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**IDENTIFICATION AND ANALYSIS OF ENDANGERED SKILLS IN THE
FARMING SYSTEMS OF THRISSUR DISTRICT
(KAU – KRPLLD Study 1998-2002)**



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CHAPTER I INTRODUCTION

1.1 Background of the project

Agriculture has been in practice for over many generations and the accumulated knowledge through generations contribute to the basic foundation of the profession. Farming, viewed through the history of human kind had undergone evolution as a result of the thorough, concerted and continuous trials and adaptations of our ancestors in their search, attempts and struggles to 'manage' the environment for food and shelter. Agricultural production is primarily and almost entirely dependent on natural resource endowments. No human activity is so intimately connected with and dependent on nature, as farming is. Hence, in no other human endeavour, the influence of traditional culture is as pervasive in the evolution of innovations and technologies as in farming. Through the sustained process of experimentation with odds of the nature, our ancestors have acquired innumerable bits of valuable knowledge, skills and arts. These practices over time have got embedded in the social values and culture. Most of the farm operations are, therefore, associated with various facets of the culture and the value systems pursued by the communities. Perpetuation of such value systems over generations has formed the basic foundation of any society to sustain its agriculture. In fact, the traditional farming systems are not just primitive left overs from the past, but are, on the contrary, systems which are finely tuned and adapted, both biologically and socially through thousands of years. The pieces of information thus gathered and accumulated were mainly transmitted through informal word - of - mouth communication to the farmers from one generation to another.

Our farming systems operate neither in isolation, nor in vacuum. As in the case of all other spheres, agricultural sector also undergoes changes. The revolutionary changes brought by green revolution, the changes in socio-economic and cultural spheres and the planned interventions of development have paved the way for innovative approaches in farming. As a result, many of the traditions which existed in among Kerala peasant culture are being forsaken, getting 'endangered' and are facing literal 'extinction'. However, of late, the research systems also have recognised the fact that through modernization, the social systems which were once self reliant are virtually being transformed and made dependent on exogenous technologies and inputs and in this process, the rural social system has discarded the numerous locally adapted land resources and indigenous technologies, skills and related wisdom and relations. Now of late, the idea that the beauty and essence of sustainable development lies in integrating and blending the basics of the tradition with the technological innovations of modern science is gaining popularity and acceptance. Against this background, the present study on "**Identification and analysis of endangered skills in the farming systems of Thrissur District**" was conceptualised and implemented in Kerala

Agricultural University during 1998-2002, as a project sponsored by Kerala Research Programme on Local Level Development (KRPLLD).

1.2 Concept of indigenous knowledge and endangered farm skills

A glance through the views and observations of the scholars who had already made efforts towards the preservation of local wisdom can help one to understand the process and concept of indigenous knowledge system. Indigenous knowledge was defined as a system finely tuned and adapted both biologically and socially to counter the process of what are often harsh and inimical environments and often represents hundreds or thousands of years of adaptive evolution in which the vagaries of climate, availability of land and water, the basic needs of people and their animals for food, shelter and health have been amalgamated in a system which has allowed society to exist and develop in the face of tremendous odds (Haskell *et al.*, 1981). Alcorn, 1984, Hunn, 1985, Carter 1988 and Terri and Mohammed 1988 also have emphasised the highly localised, restricted and practical nature of indigenous knowledge and they were appropriate skills in using the natural resources to gain their livelihood.

The knowledge generated through generations which can be described as local knowledge, traditional knowledge or indigenous knowledge is unique to a given culture or society and is dynamic with changes through indigenous creativity and innovativeness as well as through contact with other knowledge systems i.e. with environment. Terri and Mohammed (1988), Wang (1988) and Warren (1989) have pointed out the chances of influences of environment through creativity and contact with other knowledge as the basic knowledge of any society. This knowledge generated and adapted through generations, in today's parlance, is called 'local knowledge', 'traditional knowledge' or simply, 'indigenous knowledge' (Chittirachelvan and Raman, 1991). This indigenous knowledge, which is unique to a given culture, is abbreviated as IK. According to them, indigenous knowledge was passed on from generation to generation by word of mouth. It includes various social and religious taboos, beliefs and customs, communication patterns, music, ecology, vegetation, climate and so on. It has also been pointed that IK was mainly inherited through the socio-cultural system, and was maintained and developed through oral traditions, folk tales, proverbs and through indigenous beliefs, attitudes, customs, rituals etc. In the opinion of Thurston (1992) and Balasubramanian *et al* (1994), the research in the modern sense and its contribution to agriculture is relevant. But the attempts of research, which our ancestors carried in their own traditional way, may be through accident, intuition, trial and error and which actually paved the base of the present agriculture, cannot be over looked. Vasu (1994) had epitomised traditional agriculture as the scientific wisdom of generations and equated with simplicity. Preetha (1997) has operationally defined indigenous practices as resource - saving, site-specific, farmer-devised technologies experimented and adapted by themselves which is simple to practice, flexible in use and sustainable in effect.

In this context, the present investigation has focused on the knowledge associated with the traditional ways of farming system management, may be with crops, or animals subsistence and livelihood by different sections of people in the society i.e., the study has tried to see and analyse the knowledge and skills possessed in managing the farm activities by

the farmers and their subsystems, farm labourers, rural artisans, local money lenders, feudal lords, local medical practitioners, local vendors, religious institutions etc. in the recent past-roughly for the last 50 years.

What is the importance of indigenous farm skills?

Knight (1980) and Rolling (1989) had called for systematic documentation of traditional knowledge into an 'information bank' from which all concerned can draw enlightenment and insight. Farmers are not passive consumers, but active problem solvers who, in fact, have developed most of the technology they use. It is right to consider the present day farmers as researchers who adopt and adapt technologies to specific circumstances, and farmer experimentation is able to accommodate changing circumstances and diversity and farmers' own analysis of farming systems offers important insights, different from that of scientists.

Nitsch (1991) has rightly pointed out that farm management requires a combination of experience, intuition and practical know-how that can only be learned in the context in which it is applied and the traditional agricultural systems are to be considered for their productivity, sustainability, stability and equitability. Thurston (1992) also has observed that most of our present practices and cultivations are evolved from ancient techniques and plant materials. Projects lacking sufficient understanding of traditional agriculture systems become irrelevant to the context fail and cause ecological problems. Since traditional systems are in danger of being lost as agriculture modernizes, they should be studied and conserved, before they are completely lost. Traditional farming resemble natural ecosystems and their diversity give a high degree of stability, resilience and efficiency. Ghotge and Ramdas (1995) identified the most important reasons for conservation of indigenous breeds of livestock as preservation of valuable genetic material and maintaining biodiversity. All these remind that it is crucial that development workers need to study local production processes and goals before designing and implementing livestock development programmes. Walt and Walt (1993) also have made a very critical comment that most of the technologies used for increased production are unsustainable and environmentally damaging. It can be noticed that many of the researchers are of the argument that a cry for the reconstruction of a more sustainable and socially just agriculture has arose with the belief that greater attention must be given to local knowledge systems, involving more environment friendly technologies, empowering people like farmers and creating technologies that will have more socio-economic implications. Sandoval 1992, Walt 1994; Rajasekharan and Warren 1994; Salas 1994; and MANAGE, 1995 also emphasised utilization of farmer's knowledge in the scope for participatory technology development. Reijntjes *et al.* (1992) had observed that specialised indigenous knowledge is often kept secret or made known only to select few. In any case, peasants do not document their knowledge so that it can be made available to strangers. Their knowledge may be implicit within their practices, actions and reaction, rather than a conscious resource. Suitably Agarwal and Narain (1997) have also stated that many of the traditional agricultural practices are now dead, but memories of most of them continue among farmers and villagers even today and constitute their body of knowledge. All these

emphasize the need for an in depth analysis of the indigenous wisdom, their endangerment and the factors behind them.

Factors and constraints in the use of indigenous practices

An effort to identify the factors involved in the use of indigenous practices would indicate many complicated factors as specific causes behind the changes that have happened in the farming scene in general. The planned development efforts those were introduced in the agricultural scene and the accompanying or isolated changes those occurred in the rural social scene also have to be analysed to understand how and why the traditional farming practices have given way to the modern practices.

Many scientists in the past have reported many factors, which influence and decide the use of traditional practices like (Wilkin, 1974); shortage of land holding and low crop productivity (Anantharaman, 1971); foreign technology education, religion and cultural values, and marginalisation of farmers knowledge growth (Reijntjes *et al*, 1992); increased market orientation and changing consumption patterns (Alders *et al* 1994) skill intensive nature (Kurien 1995), unscientific and unreliable nature of traditional wisdom (Sager, 1995), economic change and capital market penetration (Alrein *et al* 1996)

Wilkin (1974) found that most of the traditional practices are labour intensive. Dunkel (1985) opined that many of the farming techniques were often family secrets and as such they do not form part of the extension system. Such techniques frequently do not become widely accepted in a country or even in a similar region of the country. He warned that only through national survey conducted by interested persons such techniques surface and become disseminated. Ananatharaman (1991) stated that farmers have their own reasons for practices followed and noticed that they are not bound by economic or social factors, but largely by scientific reasoning. Increase in population, shortage of land holdings, decrease in crop productivity etc, are identified by Bharara (1991) as some of the major constraints in adoption of IK.

Reijntjes *et al.* (1992) explained various limits to indigenous knowledge: IK is not uniformly spread throughout a community and individual aptitude for strong traditional knowledge and generating new knowledge differ. Each individual possesses only a part of the communities' IK.-In many cases, farmers do not document their knowledge so that it can be made available to others. Their knowledge may be implicit with their practices, actions and reactions rather than a conscious resource. Farmers' knowledge is limited to what they can sense directly, usually through observation, and what they can comprehend with their own concepts. It may, therefore, be difficult for them to relate to process which are new or affect them only very gradually or indirectly. Eg, population growth, deteriorating natural resources, external markets, foreign technology, education, religious and cultural values, marginalisation of farmers' knowledge etc. In situations where land is limited and the population continues to grow, the traditional ways of farming may no longer be tenable.

Alders *et al* (1994) found that increased market orientation and changing consumption patterns create disrespect of traditional authorities and indigenous knowledge. Simpson (1994) identified that a number of social factors contribute to the differentiation in individual knowledge, by defining the range of personal experiences, access to resources and

opportunities for observation in the acquisition of knowledge and the exchange of information and materials. Of these social factors, which include kinship, age, ethnicity, religious affiliation and wealth, gender is one of the most influential. He concluded that any intervention or development effort aimed at engaging the local knowledge systems must give particular attention to 'whose knowledge', which is important. Just as with popular participation, the inclusion or exclusion of different sets of knowledge will determine to a large part who ultimately benefits.

Kurien (1995) had explained various limits to indigenous knowledge: Ethics of survival is one of the motivating facts for traditional innovative activity. Traditional innovations are skill intensive and presuppose certain degree of experience and fund of knowledge. In innovations there is emphasis on diversity and materials used are local. Almost all technologies are within the community of genuine users. Shiva 1995 also had observed that indigenous seeds, indigenous knowledge and culture they embody are under threat from technological change, monoculture paradigm, economic changes and monopoly control of agribusiness. Altein (1996) reported that economic change, capital and market penetration etc. lead to ecological breakdown, which in turn destroy the productivity and sustainability of traditional knowledge.

1.3 Operational definition of the concepts used in the study

Indigenous practices

Indigenous practices are operationally defined as farmer devised, location/site specific technologies evolved over long period and inherited and adapted by the farming community, in their sustained efforts of farm management.

Indigenous farm skills

Indigenous farm skills are those practices wherein components of abilities, expertise or proficiencies are involved and which necessitate acquisition of those abilities by the farmers for their effective utilization in farming

"Endangered" indigenous farm skills

'Endangered' indigenous farm skills are those skills, which face the danger and likelihood of becoming extinct in the farming systems within short period.

"Extinct" indigenous farm skills

'Extinct' indigenous farm skills are those skills, which have disappeared and no longer in existence or use in the farming systems

Farming system

Farming system is the entire complex of development, management and allocation of resources as well as decisions and activities, which, within an operational farm unit or combination of units, results in agricultural production, processing, consumption and marketing of products

Transition in agriculture

Transition in agriculture is operationally defined as the extent to which an area has been subjected to changes in agriculture by way of introducing new crops, new varieties, breeds, farm inputs etc. over a period of time.

1.4 Objectives

The specific objectives of the study were:

1. Identification of indigenous skills in the farming systems of Thrissur District.
2. Analysis of the indigenous farming practices in the areas of high and low transition in agriculture in Thrissur District.
3. Analysis of factors related to the present "endangered" and "extinct" conditions of farm skills in Thrissur District.

1.5 Rationale of the study approach

On identifying the importance and relevance of documenting and rendering the local knowledge system of any region, the present study has focused to identify the different indigenous skills in the farming systems of Thrissur District and to identify their present stage and the associated factors for the present stage.

In this context, the skill involved in a practice (farm skill) can be analysed mainly from two angles - the skills implied in the practice as such; and the skills involved in the process of constructing, operating and maintaining the technology. Such an analysis leads to the role of the real skill owners of the indigenous knowledge of a social system which existed in the past- as farm labourers, rural artisans, rural medical practitioners, nomadic tribes etc. along with the practising farmers. Hence the approach to be taken in any future effort of documentation of the skills in the farming system should not confine to the farmers alone, but should consider the other stakeholders of the knowledge system also. The rationalising exploration of "why knowledge" or "principle knowledge" behind any indigenous practice can be the initial step of new research efforts. The relevance of such effort has great significance in the present context of PTD (Participatory Technology Development), which is jointly implemented. The identification of the "skill owners" and utilization of their wisdom and expertise in transferring the skills to the younger generation is of much importance. This has become all the more essential since caste bound "traditional occupations" are vanishing from the rural scene and in general farm youth are reluctant to participate in farming. From another view point also this effort is of much importance i.e. the importance of documenting the identified farm knowledge system and its connected skills and their details would be the need of the coming days wherein the natural resource constrained society will be compelled to depend and rely on the old resource conserving, simple technologies.

CHAPTER 2 METHODOLOGY

2.1 Study area

The study was conducted in Thrissur district of Kerala State in India, during 1999- 2001. Thrissur District is situated in the central part of Kerala between Bharathapuzha and Periyar, the two important rivers of Kerala. The boundaries of the district are Malappuram and Palakkad in north, Palakkad and Tamil Nadu in east, Idukki and Ernakulam in the south and Arabian Sea in the west. The District consists of 17 blocks covering 98 Panchayaths. (Appendix 2)

2.2 Agricultural situation in the District

1. Crops

Out of the 22.6 lakh hectares of cultivated land in Kerala, 1.57 lakh hectares are in Thrissur District. Rice, coconut, arecanut, banana, vegetables, cashew and rubber are the major crops grown in the district. The major crop, rice, is being cultivated in an area of 51,544 hectares while all other crops together make 1,05,549 hectares. The data provided in the Table 1 clearly depict the shift that has occurred in the agricultural scene of the district. A glance through the data of the area from 1975-76 to 96-97 shows that the reduction in the area of rice cultivation is quite alarming. At the same time, increase in the area of cultivation of almost all other crops during this period is also evident.

There are mainly three methods of rice cultivation in the district- rainfed *Virippu* and *Mundakan*, irrigated *Virippu*, *Mundakan* and *Puncha* and *Kole* cultivation (*Mundakan* and *Puncha*). Rainfed cultivation is practised in Thalappilli taluk and in certain parts of Thrissur, Mukundapuram and Chavakkad taluks during *Virippu* and *Mundakan* season. Irrigated rice cultivation is practised in the command areas of Peechi, Vazhani, Chalakudi and Cheerakuzhi dams and in the areas of lift irrigation projects operated in the river basins of Chalakudi and Manali rivers. The most important crop in the garden land is coconut, followed by arecanut, vegetables and nendran banana.

2. Livestock

The livestock production of the district according to 1996 animal census is presented:

<u>Category</u>	<u>Number</u>
Cattle (local breed)	68,652
Cattle (cross breed)	1,61,579
Buffalo	19,637
Goats	1,60,927
Poultry	19,92,072
Duck	9,84,024

During 1996-97, 1.98 lakhs metric tonnes of milk, 16.8 crores of eggs, 13,800 unit meat were produced in the district.

There are 289 milk co-operative societies. The milk production as such is not profitable to the dairy farmers, as they are not in receipt of remunerative prices.

MAP OF THRISSUR DISTRICT

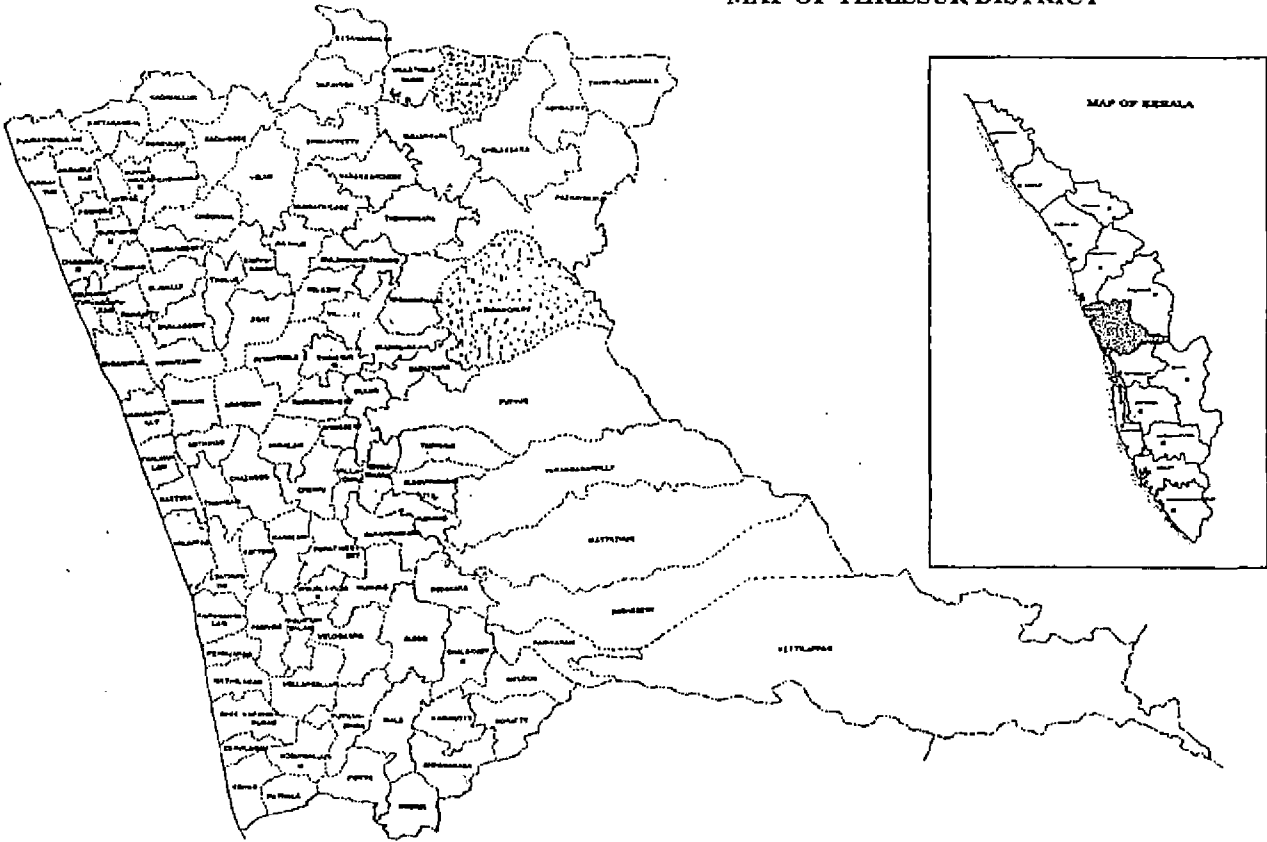


Table 1: Area under major crops of Thrissur District (in hectare)

Crops	75-76	80-81	81-82	82-83	83-84	84-85	85-86	86-87	90-91	91-92	92-93	93-94	94-95	95-96	96-97
Paddy	108378	110314	115511	107711	103391	102540	95215	89527	63078	69065	67151	61508	66144	58703	51544
Coconut	50699	54030	57312	57312	58929	62438	60366	61200	80856	84789	85600	87118	86206	55138	83978
Pepper	1525	4010	4036	4173	4073	3780	3739	3876	5457	5757	5596	5171	4983	5222	4343
Banana	1384	1549	1432	1228	1403	1577	1327	2107	1842	1685	1842	1552	1972	2128	2388
Arecanut	--	--	--	--	--	--	6165	5982	--	5429	--	6582	6637	6346	5954
Rubber	7785	9386	9386	9445	10760	11019	9493	10048	--	--	--	--	--	--	12254

(Sources : Govt. of Kerala Statistics for Planning 1988, Department of Economics and Statistics, Trivandrum and Development Report Thrissur District and Hand Book of Agriculture 1998)

3. Fisheries

The district has 54 km of seacoast area (i.e. 9.2 % of the total sea coast area of Kerala) where there are 18 villages where fishing communities reside. There are also inland fishing areas in Thrissur, mainly in Chavakkad, Nattika, Kaipamangalam and Azhikode regions.

2.3 Identification of Study Units

1. Identification of Panchayaths with high transition and low transition in agriculture

From among the 98 *Grama* Panchayaths of the district, one Panchayath with high transition in agriculture and another Panchayath with low transition in agriculture were identified following the procedure explained below.

Transition in agriculture was operationally defined as the extent to which the area has been subjected to changes in agriculture by way of introducing new crops, new varieties, breeds, farm inputs etc over a period of time. Here 25 years was taken as the time frame

A thorough review of the development reports of all *Grama* Panchayaths in the District was made. Using the data from the developed report and with the help of development personnel like Agriculture Officer, Veterinary Surgeon and Panchayath Officials, two groups of Panchayaths were identified - Group A including 7 Panchayaths with high transition in agriculture (Table 2); Group B including seven Panchayaths with low transition in agriculture (Table 3). The criteria used were - total area, gross cropped area, major crops, fertiliser use, pesticide use, mechanisation, improved breeds of cattle and area under inland aquaculture. These criteria were decided based on a consensus reached during the interaction with development personnel.

As the second step, one Panchayath with high transition in agriculture and another with low transition in agriculture was selected from these two groups following two measures of screening - a) by relevancy rating by the development personnel, and b) by working out composite index of transition in agriculture.

a) *Relevancy rating by development personnel*

The two groups of panchayaths *i.e.* (A) Panchayath with high transition and (B) Panchayath with low transition were subjected to relevancy rating by development personnel of State Department of Agriculture. Both the lists were given to selected group of 30 senior officers (*i.e.* Assistant Directors of Agriculture and Agricultural Officers with minimum 10 years experience). They were asked to select three panchayaths of high transition from group A and three panchayaths of low transition from group B. The ratings obtained for the panchayaths in both the groups are presented in Table 2 and 3.

Table 2: Group A (Panchayaths with high transition agriculture)

n= 30

Sl. No	Name of Panchayath	Frequency obtained in screening
1	Adatt	16*
2	Puthur	23*
3	Pananchery	25*
4	Kodassery	12
5	Pariyaram	9
6	Thaloor	5
7	Puthukkad	0

* Panchayaths selected with high transition in agriculture

Table 3. Group B (Panchayaths with low transition agriculture)

n=30

Sl. No	Name of Panchayath	Frequency obtained in screening
1	Kondazhy	16*
2	Koratty	0
3	Panjal	23*
4	Desamangalam	14*
5	Thekkumkara	12
6	Vellangallur	9
7	Madakkathara	9

* Panchayaths selected with low transition in agriculture

b) *Composite index of transition in agriculture*

The indicators of agricultural transition were identified as:

1. Extent of area cultivated (X_1)
2. Average fertilizer use (X_2)

3. Coverage of high yielding variety of rice (X_3)
4. Average pesticide use (X_4)
5. Extent of improved cattle population (X_5)
6. Extent of irrigation facilities (X_6)
7. Extent of mechanisation (X_7)
8. Extent of area under inland aquaculture (X_8)

Each of the above indicators was operationalised and worked out based on the data received from the development reports and extension personnel during interactions.

1. Extent of cultivated area (X_1)

Gross cropped area / Total geographical area of the Panchayath in ha.

2. Average fertilizer use (X_2)

Tonnes of fertiliser used/gross cropped area (GCA) in ha

3. Coverage of high yielding variety rice (X_3)

Area under high yielding variety of rice / gross cropped area in hectare

4. Average pesticide use (X_4)

Tonnes of pesticide used/ G.C.A in ha

5. Extent of improved cattle population (X_5)

No. of improved cattle breeds/ cattle population in thousands

6. Extent of irrigation facilities (X_6)

$(a + b + c + d)/4$

where, a = $\frac{\text{canal and river length in the panchayath}}{\text{gross cropped area}}$

b = $\frac{\text{no. of wells + ponds}}{\text{gross cropped area}}$

c = $\frac{\text{no. of pump sets}}{\text{gross cropped area}}$

d = $\frac{\text{no. of lift irrigation units working in the area}}{\text{gross cropped area}}$

7. Extent of mechanisation (X_7) = a+b+c+d

a = $\frac{\text{no. of tractors+ tillers}}{\text{gross cropped area}}$

b = $\frac{\text{no. of sprayers}}{\text{gross cropped area}}$

c = $\frac{\text{no. of threshers}}{\text{gross cropped area}}$

d = $\frac{\text{no. of coconut climbers}}{\text{gross cropped area}}$

8. Extent of area under inland aquaculture (X_8)
 = area cropped as fishery units in the Panchayath in hectare

Based on the eight indicators, a composite index was developed.

