said these types of institutions change the old products after a certain period, to give a new appearance to their institution. He opined that there will be good demand for modern pottery products, but the products should have aesthetic appeal and quality. He suggested potters working in this field should visit these hotels with models of the products with prior permission. Then only they can expect orders. Hotels not having star facility, rarely use studio pottery products. All the personnel from these hotels have the opinion that there is scope for studio pottery in this field because the tourists like these products very much. But they also mentioned that metal products are preferred for interior decoration, because if they use the pottery products, there is a chance of damage.

Along with these there is good scope for fancy products like tabletop items, which can be used as show case items and presentation goods. These types of products can be sold through the outlets in the tourist spots and also through the fancy shops of all towns. Pen stand, ash tray, flower vase, candle stand, key stand, photo frames, idols, cup and saucer, fancy boxes, wall mounting etc. are a few examples of products which can be sold through these fancy shops.

3.2. Number of major hotels in each district

Trivandrum	82	Kollam	7	Pathanamthitta	3
Alappuzha	19	Kottayam	8	Idukki	42
Ernakulam	38	Trichur	19	Palakkad	15
Malappuram	6	Kozhikkode	13	Wynad	13
Kannur	5	Kasaragode	8	**Total**	**278**

Studio pottery products can be sold through exhibitions also. Now a days so many organisations conduct 'Mela's in almost all towns. Potters can use these Melas to exhibit and sell their products. Government agencies as well as voluntary organisations can provide stalls (outlets) for these potters in the Melas conducted by them. Industries Department and organisations like Lions club, Rotary club etc, conduct such Melas regularly. If the potters get outlets in these exhibitions, it will be very useful for them. They can set up emporia at tourist centres also.

3.3. Number of Tourist Centres in each district

Trivandrum	12	Kollam	5	Pathanamthitta	6
Alappuzha	5	Kottayam	6	Idukki	6
Ernakulam	9	Trichur	5	Palakkad	5
Malappuram	6	Kozhikkode	4	Wynad	5
Kannur	6	Kasargode	5	**Total**	**85**

3.3. Some interesting case studies

Pathramangalam is a potter village in Velur panchayat of Trichur district. In that place three potter families have started to make clay rings for wells. According to them it was begun a few years back. One traditional Ayurvedic Medical Practitioner asked them to make such rings to get good quality water from the well. First they were made with wooden mould, with the help of a carpenter. Using that mould and traditional raw material they made clay rings 1.25 feet in height. This ring has several pores which permit of water. They used a round shaped kiln to bake the rings. Along with these rings they baked the traditional pots in the same kiln. They could only bake 3 rings at a time in their kiln. After sufficient production they themselves set the rings in the well. After that they got several orders. But it is noticed that in all places the rings are used in the pit of the wells already made earlier. According to an informant now they are making wells fully set with clay rings. During investigation it is found that in a house 3 rings are set in a single well, because it is very big in diameter. The potters can only make ring in the diameter of 1.5 meter because of the limitations of their kiln and also the mould. When they get an order all the three families making the rings, jointly take up the work. They charge Rs 600/- for a ring. For small sized ones they charge Rs 350/-.

Poikkattusseri in Chengamanadu and Nedumbasseri of Ernakulam district are the other villages where the potters are using some innovative methods. In those places potters have stopped production of pots and have started to purchase traditional pots from the Palakkad Kumbarans and make them black in colour, by giving smoke treatment, using a traditional method, in their own kiln. After that process they can sell it for a higher price. During investigation, the potters did not reveal the technique, they did not even agree that they are doing value addition to these products. Informants said that these people are afraid to reveal it because of the harassment by Panchayath authorities to stop the pollution caused by the kiln. Even a successful pottery industry in the same place, run by an individual potter and providing employment to more than 10 potters, is struggling for survival, because of the harassment from the Panchayath authorities. Authorities refused to renew the licence of the industry due to the complaint from some neighbours. But they

have certificates from pollution control board and managed to get an order from the court. It is found that the kiln type is normal square type improved kiln (up draught) widely used in several places in Kerala especially in KVIB sponsored potters' co-operative societies.

Aruvakode in Nilambur is another place where some unique initiatives are attempted. In that village an activist Shri. K.B.Jinan is engaged in making clay tiles with pictures and art forms in a particular method. These are used as murals to decorate walls. He also makes different types of fancy items, and markets his products in India and abroad. Shri. Jinan is a designer and he is employing the potters of that village to make innovative products. The workers in this institution were trained by him. The other potters of that village also have started to make fancy products. Kumbham purchases these products which have good demand. The living standard of the potters has improved considerably thanks to this intervention.

In **Aarpookara** of Kottayam district a potter who is employed in Municipal office as a part time employee, is engaged in idol making in clay. First he makes an idol in clay and using that he makes a mould of it using plaster of paris. After that he can make a number of pieces using that mould. But he is not interested in commercially doing this activity. Another person of the same village makes fancy items in clay, paints them and sells them in the market. He does not bake these products.

3.4. Community Associations and their activities

The first community association of potters was formed in 1946, which is "Samastha Kochi Odamahasabha" an organisation of the Odan community. It was exclusively for the Odan community at the time of formation. It was founded by Mr. Machadan Kunchu Master and other members from the Odan community. Its function is concentrated in Trichur district, and its head quarter in Eravakkad. There is one lower primary school in Eravakkad owned by this organisation. In 1981 another community organisation was formed in the name of "Bharathiya Kulala Federation". This organisation was formed to organise all the potters under one organisation. Mr. Machadan Kunchu Master from

Trichur and Mr. Rajasekharan from Palakkad were two among the founder members of this organisation.

In 1996 another community organisation was formed to organise all the potters, because some of the communities did not like to come under the organisation in the name of Kulala community. The new organisation was named "Federation of Traditional Potters' Welfare Service Society". This organisation's letterhead mentions that it is a joint organisation of Kusavan, Kumbaran, Odan, Velan, Kulalan, Anthur Nair, Anthra Nair etc. This organisation has a general secretary, president, two vice presidents, two joint secretaries and eight executive members from nine districts of Kerala. Most of the potter communities have representation in this organisation. Mr. M.K. Nair from Kozhikode is the President. President represents the Anthur Nair community and General Secretary represents the Odan community. Along with this organisation there is another organisation named "Parambaragatha Manpatra Nirmana Samudaya Samyukta Samara Samithy" (Combined action council of Traditional pottery communities) formed in 1999. This organisation is particularly meant for fighting to get the benefits from government to the potter communities. Mr. K.M. Das is the General Convener of this organisation. This organisation conducted picketing and marches towards the different district collectorates and the secretariat in Trivandrum. By organising people of different districts and different potter communities for this purpose.