Composite Agricultural Transition Index (CATT) = $(Y_1 + Y_2 + Y_3 \dots Y_k) / k$,

where, Y (individual indicator) = $\frac{X}{X_{max}}$

X = raw data of the indicator

X_{max} = the highest value for X among the Panchayaths in the group

k = the number of indicators included

Accordingly, the transition indices were worked out for the selected panchayaths in the group A and B.

Tables 4a and 5a depict the raw indicators of the agricultural transition for each panchayath while the Tables 4b and 5b depict the transformed indicators of the raw indicators and CATT for each Panchayath.

Finally considering the relevancy rating and CATT of the selected panchayats and similarity in geographic and cropping patterns, two Panchayaths, viz. Pananchery and Panjal were selected as units for the study on existing practices in the farming systems. Pananchery panchayath was selected under high transition group and Panjal panchayath under low transition group.

2.4 Tools and methods used in identification, analysis and documentation of major indigenous /traditional farm skills in the district

With the help of key informants, extension personnel, review of past studies etc, the tracts of traditional/indigenous farm skills in Thrissur district were identified. Through individual and focused group discussion with the different stakeholders involved - farmers, labourers, rural artisans, rural medical practitioners, extension personnel, local resource persons etc, details on indigenous farm practices were collected. Time line and case studies also were carried out on individual practices and general trends. The participatory discussions were mainly focused on the oral history on the skills, their present state, skills involved, actors involved, reasons and factors for non use, re-use, etc. Photographic documentation of the practices were also carried out, wherever possible. In the case of extinct practices traced illustrations only were the possibility as they could not be located any where to the best knowledge of the researchers.

The identified farm practices were then categorised on an arbitrary continuum as given below based on the perceptions reported by the group participants

Sl. No.	Category of the continuum	Perceived description
1	Common practice	Still followed as a practice in the area by a majority of farmers
2	In practice	Still used in the area along with other modern methods / practices
3	Getting endangered	Rarely in use, (as modern methods are popular/lack of need/lack of demand etc.)
4	Endangered	Facing extinction due to continuous non use
5	Extinct	Not at all in use

During discussion with the extension personnel, local key informants etc., 44 farmers each with rich experience in crops like rice, coconut, livestock etc. were selected purposively from both the Panchayaths. Through individual contacts and visits, discussion using semi structured interview schedule (Appendix 4), time line analysis, case histories etc., major farming practices were identified and studied. Through dialogue with these farmers, experienced labourers, rural artisans, rural medical practitioners etc. also were located with whom the research team had constant interactions to analyse the reasons and factors of endangerment and extinction of traditional farm practices and skills involved.

Table 4 a

INDICATORS OF AGRICULTURAL TRANSITION IN THE SELECTED
PANCHAYATHS (HIGH TRANSITION GROUP)

SL. No	Name of Panchayath	X-1	X-2	X-3	X-4	X-5	X-6	X-7	X-8
1	Adatt	0.999*	947.81*	0.969*	1.023	866.20	1.371	0.020	0.04
2	Puthur	0.522	115.74	0.644	0.288	688.40	2.090	0.162	11.82*
3	Pananchery	0.461	407.88	0.751	2.499*	822.55	1.226	0.092	2.73
4	Kodassery	0.641	326.4	0.568	1.08	935.38*	0.919	0.043	5.94
5	Pariyaram	0.524	188.8	0.566	1.08	935.38	1.385	0.066	5.94
6	Tholloor	0.751	308.29	0.900	1.64	731.88	3.093	0.179*	0.20
7	Puthukkad	0.928	119.72	0.716	0.680	801.11	3.667*	0.033	7.40

* = Highest indicator among the panchayaths grouped

Table 5 a

INDICATORS OF AGRICULTURAL TRANSITION (LOW TRANSITION GROUP)

Sl. No	Name of Panchayath	X-1	X-2	X-3	X-4	X-5	X-6	X-7	X-8
1	Kondazhy	0.736	62.87	0.445	0.487	634.62	0.304	0.014	5.54
2	Koratty	0.653	0.142	0.583	0.061	563.91	0.461	0.151	2.74
3	Panjai	0.737	0.260	0.505	0.560	742.92	0.756	0.041	1.52
4	Desamangalam	0.785	13.46	0.719*	0.420	497.93	0.676	0.037	2.39
5	Thekkumkara	0.843	56.77	0.563	0.065	723.15	0.626	0.030	3.95
6	Vellangallur	0.625	94.10	0.405	1.260	774.16*	0.623	0.036	3.58
7	Madakkathara	0.855*	37.27	0.5495	2.15*	697.65	1.796	0.284	0.20

*= Highest indicator among the panchayaths grouped

Table 4b

TRANSFORMED INDICATORS OF AGRICULTURAL TRANSITION IN THE
SELECTED PANCHAYATHS
(HIGH TRANSITION GROUP) AND COMPOSITE AGRICULTURAL TRANSITION
INDEX (CATI)

Sl. No	Name of Panchayath	Y-1	Y-2	Y-3	Y-4	Y-5	Y-6	Y-7	Y-8	CATI
1	Adatt	1.000	0.949	1.000	0.409	0.926	0.375	0.114	0.003	4.776
2	Puthur	0.525	0.116	0.664	0.115	0.736	0.569	0.902	1.000	3.727
3	Pananchery	0.461	0.409	0.775	1.00	0.879	0.334	0.512	0.231	4.601*
4	Kodassery	0.642	0.326	0.586	0.432	1.000	0.251	0.244	0.503	3.287
5	Pariyam	0.524	0.189	0.584	0.432	1.000	0.378	0.369	0.503	3.984
6	Tholoor	0.751	0.308	0.928	0.656	0.782	0.843	1.000	0.017	5.287
7	Puthukkad	0.929	0.119	0.738	0.738	0.272	1.000	0.184	0.195	4.177

*= Panchayath selected for the study

Table 5 b

TRANSFORMED INDICATORS OF AGRICULTURAL TRANSITION (LOW
TRANSITION GROUP) AND
COMPOSITE AGRICULTURAL TRANSITION INDEX (CATI)

Sl. No	Name of Panchayath	Y-1	Y-2	Y-3	Y-4	Y-5	Y-6	Y-7	Y-8	CATI
1	Kondazhy	0.861	0.640	0.619	0.227	0.820	0.169	0.049	0.7436	4.128
2	Koratty	0.764	0.001	0.811	0.028	0.728	0.257	0.532	0.3677	3.489
3	Panjai	0.863	0.003	0.487	0.261	0.960	0.421	0.144	0.2040	3.341
4	Desamangalam	0.918	0.137	1.000	0.195	0.643	0.376	0.130	0.3208	3.820
5	Thekkumkara	0.986	0.578	0.783	0.030	0.934	0.349	0.106	0.5302	4.296
6	Vellangallur	0.732	0.957	0.563	0.586	1.000	0.347	0.127	0.4805	4.382
7	Madakkathara	1.000	0.379	0.076	1.000	0.901	1.000	1.000	0.0268	5.384



Paddy seed



"Kathirkula"



Broadcasting of paddy field

CHAPTER 3

FINDINGS AND ANALYSIS

8.1 Indigenous practices and skills in the farming systems of Thrissur district

The important indigenous skills and practices identified in the farming system of Thrissur are presented in this chapter.

A. RICE CULTIVATION

Seed related practices

The major rice growing seasons of Thrissur District are *Virippu*, *Mundakan* and *Puncha*. Even in the past these were the major seasons, but season specific seeds were in use for the different rice seasons. Many traditional varieties of rice were in existence earlier such as- *Orpandi* (Black pandi), *Kazhama*, *Cherukazhama*, *Undachempavu*, *Kutti*, *Swarnapandi* and *Kuttumundakan*. Almost all of these are not in present use and have become extinct. Among these *Kuttumundakan* is reported to be in cultivation. These traditional varieties were of long duration and had tall stalks thus providing both grain and straw required in the farming system.

Sowing

Specially selected, cleaned and well dried paddy seeds were stored in storage devices like big wood boxes (*Pathazham*), bamboo basket (*Koodavatti*), wooden walled rooms (*Ara*) etc. Seeds were considered 'sacred' and women in their special physiological conditions like menstruation periods, delivery etc., were not allowed to go near or enter the storing places. The plant propagation in paddy was through seeds, either directly sown into the main field or by sowing in nursery, to raise seedlings and then transplanting. Much changes have not come into these practices. Direct sowing and transplanting are still the main methods.

Direct sowing - This is usually practised for *virippu* cultivation (1st crop season). There are two types of direct sowing - '*podivitha*' and '*chettuvitha*'. In '*podivitha*', seeds as such are broadcast in the prepared field (dry condition). In '*chettuvitha*', sprouted seeds are sown in wet condition (in puddled field). Broadcasting was popular earlier and seeding behind the plough ('*Nurivitha*' method) was in practice in the district in earlier days. *Kuttumundakan* - was a special practice wherein seeds of different durations and seasons (*Virippu* and *Mundakan*) were sown together. As both type of seeds were photosensitive and season bound, with only one set of sowing and cultivation practices, two harvests were possible in this method.

Sprouting of seeds

To make the seeds sprout, paddy seeds are soaked in water for 24 hours either in sacks, bamboo baskets or in wooden devices. Seeds through alternate soaking and draining of water will start to sprout in three days. In early days, seeds in large quantities used to be sprouted in wooden devices- heaping the seeds on wooden planks layered with leaves of arrowroot (*Koova*), teak etc. and covered with the same types of leaves. Weights are placed above the leaves. Water is sprinkled frequently and by the third day, seeds will germinate.

Nursery and transplanting

In olden days the practice was to broadcast the sprouted seeds into nursery field prepared well with 4 or 5 bullock ploughings and with standing water. On third day, water will be drained to be irrigated as and when needed. Cowdung only was used as the manure. Depending on the variety, the seedlings will be pulled out at 20-25 or 30-40 days' growth. Women labourers pull out the seedlings and tie into bundles (*Njarukettu*) and are transported to the main field for planting

Kundakootal

The pulled out rice seedlings tied into bundles are huddled together one above the other in a circle forming pyramid shaped seedling hill. The bundles are placed with their root portion facing outside and kept for two days. The heat generated inside the hill is supposed to kill pests and diseases in the seedlings. This practice is rarely practised now.

Transplanting

Women stand bending in the well puddled main fields. Holding a bundle of seedlings (*Njarukettu*) in the left hand, 3 to 4 seedlings are separated with the right hand, immersed in the mud and then planted in the field. A number of women stand in single row and from one end of the paddy fields; they move backwards planting, till the other end of the field is reached. This practice is still the major method of transplanting and is identified to be one of the drudgery involved and backbreaking farm operations which is female specific. Of late mechanical transplanting with transplanting machines and dapog nursery are getting introduced.

Ploughing the field

Ploughing with country plough (*'Kalappa'* or *'Kart'*) drawn by animals (two bullocks or buffaloes) controlled by a man (*'Kalakkaran'*) was the common practice for field preparation. Different types of ploughs were used for varied purposes /operations - (first ploughing, repeated ploughing, after seeding, different seasons, marshy land, upland, sandy soil, clayey soil etc.). Now this practice is rarely carried out as tractor/tiller ploughing is the prevalent method.

***Visbuchaal pootal* (Ploughing on Vishu day)**

This was a special custom practiced on the day of Malayalam New year *Vishu* (1st day of *Medam* month). The farmers and labourers together initiate cultivation on that day by ploughing the paddy field. The ritual is carried out by worshipping the land with lighted lamp and other auspicious offerings.

Plough

The country plough consists of *Kozhu*, *Karipidi* and *Karikole*. The metal part which breaks open the soil is the blade (*'Kozhu'*). The wooden parts are the handle (*'Karipidi'*) and pole (*'Karikole'*) which is attached to the yoke (*'nukam'*).



From nursery seedlings are pulled out, made into bundles and transplanted in the main field



Transplanting of paddy



Handle and "Kozhu" of country plough ("Kalappa/Kari")



Yoke used for bullock ploughing



Levelling plank (Njouri)



Levelling plank



Use of spade for bund preparation in garden land

Levelling the field

Levelling board (*Njouri*)

After final ploughing, before transplanting/sowing, the field is levelled. In transplanting method, the field is levelled with levelling board (*njouri*). In dry method of sowing in the *virippu* season, to break the clods and level the field, *Kattamutti* or *Kattamaram* is used. This is a rectangular wooden block (plank) with long handle which will be tied to the yoke placed on the necks of bullocks. The bullock man will stand on the plank while the animals draw the assembly.

Clod breaking

Use of clod breaker (*Kattathalli*) was in practice to break the clods. This was operated manually by women.

These practices of levelling the field are nowadays very rarely practised in paddy cultivation.

Bund preparation and strengthening

Together with ploughing and other field preparations, the bunds of the individual plots in the paddy field also are trimmed, cleaned and plastered to strengthen them. These operations were carried out using "Spades" (*Thoomba*). This is a practice which is still in use in the district.

Spades

Spades were available in different shapes and sizes, which were used for field preparations for different nature - for digging and bund preparation in paddy lands, mount forming in uplands in summer period, coconut basin opening and closing, trenching, water channel preparation, etc.

Manures and manuring

Wood ash, cow dung, green manure, dry leaves, bone meal, river silt (*Puzha mannu*) etc. were the common types of manure used for crop. Green leaves which decayed easily were used. Leaves of "*Vatta*", "*Maruthu*", "*Punna*", "*Venga*", "*Pezhu*", "*Sheelanthi*", "*Oduku*", "*Pavatta*", "*Njara*" etc were in common use as green manure ("*Tholu*") in rice fields.

Burning of dry leaves from garden land and the stubbles of the previous crops heaped in the rice field was a cultural practice carried out just before *virippu* season. This practice is noticed to be still in use in Thrissur District. But green manuring has become a rare practice due to the non-availability of green manure and high labour cost.

Water management

Attached to uplands and paddy fields there were ponds in olden days. Irrigation from these ponds was in practice for paddy field and garden land (banana, vegetables, arecanut, coconut etc.) using different local devices. Some of the old devices were:

Swing basket (*Thekkukotta*)

Using this device, from shallow ponds water was lifted to irrigate garden land or paddy field. Two skilled persons are required to handle this device. It consists of a basket or shovel like scoop to which four ropes are attached.



Veth



Using veth for irrigation



**Counterpoise bucket lift
("Thulathekku")**



Self emptying rope and bucket lift ("Kaiathekku")



Wheel ("Chakkram")



Box ("Ara")



**Wheel and and box
("Chakkram and Ara")**



Draining of water in paddy field with "Chakkram and Ara"



Swing basket ("Thekkukotta") for irrigating



Petti and Para device for drainage in Kole paddy field

"Vethu"

This device was used for irrigating/draining paddy nursery. From shallow ponds, water is lifted to irrigate the fields. This is a rectangular shaped wooden open box with a handle to which a rope is tied. This rope is tied to a triangular stand of bamboo erected over the water body. Holding the handle of the Vethu, water can be lifted by swinging the handle to drain or irrigate the field as needed, to small heights, by a single person.

Counterpoise bucket lift (*Thulathekku*)

This was mainly used for irrigating gardenland from deep-water bodies like wells. This consists of a long wooden pole, which is pivoted on a lever or a post. A weight cone shaped in bamboo baskets is fixed to the shorter end of the pole, which serves as a counterpoise for the bucket (thulakutta) suspended at the long arm of the lever by a long slender bamboo pole. Person standing on a wooden bridge placed over the water body lifts the bucket and water from the pond and places on the beginning of the small water channel where it is tilted and emptied. Through the channel water flows to the field crops. Even though the practice of using Thulathekku was neglected for a period, recently it is noticed as getting back as a method of irrigation in many parts of Thrissur.

Self emptying type rope and bucket lift (*Kalathekku*)

This is a device with metal or leather bucket (Kutta), rope, leather hose (Thumbi) and a pulley. This used to be operated by a pair of bullocks and hence the name. The metal bucket has a handle at one end. At the other end, the leather hose is attached. In the handle of the bucket, a lengthy strong rope is tied - (Kuttakayar). To the hose, another short rope is also attached. (Thumbikayar). The Kuttakayar is passed over the pulley to be attached to the yoke on the necks of the draft animals. The pulley is fixed on two poles slantingly erected near the waterbody. The rope tied to the hose is also tied to the yoke. With the yoke the bullocks walk to and fro repeatedly. When they walk backward, the rope will get loosened and the bucket goes down the tank and gets immersed in water. When the bullocks walk forward, the bucket is lifted with water and the short hose rope gets tightened as a result of which the hose will bend and empty water to the water channel from where it flows to the field. The process is repeated for hours. The bullocks used in this operation are well trained for the movements. A skilled person (Kalakkaran) controls the operation. The songs which these persons sing during this process were popularly known as Thekkupattu. It is identified as an extinct practice as it is not at all in practice in the study area.

Wheel and box (*Chakram and Ara*)

This device was mainly in use for draining paddy fields. The rotating wheel is made of wood with 4 to 25 leaves. This wheel is placed in a wooden box, which is placed in a pit made in the bund (usually between two plots or between the plot and waterways). The box and the lower leaves of the wheel will be immersed in water. Over the bund, bamboo poles are erected to place a wooden seat for the person who operates the device. The operator pedals the leaves which during circular movements lift and push the water forward thereby draining the main field. The practice is noticed to be in use even though the prevalent use of the method is replaced by motor engine.

Petti and Para

These are large scale pumping devices prevalent in the Kole fields of Thrissur district, mainly for drainage. The device is an axial flow propeller pump, which is capable of a high discharge. This is installed and operated as part of group management effort of all the farmers in the Kole area. The method of irrigation system was introduced in the area by British rulers in the beginning of the century and still it is continuing as the major practice.

Plant Protection

The plant protection practices prevalent prior to the introduction of chemical pesticides are found to be mostly mechanical and ecofriendly measures. Some important measures are:

Fixing twigs of Oduku (*Cleistanthus coleinus* Euphorbiaceae family) in paddy field was popular as a control measure against leaf eating caterpillars. Manuring with green leaves of Oduku and cashew during final ploughing was a common practice done as a precautionary measure against pests. Very few people use the method. The plant is also not common.

Kundamuram - Mechanical control of leaf roller caterpillar with Kundamuram (triangular basket made of bamboo) was a common practice. By swinging Kundamuram in a particular angle over the crop, caterpillars were collected and destroyed. Very rarely the method is practised.

Pulling thorny plants through rice plants affected by leaf rollers- By this process, the rolled leaves will be open to expose the caterpillars. Twigs of plants like Kaitha, Thodali, Parakam etc were in use for this purpose. Brooms and ropes were also used for this type of mechanical control. This method is followed sometimes by small farmers as part of organic farming.

Flooding and draining of fields were also common measures used to control case worm of paddy. It is a measure commonly practised.

Pulling Kerosinated ropes - A rope dipped in kerosene is pulled across the crop from either side. After pulling the rope, the field is drained to collect and destroy the caterpillars, which have fallen down.

Control of crabs- Crab burrows are located and the openings of the burrows are closed with colocasia leaves filled with lime. While the crabs emerge out, they pierce through the lime and get killed. It is a very rarely practised method.

Placing of cashewnut shells and cashew nut oil- in paddy field is practised to kill rice case worms

Placing of decayed sardine fish - Placing of decayed sardine fish on bunds to deter rice bug was a common practice

Banning Rice Bug (*Chazby vilakkal*)- A person with a lighted torch made of dried coconut leaves goes round the field and erects the torch in an isolated plot in a corner. All the bugs get attracted towards the light and get killed. This is repeated on all evenings.

Coconut leaf spathes are placed in paddy field on which owls come and sit. The owls are natural predators of many pests in the field. The presence of owl reduces the population of the pests.

Scare crow - Effigies made of straw, old clothes, pots etc are placed in the field to scare birds. It is also believed to avoid the passerby's 'evil eye' on bumper yield.

Control of rats - Varied types of rat traps were in use for rat control during earlier days.

Rat Traps

Kumbham

Kumbham is a death trap to control *Thorappan* (*Bandicota bengalensis*). It is made of locally available cheap materials like bamboo pipe, umbrella cribs, twine, banana fibre, etc. It is placed along the side of the rat burrow. When rat comes out of the burrow and cuts the rope, it gets killed by the tightening of the rope around its neck.

Adichil

This is also a death trap to control *Panniyeli* (*Bandicota indica*). This trap is made of locally available materials like bamboo strips, coconut petioles, wooden logs etc. This device is placed in the rat's runways. Baits are placed as attractants. A heavy log is suspended in the middle by means of a lever mechanism and triggered over a metal strip. As the metal strip near the bait moves, the log falls on the rat and kills it.

Saw toothed scissors trap (Kandamkathrika)

This is a break back type of death trap, which is made of metal. The baiting principle is made use of in this case. On a rat trying for the bait placed in the trap, the saw-toothed portion falls to pierce through its body.

Earthen pot trap

It is made using local materials like wooden plank, earthen pot, nails and coconut butter. The pot is kept downwards on the wooden plank by means of nails. A rodent trying for the bait attached to the nails makes the pot to fall on the rodent, thus trapping it inside.

Box trap

This is a wooden box having three sides closed and the fourth side open with a lid. Placing bait inside, the lid is kept open. While a rat enters to get the bait, the lid automatically closes to trap the rat.

Burying mudpots at ground level

The mud pots are buried to the ground level at junctions of field bunds. The pot is filled with starch solution or groundnut oil cake mixture. Rats on falling inside the pots are drowned to death.

Weeding of wild rice

Wild rice (*Oryza rufipogon*) popularly known as *varinellu* is a weed, which is very prevalent in the paddy fields in some parts of Thrissur. As the weed resembles the main crop, only skilled and experienced persons are able to identify and pull out. The weeds are identified based on the reddish tinge in the leaves of the wild rice. The number of tillers also will be more, and the base of the plant will be more succulent and flat than rice plant. The grains of wild rice are with very elongated awn. The shortage of women labour of old generation who were skilled in the weeding of *varinellu* was reported by many farmers.



Box Trap (Elipetti)



Saw toothed scissor trap



"Adichil"



"Kumbham"



Earthen Pot Trap

Rat traps



"Kundamuram" used to catch leafroller larva



Harvest and post harvest operations

Harvesting

Paddy is harvested by cutting the earheads together with straw, using sickle (*Arival*). The cut earheads are made into bunches by tying with strawstalk and several bunches are made into bundles which are then transported as head load to the farmers' courtyard. The courtyard adjacent to the farmhouse is usually plastered with cow dung, which is used as threshing floor (*Kalam*). Paddy earhead bundles are stalked for two to three days in the threshing yard.

Threshing (*Methikkal*)

There are two methods of threshing prevalent - threshing by legs and other by beating the earhead bunch on stones. In threshing grains get separated from the stalk.

Drying of paddy grains

Paddy grains are dried spreading on threshing yard or mats (made of screwpine or bamboo) in direct sun for two to three days.

Vithetti/Polimantbi

Wooden implements like seed shovel (*vithetti, polimantbi*) were in use for spreading and heaping of seed on the mat.

Mats

Mats are made by weaving dried screwpine leaves or with bamboo splits.

Cleaning and winnowing

Rice grains and chaff are separated by winnowing. Winnowing baskets (*Kundamuram*) are used to drop grains from a height against wind. Weightless chaffy grains fly and fall at a distance, thus getting separated from good grains.

Storage

Dried paddy grains are stored in large sized wooden boxes (*Pathazham*), large bamboo baskets (*Koodavatti*), sacks or wooden walled rooms (*Ara*).

Straw

The ricestalk left on removal of paddy grains are dried and the straw is stored as small heaps or big hills around coconut tree at a height (*Thuru*). Dried straw is also kept in the shape of trapeziums before erecting as *thuru*

Seeds

The paddy grains from the best crop/field, after sorting and cleaning, are dried for larger periods to be used as seeds. These seeds are dried to the optimum level. When the seeds are dehusked and the kernels are opened across, a white spot should be seen at the centre (*kambu*). Farmers consider this as the indication of optimum drying. Seeds are then stored in *Pathazham*, sacks or *Koodavatti*.

Parboiling

From paddy grains, rice kernel is prepared through parboiling, drying and hulling. Parboiling is the process of boiling the paddy grains in big copper vessels or earthen vessels till the grain's husk breaks open to show the reddish kernel. Then the boiled paddy will be drained in bamboo basket and spread on mats in direct sun. The boiled grains will be dried for two days and then milled. This was usually carried out by women. This process is now very rarely practiced as many are depending on 'packet' rice from shops.

Rice hulling

Ural and Ulakka - Women used to hull and polish rice with these wooden devices, which were the tools used for hulling raw rice and parboiled rice in olden days. Now milling in rice mills is the common practice. After hulling rice kernel and husk are separated by winnowing in a flat device called *Muram*.

Whole rice and broken rice

Different types of parboiling and drying of parboiled rice were in practice for the preparation of whole rice and broken rice. To get broken rice, the parboiled rice is dried half day less than whole rice. There are methods of parboiling once and also twice.

Raw rice (*Unakkalari*)

Raw rice is a product of paddy, which is hulled without parboiling. This rice is mainly used for *payasam* (sweet preparation), snacks and breakfast items. (*appam, puttu, dosa* etc.)