In addition to these organisations, some other community organisations are also functioning among the potters. Kerala Velar Service Society, Adi Andhra Sangham and Kerala Samsthana Kaliman Patra Nirmana Thozhilali Sangham [(Kumbara Samudayam),(PMTS)] are some of them. The Kumbaran community's association was formed because of some quarrel between the representatives of this community and the leaders of Federation of Traditional Potters Welfare Service Society. According to the leaders of Kumbaran community, they formed another organisation because they did not get enough representation in the executive committee of the Federation. But according to the leaders of the Federation, people from Kumbaran community do not participate in the work of the organisation or in the meetings. There is no educated persons in this

community, and that is why they did not get enough representation in the executive committee of the federation.

All these organisations are focussing on the social development of the potter communities. For this they mobilise people from all the potter communities and struggle to get educational concessions and employment reservation in government sector. These organisations have state level, district level and village level units. They mobilise people through these units after their several representations and some struggles they got OEC status (Other Eligible Communities) for educational benefits, in 1980s. Now all the leaders of these organisations are asking for Scheduled Caste status for these potter communities. Another major demand is a corporation for potters, like the Scheduled Caste Development Corporation they have placed so many demands before the government, like welfare schemes, which other backward and artisan communities are enjoying. Another demand is to ban the usage of the word 'Kusava' as it is considered a derogatory term. According to these leaders Kusavan is not a caste name. They have some stories to tell about the origin of this word.

These associations do not have any office to work properly and also they have no proper records and data regarding the details of potters. Most of the associations are functioning at the office bearers' residence. The only document found is a register having address of office bearers of local units. The Kerala Velar Service Society started to publish a magazine named 'Chakram'. They published only 4 or 5 issues of that magazine.

As part of this project work, letters were sent to the state level and district level office bearers of all these community associations. We wanted to get the details of the distribution of potter communities in Kerala. Very few responses were received. Repeated efforts were made, through letters and personal visit. The result was no better. Only 10 replies were received and some of them furnished false information also. In the format sent to these there was a question 'what are the technical problems faced by the potters?' Nobody has responded properly to that question. All of them mentioned economic backwardness, lack of raw material, need for government help etc.

3.4.1. Potters Association's View on Community Development

We have visited potter community association offices and had discussion with various Potters' association leaders in different places. During this discussion and visit, these leaders have raised many suggestions for the development of pottery occupation. They showed some representation sent to the government authorities and gave description of the strikes and picketing conducted by them in different times. Many of their demands are quite reasonable and will certainly help the development of their occupation, if they are implemented. Some of these suggestions can be implemented by the local self-governments. But some others need action at the State or even Central Govt. level. Quite a few are in the nature of conventional grievances. Some of the suggestions/demands made by these community associations are given below.

3.4.2. Demands raised by community associations

* Give SC status to the potter communities
* Form a Pottery Manufacturing and Marketing Corporation
* Start welfare fund, pension, insurance, health care programmes for potter communities
* Give membership in PSC, Khadi board, Khadi Commission, Backward community corporation, and Kerala Artisan Development Organisation (KADCO)
* Conduct an enquiry on the working of recommended community corporation.
* Exempt them from security in getting loans from Banks
* Write off the debt balance of potters' co-operatives
* Provide 25% reservation in the industries engaged in clay work
* Give permission to start new projects in Khadi units
* Ban the use of the word "Kusava" in all media.
- Form new projects for house and land for the landless, women and children
- Provide raw material for pottery at reduced rates, and give assistance to mechanisation.
- Provide electricity at reduced rate.
* Start training centres to train in modernisation in pottery

* Include the pottery occupation in the programme Pirme Minister's Rozgar Yojana (PMRY) and Peoples Planning
* Give permission and primary facilities to start educational institutions

Source: Notice distributed by KM Das, General convener, PMTS. on 15-1-'99

Demands raised by Kumbarans' Association

* Provide assistance to purchase land for clay collection in Grama Panchayaths
* Provide pug mill, modern chulah, electric motor, other equipment, and training
* Give loan facility through local co-operative banks
* Provide welfare fund from the Panchayath fund
* Provide 5% reservation in medical and engineering courses
* Include the community in scheduled caste category.

Source: Notice distributed by Kerala Samsthana Kalimanpatra Nirmana Thozhilali Sangham (Kumbara samudayam)

Demands raised by Federation of Traditional Potters Welfare Service Society.

* Provide 5%reservation in Professional and postgraduate courses
* Provide 3% reservation in Public services
* Include in scheduled caste category.
* Form a potters development corporation, issue special order to collect clay and fire wood
* Provide representation in governing body of converted Christian (Avasa Christava) Corporation and Khadi board.

Source: Memorandum submitted to Chief Minister by the President and secretary of the Federation of Traditional Potters Welfare Service Society.

3.5. Assistance to potters from Government and other Institutions

During the last two years Local Self-Governments have been providing assistance to the potter community. Some Grama Panchayaths issued potters wheel, some Panchayaths issued money to purchase clay and fire wood etc. This assistance is misused in some places. It is reported that in Pamankode colony of Trivandrum district, the respective local Self Government supplied Rs.2000/- each to 20 potter community members, but in

this colony only 2 potters are engaged in pottery work these days. In one village in Kottayam, Local self-government provided motorised potters wheel to eight potters, but only four of them have electricity. So they are unable to use this help.

Khadi and Village Industries Commission, and Khadi and Village Industries Board consider pottery as a village industry, and they have included it in the list of village industries as number one in their list of cottage industries. KVIC provided assistance to various institutions to give training to potters in studio pottery works and other modern product manufacturing. KVIB provides grant as well as loans to the individual potters and potter's co-operative societies. As per the Margin Money programme of KVIB, any potter can get loan from Nationalised bank, Scheduled bank, Co-operative bank or state financial corporation. This enterprise is eligible to get 25% of this loan as margin money grant from the Khadi board. It is 30% if the entrepreneur is a woman. Individual entrepreneur can get loan for the project up to Rs. 10 lakh and it is Rs.25 lakh to the co-operatives. If the loan amount is above Rs.10 lakh, the grant will be 25% up to Rs.10 lakh and 10% to above Rs.10 lakh. Most of the individual potters could not access this, because they could not fullfill the norms of the KVIB/Bank. For example, to get an individual loan from the KVIB. the potter has to produce document of land as security which is worth equal to the loan amount, a detailed project report, etc. But the potters normally are not much educated, and do not possess land of such value. Only very few persons have more than 10 cents of land.