Rice products

1. Rice powder (*Arippodi*)- The powder from raw rice is prepared by soaking raw rice for 3-4 hours in water and then powdering in the *ural* with *ulakka*. Now this is not common. Rice powder is made by milling or using mixie or grinder. The availability of ready to use processed rice powder in the market is another attraction now.
2. Rice flakes (*Avil*) and fluffed rice (*pori*) and *malar* are other common products from rice. Soaked paddy grains or germinated paddy grains are pound in *ural* with *ulakka* to prepare rice flake. *Malar* is prepared from dry paddy grains by frying the grains in frying vessels.

The *pori* production is a cumbersome process. Paddy grains are soaked in boiling water for 24 hours. The drained paddy is fried to cook the kernel. Again the paddy grains are soaked in water and boiled for 24 hours. The grains are then dried and milled. The rice grains are then soaked in saline water for 24 hours. Drained grains will be dried on a cement floor. On drying the grains are fried in iron vessels and then again soak in solutions sugar and salt for 6 hours. On final frying of the grain in higher temperature the fluffy rice are formed.

3. Rice fryums (*Arikondattams*)- Soaked rice grains are ground to paste and this paste is poured in clothes in definite shape and dried in sun. These are fried to be used as fried items. These can be stored for a long period.

These rice products are commonly in use and are usually produced as cottage industries.

Earhead bunch (*Kathirkula*)

This is a skilled art of preparing bouquet of rice earheads (by tying and plating each earhead). This is usually hung from roof in the front entrance of the house. This is considered a symbol of prosperity, which was common in aristocratic families. It is again an endangered skill and very few experts are there.



Paddy harvesting



Cutting paddy stalk 'Sickle'



Bundling cut ear head with straw stalk



Harvested paddy is being transported as head load



Threshing of paddy with legs



Threshing of paddy by beating on stones



Paddy straw stored as big heap around coconut tree ("Thuru")



Paddy straw is kept as small heaps



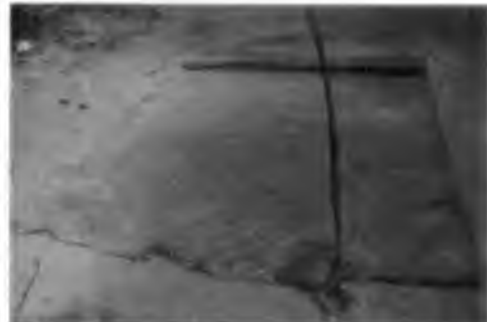
Different types of bamboo baskets ("Kutta", Kundamuram, Muram etc.)



Bamboo mat used for drying seed rolled and kept in bamboo brackets



Bamboo baskets used for carrying seeds/manure etc.



Mat (made of pandanus leaves) and wooden seed swivel (Vithetti)



Winnowing of rice to separate chaff



Wooden seed swivel (Vithetti) being used for gathering dried paddy on mat

Bamboo baskets (*Kutta, Murams*)

Bamboo baskets of varied size and shapes were in use for varied purposes related to farm operations. They are smeared and coated with cowdung to strengthen and prevent attack of insects. Round baskets (*Kutta*) are used for carrying and transporting seeds, manures, cowdung etc. Flat baskets like *Muram* are in use for winnowing (*Kombumuram, Kudamuram* etc.). These bamboo products were used to be supplied by a particular community (*Paraya*) considered to be experts of the craft. The relationship which existed between farmers and these artisans were mutual. The artisans were paid in kind (paddy) during the harvest season. As there are plastic products, which replace these bamboo baskets, this cottage industry is facing many difficulties. The scarcity of raw materials is a factor, which constrains the production of baskets.

B. OTHER FARMING SYSTEMS (Coconut, Banana, Arecanut, Vegetables livestock and fisheries)

Ploughing of garden land

The practice of ploughing garden land in the beginning of summer was meant for water conservation and weed control. The operation used to be carried out with a country plough and bullocks. Nowadays it is rarely practiced. Tiller is in common use for ploughing the garden land.

Digging of garden land

Before summer, garden lands used to be raked with spade and small mounts were raised as water conservation and weed control measures. Thus practice is also not common now due to scarcity of labour and high labour cost.

Smoking and Burning Coconut basins

After rainy season gardens are swept lean. The dry leaves and green wastes are heaped and burned in different parts of the coconut garden and in the outer basins of adult coconut tree so as to fill the garden with smoke. This is carried out as a precautionary measure to prevent pest attacks of coconut

Coconut basins

Practice of opening basins around coconut tree for irrigation, manuring etc. in summer was a common practice. These basins used to be filled with organic manure after monsoon seasons.

Manuring of coconut

Green leaf manures of *vatta, pavatta* etc. and cowdung and ash were used for manuring coconut gardens. Manuring is a common practice even now. Scarcity of green leaves is a constraint.

Irrigation channels in garden land

Water channels/trenches are opened with spade to flow water to the basins of arecanut, coconut, banana, vegetables etc. in garden lands. In olden days *Thulathekku, kalathekku*, and *thekkukotta* were used for irrigation. Motor pumpsets have replaced these devices in present days.



Single ladder coconut climbing



**Round string device on legs (Thalappu)
used for climbing coconut, arecaut etc.**



Plaiting of coconut leaf



**Coconut flowerbud being cut for
toddy production**

Coconut harvesting

To climb on coconut, two types of ladders are in practice - single ladder and double ladder. Skilled persons who are traditionally coconut climbers only can use single ladder. The ladders used are made of long bamboo. Coconut climbing was the traditional occupation of a particular community called *Vettuva*. In the present days it is no more a caste based occupation and labour high scarcity is noticed for the practice.

Coconut dehusking

Using crowbar, coconuts are dehusked. Skilled workers dehusk coconut with great speed using crowbars. Crowbars are prepared either of iron or wood with an iron tip. Mechanical coconut dehusker is also now in practice.

Coir (*Choodi*)

Coconut husks are soaked in water for weeks and are beaten with wooden planks to separate and shred coconut fibres. Skilled women workers using hand-operated machines (*Kayar Ratt*) prepare coir (*Choodi*). This craft is also getting discarded due to modern technologies of retting and coir making on factory basis.

Copra

Coconuts are dehusked, cut open and dried in the sun to prepare copra.

Coconut oil

Dried coconuts (copra) are milled to get coconut oil. In earlier days, coconut oil was extracted by crushing copra in country mills (*Kalluchakku*)

Country mill (*Kalluchakku*)

In the days of past, oil from Coconut, Sesamum, *Marotti*, *Odal*, *Punna* etc were extracted by crushing their nuts or kernels in *Kalluchakku*. These stone mills were rotated by draft animals or human beings. Artisans of Vania caste were the skilled craftspersons in this occupation. A mutually dependent relation between farmers and these artisans existed in the past.

Hand mill (*Thirikallu*)

This was a country device used for powdering and crushing pulses, ragi etc in olden days. Made up of stone, it had two halves connected with a wooden pole.

Rodent control

Rat traps (*Kumbham*) were prevalent in rat control. *Kumbham* is the major method which most of the farmers followed in garden land. *Adichil* is also another common method of rat control in garden land. *Nayadis* (a particular tribe) were the experts who could locate live furrows of rats, put fire and catch them.

Manures

Organic manures like wood ash, cowdung, FYM and green leaves were the only means of manuring in garden lands in earlier days. Putting the silt of river basins (*Korucheli*) was also a practice in olden days. Small fish like *Chala* (Sardine) in seasons were also used as manure.

Control of rhinoceros beetle

Petiole axles of coconut leaves are to be filled with sand to control rhinoceros beetle. Using *Chellikole*, the beetles were pinned to death.

Control of red palm weevil

Mixture of toddy and jaggery is kept in earthen pots and placed in coconut garden. Pests attracted by the bait flock together and fall in the solution and get killed.

Coconut Leaf Plaiting

Coconut leaves split into two halves are soaked in water for three to four days. The softened leaflets are then plaited by interweaving. Plaited coconut leaves are used for thatching of houses, sheds, *pandals*, and for fencing of homesteads.

Thatching of houses

Annual thatching of houses with plaited coconut leaves was a practice which is almost replaced by tiles and concrete structures even in the remote areas. The thatching of house used to be an occasion of mutual assistance among the neighbourhood. Neighbours used to help mutually in these operations.

Toddy making (*kallu chethal*)

Cutting the coconut spathe and producing toddy is a traditional practice. Earthen pot is placed on the cut end of spathe to collect the toddy. Light tappings are given on the cut spathes with small bones in the evening and morning. Trained and skilled persons only are engaged in this operation. Fresh toddy is a sweet liquid which on fermentation becomes an intoxicant. Toddy shops are very common in the district. In the past *Ezhava* community only used to do tapping; but all castes practice the occupation now.

Wood coal (*Marakkari*) is prepared by a process of deoxygenated burning of raw wood pieces heaped as hills and plastered with soil. This wood coal is used by blacksmiths, goldsmiths etc. in their indigenous furnaces (*uthala*)

Indigenous furnace (*Uthala*)

Uthala is the indigenous furnace wherein the blacksmith melts iron ore to prepare various farm implements-spades, knives, plough blades, bullock shoes and other iron devices required for the construction and repair of various farm implements.

PRACTICES RELATED TO BANANA CULTIVATION

1. **Planting materials** of banana rhizomes are prepared by removing the roots and dipping them in wood ash slurry. They are then dried and stored.
2. **Strychnine and neem leaves** - Green leaf manuring with strychnine and neem leaves in the planting pit is a practice followed against pseudostem borer attack in banana
3. **Covering of bunches with dry leaves** - Ripening banana bunches are covered with dry banana leaves. This will give good colour to the bunch and also will protect from birds.
4. **Presentation bunch (*Kazhchakkula*)**-Presentation bunches (*Kazhchakula*) is a special item of banana bunch produced in certain tracts of Thrissur - Choondal, Kaiparampu, Puthur, Chalissery, Kunnankulam etc. The Banana variety Nendran plants are grown with special care by families who have inherited the trade secrets of producing the special bunch - the bunches with golden flame colour, uniform sized and shaped fingers and with long whole inflorescence stalk and tips retained for decoration, which are valued for their appearance. Farmers who keep the monopoly of *Kazhchakula* production do not disclose all the secrets of special treatments given, but they just reveal the practice

of repeated coverings given to the bunch from very beginning of the finger formation. Local people report the practice of oiling each finger also before covering, which needs verification. These presentation bunches fetch a high premium price in the range of Rs. 1500 - 2500 per bunch. The bunches are used for offering as gift to lords, Gods and 'in-laws' on the occasion of Onam festival and especially to the Sree Krishna Temple of Guruvayoor. Farmers produce this crop and adjust the production to coincide with the festive occasions. Very limited number of bunches only are produced by each farmer. Usually no labourers are engaged in the farming activities of this crop. This crop cultivation is not caste bound and presentation bunches are used by all without any caste barrier.

5. **Ripening of banana bunch** - After harvesting, for quick and uniform ripening of the bunch, it is covered with paddy straw and is kept in sack, small earthen cell or container. Daily smoking at morning and evening hours through the holes of the container or cell induces the bunch to ripen out uniformly.
6. **Banana chips** - Banana chips are made by frying of thinly sliced raw banana, which is a major commercial product of banana.
7. **Banana powder** - Sliced raw banana is dried and powdered which is used as a baby food.

ROOTS

1. Arrowroot powder (*Koovapodi*)

Arrowroots are scraped on metal scrapers. The obtained paste is then decanted in water and allowed to settle over night. The sediment paste is washed in water repeatedly and then dried to obtain the powder. The use of arrowroot powder is of medicinal and religious importance. *Koova* gruel is of religious importance for Hindus and is very much associated with the *Thiruvathira* festival.

2. Dried Tapioca

Tapioca tubers are sliced and dried. Dried tapioca is used in off-season. Another preparation of boiled tapioca drying is also noticed. Sliced tapioca after putting in boiled water is drained and then dried to get *Vattukappa* (Blanched Tapioca).

3. Tapioca powder

Tapioca roots are scraped on metal scrapers and the paste is decanted in water several times to collect the sediment. The sediment on drying turns to be the white powder.

PRACTICES RELATED TO VEGETABLES

1. Storage of seeds

Storing of vegetable seeds with pepper powder, neem leaves etc are followed to prevent pest attack

2. Sowing

Sowing of bitter gourd seeds in leaf cones and planting of the seeds along with the leaf in the main field is a practice.

3. Storing

Storing of cucurbits by hanging from roof is a method of ensuring viability. Well ripe cucurbits are stored up to one year by hanging from the roof tied with dried banana leaf sheath. In off-season also the fruits were available for consumption in this way. In the present day the fruits do not have a long shelf life and decay easily.

4. Dried vegetable preparations (*Kondattoms*)

Vegetables like bittergourd, chilly, cowpea, bhindi, etc are sliced, dried, and kept for use during off-seasons as fried items.

MANGO

Mango tree was considered to be an essential component of a homestead in olden days. The district is famous for a number of traditional mango varieties. *Priyor* and *Chandrakaran* are two varieties famous for their sweet and aromatic fruits. Raw mangoes are used for pickling. The wood of mango trees is of religious importance. Among Hindus, the pyre for cremation is made of mango tree wood. The mango leaves are also used for decoration on auspicious occasions.

Pickles (*Achar*)

Various types of pickles with mango were in use. Tender mangoes used to be kept in brine solutions in porcelain jars (*chadi*) for the use in off seasons. There were typical varieties of mango with special aroma for these purposes (*naattumanga*).

JACK

Jack was another tree of importance in any homestead in the past. Jack wood was famous for furniture making. There are mainly two varieties of jack – *varikeka* and *koosha*. Raw jackfruits are used for curry preparations and chips making. Jackfruits in the very early stages are used as *idichakka* (crushed jack), a side dish with rice. Nuts of jackfruits are also used for curry preparations. Ripe fruits are sweet and aromatic for eating. It also used to be processed as candy with jaggery (*chakkavarathy*) for using in off seasons.

ARECANUT

Arecanut was a crop of religious significance in addition to its commercial significance. Arecanut palms in either side of front passage / courtyard was a sign of aristocratic families in olden days. Ripe arecanuts were a must for all Hindu religious functions – for *poojas*, initiating ceremonies, marriages. The inflorescence of arecanut was of use for *pooja* in the past. Arecanut's main use was for chewing with betel leaf. The tender leaves of betel vine, tobacco leaf, lime paste and arecanut are the four famous components of betel chewing (*vetta murukkal*). This was a practice common among people of all ages in the past.

Dried arecanuts (*Kottadakka*)

Raw arecanuts are sliced and dried to make *Kottadakka*. Now not in common use.

Soaked arecanuts (*Pazhukkadakka*)

Ripe arecanuts are kept in water in big containers for use in off seasons. As and when required, nuts are taken out and used.

Paakkuvetti (Arecanut Scissors)

Typical scissors were in use for shredding the hard kernel of arecanut but now becoming very rare.

Arecanut Pandals (*Painga Pandal*)

This is a special shed (*pandal*) set up for making *Kalipakku*.

Kalipakku

Dehusked raw arecanuts are cut into pieces and boiled with water in copper vessels. The next day this juice is continuously boiled to make slurry (*Kali*). Then the boiled nut pieces are mixed and coated with the above slurry and are dried on bamboo mats. There are different forms of this preparation - *vellavi, mukkachur, edachur, ayilan, pandurutti, bodhi, MRC, njoli, idiyan, kalippakku* etc.

Harvesting

For climbing on palms *thalappu* (strings made into ring shapes) is used so as to hold the legs together. In arecanut plots, an individual who climbs for harvesting, after harvesting the arecanut bunch from one palm, sways the palm towards nearby and adjacent palm so that he can slide directly on to the next palm. In this way, from palm to palm, the person can move without getting down each time and then climbing on each palm.

Arecanut leaf broom

The tip portions of arecanut leaves were cut at convenient length to dry and tie together to be used as brooms.

Arecanut leaf ring (*Thirika*)

Leaves are plaited and formed as round rings. These rings were in use as mats for earthen vessels in kitchen.

Arecanut leaf petiole (*Pala*)

The broad, soft, leaf petiole (*pala*) of arecanut palm was in use for varied purposes listed below.

***Pala* buckets (*Pala thotti*)**

Pala stitched with midribs of coconut leaflet were used to make small buckets for lifting water from wells.

Baby carrier / bed

In olden days newborn babies were kept in soft *palas*.

***Pala thoppi* (Caps)**

The field workers used to have caps made of *Pala* while working in the field to protect themselves from hot sun and rain. Even now this *pala thoppi* is used as a symbol of agricultural labour.

***Pala* Chappals**

After cutting *pala* into the shape of chappals and stitching it with banana sheath as strings, were used as chappals in the olden days.

***Pala* plates and cups**

Cups and plates made of *pala* were used earlier. These are now again gaining popularity as throwaway vessels (in the context of ban on use of plastics). These are items available for sale in organic shops.

***Pala* bags**

Bags made of *pala* (stitched with banana sheath or midrib of coconut leaflet) were in common use as carry bags among field workers.



Device used for catching fish from small water outlets (Kuruthi)



Hand net ("Koruvala")



Device for trapping fish ("Ottal")



"Kadakole"



**Measuring devices
("Para, changazhy and nazhy")**

KITCHEN

Women in the past were mainly confined to the kitchen and men were not expected to enter or cook in the kitchen. Kitchen was considered as a sacred place of the household, which has to face eastward. The well of the house was expected to be adjacent to or very near the kitchen. Vessels were washed outside the kitchen or in attached wash place called *kottathalam*. Women in their special physiological conditions like menstruation and delivery were not allowed to enter the kitchen.

In the present generation kitchen has undergone tremendous transformations. Except in huts the floor levels hearths are not in use. Cooking in hearths / fireplaces placed on raised slabs are now in practice and women can operate processing activities by standing. Gas stoves and kerosene stoves are common in use except in very poor households. Running water facilities are provided inside the kitchen through pipes and taps. Vessels are being washed in sinks provided inside the kitchen.

Many of the traditional utensils and devices of kitchen are not in use now. Many of them are replaced by modern equipments and devices like mixer, grinder, cooker, non-stick vessels, fridge etc. Unlike in the past processed food items are brought into the kitchen rather than processing them in the kitchen; e.g. different types of powder (rice, spices, condiments), rice, oils, snacks, bakery products etc. Women do not have to put in heavy manual work. The entry of men into the kitchen area is another mentionable change even though women have the major responsibility of cooking.

Kitchen utensils

Measuring devices (*Para, Idangazhi, nazhi*)

Para - made of wood and rimmed with iron or brass is used for measuring paddy. The volume of one *para* is roughly equal to 7-8 kilograms

Idangazhi - wooden round device used for measuring paddy and rice grains which has volume roughly equal to 1 kilogram

Nazhi - made of bamboo used for measuring rice grains, which has a volume of one-fourth of a kilogram.

Thudam was the measuring device commonly in use for liquids (ghee, oil etc.)

All these devices are even now in use in traditional houses.

Earthen vessels

Earthen pots (*Kalam, Kudam, Chatti, Kooja*) were the common vessels for cooking, serving, water fetching, water cooling etc. Earthen vessels are also not common now; these are replaced by steel, aluminium and plastic items.

Wooden spoons (*Kayil, thavi*)

Spoons made of coconut shell and wood in different sizes and shapes were in use for varied purposes - cooking, stirring, serving etc. Spoons made of bamboo and metal were also commonly used. Now these are replaced mainly by steel spoons and plastic devices.

Spoon with jack tree leaf (*Plavila*)

The use of spoon made of *plavila* (ripe leaf of jack tree) made into the shape of spoon by stitching with the midrib of coconut leaflet was typical with serving of rice gruel (*Kanji*).

Sieve plate (*Adapalaka, Adachootti*)

In cooking of rice, after boiling *adapalaka* was in use to drain away the excess water (*kanji vellam*). Covering with this lid type sieve, the vessel is positioned as slanting, so that the excess water will drain off.

Pickle Jars (*Achar Bharani, Cheena Bharani, Chadi or Thony* etc.)

Jars made of stones, clay, ceramic etc were in use for preparing and storing pickles, and keeping mango in brine solutions. Tender mangoes are kept in brine solution for use during off-season (called *Pazhamanga*) in big jars known as "*chadi*"

Bamboo baskets - Baskets made of bamboo as sieve were in use for draining water.

Wooden rice box (*Arippetti*)

Wooden boxes (*aripetti*) were in use for storing rice grain.

Wooden seat (*Irikkappalaka*)

Square wooden seats of small heights were in use to sit on while eating or doing work inside the house.

Traditional Hearth (*Aduppu*)

Traditional kitchens used to have hearths made of three bricks, placed in the three positions of a triangle. These hearths are made at floor level and then women used to do cooking activities by sitting in front of the hearth. Dried coconut spathe, leaf petiole, coconut shell and fuel wood of trees were used as fuel wood.

Knives

Knives of varied sizes and shapes were used for different purposes - *Karikathi, Arival, Vettukathi, Koduwaal* etc.

Arival (sickle) was used mainly for farm work.

Axe (*kodali*) - *Kodali* made of metal and wooden handle is in use for cutting wood and firewood.

Aattukallu

Stone device in which soaked rice, dal etc are ground to prepare various preparations like *idli, dosa, appam*. This device is also getting replaced by electric mixie and grinder.

Arakallu/Ammikallu

Stone device on which grated coconut and spices are ground to curry pastes. Now electric mixie is replacing this device in many of the houses.

Coconut grater (*Chirava*)

This is used for grating coconut. In this, the iron-toothed tongue is fixed on a wooden block. Sitting on the wooden block, women grate the cut open halves of coconut. Coconut and coconut oil are essential components of almost all preparations in Kerala.

Metal vessels of brass, copper and iron

Vessels made of brass and copper were in use for cooking (*Uruli, Varpu*), boiling (*charakku*), serving (*charuvam, korika*), eating (*Kinnam, Vattaka, Kuzhiyal*) and drinking (*Montha, lotta, ottu* glass, *kindi* etc.). It was a custom to keep water in a brass vessels- *kindi* on the verandah (entrance) of household. This was for washing legs, hands and face before stepping to the interior of the house from outside.

Ring mats for vessels (*Thirika*)

"*Thirika*" made of arecanut leaves in ring shapes were in use as mats for keeping kitchen vessels.

Brooms (*Choolu*)

Brooms made of coconut leaf midribs (*Eerkil*), arecanut leaves, grass earheads etc. were in use for sweeping floor and courtyards.

Nut cracker (*Pakuvetti*)- is the typical knife used for cutting arecanut into small pieces.

Churning rod (*Kadakole, Math*)

Kadakole is used for churning curd to separate butter from the buttermilk. *Kadakole* is placed in curd in the pot and the upper part (pole) of *kadakole* is tied to two ropes. By pulling and pushing the ropes simultaneously, the rod is rotated to churn out the ghee. Rotating the rode by holding the upper end of the pole between two palms was a common method of churning. Ghee is obtained when the butter is melted and boiled. Women used to earn money through selling buttermilk and ghee from their kitchen. Since the introduction of exotic breeds and marketing societies, these practices of producing buttermilk, ghee etc., are not much in practice. Now instead of churning rod in many houses the curd is churned in electric mixie.

Lamps (*Vilakku*)

Brass lamps

There were a variety of brass lamps in aristocratic families like *Nilavilakku*, *kuthuvilakku*, *Thookuvilakku*, *Attavilakku*, *Mangalyavilakku* etc. It was common to have at least *nilavilakku* in every Hindu family, wherein it was a practice to light it in dusk hours. Sitting around the lighted lamps children used to chant prayers in the evening. In *nilavilakku* sesame oil is used with cloth threads as wick. In olden days *punna* oil, *marotti* oil, *odal* oil etc also were used for lighting lamps. Later these oil lamps were replaced with kerosene *ranthals* and petromax lights. In almost all houses lamps are now rarely in use on introducing electricity.

Almost all the devices / tools of the kitchen in the past were produced by different craftpersons/artisans of the locality. Most of the professions were caste bound also. The earthenware was made by *Kumbhara* caste. The bamboo products – *vatti*, *kutta*, *muram* etc. were made by *paraya* or *mulaya* caste people. Carpenters used to prepare all wooden devices of farming household furniture and kitchen utensils like *para*, *nazhi*, *changazhi*, spoons, boxes etc. The blacksmiths or *kollappanicker* caste used to make the different iron devices – knives, vessels, ploughs, spades, axe, key and lock etc. The *moosari* castes were the persons to mould the beautiful brass vessels and lamps. Artisans of *Kallasari* caste used to carve the *arakallu* and *aattukallu*. Goldsmiths were responsible for gold ornaments. In each village there used to be all these caste-based families and there was a mutual symbiotic type of relationship between and among the landlords, farmers, tenants and these caste based rural artisans. All were dependent on each other for their service. Now these caste-based occupations do not exist. As the rural families are not depending on the rural artisans for their products, they were not able to earn livelihood. Hence most of them had to take up other occupations and move out. The younger generations of these castes on getting educated were reluctant to

continue caste-based occupation. Another factor is that now most of these crafts are learned and practiced by persons of different castes without any caste boundary.

Prediction of rainfall

The skill in predicting the exact day and time of rain setting or onset of monsoon is an extinct practice. The skill was a traditional wisdom with some farmers. Information collected from the local persons reveals that the individuals possessing such skill used to sit and closely observe the movement of a long thread tied to the eastward main entrance of the house on the first day of *Idavam* Malayalam month. By the occurrence of movement of the thread at a particular time of the day they used to predict the time and date of onset of rainfall.

Location of water

Locating water spots for digging wells is another rural skill or local wisdom, found as extinct nowadays among villagers. Local beliefs and practices for spotting of water - movement of gold ring, tamarind branch etc -are reported which demand verification.