Many co-operative societies have been formed by the potters with the help of KVIB, and all these institutions have enjoyed the benefits from the KVIB in the form of grant/loan. But most of these co-operatives are defunct. Many of them owe huge debts to the KVIB. Since 1960s these institutions got loans and grants, but most of them did not repay the loans properly. So the balance amount and its interest and compound interest have accumulated over these years even after their closure. Some of the institutions repaid the loan by selling the land or property owned by them. Only very few of the co-operative societies are properly functioning now. Potters co-operative society of Thozhukkal, Trivandrum, Potters co-operative society of Chelannur, Kozhikode, Potters' Industrial

Co-operative Society of Shornur, Palakkad, and Potter's co-operative society of Kizhmad, Ernakulam are among the few surviving potters co-operatives.

3.6. General observations and Recommendations

a. Observations

- In general potter communities are educationally backward.
- Representation in government service is very low.
- Representation in legislature is almost nil.
- Living condition is very bad.
- These communities have very little subsidiary income.
- The nature of this traditional occupation has become a contributory reason for the educational and social backwardness.
- Nobody has own land for clay collection.
- Availability of Clay source is not permanent or assured at least for a period of 5 years.
- Expenditure for collecting clay is rising rapidly.
- Knowledge of appropriate clay source is lacking in many cases.
- Clay is getting difficult to extract even when available.
- Potters from one colony itself often collect clay from different sources.
- They have no scientific method to test the clay quality, and the traditional wisdom is becoming extinct.
- No machines for preparation of clay.
- Drudgery is high in pugging/clay preparation.
- Most of them use traditional methods to make pots.
- Mechanisation in production is nominal, motorised wheel has been introduced in only very few colonies.
- Lack of mechanisation has resulted in drudgery and wastage of time.
- Most of the potters are not aware of modern production techniques.
- They do not have the resources to install motorised wheels.

- Spacious work place is very important in pottery, but it is limited in all potter houses.
- Lack of spacious work place causes increased damage of pots at the time of production itself
- Climatic changes affect pottery work considerably.
- Most of them use traditional kilns, which are fuel inefficient.
- Some potters complained that the damage in kilns is very high but it was noticed that if the pots are arranged in kilns traditionally by an experienced person, the damage is minimum.
- Drudgery in kiln firing is very high.
- No scientific methods to control fire or heat in kilns.
- Pollution from kilns is not controlled.
- Demand for traditional earthen pots is decreasing.
- Vendors coming from neighbouring states compete for local markets.
- Modernisation and diversification is not able to compensate for the decreasing demand for traditional pottery.
- Rural consumers are almost nil. So they have to take the pots to distant places, and hence the expenses are high.
- Middlemen take away high profit in many places.
- Most of the potters are unaware of the potential of modernisation and diversification.

b. Recommendations

- Local Self Governments (LSG) can acquire clay source and make it available to traditional potters.
- Potters association can provide information to potter families about the nearest clay sources and their quality.
- Centralised clay source and supply systems can reduce expenditure and ensure quality.
- A pug mill can be provided to a cluster of potter families.
- Mechanisation should be introduced and it must be appropriate to the local methods.
- Introduce motorised wheels.

- LSG can provide wheel (potters can not afford to purchase it) with subsidies and bank loans.
- Assistance should be given for repair and maintenance of kilns and sheds.
- New type of kiln should be introduced. Up draught kiln is not suitable for traditional pottery.
- New scientific methods should be introduced to reduce pollution from kiln.
- Marketing outlets can be set up in a co-operative basis.
- Inflow from neighbouring state should be controlled by levying entry taxes.
- Training can be given in modernisation and diversification.
- Marketing outlets for studio pottery should be provided in tourist centres.
- Stalls can be provided in exhibitions and melas.
- Possibility of export should be explored.
- New techniques of value addition must be introduced.

(Some tips for improving this craft of pottery are listed in page 39 as well)

Chapter 4

4. DISSEMINATION ACTIVITIES: TRAINING COURSES WORKSHOPS AND EXHIBITION PROGRAMMES

4.1 Training programme in studio pottery at Pulinelly, Palakkad

25-11-2001 to 1-12-2001

Since one of the major objectives of the present project was imparting training in the area of technology upgradation and value addition of traditional pottery a training programme on making artifacts and figurines was organised in one of the potter clusters of Palakkad district (Pulinelly). We have used certain criteria for choosing the above cluster. The criteria choosen were

1. Density of population was above 10 house holds/panchayath.
2. Present Technology was uneconomic and obscelete.
3. Raw material and Technological intervention was needed.
4. Receptivity towards modernisation was good.
5. Clay source was within the district
6. Youngsters were engaged in pottery
7. There was good marketing strategy.
8. LSGs had not provided any help
9. They were ready to become co-operatives
10. Living condition was not good.

For making good studio pottery items a potter needs varied speeds for throwing. For this a friction type of wheel, electrically driven with variable speed was used. Which was fabricated at M/s. Kelachanda Industries Thiruvananthapuram.

Mr. C. Sivan, the instructor in KVIC Thozhukkal, Thiruvananthapuram who is a recipient of President's Gold Medal for artisans (for the year 2000) trained the potters at Pulinelly in the operation of potters' wheel. The training provided hand-on experience in making attractive handicraft materials.

Today the potters of this cluster are quite happy to work on this because this motorised wheel has increased their productivity and reduced the drudgery.

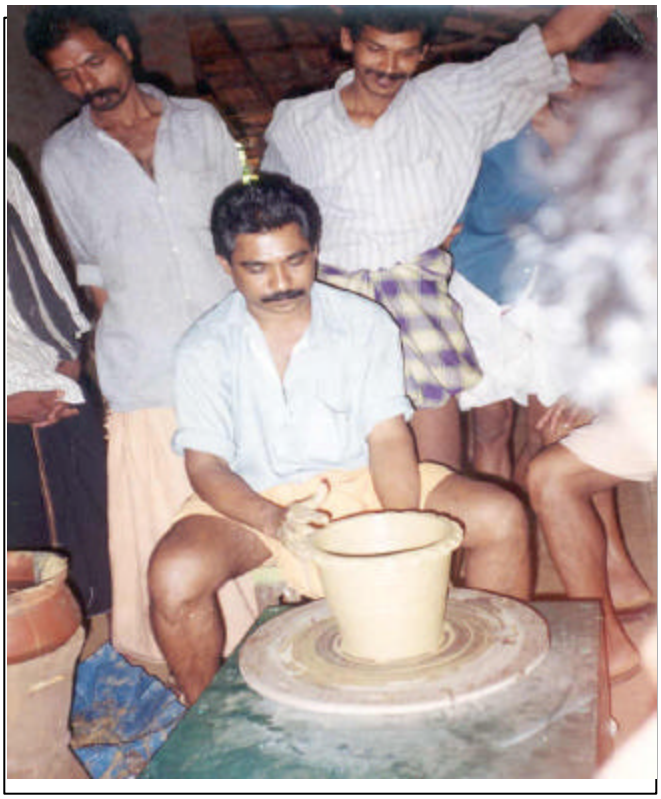

Fig. 4.1. Shri. Sivan demonstrating the operation of motorised potters wheel

Fig. 4.2 Shri. C. Pampasudhan, Ward member, Kottayi Grama Panchayath, addressing the potters

Participation in exhibition

4.2.1 Onam Fest at Neyyattinkara during September 2002

Regional Research Laboratory Trivandrum, which was the collaborating institution with IRTC, Palakkad has actively participated in the "Onam fest Exhibition organised by Shri. V.P Sivakumar, MP, Thiruvananthapuram at N.S.S. College campus, Dhanuvachapuram, Thriruvananthapuram. Lot of importance was given for the Rural Technology activities, in this exhibition. One of the exhibits among the Rural Technology Programs was the demonstration of preparation of studio pottery using motorised potters' wheel. This participation was aimed at generating awareness and interest among the people regarding the prepartion of value-added terracotta materials. Mr. Ramachandran from KVIC unit, Thozhukkal, Neyyattinkara was the instructor who introduced the visitors to the exquisite beauty of the terracotta handicraft products. The exhibition was for a period of 10 days and not less than 1000 people (and non potters potters) visited the stall.

Fig. 4.4. Pottery expert Sri. Susheel checking the performance of the motorised potters' wheel

4.2.2 Open day celebration at Regional Research Laboratory, Thiruvananthapuram October 26, 2002

Regional Research Laboratory Celebrates its foundation day during 26th of October every year. Around 250-300 school children are invited for this function. One of the exhibits during the above function was the operation of motorised potters' wheel for shaping artifacts and figurines. Many of the children, were seeing clay for the first time. It was felt that the school children really enjoyed the programme Master crafts men were there for demonstrating the shaping technique.

The phenomena of weathering of rocks resulting in the formation of clays, their properties shaping techniques, sintering behaviour the importance of terracotta and porcelain materials in the global scenario etc. were explained to the students.

4.3. Dissemination workshops

4.3.1. Dissemination workshop on value addition to pottery: Held at IRTC, Mundur, Palakkad, During 25th – 31st January 2004

This dissemination workshop was arranged to impart training to selected artisans in some modern techniques for value addition, like painting, decoupage, decorative work, etc.

The meeting was presided over by Dr. K. Unnikrishnan, Director, IRTC, Palakkad and Dr. M. Lalithambika the Principal Investigator of the project welcomed the audience and also explained the objectives of the workshop.

The presidential address of Dr. Unnikrishan was followed by two classes; one by Mr. K. B. Jinan, Artist, Kumbham, Trichur and the other by Mr. Bhargavatheeswaran, In-charge, Centre for Social Development, Thakkala, Kanyakumari District. Mr. Jinan highlighted the innovations he and his potter group could introduce during the last one decade which included different types of artistic products and also various mural designs and decorations. He also presented the idea of building spacious, livable houses exclusively

with mud using an in situ firing technique. The second speaker, Mr. Bhagawatheeswaran gave a very invigorating lecture, which could make the potter-trainees feel that their work is highly useful and essential to the society. He asserted that what a potter lacks today is self confidence and with the investment of faith and confidence in a potter this art of pottery can grow to any dimension. Shri P Balaram, the co-investigator of the project proposed a vote of thanks.

Immediately after this session the training of potters in various techniques of ornamentation of their products was started. The participants were Mr. K. P. Krishnan, (Ottappalam) Mr. Sivadasan (Kottayi), Mr. Manikantan (Kottayi), Sreekumar.K (Kottayi) Sura.L, (Kottayi), Anil Kumar.S (Thiruvananthapuram), Jayapriya.M (Palakkad), Gopakumar.P (Kuthanur), T.A.Ubaid (Palakkad) and K.Chami (Chuduvalathoor, Shornur).

The master trainers were Miss.Sulagna Baksi and Mr. Prsenjit Majumdar of Kolkata Pinnacle Society, Kolkata and Mr. George Fernandes, Flora, Oottukuzhi, Trivandrum. The artists from Kolkata gave training in painting and stone and Zari decoration of pots, while Mr. Fernandes introduced Decou Page, a French Technique of decorating pots and also floral decoration on pots with adhesives. All the techniques introduced by both the artists were much appreciated. A few pieces could be exhibited in the Kerala Science Congress held at CWRDM, Kozhikode during 29th – 31st January 2001. There had been several requests to arrange one more workshop. The potters themselves wanted to bring in more people from their own colonies. The training sessions continued until 30th.

The concluding session was chaired by Prof. P.K.Ravindran, Registrar, IRTC Palakkad. All the participants actively participated in the discussion and expressed their satisfaction as well as determination to continue with this activity as it could fetch more money for their products. In the meeting the Registrar assured all help from the side of IRTC to make their dream a success.

4.3.2. Dissemination Workshop on preparation project proposals

February 25, 2004: IRTC, Mundur

The second dissemination workshop was conducted as a "consultation on Preparation of project proposals for the Benefit of Potter Communities to be included in the Development plans of LSG Institutions". The participants included elected members of Grama/Block Panchayaths, representatives of the potter communities besides project personnel and experts from IRTC.