LIVESTOCK RELATED PRACTICES

1. Cattle shed (*thozbutu*)

Cattle sheds made of wood and thatched with coconut leaves were common. The floor of the sheds were also made of wood in earlier days. Even the *maincha* and grass baskets (*pulthotti*) etc. were made of wood. Underneath the main roofing, a small false roof with straw was common.

2. Grazing of cattle

Cattle were allowed to graze in common places in the village wherein they were able to get both exercise as well as grass. Taking out the cattle from the shed for tethering in open space was a practice.

3. Cattle feed

Grass, straw, rice gruel (*Kanji*), rice water (*Kanjivellam, kadivellam*), rice bran, tapioca, jack, coconut oil cake, bengal gram cake, cotton seed, tamarind seed etc were the common cattle feeds.

4. Milking

Manual milking methods with full hand and two fingers are in practice even now. Milking machines are also getting popularised.

5. Ghee Preparation

Butter is separated from curd by churning; it is collected and melted by boiling in copper vessels to obtain ghee. Small quantities of butter collected on different days are kept stored in water to avoid spoiling.

6. Special treatments and precautionary measures

i. To increase milk production, on 2nd or 3rd day of delivery, parboiled rice with grated coconut is fed to cow. Similarly, powdered coconut spadix (*Thengin pookula*) is also fed to cow. Feeding limewater mixed with rice gruel is also practised.

ii. **Control against worm trouble of calves**

Extracts of turmeric, guava leaves, annona leaves etc. and strong black tea are fed to calf as medicine for worm troubles.

iii. Control of foot and mouth disease

Affected parts are washed and cleaned with water (water boiled with tamarind leaves and arrowroot tubers). Then teak oil (*Thekkenna*) is applied on the wounds.

Teak oil (*Thekkenna*) preparation

Teak oil is extracted from teak wood. Small pieces of teak bark are put in an earthen pot. Another pot is buried in soil at ground level. The mouth of the first pot is turned upside down to fix just above the mouth of the buried pot. Over the pot with teak bark, firewoods are placed and burned. Due to the heat generated inside the pot, teak oil oozes and drips down to the bottom pot and get collected. This oil is used as medicine for the control of foot and mouth disease in cattle.

iv. Treatment of wounds with charcoal (*Pukarakari*)

Charcoal powder collected from kitchen roofs and walls (*Pukarakari*) together with neem oil was used to cure wounds in animals.

v. Dysentery in cattle

Paste of roasted ajowan (*Ayamodakom*), pepper and dried ginger (*Chukku*) was used to control dysentery in cattle

vi. Quick delivery of afterbirth in cow

- The unopened younger leaf of the banana variety 'Poovan' or
- the leaves of 'thondi' (*Sterculia urens*) fed to cow was followed as a practice to hasten the delivery of afterbirth in cow.

vii. Gas trouble of cattle

Feeding the cattle with roasted ajowan powder and toddy was a practice to control gas trouble in cattle. Similarly, feeding water boiled with chilli powder also was a practise.

viii. Oedema in udder of milch cattle

Paste of Clerodendron leaves applied on the udder was a practice to cure the oedema

ix. Tumor in bullock's mouth

The petiole of banana leaf after heating was placed on the area affected by tumour ("*Thavala Kachuka*"), which was done as a practice to cure tumour.

x. Treatment for fracture

The barks of '*Karizhu*' tree are crushed to paste. After removing fibre, the paste is placed and tied around the broken part with bamboo sticks on either side.

Special treatment for draft animals

To protect and restore the health of the draft animals after their continuous work in field, special medicinal treatments were in practice. In the month of August (*Karkidakom*) after *virippu* cultivation, the medicinal treatments were given.

Chicken medicine (*Kozhimarunnu*)

The flesh of hen, which is old enough to start laying eggs, is pound together with medicinal plants (ajowan, mustard, turmeric, fenugreek, *chathakuppa*) in *Ural* with *Ulakka*. When the mix becomes soft, gingelly oil is poured and made into coconut-sized balls. Rice

with bran is also cooked and made into big sized balls. Then the bullocks and buffaloes are forcefully fed with the non-vegetarian mix first and then the rice balls. No water will be given on that day to those animals.

Horse gram rice (*Muthirachoru*)

Together with cooked horsegram, rice is added and again cooked to make the mix soft. This mix is then made into balls and fed to the animals as a special feed for draft animals.

Breeding in cattle

Traditional breeding with Seed Bull (*Vithukala*)

The common practice of breeding was by mating cows with bulls. There were bulls maintained for this purpose in all villages in olden days. Consequent to the artificial insemination programs and related rules and regulations, this practice is now almost extinct.

Bullock carts

Castrated bulls and buffaloes are used as draft animals for bullock carts. Bullock carts were the main means of transportation in olden days- for goods as well as human beings. Bullock carts are made of wood and have large wheels. The wheels have iron rims and hub.

Kavu

This is a device used for the manual transportation of goods. In this device there are two baskets tied on coir and balanced at the two ends of a long pole. A single person placing the device on shoulders can carry goods to far distances.

Public Load Support (*Chumadu thangy*)

These were the stone structures of average human height erected on road sides. In the olden days of pedestal travelling and transportation, these structures were used as resting place to keep the loads, which provided temporary relief for the pedestrians and headload carriers.

Bullock - Shoe (*ladam*)

On the feet of bullocks, which draw the carts, iron shoes (*ladams*) are fixed. The production and fixing of *ladams* are done by blacksmiths.

Fishing techniques in inland fisheries

Kuruthi

'*Kuruthi*' is a fishing device used for inland fishing. It is made of bamboo and midribs of coconut leaves. Bamboo is cut into slender, long sticks and tied. It has an open mouth, middle chamber and tail end. *Kuruthi* is placed at small water outlets to catch fish.

Pipe and arrow (*Ambum kuzhalum*)

An arrow and long pipe are the main parts of this device. The arrow placed at the end of the pipe is fiercely pushed or flung towards fish located in the water, by blowing through the pipe.

Choonda

'*Choonda*' is another gear for inland fishing. A long pole and peculiarly curved iron pin (*choonda*) are the main parts. At one end of the pole, thin wire or thread is tied. At the other end of the wire, the pin is tied. Bait (earthworm, small fish etc.) is inserted to the tip of the *choonda* and is flung into water. When the fish swallows the bait, the pin pierces and get entrapped.



Pipe and Arrow used for catching fish

Handnet (*Koruvala*)

Koruvala is a device used for catching fish from inland water bodies.

Fishing net (*Veesuvala*)

Veesuvala is another fishing gear used in ponds, canals etc. where the net is swung in wide arm length to catch the fish. This is a skilled practice, which can be carried out only by skilled persons.

Ottal

Ottal is a cylindrical structure made of bamboo splits. In water, where movement of fish is suspected, this structure is placed to entrap the fish. Then inserting hand through the opening on the top of the *Ottal*, the entrapped fish is caught.

Extracts of wild plants

Neervalam (Croton tiglium) and *Oduku (Cleistanthus coleinus)* are mixed in pond water to poison fish to enable their easy catch.

3.2 Categorisation of indigenous skill / practices in Thrissur District

As described in the methodology, the identified indigenous skills / practices in the farming systems of Thrissur district were categorised based on their present state of use by the farmers (Table 6). This was done during the PRA exercise in which scientists, extension personnel, farmers, local resource persons (including old generation, labourers and artisans participated). The commonality of practices identified during the PRA exercise was later validated through semi structured interviews and observation.

3.3 Comparison of the Bio-Socio-Economic Resources and the Farming Practices Existing in the Panchayaths of Pananchery and Panjal of Thrissur District (Panchayaths With High Transition And Low Transition In Agriculture)

I. BRIEF DESCRIPTION OF THE STUDY UNITS

A. Pananchery panchayat

Pananchery panchayath was formed during 1914 Kochi Village Panchayath Act. The boundaries on the east of the panchayath are Kannambra, Wadakkanchery, Kizhakkunchery panchayaths; Puthur panchayath lies to the south, Madakkathara, Ollukkara, Nadathara panchayaths are to the west and Thekkunkara panchayath lies to the north of Pananchery. The important institutions in Pananchery panchayath are Peechi Dam and Reservoir, Kerala Engineering Research Institute (KERI), Peechi, Kerala Forest research Institute (KFRI), Peechi, Central Plantation Crops Research Institute Sub centre, Kannara, Banana Research Station, Kannara, Marakkal and State Seed Farm, Mudikkode.

Pananchery panchayath lies between 10°32' - 10°35' N and 76°17' - 76°28' E. This area is inside the Western Ghats which includes the high ranges and mid lands. This is included under high lands by according to the classification of the Land Use Board.

The average rainfall in the area in 2500-3000 mm. As there is no rainfall consecutively for six months in an year many parts falls under heavy drought. The average minimum temperature was 19.9 and maximum was 39.2 °C (1995). Some summer showers

are also obtained during the months of April and May. Even though Peechi dam comes under the Panchayath there are some wards with severe shortage of drinking water. The water wealth of the Panchayath is also enriched by the public ponds of the panchayath.

The soil of the panchayath is Latosoil, which is formed from gneiss, chanokite, granite etc. The midlands and the riverbanks are rich in clay and silt. The forest soil is rich in organic matter and high in fertility.

Out of the total land 41.5% is coming under forest and Peechi dam. The soil is acidic in nature. The main crops are paddy, coconut, banana, tapioca, rubber, arecanut, pepper, vegetables etc. The area under rubber cultivation is increasing day by day and the area under paddy cultivation is decreasing. The converted paddy land is used for cultivation of other crops and for construction works. According to the census Report 1991, the total population in the Panchayath is 37116 out of which 18263 are males and 18833 are females. Industries are very less in this area. At the same time non-availability of human labour is a major problem in the area. Agricultural labours are now shifting to tertiary sectors like construction work, production of other associated inputs, which affect the agricultural sector negatively.

The major crops are rice, coconut, banana, tapioca, rubber, arecanut, cashew, vegetables, sesame, mango, jack etc. Majority of the farmers cultivate new varieties of rice – Jaya, Jyothi, Triveni etc are the popular rice varieties.

The old varieties, which have high resistance to pests and diseases like Thavalakkannan, Chempavu, Cheera, Chitteni etc are now out of the field. In coconut, the main varieties are Komadan, WCT and other hybrids. Nendran, Poovan, Palayakodan, Kannan, Kadali and Robusta are the banana varieties being cultivated here. The selection in Amaranthus and Cucumber named Kannara local and Mudicode local are popular and widely accepted vegetables. In areas where irrigation facilities were available 3 crops were taken. In those times biological agents like neem oil was in common use. The organic fertilizers used for cultivation were crop wastes, cow dung and ash. Other major crops apart from rice were yams, ginger, sesame, coleus, cowpea etc

Table 7a. Area and production of important crops in Pananchery Panchayath

Crop	Area (ha)	Total production	Productivity (per ha)
Rice	1885	5291	8450 kg
Cowpea	50	37.5	750 kg
Sesamum	20	15	
Vegetables	50	250	510 kg
Coconut	1050	14280000 nos.	13600 nos.
Banana	500	8000 MTM	16000 kg
Tapioca	350	7000 MTM	20 MTM
Pepper	150	48 MTM	320 kg
Cashewnut	110	104.5 MTM	950 kg
Mango	20	87 MTM	4350 kg
Rubber	250	162.5 MTM	650 kg
Arecanut	210	4.725 crore nos.	225000 kg

The cattle wealth of the area is also the same as in the case of plants, the traditional breeds being replaced by exotic breeds. The forests in this area are rich in biodiversity and have partial evergreen forests, winter forests, grasslands, plantations of different trees etc., as a part of the ecosystem. About 700 species of rare plants which were seen in the Western Ghats are seen here. 170 species of medicinal plants are also there.

Fertiliser stores are plenty in number in this panchayath. In the co-operative sector there are 5 and 4 in private sector. Eighty percentage of the farmers use chemical fertilizers. Two nationalised banks, one scheduled bank, one co-operative bank, one co-operative society, State Bank of Travancore, Land Mortgage Bank etc take care of the agricultural credit requirement of this Panchayath. The Panchayath has 1841 wells and 14 ponds. Irrigation using pump sets has become very common.

Krishi Bhavan in this panchayath was started in 1987, together with the group farming system, which reduced cost of cultivation to a great extent.

One third of this Panchayath is covered with forests. People used to collect water, small timber pieces, firewood etc from the forest. Also they use it as the grazing land for cattle. Social re forestation was also conducted successfully in this area.

Official starting of the Animal Husbandry development activities in this Panchayath was in 1950 with the starting of stockman station. In the agricultural sector 35% of the population is depending on animals for their livelihood. In 1955-56, a bull station with four substations was started in this Panchayath. During 1978, Veterinary hospital was established. Artificial insemination led to high productivity of milk and resulted in the formation of 12 milk societies.

There are 77 families in this panchayath who have selected fishing as their primary occupation. Still it is not using its full potential in inland fisheries. Peechi dam is the ideal place for fish cultivation. *Robu, Catla, Mrigal* etc are cultivated in Peechi dam.

In this panchayath no industries have been developed at a large scale. Now all together 55 small-scale units are working in this panchayath, which give employment to 870 labourers (352 men and 518 women). The conventional cottage industries like mat weaving and bamboo basket making are rare. The first co-operative society formed was Pananchery Mutual Helping Co-operative society established in 1946, which was renamed as Pananchery Service Co-operative Bank. In 1994 Vilayannur Service Co-operative Bank was established. In 1962 Milk Producers Society was established after which 11 more of the same kind was established in the Panchayath. Now there are 3 Credit Co-operative Societies, 8 Non-Credit Co-operative Societies and 12 Milk Societies in this Panchayath.

B. Panjal panchayat

Panjal, a scenic landscape, is internationally known for *Koothu, Koodiyattam* and *Athirathram*. The Bharathapuzha flows by its northern border increasing its idyllic beauty. Lore has it that the Panjala King established the Lakshminarayanan Temple here; thereby the place being called Panjal. Panjal was a predominantly *Namboodiri* settlement area. However

the Freedom Movement and Social Reform Movement was very active here. Active reforms were carried out in the closed *Namboodiri* society, by starting evening classes, libraries etc.; to break the cultural barriers that existed. It is to be noted with special reference to Shri. V. T. Bhattathiripad, that the land reforms were also done here with zeal though the majority of the land in the Panchayath was the property of the Panjal *Devaswam* and the important *Illams* (*Namboodiri* houses) of the area. Though the caste system, untouchability etc prevailed in the area, the people here were active participants in the anti war movement and famine relief measures.

The Panchayath has a largely Hindu population followed by Muslims and Christians; who have always co existed in peace and harmony. Muslims were residents of the Panchayath as early as AD 1400. They are the second largest community in number. They have played an important role in the economic growth of the panchayath by bringing in Gulf money to a panchayath that was primarily dependent on agriculture for its revenue. The Christian community came to this panchayath as migrant farmers about 55 years ago and brought about progressive changes in the agriculture of this area and introduced the cash crop of rubber. The history of education of Panjal panchayath dates back to Malayalam year 1105 (1930 AD) when the Panjal High School was started. The *Namboodiri* Girls' School was converted as a part of social reforms into the high school. Killimangalam, Painkulam and Panjal had many schools and it is said that a Nair school functioned here long back and taught all students irrespective of caste and creed. The Literacy Movement was one of the social reform movements of recent times which has to be mentioned specially. There was massive participation in the movement and the benefit has reached a lot of illiterates. As its boundaries Panjal has the forest lands adjacent to Kondazhi to its east and adjacent to Chelakkara to its south; Vallathol Nagar and Mullurkara panchayaths to its west and Bharathapuzha to its north. The total area of 30.39 sq. m. comprises of hills, valleys and plains. This panchayath came into existence approximately 50 years ago. Though the primary occupation in Panjal is agriculture, unscientific farming is prevalent among farmers. The canal from Cheerakuzhi river passes through the panchayath but does not provide sufficient water for summer cultivation. The panchayath faces shortage of water as there are only 3 small canals and 11 ponds as water sources.

Rubber was introduced in Panjal by the migrant farmers from South Kerala. Now it is fast replacing paddy and forms the major crop. The cultivation of pepper, ginger, other plantation crops, coconut, banana and few vegetables are also being carried out on a small scale. In general farming here does not have the importance it should have and farmers are in general not satisfied with farming.

Land Reforms Act brought about a drastic change in the land ownership patterns of the panchayath. Of the total 3039 ha of land, 1309 ha exists as garden lands, 475 ha as paddy fields, 526 ha as forest land, 10 ha as arable waste land and 2 ha as non arable waste lands.

Table 7b. Area and production of important crops in Panjal Panchayath

Crop	Area (ha)	Total production	Productivity (per ha)
Paddy – first crop	475	1662.5 MT	3.5 MT
Paddy – second crop	449	1077.6 MT	2.4 MT
Paddy – third crop	5	15 MT	3 MT
Cowpea	30	24 MT	0.8 MT
Gingelly	5	1.75 MT	0.35 MT
Vegetables	80	320 MT	4 MT
Coconut	471/400	55 lakhs	80 nuts /tree /annum
Banana, Nendran	83	2075 MT	10 kg bunch/25MT/H
Tapioca	24	360 MT / year	15 MT
Pepper	41	6.56 MT	160 kg/ha
Jack	Negligible		
Cashew	30	18.3 MT	611 kg
Mango	30	120 MT/year	4 MT
Rubber	400	240 MT	600 kg dry rubber
Arecanut	79	158 MT	2 MT dry nuts / year
Local variety banana	60	630 MT	8 kg/ bunch
Other fruit trees	1	4 MT	4 MT/ha
Ginger	15	32.25 MT	2.15 MT dry ginger
Turmeric	10	17.5 MT	175 MT/ha cured turmeric

Two crops of paddy are cultivated in 449 ha with a total production of 1077.6 MT and a productivity of 2.4 MT/ha. The third crop of paddy is cultivated only in 5 ha. The production is 15 MT and productivity 3 MT. Around 2499 farmers have land holdings below 1 ha and their land is fragmented in to 2 – 6 plots. There are 3670 agricultural families that hold 1784 ha of land. The average land per family is 0.62 ha. 10.62 % of families have land less than approximately 5 cents. There are only 46.57 % families with 25 cents of land. Earlier farmers used organic manure for farming. With the advent of chemical fertilisers and new farming techniques and the scarcity of cow dung and green manure, the use of organic manure decreased while chemical fertiliser and pesticide application increased many fold. Indigenous knowledge and native methods of farming have almost disappeared. The earlier seed varieties of *Thavalakkannan*, *Kattamodan*, *Chittyeni*, *Aryan* etc have been replaced by the early maturing high yielding varieties of *Matta Triveni*, *Jyothi*, *Pavizham*, *Kairali* etc. In paddy farming the traditional practice was to burn the stubble during summer, plough the land thrice, addition of organic manure and conditioning the soil for a minimum of 10 days, destroying pests naturally and then to begin cultivation. Nowadays, land is ploughed using tractor or tiller immediately after harvest, following which chemical fertilisers are applied and cultivation started without any gap or rest.

Only 6 % of the people earn their major income from agriculture. Decrease in income from agriculture, unavailability of agricultural labourers and disinterest of farmers to change over to paddy cultivation from other crops etc have turned agriculture topsy-turvy. Pests like stem borer, leaf roller and rice bug etc and diseases like blast, blight etc affect paddy severely.

Table 8a: Existing farming practices in Pananchery panchayath (High transition)

1. Crops

(n= 44)

(n= 44)

Sl. No.	Practices/ Crops	Modern practices (Methods / inputs used)		%	Traditional practices (Methods / inputs used)		%
1	Seed	HYV	40	91	Local	44	100
					Manual	44	100
2	Fertilisers	Factomphos	32	73	Green leaf manure	29	66
		Urea	29	66	Cattle manure	39	89
		Potash	26	60	Neem cake	2	5
		20:20-1			Salt	1	2
		Rubber mixture	6	14	Organic manures	4	9
		17: 17-3			Dry leaf manure	3	7
		Fertiliser mixtures	1	2	Poultry manure	5	11
		Lime	3	7	Wood ash	4	9
		Massoriephos	4	9	Oil cake	4	9
3	Water management	Electric motor	39	89			
	a. Irrigation	Kerosene Engine	1	2			
		Diesel engine	1	2			
	b. Water conservation				Banana pseudostem	1	2
					Leaf mulching	16	36
					Water conservation pits	4	9
					Husk burial	11	25
					Furrows	2	5
	c. Drainage				Drainage channel	38	86
4	Plant Protection	Bordeaux mixture	16	36	Manual control		

		Ecalux	12	27	Tobacco decoction		
		Dimecron	4	9	Neem cake		
		Endrin	2	5			
		Carbendazim	1	2			
		Ziram	1	2			
		2,4-D	1	2			
		Furodan	4	9			
		Metacid	5	11			
		Rogor	1	2			
		Zimbush	1	2			
		B.H.C.dust	1	2			
		Copper oxychloride	1	2			
5	Intercultivation	Arecanut + Coconut	22	50			
		Banana+Coconut	33	75			
		Pepper + Coconut	11	25			
		Cowpea + Rubber	1	2			
		Pineapple + Coconut	1	2			
		Vegetables + Coconut	2	5			
		Elephant foot yam + coconut	4	9			
		Cococasia + coconut	2	5			
		Nutmeg + coconut	8	18			
		Allspice + coconut	1	2			
		Clove + Coconut	1	2			
		Cinnamon + coconut	1	2			
		Tapioca + Coconut	4	9			
		Ginger + Coconut	3	7			

		Turmeric + Coconut	2	5			
6	Weeding				Manual	40	91
7	Soil Conservation				Bunds	1	2
					Platform	1	2
					Terracing	16	36
					Cover Cropping	1	2
8	Processing of produces				Copra processing	17	39
					Coconut oil	15	34
					Rice parboiling	2	5
					Drying of arecanut	1	2
					Rubber sheet	1	2
9	Harvesting				Manual	44	100
10	Threshing				Manual	44	100
11	Storage				Pathayam	4	9
					Gunny bags	2	5
					Large containers	1	2
					Sack	13	30
					Tank	1	2
					Store room	6	14
12	Implements used	Tractor	34	77	Country plough	4	9
		Tiller	40	90	Kattamutti	3	7
		Sprayer	39	89	Chavittumaram	1	2
		Coconut dehusker	5	11			
		Spade	1	2			

2 Livestock

2.1 animals

(n= 44)

(n= 44)

Sl. No.	Practices/ Crops	Modern practices		Traditional practices			
		f	%	f	%		
1	Breed	Jersey	21	48	Local	24	56
		Sunandhini	1	2			
2	Feeds and feeding	Cattle feed	11	25	Rice	5	11
		K. S. Cattle feed	5	11	Rice gruel	3	7
		Godrej Cattle feed	1	2	Paddy straw	23	52
					Grass	23	52
					Oil cake	12	39
					Rice bran	9	20
					Coconut oil cake	5	11
					Groundnut oil cake	8	18
3	Precautions against disease occurrence	By consulting veterinary doctor	30	68			
4	Treatment on disease occurrence	Veterinary doctor	30	68	Ginger juice	1	2
					Teak oil	6	14
					Pig's fat + salt	1	2
					Neem oil (F & M)	1	2
					Turmeric + Salt	1	2
					Carbon from kitchen smoke + salt (wound)	1	2
					Pepper + dried ginger + salt+ghee	1	2
					Neem leaf + turmeric (indigestion)		
					Teak oil +Pig's fat	1	2

					Ajowan + ginger+ pepper (fever)	1	2
						1	2
						1	2
5	Sanitation of cattle and shed surroundings				Kept clean	34	77
6	Milking				Manual	30	68
7	Ploughing (using animal)				By bullocks	2	5
8	Breeding	Artificial insemination	30	68	By bulls	3	7
9	Processing of produces				Ghee	9	20
					Butter	9	20
10	Storage of feeds				Sacks	19	43
					Paddy straw as 'thuru'	4	9
11	Storage of produces	Refrigerator	9	20	Store room	2	5
12	Implements used	--					

2.2 Poultry

Sl. No.	Practices/ Crops	(n= 44)				(n= 44)	
		Modern practices	f	%	Traditional practices	f	%
1	Breed	Girirajan	4	9	Local	20	45
		Gini	1	2			
		Cross	1	2			
2	Feed	B-complex	1	2	Maize	1	2

					Wheat	3	7
					Rice bran	5	11
					Household food + waste	21	48
					Rice grains	5	11
					Crushed rice grains	1	2
					Oil cake	3	7
3	Housing				Poultry house	23	52
4	Precautions against ailments				B-complex	1	2
					Injection	1	2
					By consulting veterinary doctor	7	16
5	Treatment of disease occurrence	Veterinary doctor	20	45	Neem leaf + turmeric	6	14
		Medical shop	1	2	Kerosene + coconut oil	1	2
					Neem leaf+ salt	1	2
					Turmeric paste	2	5
					Kerosene + rice	2	5
					Turmeric + ocimum	1	2
					Turmeric + alcohol (indigestion)	1	2
6	Hatching & brooding				In home	21	48
7	Special management practices if any	--					
8	Processing	--					
9	Marketing of produce	Egg	17	39			
		Chicken	5	11			
10	Storage	Refrigerator	2	5	Eggs are stored in rice husk	6	14
					Ash	1	2
					Rice bran	2	5

Table 8b: Existing farming practices in Panjal panchayath (low transition)

1. Crops
(n= 44)

(n= 44)