Background

Based on our observations and interviews, we have arrived at some perceptions of the problems faced by the potter communities. After examining the data and the role of the various stakeholders, we have tentatively formulated certain proposals to ameliorate their conditions. Some of these could be taken up by Grama /Block/ District Panchayats, as part of their development plans.

The purpose of the present workshop/ consultation was to get the feed back from People's Representatives (Panchayath members) and the Potter Community Representatives, on these proposals so that they can be made realistic and viable. (Kindly see the enclosed model projects enclosures 1 and 2)

The feedback

The potter community Representatives from Pulinelly were very frank and forthright in their views. They expressed their skepticisms regarding the sincerity of the Grama Panchayath, based on their past experience. However they agreed with the finding of the project that the priority should be given to.

1. Electric wheels
2. Pugging of clay
3. Improved kiln

It appeared that facility, at Pulinelly was rather exceptional because they have a well-established workers co-operative society and they have a history of availing bank loans and repaying them promptly.

4. Marketing.

It was pointed out by the hon'ble Panchayth Member from Areekode that this was not the case with the potters in their Panchayath. There the Grama Panchayaths had offered Rs.7100/-per household as a subsidy for installing kiln sheds at a cost of Rs.19000/-. But the beneficiaries were unable to raise their own share. So the project could not be implemented.

Same was the case with another project for building a work shed as a common facility. This happens because the potters of Areekode are not organised and lack self-confidence to take up such projects.

The hon'ble Panchayath Member from Kottayi Panchayath emphasized that it may not be possible any longer to distribute money to individuals. Any project must be based on group initiative. It should also be possible to enlist the support of commercial banks. Co-ordinated efforts from Grama/Block/District Panchayaths should also be explored.

Follow –up

It was agreed that the views expressed in the consultation would be incorporated and the proposals so modified. The revised model project would then be circulated among the concerned LSG/S with the advice that they are not to be copied blindly, but to be adapted with appropriate modifications to suit the local conditions and peculiarities.

In one sense the very concept of a model project was questionable. What worked quite well in one Panchayath might fail in another. So proposals are necessarily to be modified and adapted to suit the local conditions. It was decided to forward some possible project ideas with a variety of options from which, the Panchayath could choose the appropriate solutions.

4.3.3. Dissemination workshop on shaping of terracotta artifacts using potter's wheel

IRTC, Mundur, Palakkad

26-28 July 2004

The third dissemination workshop on pottery was arranged to give training primarily to Kudumbasree unit of Pirayiri Panchayath of Palakkad Distrct. Shri. K. Sridharan Master craftsman, KVIC Unit, Thozhukkal, Thiruvananthapuram and shri. G. Baby who is an expert on the operation of pug mill were invited as instructors. 11 women from Pirayiri Panchayath and 4 male artisans participated in the training program.

Dr. K. Unnikrishnan, Director, IRTC welcomed the participants and also briefed them regarding the objectives of the workshop. Dr. R.V.G. Menon Fellow, IRTC in his address explained the terracotta chulah work taken up at IRTC earlier and also the scope of entering into value addition of terracotta materials. Dr. M. Lalithambika one of the co-ordinators of the programme explained the importance of choosing the right type of raw material and also the necessity of using pugged material for making artifacts with the help of motorized potter's wheel. This deliberation was followed by the training on imparting hand-on experience on motorized potters' wheel using the clay prepared using the pug mill installed at IRTC.

The training involved two parts

1. Pugging of clay using the pugmill.
2. Shaping of artifacts on motorized potters wheel.

Since most of the potters were familiar with only the preparation of clay manually, i.e kneeding with hands and legs, the mechanical preparation of the clay body using a machine attracted the participants very much. This type of preparation reduced the drudgery and also saved lot of time used for the preparation of the clay body.

Two motorized potter's wheels were used for training, one fabricated by M/s. Kelchanda, Electrical company, Trivandrum, and the other fabricated at IRTC itself. The latter

showed comparable performance with the commercially fabricated machine, and also had some improved features.

All participants showed keen interest in the training program. The 3-day training could give them only a flavour of the scope of mechanising the activity. The shaping part is manual and demands the aesthetic sense and manual skill on the part of the potter. Since real expertise can be achieved only with regular practice the Kudumbasree members have decided to procure a potters' wheel so as to have regular practice at their end.

The trainees were also given a short exposure to the painting and decopasche techniques for value addition of the terracotta materials.

Fig. 4.9. Shri. G. Baby Preparing pugged clay to be used on the potters' wheel

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Table 1.1

Number of Panchayaths and the number of households engaged in Pottery.

Sl. No.	District	No. of Panchayaths	No. of households engaged in pottery
1	Trivandrum	15	350
2	Kollam	5	19
3	Alappuzha	3	51
4	Pathanamthitta	3	12
5	Kottayam	7	74
6	Idukki	2	5
7	Ernakulam	24	184
8	Thrissur	33	387
9	Palakkad	40	646
10	Malappuram	13	106
11	Kozhikode	17	157
12	Wynad	17	235
13	Kannur	13	137
14	Kasaragod	7	120
	Total	**199**	**2483**

Table-1.2

Potter Communities found in the different districts of Kerala

Districts	Community
Trivandrum	Velan
Kollam	Velan
Pathanamthitta	Velan
Alappuzha	Velan
Kottayam	Velan
Idukki	Velan
Ernakulam	Velan, Kumbaran

Trichur	Kumbaran, Odan
Palakkad	Kumbaran, TamilKumbaran, Kulala/Anthur Nair, Velan
Malappuram	Kumbaran, Andhur Nair
Kozhikode	Kumbaran/Kusavan/Adi Andhra, Andhur Nair/Andhra Nair
Wynad	Kumbaran, Urali Kurumban, Velan.
Kannur	Aadi Andhra/Kumbaran/Kusavan, Kulala/Andhur Nair/Kusava
Kasaragod	Kulala/Anthur Nair/Kusava

Table 1.3. Monthly Income of Potters

Sl. No.	Income group	No. of Households	Percentage
1	<500	25	13.29
2	500-1000	72	38.30
3	1000-1500	46	24.47
4	1500-2000	41	21.80
5	>2000	4	2.13
Total		**188**	**100**

Table 1.4. Occupational Status (Percentage)