Sl. No	Practices/ Crops	Modern practices (Methods / inputs used)	f	%	Traditional practices (Methods / inputs used)	f	%
1	Seed	HYV	37	84	Local	42	95
2	Fertilisers	Urea	31	70	Green leaf manure	42	95
		MOP	7	16	Cattle manure	4	9
		17: 17	2	5	Neem cake	15	34
		Potash	26	59	Organic manures	1	2
		Factomphos	21	48	Dry leaf manure	1	2
		20:20	2	5	Poultry manure	3	7
		Fertiliser mixture	3	7	Wood ash	18	41
		Coconut mixture	2	5	Oil cake	2	5
		Lime	4	9	Compost	2	5
		Rubber mixture	1	2	Bonemeal	2	5
		Complex fertiliser	5	11			
3	Water management	Electric motor	41	93			
	A. irrigation						
	b. Water conservation				Leaf mulching	23	52
					Water conservation pits	8	18
					Husk burial	17	39
	c. Drainage				Drainage channel	37	84
4	Plant Protection	Bordeaux mixture	5	11	Manual control		
		Furadan	6	14	Toddy lime mixture (beetle)		
		B.H.C.dust	3	7	Oduku leaves (leaf roller)		

	Phytolan	1	2	Kumbham		
	Malathion	15	34	Tobacco dectocion		
	Dimecron	11	25	Box trap		
	Ecalux	12	27	Sand + salt (coconut beetle)		
	Zimazine	1	2	Pulling thorny twig over rice		
	Metacid	3	7	crop		
	Carcin Powder	1	2	Neem cake		
	Nucacron	1	2	Eenthachakka		
				Kundamuram		
				Dead & decayed rodent put in		
				paddy field (rice bug)		
				Cement + jaggery mixture		
				rodent		
				Leaves of strychnine + neem		
				to control pseudostem weevil		
				in banana		
				Neem oil		
				Burning fire at night (rice bug)		
				Lime shell burrying in rice field		
				(leaf roller)		
				Sparying cashew nut oil (leaf		
				roller)		
				Putting pandanus leaves on		
				paddy field bunds (rodent)		
				"Chazhiye vilakkal"		
				fixing white flags in field		

5	Intercultivation	Arecanut + Coconut	12	27			
		Banana+Coconut	33	75			
		Pepper + Coconut	22	50			
		Vegetables + Coconut	20	45			
		Ginger + Coconut	4	9			
		Turmeric + Coconut	2	5			
		Coleus + coconut	2	5			
		Tuber crops + coconut	7	16			
6	Weeding				Manual	38	86
7	Soil Conservation				Leaf mulching	2	5
					Water conservation pits	2	5
					Terracing	17	39
					Cover Cropping	2	5
8	Processing of produces				Copra	25	57
					Coconut oil	25	57
					Rubber sheet	2	5
9	Storage				Store room	8	18
					Sack	15	34
					Pathayam	4	9
					Cowpea seeds are stored in pod, under kitchen smoke	2	5
					Cucurbits are mixed with wood ash & stored in closed vessels	2	5
					In tightly closed bottles	10	23

					In baskets	1	2
					Bittergourd + snakegourd as cattle manure balls	3	7
					Glass bottles	1	2
10	Implements used	Tractor	28	64	Country plough	10	23
		Tiller	41	93	Counterpoise bucket lift	1	2
		Sprayer	42	95	Saw toothed scissor trap	9	20
		Coconut dehusker	8	18	Adichil	2	5
					Box trap	8	18
					Weeding machine	1	2
					Kattamaram	3	7
					Eerchamaram	6	14

2 Live stock

2.1 Animals

Sl. No.	Practices/ Crops	Modern practices	F	%	Traditional practices	F	%
1	Breed	Jersey	20	45	Local	14	32
		Sindhi	1	2			

2	Feeds and feeding	Cattle feed K. S. Cattle feed	21 1	48 2	Rice Paddy straw Grass Oil cake Rice bran Coconut oil cake Groundnut oil cake Cotton seed	5 26 25 13 11 1 5 1	11 59 57 30 25 2 11 2
3	Precautions against disease occurrence	By consulting veterinary doctor					
4	Treatment on disease occurrence	Veterinary doctor	18	40	Neem leaf + turmeric + ajowan Cashewnut oil Oduku leaves Ajowan + paddy straw Teak oil Ajowan + ginger+ pepper Pepper + dried ginger + ocimum Neem oil Warm water + salt Eucalyptus oil Turmeric + salt	1 2 3 1 7 2 1 4 3 1 1	2 5 7 2 16 5 2 9 7 2 2

					Carbon from kitchen smoke	1	2
5	Sanitation of cattle and surroundings				Kept clean	26	59
6	Milking				Manual	25	57
7	Ploughing (using animal)				By bullocks	10	23
8	Breeding	Artificial insemination	24	55	By bulls	2	5
9	Processing of produces				Ghee	10	23
					Butter	10	23
10	Storage of feeds				Sacks	17	39
					Store room	6	14
11	Storage of produces	Refrigerator	2		Tightly closed bottles	10	23
					Glass bottles	3	7

2.2 Poultry

Sl. No.	Practices/ Crops	Modern practices	f	%	Traditional practices	f	%
1	Breed	Girirajan	3	7	Local	11	25
2	Feed				Wheat	1	2
					Rice bran	3	7
					Household food + waste	12	27
					Rice grains	1	2
3	Housing				Poultry house	8	18

4	Precautions against ailments	By consulting veterinary doctor	3	7			
5	Treatment of disease occurrence	Veterinary doctor	9	20	Turmeric +pepper	3	7
6	Hatching & brooding				In home	12	27
7	Storage	Refrigerator	2	5	Eggs are stored in rice husk Wood Ash	6 2	14 5
8	Marketing				Eggs Meat	5 3	11 7

3. Fisheries - No fishery farmers could be contacted in the panchayath

Practices / skills identified in the farming systems of Pananchery Panchayath

Sl. No.	Farming systems component /practices	Modern practices	Traditional practices
<i>Crops</i>			
1	Seeds	HYV of seeds	Traditional /local varieties are used
2	Fertilizers and manures	Factomphos, MOP, 17:17, fertilizer mixer, urea, potash, rubber mixture, 20:20, massorei phos, coconut mixture	Green leaf manure, cattle manure, FYM, dry leaf manure, goat manure, poultry manure, wood ash, oil cake, lime
3	Water management - irrigation - conservation	Motor-electric/diesel Kerosene engine	Rainfed cultivation Mulching with dry leaves, soil mulching, husk burial, banana pseudostem for mulching water conservation pits

	- drainage	Furrows	
4	Plant protection	Bordeaux mixture, ecalux, dimecron, endrin, carbendazine, ziram, 2,4-D, furodan, metacid, rogor, zimbush, copper oxy chloride	Neem cake, manual, tobacco decoction
5	Intercultivation	Cowpea + rubber Arecanut+ pepper+coconut Vegetables + coconut tubers + coconut Spices (clove, cinnamon, nutmeg), tapioca, ginger, colocasia, elephant foot yam, turmeric, pepper, pine apple	
6	Weeding	2,4-D (1) Tiller ploughing Almost all the farmers are following manual weeding	Manual
7	Soil conservation	None of the farmers use modern methods of polythene covering etc	Bunds and platforms, terracing, cover cropping. Majority do not follow any means of soil conservation
8	Processing of produces		Copra drying, coconut oil extraction, parboiling of rice and milling drying of arecanut, rubber sheet preparation, ginger,

			turmeric drying
9	Storage	Gunny bags, store house/ rooms, parboiled rice in large containers, paddy seeds in gunny bags, pathayam	
10	Implements used	Tractor, tiller, sprayer, coconut dehusker, spade	Once used, not now (kari, nukam, chavittumaram, kattumuti)

Animals

1	Breeds	Jersey, sunandhini	

Table 9. Categorisation of indigenous practices / skills in the farming systems of Thrissur District based on their present state of use (Consensus arrived through PRA of local resource persons, farmers, labourers, artisans, scientists and extension personnel)

Sl No	Practice /Skill	Present state of the practice/skill	Major factor identified for the present state of use
A. Rice cultivation			
1.	Indigenous varieties	endangered and extinct	Replaced by high yielding and exotic varieties
2.	Seed germination in wooden tanks	endangered	More convenient to soak and germinate in sacks and baskets
3.	Sowing in main field	common practice	Seed drills are being introduced
4.	Transplanting	Common practice	Transplanters, are being introduced
5.	<i>Kundakootal</i> of seedling	Endangered	Replaced by chemical control measures
6.	Ploughing with country ploughs and bullocks	Getting endangered	Replaced by tractor ploughing
7.	Production of ploughs, levelling boards in the village	Endangered	Limited demand, Replacement by tractor
8.	Bund preparation	Common practice	---
9.	Use of spade	Common practice	---
10.	Production of spade in the villages	Endangered	Limited demand and changed consumer behaviour of the social system
11.	Manuring	Common practice	
12.	Use of swing basket	Endangered	Replaced by motor pumpsets, canal irrigation

13.	Production of swing baskets	Endangered	Limited demand
14.	Use of <i>Vethu</i>	Endangered	Replaced by motor pumpsets, canal irrigation
15.	Construction of <i>Vethu</i>	Endangered	No demand
16.	<i>Thulatbekku</i>	Endangered, but in practice	Replaced by motor pumpsets, canal irrigation
17.	Construction of <i>thulatbekku</i>	Endangered, but in practice	Replaced by motor and canal irrigation but the practice is re-entering into the social system
18.	<i>Kalathekku</i>	Extinct	Replaced by motor pumpsets, canal irrigation.
19.	Construction of <i>Kalathekku</i>	Extinct	No demand
20.	Use of wheel and box	Endangered	No demand
21.	Construction of wheel and box	Endangered	No demand
22.	<i>Petti</i> and <i>Para</i>	Common practice	No demand
23.	Indigenous medicinal plants for plant protection	Endangered	Replaced by chemical control measures and no demand
24.	Prescription by the " <i>Nattu vaidhyan</i> " for ailments and diseases of livestock	Endangered	No demand, Veterinary services available
25.	Rat - traps	In practice	Replaced by chemical means of rat control
26.	Manual Weeding wild rice (skill in locating the weeds)	Getting endangered	Chemical weed control in largely affected areas/otherwise neglected
27.	Harvesting	Common practice	Getting replaced by harvester

28.	Use of sickle	Common practice	
29	Production of sickle by rural artisan	Endangered	No demand/ changed consumer behaviour - buying from market.
30.	Threshing	Common practice	Combine harvester and thresher are being introduced.
31.	Winnowing with basket	In practice	Getting replaced by adaptations attached to thresher and by using electric fan
32.	Seed drying and storage	Partly in practice	Majority of the farmers now buy seeds
33.	Storage of paddy in <i>pathazham</i>	Endangered	Replaced by gunny bags/ selling of produce with out storage
34.	Straw storage	In practice	Farmers mostly sell since no livestock and livestock farmers buy from traders
35.	Parboiling	In practice (getting endangered)	(Changed consumer behaviour - Buying from shops)Most of the farmers sell and buy rice from shops
36.	Country milling device (<i>Ural & Ulakka</i>)	Endangered	Replaced by rice mills and flour mills, mixie, grinder etc.
37.	Bamboo/cane baskets	Common practice	Bought from market (changed consumer behavior)
B. Other farming systems			
38.	Coconut climbing (using ladder)	In practice	'Coconut climbing machines' are being introduced / lack of skilled hands
39	Coconut dehusking with crowbar	Common practice	Coconut dehuskers are also in use

40	Coconut leaf plaiting/ plaited cocunut leaves / thatching	In practice	Getting replaced by tiles, concrete , asbastose, canvas, polythene
41.	Copra processing	In practice	Coconut is sold without processing
42.	Use of <i>Kalluchakku</i> for oil extraction	Extinct	Replaced by oil expeller
43.	" Presentation bunch"(<i>Kazhchakula</i>)	In practice	Prevalent in certain pockets of the District (location specific)
44.	Storage of cucumbers as hanging from roof	Endangered	Available in all seasons in vegetable shops and can be stored in refrigerators (changed consumer behaviour)
45.	<i>Kondattams</i>	In practice, but getting endangered	Available from shops (changed consumer behaviour)
46.	<i>Kalippakku</i>	In practice ,but getting endangered as a business	Changed consumption pattern and consumer behaviour and market
47.	<i>Palathoppi</i>	Endangered	No need/demand
48.	"Para" and "changazhy" (<i>Idangazhi</i>)	In practice, but getting endangered	Getting replaced by weighing balances/metric system of measurement
49.	<i>Kathirkula</i>	Getting endangered	No appreciation value and lack of expertised hands
50.	Coir	In practice	Factory and machines replace the manual workers of husk beating and coir making
51.	Earthen vessels	Getting endangered	Replaced by aluminium, steel alloy and plastic vessels.
52	Wooden spoons	Getting endangered	Replaced by aluminium, steel and plastic spoons

53.	Sieve plate (<i>Adapalaka</i>)	Getting endangered	Replaced by aluminium, steel and alloy vessels
54.	Pickle Jars(<i>Bharani, Chadi</i> etc.)	Getting endangered	Not being prepared in large quantities. Buying from shops(changed consumption pattern consumer behaviour))
55.	Rice Box (<i>Aripetti</i>)	Getting endangered	No need of storing rice in large quantities and buying from shops(changed consumer behaviour)
56.	Wooden seat (<i>Irikka palaka</i>)	Getting endangered	Changes in the work posture/ replaced by dinning tables and chairs in kitchen
57.	Coconut grater (<i>Chirava</i>)	Still in practice	Getting replaced by modified grater and mixie, grinder etc.
58.	Brass and Copper vessels	Still in practice	Replaced by aluminium, steel and alloy vessels
59.	<i>Thirika</i> (leaf made mats)	endangered	Replaced by mats of rubber, steel plastic etc.
60	Predicting onset of rain	endangered	The wisdom is almost lost/ use of meteorological data
61	Water spot location	In practice	No other better technology
Livestock			
62	Local breeds of cattle	endangered	Replaced by exotic breeds as a result of development programmes and Artificial Isemination programmes
63.	Churning rode	endangered	Getting replaced by mixie and buying of ghee

			from markets
64.	Ghee production	endangered	Mainly buying from markets and changed consumer behaviour
65.	Traditional cattleshed	endangered	Replaced by Concrete modern sheds / kept as un used.
66.	Grazing of cattle	Getting endangered	Lack of common property and places for grazing
67.	Traditional cattle feeds	In practice	Replaced by factory feeds from markets (changed consumer behaviour)
68.	Manual milking	Still in practice	Milking machines are being introduced slowly
69.	Draft animals	Getting endangered	Replaced by machines / the bulls of exotic varieties introduced are not suitable for draft work
70.	Bullock cart	Getting endangered	Replaced by motor vehicles and changed outlook
71.	Bullock shoe	Getting endangered	Limited demand from bullockcart owners
72.	Traditional treatment with medicinal plants for ailments of livestock	Getting endangered	Replaced by modern veterinary medicines and practices
73.	Teak oil production	Getting endangered	Replaced by modern vet. medicine
74.	Traditional method of breeding with seed bull	endangered	Replaced by technological interventions like artificial insemination programme, castration of seed bulls etc
75.	Poultry local breeds	Still available, but getting endangered	Popularisation of improved poultry breeds

76	Traditional poultry feeds	In practice	Poultry feeds are also used-changed consumer behaviour
77	Storage of eggs in bran, ash, husk etc	In practice	Changed consumer behaviour - buy from shops/store in refrigerator
78	Hatching chicks	In practice, but getting endangered	Changed consumer behaviour only local varieties brood and hatch chicks are bought from hatcheries
79	Traditional fishing devices	In practice	Low catch / low profitability

The table indicates the present stage of use of the identified indigenous farm skills in Thrissur district. In the discussions conducted among different categories of the respondents, only two of the skills were identified as completely out of use or 'extinct' - i.e. use of *Kalathekku* and *Kalluchakku*. Some land races of rice were also pointed out as extinct (*orpandi*, *cherukazhama* etc.). Many of the indigenous practices were identified as getting endangered (parboiling of rice, milling of rice in *ural*, ploughing with country plough and bullocks, grazing of cattle, draft animals, bullock carts, traditional treatments, hatching chicks, kitchen utensils etc.). The practices like seed germination in wooden tanks, kundakoottal of seedlings, production and use of swing baskets, production and use of *vethu*, production and use of *chakram* and *ara* storage of paddy in *patbazham*, predicting onset of rain, traditional cattle breeding, etc were identified as endangered in the farming systems. The use of *Thulathekku* was noticed to be got endangered but as getting reintroduced again in many parts of the district. One of major factors identified for the present state of use of the skills and practices was introduction of improved methods, machines, infrastructural facilities and inputs. Limited and scarce demand for the skills in the social system was another important factor. Changed consumer and consumption behaviour also was pointed out as deciding factors for the use and disuse of the practices.

The main water sources of the panchayath are Aattur canal, Kooli canal, Cheerakuzhi canal, Bharathapuzha etc. The Parakkal *thodu* from Aattur and Kooli *thodu* from Chelakkara flow through the heart of the panchayath. Area under coconut is 471 ha, from which 55 lakh coconuts are obtained. Rhinoceros beetle, Red Palm weevil, *pookulachazhi* are the main pests and bud rot, stem bleeding etc are the diseases found here. 400 ha are under rubber cultivation with a production of 240 MT and 600 kg of rubber. Majority of the farmers are medium farmers. Tractors and tillers have replaced bullocks and oxen from ploughing and transportation operations. Cows are the common animals reared here due to the profit and ease of maintenance. The veterinary sub centre, which existed here, has been upgraded to a veterinary dispensary only recently. The benefits of the various schemes of the veterinary department are not fully available in the panchayath. The traditional method of cattle management are also in practice in the panchayat. There are 3 milk marketing co-operatives in the panchayat.

The major rural industries of the Panchayath are matchbox making, brick making, saw mills, packing case manufacturing, hotels etc, which are functioning well. There are several provisional stores also. Traditional industries like basket making, granite equipments, carpentry, farm equipment making, goldsmithing, leather industry etc also employ many people of the Panchayath. Cottage industries like making agarbathis, pickles, soaps, pappads, grass mat weaving, thread making also exist here. The Panchayath had a pottery unit, which has closed now.

The Killimangalam Service Co-operative Society was formed in 1916 (ME 1091). The Cheruthuruthy Service Co-operative Society started functioning in 1924 (ME1099) with Painkulam and Cheruthuruthy included in its purview. Following this, the societies functioning at Panjal affiliated to the Killimangalam society. The Panjal Sericultural Society, Killimangalam Grass Mat Weavers Co-operative Society, Painkulam Milk Producers Co-operative Society, Panjal Milk Producers Co-operative Society and the Killimangalam Milk Producers Service Co-operative also function here. The most important service bank here is the Killimangalam Service Co-operative Bank with schemes such as gold loans and agricultural loans.

II. COMPARISON OF THE EXISTING FARM PRACTICES IN THE PANANCHERRY AND PANJAL PANCHAYATHS

The comparison of major farming practices both modern and traditional as followed by the farmers in the two panchayaths, *viz*, Pananchery (high transition) and Panjal (low transition) is attempted in the tables 8 and 9

A comparison of the above tables reveals that the two panchayath areas are not much different with regard to the use of farm practices - both modern and traditional.

Crop management

1. Seeds

In both Panchayaths, high yielding varieties as well as some of the local varieties of paddy are prevalent.

9. Fertilisers and manures

Farmers of both the Panchayaths use organic manures and at the same time, inorganic (chemical) fertilisers in farming.

10. Water management

Motor pumpsets and canal irrigation are found to have replaced the old methods of irrigation in both the panchayaths. In Pananchery, none of the old devices like - *Kalathekku*, *Kottathekku*, *Chakeram* and *Ara*, and *Thulathekku* were reported to be in use. However, in Panjal one farmer has reported the use of *Thulathekku* for irrigating garden land.

11. Plant protection

The farmers of both Panchayaths use chemicals for plant protection. The use of medicinal plants, mechanical devices etc. for plant protection on a comparatively higher level in Panjal Panchayath is noted.

12. Weeding

Manual weeding is reported as the common method of weeding in rice cultivation in both the Panchayaths

13. Soil conservation

Terracing, bunding, cover crops etc. are the popular measures of soil conservation in both panchayaths.

14. Processing of farm produce

The major processing activities noticed in both study areas are copra processing, rubber sheet preparation and parboiling of rice. Drying arecanut was also reported among the farmers of Pananchery.

15. Storage

Gunny bag is found to be the major storing device for rice. A few households having granary (*Pathayam*) were found in both area, while the practice of '*Ara*' for storage is noticed only in Panjal Panchayath. The farmers of Panjal also have reported the use of indigenous preservation methods of vegetable seeds and were mostly using their own vegetable seeds. But in Pananchery Panchayath majority of the farmers depend on Government seed farms, Kerala Agricultural University etc. for vegetable seeds. However, in both the Panchayaths, farmers buy high yielding paddy seeds either from seed farms or University.

16. Implements

In both the Panchayaths, use of tractor, tiller, sprayer, coconut dehusker etc. are common. The traditional implements like country plough and levellers are rarely used except for special cases of farming (paddy nursery, corner plots etc.). The use of counter poise bucket was noticed in Panjal.

Animal management

1. Breeds

Local and cross breeds of cattle were observed in both the study units.

2. Feeds

No difference was observed with regard to the feed materials provided to cattle in both the Panchayaths.

3. Precautions and treatment of diseases

In both the panchayaths almost all livestock farmers depend on Veterinary doctors and follow modern medicines for major diseases of cattle. Only in cases of minor ailments like gas trouble, wound, cough etc. they follow traditional methods in both areas. The use of teak oil for foot and mouth disease was noticed in both areas. This is a practice, which requires validation through research. It is noticed that the farmers of Panachery are still practising the production of teak oil.

4. Milking

Manual milking is the common practice in both the areas.

5. Draft animal

Bullocks are used as draft animals for ploughing in both Panchayaths. But only in Panjal Panchayath, the existence of bullock carts and use of bullocks as draft animals were noticed

6. Breeding

In both the Panchayaths, majority of the farmers utilise artificial insemination for their cattle while a small minority still utilise seed bulls in the traditional way for breeding.

7. Processing and storage of milk and milk products

No difference is noticed in the areas of study with regard to the processing and storage activities in relation to milk.

Poultry

1. Breed

Both local (*desi*) and improved breeds of poultry were noticed in the study areas.

2. Feeds and system of rearing

The poultry feeds and the systems of rearing are found to be same in the areas of study.

3. Precautionary measures

Poultry farmers of the Panachery Panchayath were found to adopt more precautions like administering vaccines, while no precautionary measures for poultry are reported in Panjal.

4. Treatment of diseases

In both Panchayaths, poultry farmers depend on veterinary doctors for treatment of major diseases while they use medicinal plants/ traditional methods for lighter ailments. It is also noticed that the farmers of Panachery had indicated more alternatives of traditional measures for the treatment of poultry birds.

5. Hatching of chick

In both the areas, poultry farmers buy improved breeds from hatcheries, Department of Animal Husbandry, University etc, while they produce the local breeds by hatching at home.

6. Storage

No difference was noticed with regard to the storage and marketing practices among the poultry farmers in both the areas.

Fisheries

In Panjal panchayath, any farmer raising fishery crop could be located. Hence comparison on fisheries management was not attempted.

A glance through the farm practices followed by farmers in both the Panchayaths and the case histories illustrated reveals that there is not much difference between the identified Panchayaths of high and low transition in agriculture. It may be noticed that the statistical procedure of proving or disproving the hypothesis is not possible in the present study with the type of observations made. As a detailed census of the practices in the Panchayaths was not possible, the obtained observation may be considered as an indication of non-difference between the two Panchayaths in major aspects of farm practices.

The few areas of differences observed were - non existence of fisheries units, reintroduction of *thulathekku*, existence of bullock carts, non adoption of precautionary vaccines for poultry, increased use of organic and mechanical measures for plant protection, etc in Panjal panchayath and some traditional practices like, production and use of teak oil and adoption of more traditional practices in the treatment of livestock as in Pananchery Panchayath

The observation in another way is an indication of the general trend and changes in the socio-economic, techno-cultural and consumer behavioural pattern of villages in Kerala that equally hold good to both the panchayaths. An important aspect to be noticed here is that even with all modern facilities available in the Pananchery Panchayath (closer to Thrissur city, near to National High Way, near to many development institutions in the area etc.), this panchayath it is not much different with regard to the use of traditional and modern practices in agriculture from that which exist in Panjal Panchayath, which is a remote village cut off from the facilities of the progressive towns and city of Thrissur.

3.4 Analysis of Endangered / Extinct Farm Skills through Cases and Experiences

Based on the importance of the farming skill as perceived by the researchers during interactions with the farmers and also during PRA sessions an attempt was made to study selected situations of technologies, skills and practices in detail. They are presented as case histories and analysis on situations and technologies which are extinct, endangered, reintroduced and still continuing.

A. REPLACEMENT OF AN EXISTING PRACTICE WITH AN IMPROVED PRACTICE - PLOUGHING AS A FIELD OPERATION

Ploughing, as a field operation prior to sowing of seed and transplanting was a common practice in paddy fields, which still exists in the study area. But the way in which ploughing is carried out has changed totally. The implements, resources and skills used in the process have undergone drastic change. The practice of ploughing with country plough, drawn by bullocks was the traditional practice for field preparation in rice fields. The observation in both Pananchery and Panjal Panchayaths indicate that almost all the farmers are now following either tractor or tiller ploughing. The bullock ploughing is in practice in very rare cases, that too, for specific purposes - for ploughing corner plots or plots where tractor or tiller cannot be moved into.

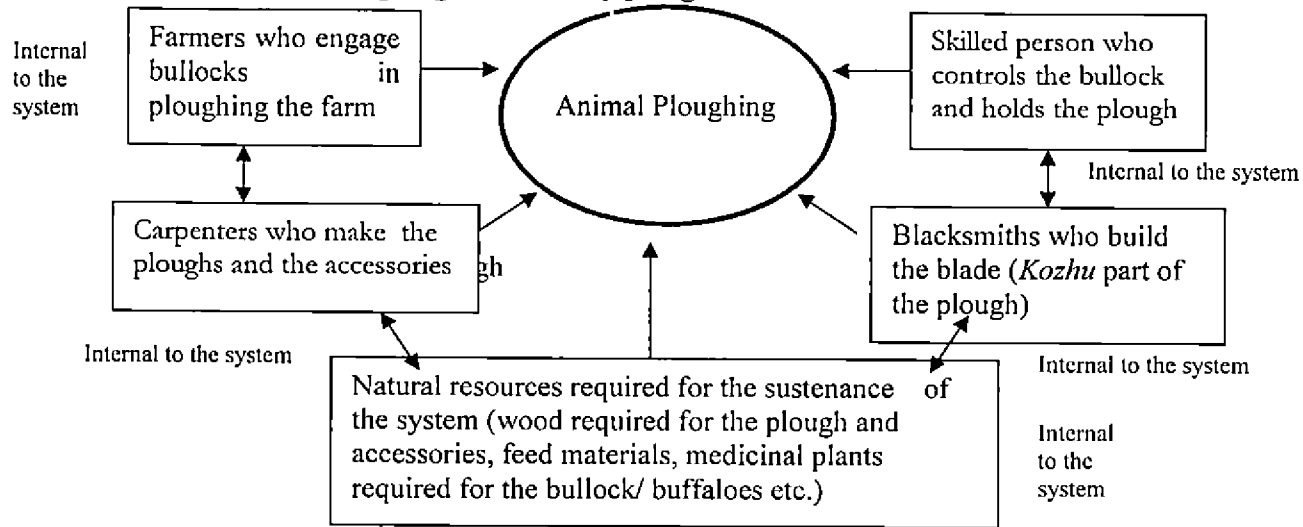
The rapid popularisation of mechanised ploughing and ready acceptance by the farmers have almost completely displaced the practice of the animal ploughing in the study area.

The focus group discussion of farmers, labourers, artisans, development personnel and scientists organised on the topic of displacement of animal ploughing and use of country plough with tiller/ tractor ploughing has lead to the following observations :

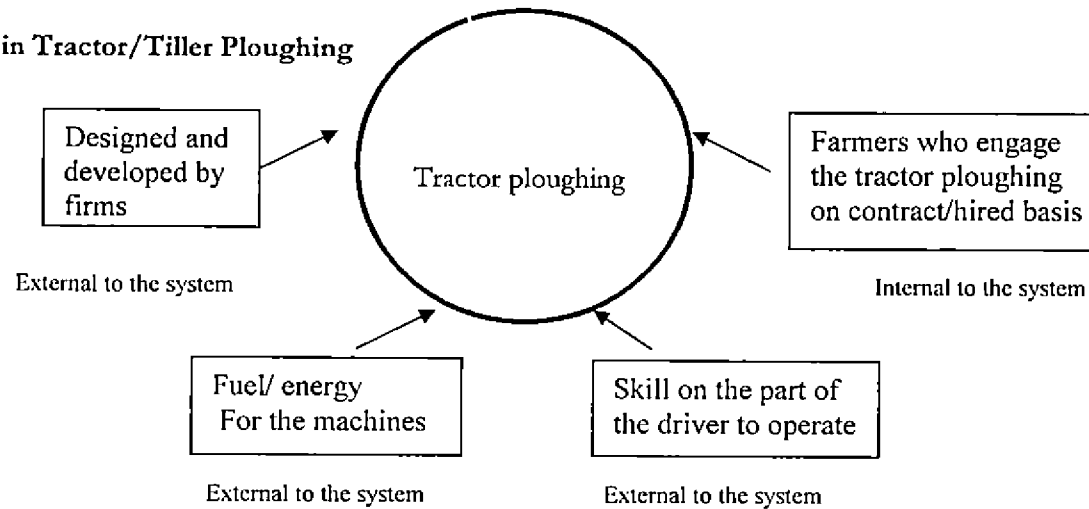
- ❑ Tractor / tiller ploughing is easier compared to the procedure of ploughing by animal drawn implements (Relative easiness)
- ❑ The number of ploughings carried out using the country ploughing (upto 6 times ploughings are required) and levelling of field are tedious compared to tractor / tiller ploughing which can be completed in one ploughing itself. (Relative efficiency)
- ❑ Tractor ploughing is cheaper in relation to the quantum of work and the corresponding cost incurred for the operation.(Relative cost)
- ❑ The difficulty of maintaining draft animals (bullocks/ buffalo) is an important reason for adopting tractor ploughing.
- ❑ Skilled labour required for bullock ploughing is not available in the locality
- ❑ Skilled rural artisans required for the production , repair and maintenance of plough and the connected assemblies for bullock ploughing do not exist.
- ❑ The maintenance and protection of animals for draft purpose is very costly and unremunerative

A comparison of the skills and relations involved in the two types of ploughing is attempted.

Skills and relations involved in animal ploughing with country plough



Skills and relations involved in Tractor/Tiller Ploughing



In the case of bullock ploughing, every component of the operation and maintenance of the system is highly inter dependent on the different groups of the rural social set up and environment which the rural society has to maintain for its sustenance. This is a difficult proposition in the present day scenario of farming. When the requirements in relation to the introduction and adoption of tractor ploughing is analysed, it is observed that the rural system has nothing to do to maintain and sustain it - the equipment being exotic to the system. It is the product of a firm/ company, which is exogenous to the system. It is either owned by an individual farmer or hired from Krishi Bhavan or *padasekhara samithi*. The driver and other functionaries who perform the functions of operation, repair and maintenance are also external to the system and the fuel (diesel/ petrol) is also exogenous to the system. On the contrary, the raw materials and resources required for the maintenance and sustenance of bullock ploughing is very much a part of the society. It could be identified as a highly dependent operation of the village and its different categories (classes and castes) in the society. In olden days, big farmers used to maintain their own bullocks and bullock man as part of their farm. Later, as bullock ploughing became a paid work and became a monopoly of certain local persons engaged in the work farmers were dependent on the bullock man for his essential service for this farm operation and the bullock man in turn become dependent on the farmers for his livelihood. In turn, the bullock man is in need of bullocks and the necessary equipments needed for the operation - (plough, yoke, levelling boards etc.) for which he was dependent on another set of skilled persons - the carpenters and blacksmith for the wooden part of the plough and levelling boards and the iron parts of the plough respectively. The bullock man was again dependent on the natural resources and skills of the village for the feeding, protection and treatment of the bullocks- grass, straw, medicinal plants, special treatment for draft animals, etc. It could be seen from the below illustrated case how the whole operation and social system was interconnected and interdependent.

a) Case of Velayudhan, skilled labour in bullock ploughing, Chemboothara, Pananchery Panchayath

Velayudhan 65 years old is one of the two persons available now as skilled in "*Kalapootal*" (bullock ploughing) for the whole panchayath of Pananchery. Velayudhan learned the skill at the age of 15 years. As a small boy he used to accompany his father who was an expert in bullock ploughing, to the field. In the beginning of his career as a bullock-ploughing labourer i.e. in 1953 the wage rate was Rs. 6 per day, which became Rs. 50 – 60 in 1970s and now it has gone up to Rs. 200 in the present. Then ploughing with bullocks was the only means of field preparation both in paddy lands and garden lands. His labour was on high demand and he had to work two times a day i.e. 7 a.m. till 11.30 a.m. in the morning and 1 p.m. to 5 p.m. in the afternoon to meet the demand. He remembers about the vast spread of the paddy fields of the village which are now converted as garden land or are kept as uncultivated. Then farmers were landlords of vast spread of paddy fields and garden lands.

He has memories of the bullocks he used to work with in different periods. Normally strong bullocks are used for bullock ploughing. In those times all big farmers used to keep and look after bullocks with special treatments in their farms. The farmers also had all farm implements required for the different field preparations, ploughs, spades etc. Then labour need not keep bullocks and implements. The farmers used to take extra care to buy and maintain good bullocks. After each season's work they used to feed the bullocks with special ayurveda preparations eg: (*kozhimarunnu*). He remembers that in those days bullocks rarely had diseases except occasional indigestion. He recalled the beginning of the Veterinary Hospital in Pattikkad in 1970.

Not only in the past, even in the present there is no caste discrimination for taking up bullock ploughing as an occupation. There were a large number of labourers engaged in bullock ploughing in the panchayath (about 100). For small farmers the labourers had to take their bullocks and implements as the small farmers were not rearing bullocks. In the case of large farmers physical labour was enough as the large farmers used to rear bullocks. He remembers about the strong bondage that used to exist between landlords and labourers in those days. For all festive occasions, family functions and emergencies – marriages, death etc the land lords used to help the labourers in cash and kind (with new clothes, paddy, vegetables, coconut oil etc) The labourers also used to offer their best farm produce to their land lords in the festival season. Now no such strong relation or bondage is there between labourers and farmers. All are changed to mere business terms, and end then and there.

He observed the present day's agriculture as the era of the tractor. He remembers about the introduction of tractor in 1970s and the initial reluctance on the part of the farmers, the then wide acceptance and the associated neglect of the bullock ploughing. Now he is rarely engaged by the farmers. Now farmers do not keep bullocks and the bullock men have to keep themselves, bring the plough and other tools. Nowadays people depend on tractors and tillers. Now only for isolated plots and untimely planting the bullock ploughing is in use. He observed the loss of labour days as purely not of mechanisation but it is also due to the abandoning of paddy cultivation, paddy field conversion into building sites and introduction of commercial perennial crops also have led to the predicament. Now during paddy seasons he gets maximum 10 days employment compared to full season employment of the past. No farmers now do the field digging work in garden land. He pointed out two big farmers in his neighbourhood who keeps their paddy fields and garden land as uncultivated.

According to Velayudhan, keeping bullocks through out the year has become an expensive process now. Hence every year just before the season he buys a pair, use for ploughing and sell off after the season to avoid the waste of money. He goes for farm labour and also lease in land for joint cultivation of paddy and banana with his neighbour for the subsistence of the family.

Now during the days of non employment for bullock ploughing, he goes for farm labour work – digging, bund making etc. He also goes to other panchayaths - Puthukkad, Amballur etc for ploughing, on demand. His wife also is a farm labour who works in the field operations like transplanting, weeding, green leaf cutting, fuel collection etc. He has four grown up children- daughter is married, one son is mentally retarded and cannot work. The other son is a farm labour who has learnt to do bullock ploughing, but does not go for ploughing. Velayudhan observed the reluctance on the part of his son to take it as his occupation as there is no demand. Another son is a government employee. Velayudhan remembered about the use of bullocks in the olden days to do “Kalathekku” (before the introduction of the motor pump and canal irrigation) for irrigating coconut and arecanut, vegetables and banana. He used to do *Kalathekku* irrigation for his landlord along with his friend. There should be two persons to work the *Kalathekku* – one to control the bullock sitting on the rope, and another to channelise the water to the crop basins.

Velayudhan described about the special types of timber the carpenters were using to make ploughs (eg. Mango tree) and how the blacksmiths used to fix the plough blade. Even now there are carpenters and blacksmiths in the panchayath, but rarely make these farm implements as there is no demand. Moreover now carpentry is not a caste bound occupation. Presently there are only two men who do bullock ploughing in the panchayath – he himself and another one in the eastern part of the panchayath. He used to get ayurvedic preparations for the bullocks from the traditional “*vaidya*”. He admired about the strong dependence and bondage among different sections of the villagers that used to exist in the village life in the past.

With the replacement of the particular farm operation (bullock ploughing), which is very essential for the paddy crop, with a more efficient and less socially dependent technology (tractor / tiller ploughing), the old practice gradually became endangered. The loss of livelihoods for the categories involved are self evident - bullock man, black smiths, carpenters etc. and the natural non-use of the skills connected to their crafts. Thus once these skills become "extinct" from the farm system forever, it will be difficult to bring the practice back in the system. Due to the replacement of a single operation, how the interconnected skills of farming systems are getting non functional and thus resulting in a practice getting "endangered" is quite evident from this single case.

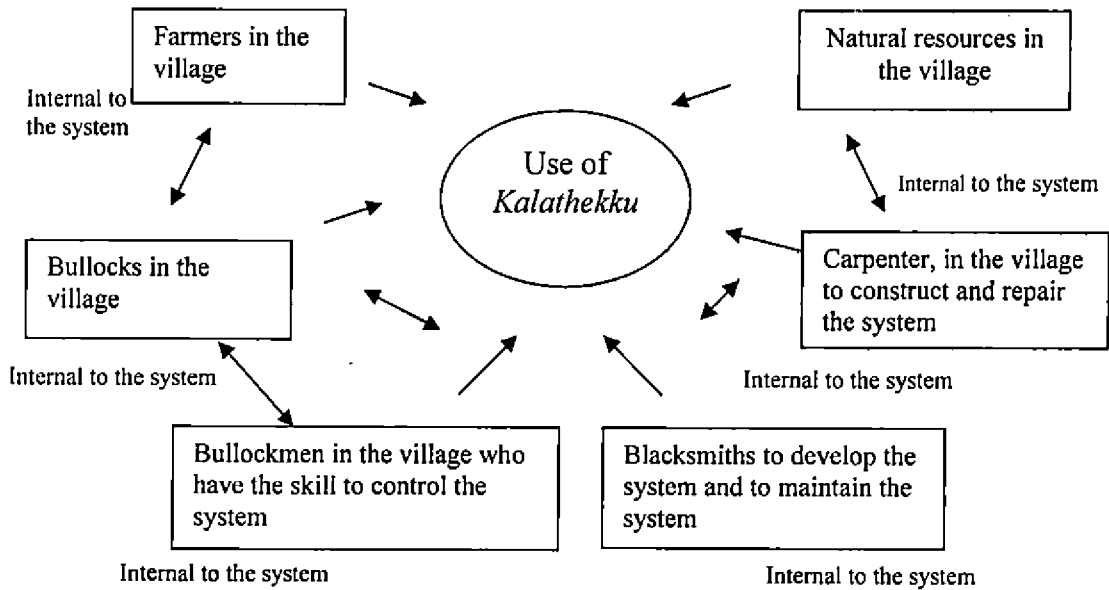
B. EXTINCTION OF A FARM PRACTICE - *KALATHEKKU*

Kalathekku is observed to be an irrigation practice, which existed in the farming systems of both the Panchayaths - Panjal and Pananchery, which has become now extinct. It was a very common irrigation method for garden land in the days when motor pumpsets and canal irrigation were not common (till 1960s).

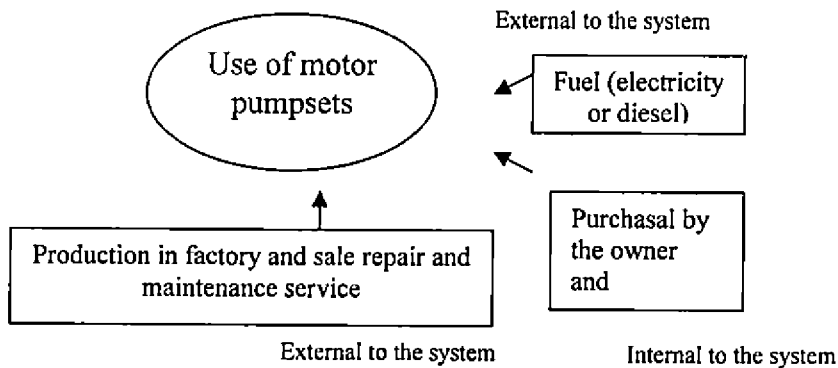
The actors involved in this operation are: bullock man, bullocks, blacksmiths and carpenters of the village system. At present, the operation is "extinct" and it is completely replaced by motor pumpsets operated either by diesel or electricity or by canal irrigation.

A comparison of the skills and relations involved in *Kalathekku* and motor pumpsets attempted.

Skills and relations involved in the *Kalathekku*



Skills and relations involved in the use of motor pumpsets



The self-reliance on the part of the village system and the interdependence of the various classes and castes inside the village which once existed is again evident in the interdependence. The dimensions of skills and relations involved in the use of motor pumpsets as an irrigation device clearly indicate how the farmers and farming system have become externally oriented and independent. The farm practice "*Kalathekku*" could be identified as a skill, which was in use by a closely knit, interconnected system inside the village as mostly owned and maintained by big farmers.

The introduction of a simple, convenient and completely external oriented system has quickly replaced the old practice. This transition of the farming system from its self-reliance to the "external dependence" has to the "extinction" of the use of *Kalathekku*, which is not possible to be re-introduced and maintained in the present system. The intervention by the government development department by way of providing irrigation support to the

farmers by constructing canals and other structures also has influenced the extinction of *Kaalathekku* as an irrigation device. The details of the social system that was in vogue is evident in the narration of Sri. Thankappan Nair. This is of much use to analyse this transition (page no. 99)

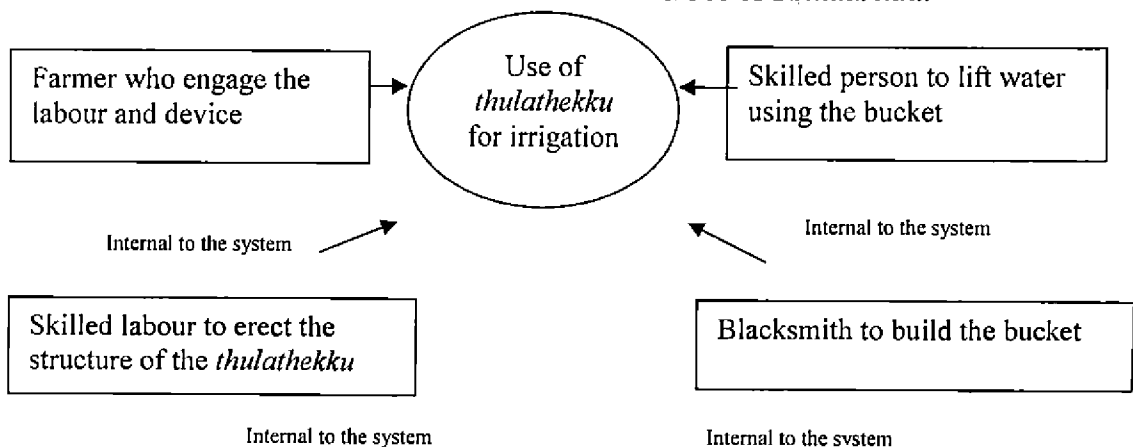
As in the case of animal ploughing, in the case of the "extinction" of *Kaalathekku* also, the focus group discussion brought out the following observations.

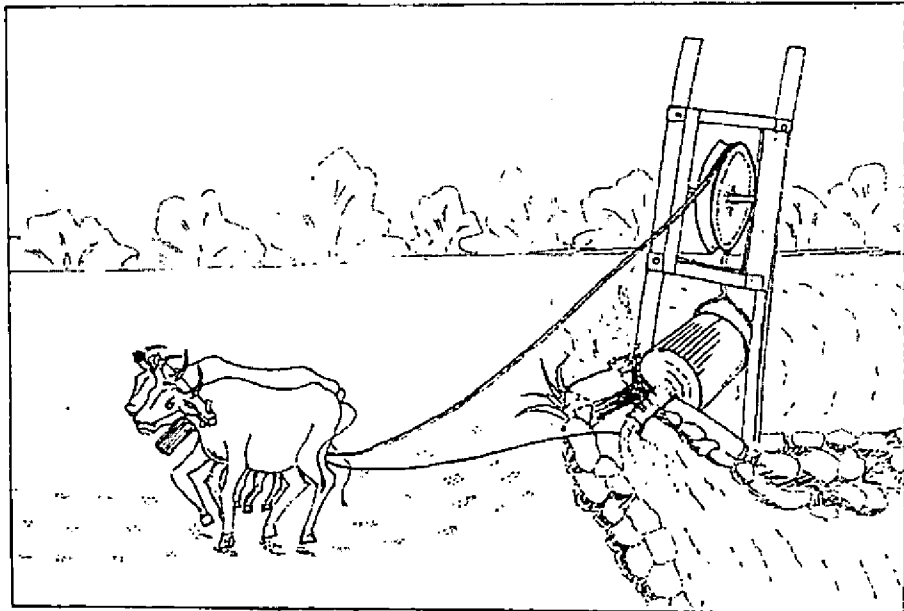
1. Irrigation by motor pumpsets is efficient, easy and convenient compared to the operations involved in "*Kaalathekku*" (technical efficiency, easiness and convenience of operation)
2. Even the unskilled family members can operate the new system and is less labour intensive. (labour saving and less skill demanding)
3. Irrigation by motor pumpset and irrigation by canal system are cheaper compared to *Kaalathekku* (relative cost)
4. The equipments required for the operation and maintenance of *Kaalathekku* are not in production / available in the present system (unavailable resources)
5. Skilled persons are not available for production, operation and connected activities of *Kaalathekku* (lack of human skill)
6. Big farmers are not interested in maintaining the system since there is more efficient alternative.

C. Re-introduction / continuation of an endangered practice -*thulathekku* (counterpoise bucket lift)

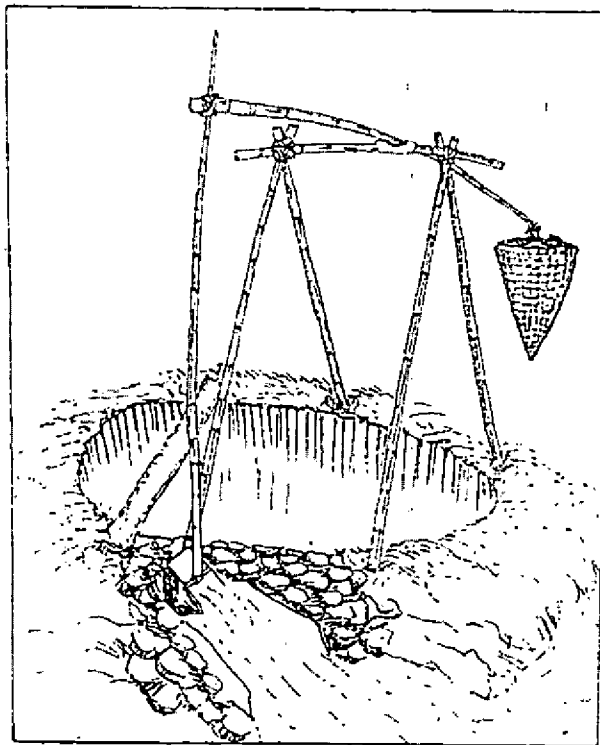
Like '*Kaalathekku*', "*Thulathekku*" was also very common in Thrissur as an irrigation device for garden land (banana, coconut, vegetables) as well as in paddy field. Even though this method of irrigation also was replaced by motor pump sets and canal irrigation in 1950's and '60s, it is quite interesting to observe that this method has been reintroduced to the social system and is in use in many parts of Thrissur. This practice is noticed mostly in areas where there are problems connected with electricity and also in water resources where motor pump sets cannot be installed e.g., in open spaces of river banks. The simple principle of the device, which is skill intensive, also may be a factor behind its reintroduction or continuation, which makes it easy to be constructed and operated.

Skills and Relations involved in the Use of *Thulathekku*





Self emptying type rope and bucket lift (*Kalathekku*)



Counterpoise bucket lift (*Thulathekku*)

The skills and relations involved in the use of *Thulathekku* can be identified as interdependent and confined to the local social system. The resources (bamboo poles, basket, water, human labour etc.) and skills (raising of the structure, lifting and tilting of water etc.) are still available or are within the reach of the present social system. The shortage of skill identified in the production of iron bucket can be considered as an entry point and integration of the external skill to the social system. The required types of buckets can be produced by external agency using the appropriate models of the past. In this context, the importance of documentation and preservation of left over models of the indigenous devices in cultural heritage museums cannot be exaggerated. An important point to be noted here is the realisation that the skills of a social system can be reintroduced at any time if the details of its working are not lost from the community wisdom. The needed recognition and initiative on the part of the research system to identify and validate the principles of the device is another point to be emphasised here.

In contrast to the extinct practice of '*Kaalathekku*', the components involved in '*Thulathekku*' are not demanding for sustenance and protection of skilled animal labour and human labour. Another attribute which made the reintroduction of *Thulathekku* possible is the advantage of raising the structure in common property places like river bank, paddy field etc without much protection and watching.

a) Case of Chandran, operator of *Thulathekku*, in Irinjalakuda, Thrissur

Chandran, aged 67, lives in Nellissery, 10 kms north of Irinjalakuda. He has four children – two girls and two boys. As a farmer he has been engaged in paddy cultivation since he was 15 years old and he uses *Thulathekku*, the indigenous water lifting device for irrigating his crop. Now a days only he is the only person practising *Thulathekku* in the area. Before 25 years it was the common method of irrigation. However he owns a *Thulathekku* and has been doing its operations by himself in these years.