Sl. No.	Occupation	Male	Female	Total
1	Pottery	54.7	55	54.8
2	Masonry work	1.1	0.2	0.7
3	Manual labour	4.3	1.2	2.9
4	Brick &tile work	1.3	0.3	0.8
5	Sales person	1.1	0.2	0.7

6	Maid servant	0	0.2	0.01
7	State govt. employees	0.1	0.2	0.2
8	Central govt. employees	0.3	0	0.2
9	Working in pvt. Concerns	1.1	0.7	0.9
10	Other skilled labours	2.4	0.7	1.6
11	Employed abroad	1.6	0.2	0.9
12	Agriculture	0	0.2	0.1

Table 1.5. Type of houses of the surveyed households

Sl. No.	Type of house	Nos.	Percentage
1	Thatched	25	11.16
2	Tiled	184	82.14
3	Terraced	15	6.69
Total		**224**	**100**

Table 1.6. Cost calculation of pottery production

Clay quantity required for a year	2 Tractor loads
Cost of clay at source (2X100)	Rs. 200/-
Transportation (2X450)	Rs. 900/-
Labour (6 man days)	Rs. 600/-
Other expenses	Rs. 200/-
Fire wood per year (2100kg)	Rs. 3150/-
Husk (2800 Nos.)	Rs. 840/-
Hay (280 bundles)	Rs. 560/-
Transportation (for sales)(350X14loads)	Rs. 4900/-
Food expenses (Rs 30X10daysX14 Trips)	Rs. 4200/-
Total expenses	Rs. 15,550/-
Production per day	25 pots
Interval of each kiln firing:	25 days
Total no of kiln firing per year	14 Nos.

No. of pots per kiln	350 Nos
Damage during firing	10%
Total pots per year	4410 Nos
Average rate per pot	Rs.10/-
Total cost of 4410 pots @ Rs.10/-	Rs. 44100/-
Income after expenditure	Rs. 28,550/-
Based on this cost calculation the average income per day per family	Rs. 78/-

Table 1.7. Types of products prepared in different methods

1. Wheel made	2. Mould made	3. Hand made
Kitchen vessels, Flower pots Studio pottery, Fancy products Smokeless chulha mould Toddy drawing pots	Irrigation pipes, Flower pots Corner tiles, Fancy products Stoves	Kitchen vessels Flower pots Water storing pots Fancy products Stoves

Table 1.8 Status of modernisation

Item	Traditional	Improved	Both
Kiln	86.61	10.71	2.68
Wheel	61.16	32.14	5.36
Colour	87.05	1.34	-
Polishing	84.37	0.89	-
Body preparation	80.36	1.34	17.41
Raw material	100	-	-

Table 1.9 Kiln status of the surveyed households

Sl. No.	Kiln status	Nos.	Percentage
1	Own Kiln	150	66.96
2	Neighbour's kiln	50	22.32
3	Common kiln	24	10.71
Total		**224**	**100**

Table 2.1 Reported clay sources in each district

District	Clay Source	District	Clay Source
1. Trivandrum	Amaravila, Nemom	8. Palakkad	Alur, Kavasseri, Yakkara, Shornur, Akathethara, Parali, Alathur, Thrithala, Peringottukurissi, Puthunagaram, Nenmara, Melarkode, Pirayiri, Vadakkencheri, Athalur
2. Kollam	Oyur, Kulakkada, Poruvazhi	9. Malappuram	Edavanna, Cheekode
3. Pathanamthitta	Enath-Ilangamangalam, Thuvayur-Kadambanad	10. Kozhikode	Mavur, Olavanna, Vadakara
4. Alappuzha	Thalavadi	11. Wynad	Kalpetta, Meppadi, Maikkad- Mananthavadi
5. Kottayam	Thiruvarppu, Kidangur, Vaikkaprayar	12. Kannur	Munderi, Thaliparambu, Kannapuram
6. Ernakulam	Kizhmad, Karumallur, Alangad, Vaikkom, Angamali, Chengamanad, Paravur	13. Kasaragod	Pullurperiya, Erikkulam, Manya
7. Thrissur	Kondazhi, Thirumattakkode, Venkidangu, Thanniam, Chittisseri, Oorakam, Painkulam, Kanjani		

Table 2.2 Clusters from where samples have been collected

Trivandrum	**Kollam**	**Pathanamthitta**	**Alleppey**	**Kottayam**	**Ernakulam**	**Trichur**
Pamamcode	Kalavayal		Thalavadi	Chegalam	Karumallur	Chittissery
Pullamala	Poruvazhi	Valanjavattom	Kallissery	Kattachira	Eroor	Madakkathara
Mudavanmugal	Anthaman	Thuvayur (South)	Thiramallikara	Vaikaprayar	Enathu	Karamukku
Melamcode					Muthirakkad	Vilpadam
Thozhukkal Amaravila					Ezhipram	Nadathara, Panjal, Villadam
Palakkad	**Kozhikkode**	**Malappuram**	**Wynad**	**Kasargode**	**Kannur**	
Pulinelli		Elamkulam	Alamkandi	Paika	Moothammal	
Parli-Thenur		Aruvakkodu 1	Kanacheri	Punnapalam	Paravur	
Akathethara	AKG Colony	Aruvakkode 11	Madiyur Kuni	Erikkulam	Thricham baram	
Kodakkattu Parambu	Olavanna	Melettoor	Nadavayyal	Kayakulam		
Melarcode	Nandiyar Kunnu (Koothali)	Mavoor	Attakandi			
Kuzhalmannam						
Pilappally						
Padoor						
Thirunellay						
Nadathara						
Kondazhi						

Table 2.3. Physical characteristics of clays from Thiruvananthapuram District.

Sl. No.	Sample location	Grit content (%)	Fines (%)	Plasticity (%)	Green / dry shrinkage (%)	Fired Shrinkage (%)	Water absorption after firing (%)	Cold crushing strength (kg/cm^2)
1	Pamamcode I	19.1	79.9	40.6	8.66	10.33	17.5	215.61
2	Mudavan mugal	24.2	75.8	31.6	6.66	8.5	21.2	188.28
3	Melamcode	22.2	77.8	39.4	7.33	9.18	22.3	157.03
4	Pamamcode II	22.9	77.1	31.9	7	8.88	16.5	232.44
5	Thozhukkal	14.5	85.5	34.5	6.83	9.1	15.42	203.54
6	Amaravila	23.4	76.6	26.14	7.62	8.5	15.82	196.42

Observation: Of the seven samples analysed the sample from Thozhukkal looks to be the best. This contains a grit percentage of only around 15%. The percentage of fines is around 85, which indicates that the clay is very good for high quality terracotta materials.

Table 2.4. Physical characteristics of clays from Kollam district

Sl. No.	Sample location	Grit content (%)	Fines (%)	Plasticity (%)	Green shrinkage (%)	Fired Shrinkage (%)	Water absorption after firing (%)	Cold crushing strength (kg/cm^2)
1	Anthaman	3.68	96.32	34.34	8.91	2.16	20.96	309.46
2	Poruvazhi	13.2	86.8	12.48	8.54	1.1	14.92	169.43
3	Kalavayal	24.2	75.8	33.55	6.54	8.66	12.50	335.43

Observation: clay collected from Anthaman has more than 95% of fines. It has good plasticity, low-fired shrinkage and high cold crushing strength. The properties indicate that the clay is suitable for fine red clay products.

Table 2.5. Physical charecteristics of clays for Alappuzha

Sl. No	Sample location	Coarse fraction	Fine fraction (%)	Water of Plasticity (%)	Dry linear Shrinkage(%)	Fired linear Shrinkage (%)	Water absorption after firing (%)	Cold crushing strength (kg/cm^2)
1	Thalavadi	30.62	69.38	29.80	8.88	1.19	20.89	226.60
2	Kallissery	13.20	86.80	39.01	10.93	1.13	19.56	155.95

Observation : The clay bearing area is very limited in Alappuzha. The sample from Thalavadi was found to be quite gritty. However strength wise the products show satisfactory results.

Table 2.6. Physical characteristics of clays from Pathanmthitta District

Sl. No.	Sample location	Grit content (%)	Fines (%)	Plasticity (%)	Green shrinkage (%)	Fired Shrinkage (%)	Water absorption after firing (%)	Cold crushing strength (kg/cm^2)
1	Thiruvayoor	21.2	78.8	28.32	7.88	1.14	19.85	261.8
2	Valanjavattom	14.7	85.3	47.66	1.04	1.05	17.47	255.63

Observation: Valanjavattom Sample shows some speciality. It has very high water of plasticity and at the same time very low dry linear shrinkage and fired linear shrinkage.

Table 2.7. Physical characteristics of clays from Kottayam District

Sl. No.	Sample location	Grit content (%)	Fines (%)	Plasticity (%)	Green shrinkage (%)	Fired Shrinkage (%)	Water absorption after firing (%)	Cold crushing strength (kg/cm^2)
1	Vaika prayar	12.65	87.35	29.30	10.89	1.10	18.85	228.10
2	Chengalam	14.7	85.3	39.18	5.23	0.94	21.23	181.30
3	Kattachira	5.35	94.15	54.59	11.48	1.12	15.04	136.83

Observation: The sample from Vaika prayar indicated maximum cold crushing strength. Water of plasticity of the raw clay is very high (54.59 %). One would naturally expect higher fired shrinkage in this case. However this value is quite low. May be the body might have developed micro cracks during drying which resulted in a low CCS.

Table 2.8. Physical characteristics of clays from Ernakulam

Sl.No.	Sample location	Grit (%)	Fines (%)	Water of Plasticity (%)	Dry linear shrinkage	Fired linear Shrinkage (%)	Water absorption after firing	Cold crushing strength (kg/cm^2)
1	Karumalloor 1	20	80	39.42	3.27	8.01	15.8	69.3
2	Karumalloor- 11	11.1	88.9	42.34	4.01	8.07	14.91	18.88
3	Eroor	14.1	85.9	38.45	3.55	8.32	13.45	191.5
4	Enath	10.9	91.1	40.68	6.42	10.4	18.3	180.1
5	Muthirakkad	8.3	91.7	45.21	10.91	2.16	20.41	173.5
6	Ezhipram	7.2	92.8	37.71	1	0.73	28.41	166.3
7	Nedumbassery	9.9	90.1	42.48	1.04	2.05	26.82	143.2

Observation: The samples which show higher values for water absorption of the fired samples (samples 5, 6 and 7) have lower crushing strength. Fired linear shrinkage varies from 2-10.5%. This is an indication that the fine silica content (which does not contribute for shrinkage) in these clays varies to some extent. Higher the amount of silica content, lower will be the sinterability and lower will be the crushing strength.

Table 2.9. Physical characteristics of clays from Trichur District

Sl. No.	Sample location	Grit content (%)	Fines (%)	Plasticity (%)	Green shrinkage (%)	Fired Shrinkage (%)	Water absorption after firing (%)	Cold crushing strength (kg/cm^2)
1	Chittissery	36.50	63.50	28.10	8.80	2.28	15.38	163.32
2	Madakkathara	13.10	86.90	29.67	5.62	6.80	5.52	189.82
3	Villadam	18.50	81.50	37.58	8.53	4.44	14.27	152.13
4	Karamukku	32.20	67.80	44.32	6.58	7.15	12.41	153.31
5	Nadathara	20.16	79.84	38.38	8.54	1.08	13.10	152.53
6	Panjal	11.15	88.85	41.56	10.23	1.12	16.43	255.14
7	Kondazhi	20.15	79.85	51.68	9.96	1.12	8.73	171.67

Observation: The sample from Panjal contains the least amount of coarse fraction (11.15%). Incidentally this samples also shows the maximum cold crushing strength (255.14 kg/cm^2). Other factors being more or less comparable, higher finer fraction in the sample has shown to give a better product.

Table 2.10. Physical characteristics of clays from Palakkad District

Sl. No.	Sample location	Grit (%)	Fines (%)	Water of Plasticity (%)	Dry linear shrinkage	Fired linear Shrinkage (%)	Water absorption after firing	Cold crushing strength (kg/cm^2)
1	Pulinelli	4.1	95.9	37.39	11.62	1.14	14.14	225.80
2	Parali	11.4	88.6	34.78	11.0	12.75	17.80	180.17
3	Akathethara	26.2	73.8	38.40	8.16	10.84	20.80	237.30
4	Vadakkenchery	11.7	88.3	53.94	11.39	1.09	25.03	252.01
5	Melarcode	17.4	82.67	29.88	9.73	1.07	12.20	234.65
6	Kuzhamannam	11.75	88.25	36.45	11.39	1.07	14.43	197.27
7	Pilapally	11.82	88.18	32.55	9.72	1.10	12.12	146.81
8	Padoor	17.28	82.72	27.19	12.17	1.16	16.78	218.50
9	Tirunellay	9.88	90.12	34.71	9.73	0.98	6.89	272.22

Observation: The grit content varies significantly. The grit content of the sample from Pulinelli is quite low (4.1%), whereas, the clay used in Akathethara Panchayath contained a high amount of grit. This indicates the inconsistency of the raw material used. Further, sample from Vadakkenchery indicated a plasticity of 53.94%, which was the highest among the samples of various Panchayaths of Palakkad District. The water absorption after firing showed very low value which indicated the good sinterability of the products. CCS which is a measure of the strength of the products also was quite high.