He has one *Thulathekku* in a field of 60 cents. When asked for the reason for retaining this practice he pointed out the unavailability of electricity as the major reason. Though he has submitted all the necessary papers years ago he is still to get the electric connection. So it is inevitable that he continue the use of the *thulathekku* for irrigation. Earlier *thulathekku* and *kaalathekku* were available with every farmers field but with the advent of the diesel / kerosene pump sets and electric motor everyone shifted to the newer technologies.

When he was about 14 – 15 years old he used to operate the *thulathekku* for irrigating others' fields. Around 15 years ago, the wages of the operator for irrigating one *para* paddy using the *thulathekku* (i.e. for 60 – 65 days) was the cost of 2 *paras* of paddy i.e. Rs. 5/-. During harvests the wages were 1/7th of the total produce of paddy; but if other allowances are taken care of then the wages came up to 2/7th of the total produce. The operations of *thekeku* for irrigation has stopped from the seventies and eighties. No one operates the *kaalathekku* in this region any longer. The wages of field labourers have gone above Rs. 50 only in recent times (in the past 10 – 15 years). Till then it used to range from Rs. 35 – 50/-. Even in those days good labourers could get Rs. 50/day.

Apart from paddy cultivation, Chandran also had irrigation in his garden land, which he used to do with the help of bullocks. He had two bullocks for about 35 years but sold the last pair 10 years ago, as he could not care for them any longer. Chandran operated the *thulathekku* for irrigating his paddy field for about 70 days. He used to irrigate for rice about two hours everyday – 1 to 1 ½ hours in the morning from about 4.30 or 5.00 a.m. He owns all necessary equipment of the *thulathekku* and sets it up in the field himself. The operational implements like *Thulan*, *Kaalathekku thekkukutta*, bucket for lifting water with the *thekku*, etc are made by the local carpenters. Sometimes Chandran also seeks his friends' help to operate the *thulathekku*.

Chandran used to operate the *thulathekku* for other farmers also initially. He used to get up at around 3 to 4 a.m. in the morning and finish the operations of the *thekku* and then go to work of other farm labour. After that he also used to do *kaalapottal*, (ploughing using bullocks). He has stopped the operations after selling off his bullocks in 1985. Even now he ploughs for short intervals in emergencies. The practice of ploughing using bullocks is prevalent even after the introduction of tractors and tillers, because it is considered essential for proper land levelling. The practice is called “*njavarkkal*”. The wages for this operation are also premium – Rs. 40/- per *para* (10 cents). The work is easy for the bullocks too. The equipment consists of a split bamboo and two hooks on which it is suspended and attached to the bullocks. He keenly observes the changes happening in the farming scene but prefers to follow the old irrigation method.

b) Case of Chandran, Menath P. O., Thanissery, Vellani, Irijanlakuda

Chandran is aged 65 now. He remembers the use of *chakram* (wheel and box) in fields around when he was 6 – 7 years old. The *chakram* used to be fixed in the fields on two to four poles and people used to operate the wheel (by treading the leaves) by sitting on the pole. He had started operating the *chakram* about 50 years back. He had operated the *chakram* as labour for others. In those days the work used to be from 4 to 4.30 in the morning and up to 12.30 p.m. After a break the work would commence from 2 or 2.30 p.m. to 5.30 to 6.00 p.m. in the evening. Chandran does not remember the exact wages of that period. When he started work on *chakram*, about forty years ago, the first wage he has received was Rs. 1 per day. Labour was in excess those days and the landlords rarely paid their wages. Chandran remembers getting 8 *annas* (1/2 of a rupee) from the landlords for 5 –6 days' work; but it was enough as it could satisfy his personal needs in those days. Then the landlords were farmers who had vast areas of paddy fields.

He remembers a farmer Kodankandath Achuthan Nair who had paddy fields for 125 *para* which was surrounded on all four sides by bunds with facilities to channelise water from the river to the fields. In these fields fixed *chakrams* were there to drain and irrigate. There were two *chakrams* in this field with 19 leaves each, which used to be taller than a man. About 14 to 16 people were required to operate such big *chakrams*. If motorised, these fields would require motors and pumps of 40 – 50 hp. Posts were fixed at different points and two to three people would sit on or remain below each pole and would pedal the leaves / blades of the *chakram* for 10 to 20 minutes and then would change their positions by turn. The

change of turn would take place at the count of 400 or 800 pedalling. This was also applicable to *thulathekeku* operations. The time required to count to 800 would be approximately 30 –40 minutes. After a count of 800, the operators would get down and take rest and then would change positions (the people on top of the *chakram* would in turn take their place at the bottom). Now there are only two or three similar *chakrams* remaining in the area. Electric motors and pumps were introduced into this area around 10 – 15 years ago. Till then there were around 300 *chakrams* in this area. They were used for both irrigation and drainage by changing the direction of the blades.

Chandran had installed *chakram* in his field 35 years ago. He has performed the operations of the *chakram* himself, through all these years. *Chakrams* used to vary in size from 4 to 21 blades. Initially Chandran had *chakrams* with eleven, nine and five blades. The *chakram* installed at present in his field is of 7 blades. The cost of manufacture of such *chakrams* about 25 years ago was about Rs. 500 – 600. Teak was the wood used for making the *chakram* as the parts had to remain immersed in water for long periods of time. One-foot long or three fourth of a foot long teak pole called *kutti* was taken and holes were made at equal spacing for fixing the blades. This work was done by the carpenters and the completed *chakram* was installed in the field by the concerned operator / labourers. No one does these operations as hired labour any longer. There is only one carpenter who knows the craft now. Chandran expressed the need for hiring someone to operate his *chakram* when he would not be able to do it. But as the wages are as high as Rupees 100 per day, it is difficult to engage labourers. This high labour charges makes the people to stop taking up *chakram* operations in field and have switched over to motors and pumps. Nowadays the *chakrams* are not being used, as the *padasekharams* / fields are totally drained out using pumps and motors. So *chakrams* don't find a use there. Earlier they were used for both *punja* and *mundakan* paddy seasons. *Chakram* was useful to keep the fields wet even during the dry seasons.

It was used for draining out water also. Nowadays, new *chakrams* are rarely made. The other implements associated with *chakram* are a box called *petti*, *paathi* (a channel), poles etc., which are also made of strong wood. These are costlier to make than the *chakram* itself. After fitting the poles the planks of wood would be tilted and brought into position. Then the *petti* is fixed using wooden rivets to the *nilapalakeka*. There is still one carpenter in the region who makes *chakrams*.

Chandran has 3 children – 2 sons and a daughter- all of whom are married. His sons used to operate *chakram* till they were 15-16 years old but now they are all in Bombay and only he performs the operations in the village.

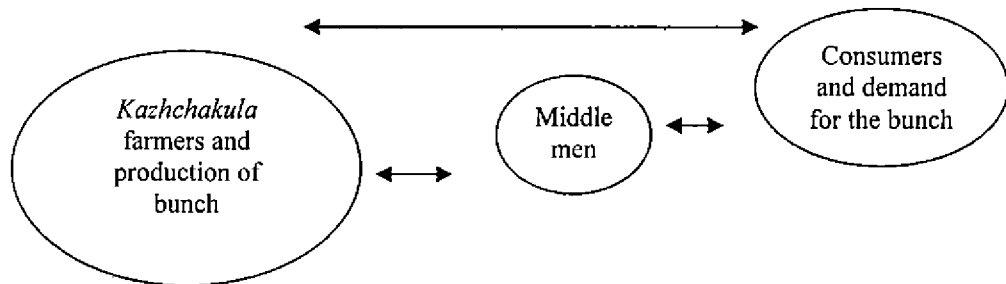
Factors behind re - introduction of the farm skills

The "re-entry " or continuance of the common traditional practices which existed earlier and later "endangered" can be analysed through the classic example of the "*thulathekeku*" (counterpoise bucket method of irrigation). This practice is not a very rare irrigation method even now in rural areas of Thrissur. In locations where electricity is not available to operate the pump sets and purpose for which 'year round' irrigation requirement is either not available or possible, and in common property places like river bank, middle of *padasekharams* etc., during summer, this irrigation method is still in use. The low degree of

skill components involved in the construction and maintenance of the irrigation compared to the other traditional method *kalathekku*, which was common in the area, is noticed. To install and operate *Kalathekku*, there is the essentiality of a number of skilled and interdependent components, which do not exist and are difficult to be brought back to the present day farming system. eg. skill on the part of the bullock man, trainings of bullocks, construction of complex irrigation device etc.. Hence the use of the *thulathekku* can be considered as an example to illustrate the possibility of reintroduction of many of the "endangered" / "extinct" farm skills- which seems to be 'endangered' or 'extinct' in the present day system. The limited and ever reducing natural resources like water and fuel on which the present , modern farming is over dependent also leads to the need for reintroduction of economic and efficient water use methods - pot irrigation, bucket irrigation etc. compared to the less economic lift irrigation and canal irrigation. The scope of modifying or re appropriating the old devices or utilising the principles involved in the traditional farm skills to modify the existing practices and develop new technologies is also worth trying.

D. CONTINUATION OF INDIGENOUS SKILL IN HIGH DEMAND – CASE OF PRESENTATION BUNCH (*KAZHCHAKKULA*)

Skills and relations involved in the practice and production of Presentation Bunch (*Kazhchakula*)



The special nature and secrecy of the components, skills and relations involved in the practice of producing presentation bunch (*Kazhchakula*) are noticeable in the above illustration. The closed system of farmers producing presentation bunch confine the related skill as "trade secrets" within their system. The farmers who were interviewed claimed that they do not follow any special treatment different from the common practices followed in the banana *nendran* cultivation except for repeated coverings given to the bunches. In their opinion, the repeated coverings given from the beginning of finger formation is the reason behind the good appearance and colour of the banana. But the details of covering with what, how, when etc are not disclosed by them. It is said that the farmers apply oil to the fingers during the repeated coverings, which needs to be verified and established. The farmers produce very limited number of bunches in a season and that too, without the help of outside labour. In the marketing channel of this produce there are middlemen who enter into

contract with the farmers. The high remunerative price the bunches fetch is also to be taken into account- the range varies from Rs 1500-2500 per bunch. Eventhough cultivated only in certain tracts of Thrissur -Choondal, Kunnankulam, Chalissery, Kaipparambu, Puthur etc - there is wide demand for the produce from different parts. Prices for the bunches are fixed not on weight, but based on the appearance. These bunches are usually bought by people who 'offer' them as special gifts (*kanicka*) to "in laws", relatives, lords, temples etc. This ritual or custom can be identified as the continuation of the feudal system, still in vogue in the society in all religions in the region.

The profitability involved, assured markets, high demand and monopoly are the factors which sustain the traditional skill as a practice still in demand. The value system with religious and cultural dimensions and the beliefs and aesthetic sense of the people sustain the major demand for the produce. The self-reliance on the part of the producers to maintain the production system as an independent activity is another major factor, which helps the continuation of the practice as monopoly. This case can be identified as a typical one of a traditional skill in "high demand" and which has overcome rejection inspite of the changes in the socio economic and cultural spheres. But it is a necessity to identify the threat of "endangerment" of the skill due to the 'monopoly' and secret nature kept by the cultivators' family through inheritance. This art of *Kazhchakula* production should be encouraged and recognised through competitions, awards etc. so that the skill will sustain, flourish and be alive in the group of "traditional farmers" and won't get endangered from the social system. Even though, the issues of intellectual property rights are involved, the research system has a duty to explore, analyse and document the technology and skill involved, which otherwise may face the threat of extinction.

Factors behind continued use of Traditional Practice.

Another set of factors which influence and contribute to the continued use of traditional farm skills as evident in the case of *kazhchakula* are the lack of a better alternative improved technology, high demand for the produce and the traditional value system attached to the produce. The monopoly of the farming to retain the techniques of production of *Kazhchakula* is still maintained. Due to the issues of IPR involved in this, further effort was not taken to find the trade secret in this study.

E. ENDANGERED PRACTICE – RURAL TRANSPORTATION USING BULLOCK CARTS

Bullock carts were the major means of transportation in olden days - till about 60 - 70 years ago- both for people and goods. Poor people used to walk long distances and used to carry head loads. In those days there were *nadapaathas* - country roads, not the metal roads. Along these country roads at places *chumaduthangis* used to be installed by the rulers. These are strong granite pieces raised on two granite pillars. This would be of an average person's height - meant for the relief of pedestrians to relieve the load while taking rest to the stone surface. Even now at places in villages these are to be seen as of no use. From its name the proverb of *chumaduthangi* (doing / taking anybody's work without any complaint) was popularised.



Presentation Bunch (*Kazhakkula*)



Ploughing with bullocks

Bullock carts' wheels in the olden days were made completely of wood. Now the rim is replaced by tyre, which has made the functioning of the cart easier. Big landlords had specially decorated bullock carts for their *savaris*. This disappeared on introduction of motorised transport around 1935. But the use of carts for transportation of agricultural goods - manures, harvested paddy, coconut, vegetables etc for marketing - was prevalent till as recently as 1980 - 90's. Since the introduction of autorickshaw, tractor, mini lorries etc the use of bullock carts got reduced. Now very rarely they are in use for these purposes. Tractors, tillers, autorickshaws and mini lorries have displaced the cart. Paddy straw transportation is now the only major means of work for the bullock cart workers. And also to transport goods to fields where motor vehicles can't go - which is also very rare nowadays.

Bullock man should know the skill of managing the bullocks - there is a typical language by which the bullock man conducts and instructs the bullocks. This language is mostly of some typical sounds and syllables - which are meaningful to both parties. The bullock man used to understand any discomfort or complaints of the bullocks from their behaviour. The animals were also used in certain pattern / same position for example (left or right of the cart).

Castrated bullocks were used as the draft animals. As they walk continuously their hooves are protected by fixing iron shoes (*ladams*). The fixing of *ladam* is done by blacksmiths. Now there are very few blacksmiths who know these skills.

a) Case of Subramanyan, Blacksmith, Karuvarappurackal, Cheruthuruthy

Now the bullock cart owners of Panjal Panchayath depend on Subramanyam the blacksmith of Cheruthuruthy for doing the work of *ladam* fixing on the legs of their bullocks. *Ladam* is the metal shoe fixed on the hoof of bullocks as a protective device. He has opened a small shop in Cheruthuruthy, which is a nearby marketplace of Panjal Panchayath.

Subramanyam is expert in preparing *ladam*. Two *ladams* each are fixed on the four legs of a bullock. Altogether there are 8 *ladams* for one bullock and 16 for a pair of them. Three nails are pierced to fix a *ladam*, thus 48 nails are required totally. Subramanyam charges Rs. 200 to prepare and fix *ladam* for a pair of bullocks. He is fixing *ladam* by forcefully making the bullocks lie by tying ropes. For a bullock which is working daily, its *ladam* should be changed in every 15 days. A *ladam* will be useful for a maximum of 30 days.

Subramanyam is purchasing iron from the iron shop to prepare different items. The other items he prepares are *madaval*, *koduval*, *kozhu*, sickle etc. the last time has prepared a *kozhu* is before 15 years. He charges about Rs. 50 to prepare a sickle. Two types of iron are used; the iron with high temper is costlier; about Rs 15 per kg. It is tougher and durable. He prepares a variety of knives, which costs from Rs. 20 to 100.

Since the socio economic system has changed he is not waiting for his old customers. Now he is doing any blacksmith work demanded by the people. He is mainly involved in preparing parts of bicycle. He charges about Rs. 20 to sharpen a big knife. The charges will vary according to the implement to be sharpened, and the amount of work to be done.

F. TRANSFORMED SOCIO – ECONOMIC SYSTEMS OF THE VILLAGES

a) Case of Sri. Thankappan Nair narrating about the old social systems of Pananchery

According to Shri. Thankappan Nair, an old farmer (70) of Kundupara, Chemputhara in Pananchery Panchayath, there existed strong bondage between the old farming practices and relations of various categories of villagers.

In Pananchery Panchayath in earlier days before 1950, farmers used to raise paddy in only one season in a year (*Mundakan*). In certain low parts of the Panchayath, two crops were also in practice. Cow pea, horse gram, black gram, sesame etc., were grown in uplands in the other two crop seasons. The rice varieties used in the past were *Chitteni*, *Cheera*, *Chembavu*, *Arayan*, *Thavalakannan*, *Kutti*, *Njavara* etc. None of these varieties are grown now.

In the olden days, the villagers used to meet their needs almost from the resources within and nearby the area. The people used to live utilizing the local natural human, social and bio resource facilities. An analysis of the farming system from the stand point of view of the farmer will help us to identify how the different classes and castes of the society were interdependent and mutually contributing for their sustenance.

Farmers were usually big landlords who used to cultivate their land directly engaging labourers or used to give land for lease to other small farmers. The big farmers used to have their own labour families of lower castes (bonded nature). The labour families will attend work of the landlord to which they are bonded and won't attend anyone else's work. *Janmi* (landlord) and *Kudiyar* (labour) system was in existence, in the Panchayath. Wages were given in kind in terms of paddy, and not as cash. In those days cash - "*Chakram*" - was rarely available to labour class. The landlord used to provide one meal of *Kanji* (rice gruel) daily at noon. The labour families used to process and cook each day's paddy for their daily existence or they used to sell the paddy to buy grocery items. In those days there were very few shops and very few essential stationery items for purchase. Chilli, salt, jaggery, coconut oil and kerosene, tobacco leaves and dried fish were the major grocery items the villagers used to purchase. Vegetables, fruits and tubers grown in the households were used for the dishes. Cucumber, pumpkin, banana, cow pea and amaranthus were the major vegetables. Different items of jackfruit and mango were in use. By products of banana like "*koombu*" (inflorescence tip), "*pindi*" (pseudostem) and sucker of banana were common items for dishes. The common breakfast items were *kanji* (rice gruel) and dishes in the farmers' houses; labourers used to have *pazhakanji* (previous night's rice stored in water) and tapioca. Labourers used to have only two meals a day.

The system indicates the minimum cash transaction involved in the daily life of the villagers. All the farm management works of landlords were looked after by *Karyasthan* (supervisor) who usually will be a person of low income group but of higher caste;

An analysis of the caste system prevailed and caste bound occupations which did exist really give the picture of interdependence of the farming systems and the villagers. Farming and its related works were the major livelihoods for the villagers and all were the stake holders of the farming systems. Apart from the major field works performed by the

labourers all other farm skills were performed by rural artisans who belonged to specific castes – carpentry, blacksmithing, pottery, basket making etc. Farm labourers mainly belonged to the caste of *Ezhavas* and scheduled castes (*cherumas, parayas, pulayas, mulayas, kavaras*) and rarely from the poor families of the subcastes of Nair. Majority of the landlords were Nairs and a few of them were *Ezhavas* and Christians. Carpenters used to make all farm implements – ploughs, yokes, leveling planks, *chakram*, all farm furniture, wooden vessels, spoons, measuring devices etc., baskets of *theku* etc. *Parayas* used to make all types of baskets, mats etc out of bamboo. Potters (*Kumbarans*) used to bring vessels made of clay. Goldsmiths were the artisan of ornaments. *Moosari* (artisan who moulds brass vessels) used to make all big types of brass vessels – *varpu, uruli* etc. *Pulluvass* used to come to sing appeasement songs for serpentine gods and for prosperity of the *tharavadu*. *Mannans* (dhobi) were in charge of washing clothes. On all auspicious days clothes washed by *Mannans* were essential to remove impurity from the *tharavadu*. *Enna chettis* used to supply oils (coconut oil, gingely oil, *punnacka* oil etc.). *Vathir* (barber) used to come to households for haircutting. *Chaliyas / chettis* used to bring clothes as head loads from far away places.

The bullocks maintained by the landlords were used for land operations/ploughing. The bullock men either used these draught animals or raised their animals for their ploughing occupation or for irrigation operations (*Kalathekku*). Field digging, transporting manures, harvesting, threshing, seed storage, irrigation, garden land work etc were the major operations. Farm labour for field work were drawn from different castes of backward and scheduled castes. Good farm implements and bullocks were matters of prestige for the owner farmers. Big landlords had their own labour men and women attached to their families. Women labourers were mostly engaged in seeding, transplanting, weeding, harvesting, threshing, seed drying, straw drying, paddy parboiling, dehusking, winnowing, green manure cutting/ collecting and harvesting activities of the landlord. The lower class and caste field workers Nairs, *Ezhavas, Pulayas, Parayas, Ezhuthachan* etc used to perform these activities. Other caste people who used to sustain the farming systems were carpenters (for wood work), blacksmiths (for iron works), *Mulaya, Paraya* (for bamboo work), vessel makers (*Moosaris*), barber, toddy tappers (toddy production), *Kumbaran* (clay work), dhobis (cleaning of cloth). From the field to the kitchen there existed an array of equipments/utensils made of wood – from different types of ploughs, crowbars, handles, planks, handles of spades – farm houses, seed storing houses/ devices (*Ara, Pathayam*), bullock carts, measuring devices (*para, changazhi, nazhi*), rice storing boxes, coconut grater, country rice huller (*ural* and *ulakka*), wooden seats, wooden spoons, wooden jars – pickle palette etc were the hand work of the carpenters. Along with metal parts of the above equipments, devices such as the axe, *kozhu* (plough), irrigation buckets (*kalathekku*, swing baskets), knives, spades, boxes, latches and keys, cast wheels, metal shoes for bullocks (*ladams*) etc were the contributions of blacksmiths of the village. The whole array of different types of baskets, mats made of bamboo and cane (for carrying, storing, winnowing, plant protection, drying) etc were made by the *mulaya/parayas*.

He remembers the introduction of canal irrigation as the starting point for all the drastic changes brought about in agriculture atmosphere of the Panchayath. He also recalled all other changes that came there in succession.

Time line of the major events that led to major agricultural changes in Pananchery Panchayath:

<u>Events</u>	<u>Year</u>
Canal Irrigation	1950
Use of inorganic fertilizers (Ammonium sulphate)	1950
Use of DDT	1950
Oil engine for irrigation	1950
Land Reforms Act	1962
Use of tractor for the first time	1963
Use of tiller	1965
Wide use of tractor and tiller	1975
Wide use of new paddy seeds	1975
Use of pesticides (Endrin)	1978
Use of sprayer	1980
Loan for agriculture	1985

He enlisted old practices of rice farming in the Panchayath. Bullock ploughing was the old procedure for land preparation. The land used to be repeatedly (6 to 8 times) ploughed to prepare the land. After the 2nd ploughing cattle manure and green manure in ample amount used to be put into the field and ploughed in one bundle (25 leg) of green leaf / cent. For four days the manure used to be kept in the field. After which another two ploughings were given to incorporate the manure into the soil. For this purpose the “*mutti*” (a special attachment to the plough) was used. The field is then left as such for 5 – 7 days for ripening (*pazhuppikkal*) and then two more ploughing were given. During the last ploughing “*Njauri*” was used for leveling the field.

On the day of the last ploughing or the next day seedlings are transplanted to the fields. From the paddy nursery women pull out seedlings and tie into bundles two or three days before planting. The tips of the seedlings were cut and removed. Then the seedling bundles are heaped together for three days. This practice is called “*Kundakootta*” (hill making). Here the seedlings will be placed in a circular fashion wherein the roots are kept outwards and shoots towards the center. The seedlings get a yellowish colour by three days. These were then transplanted to the paddy field and women plant the seedlings. Cowdung and ash were the only manures then used to be applied to the field. Rarely bone meal application also was in practice. Weeding was a practice carried out by women labourers. In those days women were experts in identifying the *varinellu* (wild rice) even at seedling stage of the crop. Chemical fertilizers were not common. Plants like *Oduku* were in use for plant protection in paddy cultivation. He remembered about teak oil as a good medicine for the foot and mouth disease of cattle.

At present Thankappan Nair has no paddy cultivation, but has some garden land with coconut, arecanut and banana as the major crops. His wife is employed as teacher in the nearby school. He has two grown up children, employed elsewhere and they have no interest in farming. He pointed out the problems as scarcity of labour, high wage rates, non profitability, low price of produce etc.

b) Case of Sri. Ramankutty, Farmer in Paikulam, Panjal Panchayat, Thrissur

Ramankutty (98) is a very old farmer of Paikulam, Panjal, who is even now active in farming.

He remembers about the old Panjal village and its farming traditions. The village was a very orthodox one. There were big landlords of forward castes – Brahmins and Nairs and very rarely from Ezhavas and Ezhuthachan castes. Other religions – Christians and Muslims – were very few in the past. Brahmins were ardent followers of their Vedic customs, traditions and ceremonies. He remembers about the traditional varieties of paddy they used to grow. He had paddy cultivation, banana cultivation in his farm and also he used to go as farm labour of Nair *tharavadu*.

In those period there were no chemical fertilisers or pesticides in practice. Cowdung, green leaves and ash were the manures used. In case of diseases plant based products were used such as *oduku* leaves, fronds of Pandanus, cashewnut oil, etc. He also remembers about the *Chazhikettu* – a mantra based control of rice bug for which local *mantravaadis* were called for. In those days seeds were kept in *Koodavattis* – baskets made of bamboo. *Vishu poottal*, *kalathekku* and *thulathekku* were in practice. He used to rear buffaloes. His grandson Ramankutty is now a farmer – looking after his farm and also a local political leader of the farmers.