Table 2.11. Physical characteristics of clays from Malappuram District

Sl. No.	Sample location	Grit content (%)	Fines (%)	Plasticity (%)	Green shrinkage (%)	Fired Shrinkage (%)	Water absorption after firing (%)	Cold crushing strength (kg/cm^2)
1	Elamkulam	4.94	95.06	44.32	8.61	1.79	12.41	287.33
2	Aruvakkodu 1	11.68	88.32	50.13	9.68	1.42	16.09	239.49
3	Aruvakkodu 11	10.68	89.32	39.35	9.82	1.92	5.52	151.03
4	Melattoor	11.82	88.18	29.97	9.04	3.12	16.37	155.13
5	Mavoor	21.20	78.80	27.82	9.35	1.12	19.88	182.79

Observation : The values show a direct relationship between the % of fires and cold crushing strength. The samples from Elamkulam and Aruvakkodu are excellent for fine terracotta wares. The shrinkage percentage on firing is within limits and the water absorption after firing also fall below 20 %.

Table 2.12. Physical characteristics of clays from Kozhikkode District

Sl.No	Sample Location	Grit (%)	Fines (%)	Water of Plasticity (%)	Dry Linear Shrinkage (%)	Fired Linear Shrinkage (%)	Water absorption after firing	Cold crushing strength (kg/cm^2)
1	A. K. G colony	11.2	88.8	27.2	8.83	2.32	15.32	169.3
2	Olavanna	9.88	90.12	48.8	2.17	3.37	18.13	164.88
3	Nandiar Kunnu	14.69	85.31	32.92	7.73	4.47	10.82	188.21

Observation: Olavanna clay has lowest dry linear shrinkage. This indicates the presence of higher silica percentage in this sample. The same sample is showing higher water absorption of fired samples and also the lowest cold crushing strength.

Table 2.13. Physical characteristics of clays from Wynad District

Sl. No.	Sample location	Grit content (%)	Fines (%)	Plasticity (%)	Green shrinkage (%)	Fired Shrinkage (%)	Water absorption after firing (%)	Cold crushing strength (kg/cm^2)
1	Nadavayal	11.10	88.90	35.88	7.37	1.08	14.36	251.04
2	Kananchery	6.40	93.60	38.01	9.79	1.04	15.01	329.85
3	Alankandi	20.70	79.30	32.85	9.72	1.18	15.25	351.85
4	Madiyurkuni	20.88	79.12	29.23	8.53	2.21	12.61	282.87

Observation: The samples show good water of plasticity and good cold crushing strength. Water absorption after firing is well within limits. The properties indicate that they are good for studio pottery.

Table 2.14. Physical characteristics of clays from Kannur District

Sl. No	Sample Location	Coarse fraction (%)	Fines fraction (%)	Water of Plasticity (%)	Dry Linear Shrinkage (%)	Fired Linear Shrinkage (%)	Water absorption after firing	Cold crushing strength (kg/cm^2)
1	Mottammal	15.30	84.78	29.26	9.88	0.06	18.88	180.33
2	Peravur	10.20	89.80	28.82	9.86	0.12	16.01	241.94
3	Thricham baram	17.52	82.40	49.39	9.01	1.10	11.98	137.06

Observation: Sample from Thrichambaram shows good water of plasticity. However the fired strength of the material manifested by the cold crushing strength shows lower value compared to the other two samples. One will certainly expect a higher value for this as the fired shrinkage is low and also water absorption of the fired sample is minimum. One possibility is that it contained calcarious or carbonaceous impurities, which resulted in the low CCS.

Table 2.15 Physical characteristics of clays from Kasaragod District

Sl. No.	Sample location	Grit content (%)	Fines (%)	Plasticity (%)	Green shrinkage (%)	Fired Shrinkage (%)	Water absorption after firing (%)	Cold crushing strength (kg/cm^2)
1	Paika	9.6	80.4	36.3	8.60	2.11	19.20	252.8
2	Punnappalam	3.72	86.28	38.6	9.30	1.08	15.81	248.6
3	Erikkulam	9.68	90.32	38.6	9.67	0.14	17.60	236.6
4	Kayakulam	7.20	82.80	42.8	10.20	1.02	20.20	233.4

Observation: The cold crushing strength above 220 kg/cm^2 is quite good. In this respect all the above clay samples are good for pottery applications including studio pottery. The coarse fractions are found low and the fired shrinkage values are also minimal. These observations indicate that the possibility of deformation during firing is very low.

3.1. Present marketing strategies

Sl. No.	Method of sales	No of Potters	Percentage
1	Selling at site	58	25.89
2	Sell at the market	45	20.08
3	Head load vending	83	37.05
4	Selling at site and at the market	4	1.78
5	Selling at the market and head load vending	10	4.46
6	Selling to the co-operative society	8	3.57
7	Selling at site, market and head load vending	2	0.89
8	Selling to society and head load vending	13	5.80
9	Others	1	0.45
Total		**224**	**100**

3.2. Number of major hotels in each district

Trivandrum	82	Kollam	7	Pathanamthitta	3
Alappuzha	19	Kottayam	8	Idukki	42
Ernakulam	38	Trichur	19	Palakkad	15
Malappuram	6	Kozhikkode	13	Wynad	13
Kannur	5	Kasaragode	8	**Total**	**278**

3.3. Number of Tourist Centres in each district

Trivandrum	12	Kollam	5	Pathanamthitta	6
Alappuzha	5	Kottayam	6	Idukki	6
Ernakulam	9	Trichur	5	Palakkad	5
Malappuram	6	Kozhikkode	4	Wynad	5
Kannur	6	Kasargode	5	**Total**	**85**