He remembers about the introduction of rubber as a new crop in the area and how the labourers and farmers were drawn into the new system. In the old village based system, all rural artisans were there – *parayas*, *pulayas*, blacksmiths, carpenters etc. Now almost all have shifted from their traditional occupations and took diversified occupations due to education and other changes. He remembers about how he used to irrigate his farm using *Kalathekku* in the early morning hours. Bullock carts were the only means of transportation for people and goods. In these days there are only a few bullock carts and they are used for transportation of straw or manure. His wife Lakshmi (70) is also very active and participates in all house management activities.

c) Case of Sreedevi, Farmer, Thazhathu Mana, Panjal Panchayath

Sreedevi, 38 years old, is the daughter in law of a Brahmin family in Panjal. She is SSLC passed. Her husband is a *poojari* (priest) of a temple in the neighbouring village. Two sons of age 6 and 4 and her mother in law are the other members of her family.

They have a farm of 2 ½ acres land, wherein coconut, arecanut, pepper, banana etc are raised. Vegetable cultivation is undertaken in a large scale. Sreedevi looks after these farming activities as her husband is otherwise engaged and has no interest in farming activities. Sreedevi engages labourers for manual operations in the field and supervises these activities. This male labour help her in marketing, purchasing farm inputs and also for selling

the farm produce - vegetables etc to the market. Her mother-in-law also helps her in irrigating the plants. Her sons are studying in school and also attend *Veda* classes. Sreedevi takes all decisions with regards to the farming and attends all meetings of *Krishi Bhavans* and is the leader of *Mahila samajam* in the village. Her mother-in-law also encourages her leadership among the local women.

This picture of the gender role change in the Brahmin family is a classic example for the transition that has happened to the traditional socio economic scene of Panjal panchayat. The Panjal Panchayath is a place heard for its ancestry as well as vedic practices like *athirathram*. But majority of the villagers are non-Brahmins. Even in the Brahmin families few were found to be sticking on to the old traditions and among family members only very few were found to be following traditional/ religious practices and work as priests of temples. Even the so called *antharjanams* (ladies of Brahmin families) who used to remain to the interior of the *manas* (houses) and who used to travel with the covering of palm leaf umbrella (*Olakuda*) are now behaving, dressing, moving, attending offices, going to shops, public meetings, engaging in farm operations etc., like any other non Brahmin women in the village.

The material culture and rituals are still a part of their life, but to a very limited extent. No Brahmin families are now able to lead their tradition bound customs and practices strictly in the modern socio economic and technological systems. In many of their houses (*manas*), traditional utensils, typical house structures etc are kept; but not for daily use. Occasionally they are used for ritualistic/festival purposes but not in daily use.

The panchayat is still famous for its tradition based religious functions of *athirathram*, *homams*, *yagams* etc. and some of the Brahmin families still practice the learning of *Vedas* and do take up the occupation of priests in temples etc. But the Brahmin families who were once tradition bound are no more an elite group of their own practices and life style. The socio economic transformation that has happened in their immediate surroundings have certainly transformed their lives too. The children lead normal lives and get educated in other children in schools. Some families see that small children get educated about the *Vedas*. But such practices are not observed to influence them to behave differently in the society.

This case of a Brahmin lady very well indicates how the gender roles have changed overtime and how the socio economic changes that happened in the society has impacted the lifestyle of even the tradition bound Brahmin families in the Panjal Panchayath.

d) Case of C. P. Pilipose (Baby), Chembanal House, Thanippadam, Pananchery - A migrant farmer

Mr. Pilipose came to Thanippadam from his native Thiruvalla in 1950 following his relatives, who had come here in 1948 when the construction of Peechi Dam was started. Pilipose purchased 60 acres of land for Rs. 15,000/-. But after the Land Ceiling Act, his land area has reduced to an area of 45 acres.

Pilipose's land was completely under forest when he purchased it. He felled the trees and started cultivation in the area. The crops cultivated were rice, banana, vegetables and tuber crops. He introduced tapioca to the region. The seeds and seedlings were brought

from Thiruvalla. Tapioca was priced at Rs. 9/- only per tonne in 1950 and this got increased to Rs. 50/- by 1952.

Hand tools were used then for different farm operations. *Koonthali* (spade) was used commonly. Both the pole and the sharp edge of the tool were made of iron and it weighed about 7 – 8 kg. This implement also was introduced from Thiruvalla.

The cultivation practices of crops in those days were different from the present ways of farming. Each crop had a distinct set of practices. Paddy was mainly cultivated in the low lands. Ploughing was done using country plough and bullocks. Five to six ploughings were done with a gap of 3-4 days in between. He himself owned six pairs of buffaloes. Green leaf manure, cattle manure and wood ash were used as fertilisers in the paddy fields. The pests and disease control was done using natural, easily available materials collected from the surroundings. For example, leaf roller was controlled by fixing the twigs of *oduku* in the field. The resin oozing out from them controlled the pest. He observed that in the olden days pest and disease attack was minimum. The labourers were paid in kind then for their labour. This practice was called *pattom*. For paddy, the *pattom* was 1 *para* (7 – 8 kilogram) of paddy for 8 *paras* of winnowed paddy.

The advent of mechanisation, chemical fertilisers, and pesticides in paddy cultivation happened by the 1980s. Tractors became popular by 1982. The low unit cost of ploughing and the reduced time required in completing the farm operation made the tractor very popular. It also contrasted with the high maintenance cost of bullocks and the drudgery involved in bullock ploughing. Hence ploughing using tractors gained popularity and displaced the bullock ploughing.

Chemical fertilisers and pesticides were also introduced to the area in 1980s. Village Extension workers motivated the process by giving free samples to the farmers for conducting trials. The application of urea provided very good results and yield, compared to the organic manure of wood ash, cowdung and leaf manure. People started shifting to the inorganic fertilisers, pesticides and reduced the use of organic manure. This soon became the case for all crops.

In the olden days paddy cultivation was done with great care; which is not observed now. Pilipose had also planted coconut palms along with tapioca and rubber in his land. The rubber seedlings were prepared at home and were planted in pits 1 m wide and deep. About 10 months old seedlings were used for planting. Transplanting was done during *Kumbham – Meenam* (March – April). Irrigation was done 2 – 3 times a week for young seedlings and they establish by the onset of monsoon in May – June. The palm used to bear fruit in 5 years. The incidence of pest and diseases was also very low and the farmers could get a good yield even without any particular care. Now the palms take more time to bear fruit, pest attack and disease incidence are severe and the fertility of the soil has also reduced.

Diesel engine was introduced for irrigation in 1960 – 1965 and electric motor got popularised about 10 years later.

Pilipose had banana cultivation also. Saplings were planted in small pits. The manures used were cattle manure and ash. After adding green leaf manure, the basins were pressed by feet. The buds sprout in 15 days. At 3 – 4 leaf stage, dried cattle manure, wood

ash and goat manure will be applied to the basin. These will be raked well. Oil cakes also used to be applied after a month. Propping was done using teak or bamboo poles. In those days, cutting of bamboo was the job of a people of a particular caste – *Mulayas* (scheduled castes). Nowadays there are no such restrictions. *Kalathekeku* was the method of irrigation for banana in those days.

There were traditional medicinal preparations for the treatments of animals. Teak oil was a good medicine for the control of foot and mouth disease of cattle. The teak oil is to be applied on the cattle's foot after cleaning the wounds. Another medicine for foot and mouth disease was a preparation using a plant called *puzhukolli*. Leaves of this plant are taken in equal proportion to the leaves of tobacco, ground well and applied to the wounds on the cattle's foot. This according to Mr. Pilipose is a very good remedy for Foot and Mouth disease. The external pests on the cattle's body were controlled by bathing and scratching with *adaykamaniyan* plant. Diseases of poultry were controlled by applying a mixture of neem, turmeric and pepper in ground form. These traditional medicines are now forgotten and people depend solely on the Veterinary Hospital, which was started in the village in the 1970's.

e) Case of Indigenous Method of Prediction of Rainfall (Neelakandan Namboothiri, Mazhuvanchery Mana, Chazhoor Panchayath, Thrissur)

Mr. Neelakandan Namboothiri is a traditional farmer in the Chazhoor Panchayath of Thrissur District. His *mana* (traditional house) is a *Naalukettu*. In his home he still follows the traditional practices of vegetarianism, *chukeku vellam*, *pooja* and keeps old traditional vessels and has an *Ara* (wooden storage device) etc. He described the method followed by his ancestors for predicting rain.

Rains are of two types - South West Monsoon (*Kalavarsham*), locally known as Edavapaathi (during May – June to August – September) and North East Monsoon or *Thulavarsham* (October – November). *Kalavarsham* can be expected at any time of the day. *Thulavarsham* occurs only in the afternoon of the day. After *thulavarsham*, *Vrishchikaattu* - gusty winds - occur. It permits the pollination of coconut. New roots develop at this time. By *Makaram 28th* (*28 Uchala*) - the direction of wind reverses. The wind from the east changes direction and flows from west. This is known as "*kudam marichil*". To predict the day of summer rains' arrival the following method was in practice. On *Makaram 28th*, a small *mundu* (dhothi) is hung from the front door frame in the eastern side. One person will sit and closely observe the *mundu*. The movements and change in position of the *mundu* will be keenly noted.

Accordingly the following conclusions will be drawn:

1. If the *mundu* changes direction at noon, the south west monsoon will commence by *Edavam 15th*. (31st May – 1st June)
2. If the change of direction is before 12 noon, South West monsoon will commence before *Edavam 15th*. (before 31st May)
3. If the change of direction is after 12 noon, *kalavarsham* / south west monsoon will commence after *Edavam 15th*. (after 1st June)

Advantages of the method are following: The onset of the South West monsoon can be predicted 6 months in advance and Agricultural operations can be planned / performed by understanding the availability of water.

One of the beliefs attached is that on the above said *Uchala* day, no cultural operations must be performed. This is the day of complete rest for the farmers.

Other methods of prediction of rain are:

1. Nearing *Makaram* 28th (February 10th) a mass of gummy thread (*marala*) appears in the environment - (air and fields). If the appearance of these threads is before noon, then the southwest monsoons will arrive early. If the threads are seen afternoon then the monsoons will be late.
2. Some people use a thread to predict monsoon. They tie the thread to the doorframe and predict / forecast the monsoon by observing the change in its direction.

Observations from the analysed cases

The above analysed four typical situations of farming situations and skills – endangered practices, reintroduced or continuing endangered practice, extinct practice, indigenous practice in high demand and their individual cases very well contribute to the following conclusions.

1. Both the cases of extinct and getting endangered (*kalathekku* and ploughing) -the responsibility and burden of the farmers and the related components of the social system to sustain the practice are very high, eg: skilled and trained bullocks and bullock men are essential components which at the same time are costly also. The introduction and rapid popularisation of improved technologies (tractor ploughing, motor pumpsets, canal irrigation etc.) are not only helping the farmers to be free from worries of sustenance, but are cost effective also.
2. In the case of practices, which are reintroduced and continuing (*thulathekku*, *chakram* and *kazhchakula*), the flexibility and relatively simple skilled nature of the components and relations involved are to be identified. The flexibility of the system to integrate external components to the changed social set up is another dimension of importance.

Thus the major conclusion that one can draw from these analyses is that traditional practices which are not complex, not rigid and which are simple, less labour intensive and less costly can thrive the modern socio, economic and technological transition in the social system, and can re-enter the social system at any time. Moreover the possibility of adaptation and improvements in these devices are also to be thought e.g. through mechanisation (mechanised *thulathekku* or *chakram*). From the point of view of the resource use efficiency (economic use of water / energy etc) these may be of much relevance. However, there are many traditional practices and skills in the farming system, which are important, but cannot be sustained by the present social set up and hence have become extinct. All the actors of the social system have a definite role in identifying, promoting and sustaining such skills, especially in the context and relevance of organic farming and sustainable agriculture practices which are regaining popularity in market and among farmers. The roles of research system cannot be exaggerated. The wisdom of the farmers, their suitability to the environment and users should be appreciated. The researchers and extension personnel of

the future also should be oriented to the value and importance through necessary orientation.

3. 5 Factors influencing the use of indigenous farm skills

I. From the above cases analysed, the factors, which mainly influence the use of indigenous farm skills, were identified as 1. Human Factors 2. Technological factors 3. Resource related factors 4. Intervention factors 5. Social system factors

1. Human factors

Absence / lack of skilled manpower

The skills required to produce the tools or devices and the skills to use the tools are essential for the adoption of any farm practice. The skills possessed by the rural artisans in cutting, melting or moulding or weaving a particular device are getting “endangered”. As the farming systems are not using the devices, the specific skills needed for developing and operating are becoming unknown to the present generation, thus making them “endangered”, leading to its “extinction”. The user system - the farmers, point out that one of the main reasons for non-use of the practice is the non-availability of the skilled labour and devices. Lack of awareness on the part of the people about the existence of such practices is another deciding factor. The lack of confidence on the part of the farmers to try the traditional wisdom is another factor, which leads to “endangerment” or “extinction” of the many traditional skills from the community wisdom.

Occupational diversification and increased level of education and employment opportunities outside the rural set up also lead to the alienation of youth from entering into traditional occupation such as of farm labour, blacksmith, carpenter, etc. The limited demand for the production of farm implements and services also lead to the unemployment of such labour in rural sector, which leads to the endangerment of the practice and in turn results in the lack of skilled hands.

2. Technological factors

a. Improved technologies

Inefficiency of the indigenous practices and their replacement by improved modern technologies are quite interconnected, and acts as one important reason behind the erosion of indigenous skills from the rural scene. The rate and speed with which the indigenous systems could work and the volume of output they could produce were found to be very low compared to the modern technologies in most of the cases (eg. *Kalathbekku/thulathbekku, chakram* and *ara*, compared to the motor pumpsets, and ploughing with country plough to tractor / tiller operation).

b) Increased drudgery and labour intensive nature of traditional technologies

The increased manual skills and exertion in using many of the indigenous skills compared to the easiness and convenience of the replaced modern technologies are also pointed out as important pull factors in their present use. Thus the easiness with which the modern technologies are operated compared to the drudgery and hard manual work involved in the use of traditional practices as a factor has hastened the replacement of the indigenous technologies. Many of the labour intensive operations have now turned to be family labour

operated as a result of the introduction of simple machines. (eg. irrigation by motor pumpset compared to the manually operated and animal drawn devices.)

3. Resource related factors

a) Non availability of raw materials required in operating the skills

High dependence on the utilisation of natural resources for the construction, operation and maintenance of the traditional devices utilised in farm operations are noticeable. The ploughs and the different types of levelling planks were made using special species of trees. Similarly the devices which were made of bamboo also need local raw materials. The cattle available in a locality and their suitability for employing them for draft purpose also should be related in this context. Due to introduction of the exotic varieties of cattle, the male cattle population suitable for draft work itself has become not existent. The high dependence on plant biotics (medicinal plants) for the indigenous skills identified for plant protection and treatment of livestock are also noticeable. Many of those plants are now either not available in our rural areas or could be properly identified by the present generation. The scarcity of raw materials is a major factor for the non-use of these skills in the present farming systems and in the same way; lack of proper care and management of the plants might have resulted in their endangerment also.

b) High cost and Scarcity of labour

The labour scarcity is another major factor, which hinders the use of traditional skills. It is noticeable that almost all the practices are labour intensive, which is manually operated. The relative easiness and speed of the operations of the modern devices have easily influenced their quick acceptance in the farming system. Most of the devices like motor pumpsets; machines, modern medicines etc can be operated by the family members themselves without depending on the labour class. The high cost incurred to maintain and operate the labour-intensive old systems need special mention especially in the context of the present labour wages, which are quite high. Small size of holding in the present system is another pull factor worth mentioning. The reduced size of the farms due to fragmentation can be identified as a factor behind the endangerment. Due to the low volume of the farm business involved, the farmers as such are also not interested to maintain such costly traditional practices like *Kalathekkun*, bullock ploughing etc. which used to be essential components of the land lord system and big farmers.

4. Intervention factors

a) Government sponsored technological interventions

The development agencies who have intervened in the social system with programmes, new technologies, strategies for the promotion of modern technologies (high yielding varieties, fertilisers, pesticides, canal irrigation, motor pumpsets, artificial insemination, tractors, sprayers etc.) have immensely influenced the farmers to adopt the new technologies. The role played by these agencies in changing the farming practices of the area and lifestyle of the farmers as anywhere else in Kerala can not be ignored. Similarly, the incentives and other economic benefits offered by the development agencies also have resulted in motivating the farmers to adopt new practices.

b) Introduction and development of infrastructural facilities and services

The development of infrastructural facilities like electricity, petroleum products, mechanised transportation, canal irrigation, storage facilities etc. together with the promotion of modern technologies, actually has hastened the adoption of modern technologies. The new services created by development departments (Agriculture, Animal Husbandry, Co-operation, Fisheries, Dairy, Irrigation), financial and other inputs (loans, subsidies, markets, fertilisers, pesticides, medicines, machines, processing etc.) also had influenced the consumer behaviour of the total farming system. The locally oriented independent social system, which was more or less self reliant, had turned out to be dependent and external input -oriented system of production through this transition. Now the farmers are dependent on markets not only for farm inputs and implements, but also for many of their consumables like rice, vegetables, milk, ghee, flour, pickles, snacks, ready to eat items, etc., which were really the farm produces of the old farming systems, which they had produced / processed in their own farms and houses

5. Social system factors

a) Attitude and consumer behaviour

The changes in the mental disposition of the individuals and their positive shift towards the use of modern technologies are push factors supporting the spread of utilization of modern practices. The changed consumer behaviour of the farmer system which is a reflection of the general trend of the total social system also should be highlighted in this context. It is quite natural that together with the changes in the larger social system (in relation to changed values of tradition), the sub system of agriculture also had changed resulting in the neglect and non use of the old devices, practices and farm produces.

b) Conformity to the norms of social system to use modern techniques / technologies

The tendency on the part of the society to stick on to the accepted patterns of behaviour is another natural cause for the endangerment and extinction of the traditional skills and practices. As majority of the farmers in the locality shift to modern technologies, those who wish to adhere to indigenous practices become helpless and will be forced to join the mainstream. As a result of tractor ploughing, the service/skill of ploughing, making and maintenance of plough, local breeding of cow with bull etc. have become gradually unavailable or scarce in the locality due to lack of regular demand.

c) Changes related to land reforms

With the changes in the feudal system, the nature and relationship of landlords (*Janmi*), lease (*Paattom*) and contract labour tenants (*Kudiyar*) etc have changed. The close and well knit relations and interdependence which existed in the rural life, - the bondage that existed between the farmers and the tenants, farmers and labourers, farmers and artisans and between farmers themselves are lost forever from the rural life.

d) Changes in the nature of family systems.

The deterioration of the joint family set up and the emergence of the nuclear family system also have led to acute shortage of family labour and fragmentation of farm holdings

which do not provide much scope and adequate manpower for the adoption of many endangered farm skills.

Thus the factors which are identified under the major headings - **human factors, technological factors, resource related factors, intervention factors and social system factors** to a large extent explain the influencing factors as reasons and constraints for the loss of the well established farm skills which existed earlier and their "endangerment" and "extinction" from the rural scene of Thrissur District.

CHAPTER 4 SUMMARY

The project on " Identification and analysis of endangered skills in the farming systems of Thrissur District " - undertaken in KAU as a KRPLLD sponsored project was implemented during 1998 - 2002 with the following specific objectives:

1. Identification of indigenous skills in the farming systems of Thrissur District
2. Analysis of the indigenous farming practices in the areas of high and low transition in agriculture in Thrissur District.
3. Analysis of factors related to the present " endangered " and "extinct" condition of farm skills in Thrissur District.

The skills involved in the farm practices were analysed from two angles - the skills implied in the use of the practice as such and the skills involved in the process of developing/ constructing, operating and maintaining the technology/practice.

The study was conducted in two phases. During the first phase the major indigenous and traditional practices and skills in Thrissur district were identified/ documented with the help of key informants, extension personnel, review of past studies etc., by locating the tracts of traditional / indigenous farm skills in the district. Through individual and focussed group discussion with different stakeholders -farmers, labourers, rural artisans, rural medical practitioners, extension personnel, local resource persons etc. details on indigenous farm practices were collected - skills involved, their present state, actors involved, reasons and factors for non use, re-introduction, continuation etc. Documentation of important practices by recording, using photographs and illustrations were done wherever possible.

In the second phase of the study from among the 98 Panchayaths of Thrissur district, one Panchayath under 'high transition' in agriculture and another under 'low transition' in agriculture were selected. The selection of the Panchayath was done scientifically with the help of a Composite Agricultural Transition Index (CATI) developed for the purpose and based on the relevancy rating by the experienced development personnel of the Department of Agriculture in the district.

The (CATI) was developed using the following indicators - Extent of area cultivated (X1), average fertiliser use (X2), coverage of high yielding variety of rice (X3), average pesticide use (X4), extent of improved cattle population (X5), extent of irrigation facilities (X6), extent of mechanisation (X7) and extent of area under inland aquaculture (X8),

$$\text{CATI} = \frac{(Y_1 + Y_2 + Y_3 + \dots + Y_k)}{k}$$

$$\text{where } Y = (\text{individual indicator}) = \frac{X}{X, \text{ max}}$$

X = raw data of the indicator

X max = the highest value for X among the Panchayaths in the group

k = the number of indicators involved

Accordingly, Pananchery and Panjal Panchayaths were selected as units for the study on existing practices in the farming systems. Pananchery was selected representing an area under high transition in agriculture while Panjal was chosen as an area under low transition in agriculture. With the help of local key informants and extension personnel, 44 farmers with rich experience in crops like rice, coconut, livestock etc were selected purposively from each of the Panchayath. Through individual contacts, visits and discussion using semi structured interview schedule, time line analysis, case histories etc., the major farming practices were identified, categorised and the factors influencing the endangerment and extinction of the traditional practices and the skills involved were analysed.

The research team could identify many skills, practices / devices involved in rice cultivation. Some of the important skills / practices identified were - seed germination in wooden tanks, sowing and transplanting, *Kundakootal*, Ploughing with country plough and bullocks, plastering of bunds, use of swing basket, *Vethu*, wheel and box, *Thulathekku*, *Kalathekku*, use of Indigenous medicinal plants for plant protection, rat traps, baskets, mats, weeding of wild rice, harvesting, threshing, winnowing, seed preparation, and parboiling.

Similarly some of the practices / skills identified in relation to coconut, arecanut, vegetables and other related systems - use of single ladder for coconut climbing, copra processing, coir making, coconut leaf plaiting, thatching, toddy preparation, milling of coconut oil, production of varied types of arecanut products, utilisation of palm leaves as broom, baskets, buckets, vessel mat, varied types of kitchen utensils for processing made of earthen vessels, wooden spoons, sieve plates, pickle jars, rice box, coconut grater, *Ural* and *Ulakka*, Churning rod, *Irikeka palaka*, knives, etc.

Some of the major traditional practices and skills located in livestock rearing were - traditional cattle shed, grazing of cattle, traditional cattle feeds, manual milking, treatment for fractures, draft animals, bullock carts, bullocks hoes, medicinal plants used for treatment of cattle, special medicinal preparations for draft animals, teak oil production, practices of seed bull, etc. Practices related to hatching of local breeds of chicks and indigenous treatment of poultry, storage of eggs etc. also could be located. The devices like *Ottal*, *Koruvala*, *Choonda*, Pipe and arrow (*oothuli*) etc. were the traditional fishing devices identified in the study area.

The comparison of the existing farming practices in Pananchery and Panjal revealed that there is not much difference in the two areas with regard to the use of indigenous and traditional farm practices and skills; Both modern practices and traditional practices were found to exist more or less equally in both the panchayaths. This very well indicate that the transitions happened in the socio economic, techno -cultural and consumer behavioural pattern of villages in Kerala equally holds good to both the panchayaths. The impact of common developmental interventions of the agricultural sector in the district is also to be recognised here. Some practices were identified as extinct as social practices or skills in farming cannot be re - introduced or re- used at any point of time in the social system. The use of *Kalathekku* and *Kalluchakku* were identified as 'extinct' during the period of reporting, as the research team could not locate their use anywhere in the district.

Some of the important endangered practices are the use of wheel and box, swing basket, *vethu*, ploughing with country plough and bullocks, use of indigenous medicinal

plants, *Ural* and *Ulakka*, thatching, products made of areacnut spathe, earthen vessels, wooden utensils, bullock carts, traditional cattle shed, teak oil production, breeding with seed bull etc.

Thulathekku as irrigation practice once got endangered was identified as one, which is now getting reintroduced in many parts of the district during the period of study. Another important traditional practice still in demand and use was the production of *Kazhchakula* (presentation bunch of banana).

Analysis of four selected situations of traditional practices by identifying the skills and relations involved in their use was carried out - ploughing with bullocks, practice of *Kalathekku*, re- introduction of *thulathekku*, *chakram* and *ara* and the demand of *Kazhchakula*. These were then analysed in depth through individual case histories which could illustrate the old social relations, systems, customs, traditions and actors once involved and the extent of present changes. The analysis of the factors and relations involved has helped to draw the conclusion that traditional practices or skills which involve intensive labour and skill and depend highly on the social system for its sustenance are not be continued on the introduction of improved technologies. It was also identified that skills / practices which are simple involving less intensive labour and low skill can be reintroduced as and when the need arises in the society, provided the related skills are not lost from the community wisdom once for ever.

The major factors observed to influence the use, non-use or re-use of traditional practices or skills in farming were - human factors (absence of skilled hands), technological factors (improved technologies, drudgery and labour intensive nature), resource related factors (high cost and scarcity of labour, non availability of the raw materials and skills, demand in market), intervention factors (technological development programmes, infrastructural development) and social system factors (attitude and consumer behaviour, conformity to the norms of social system, land reforms, etc.)

These observations, analyses and interpretations made in the study emphasise the need for detailed documentation of all traditional and indigenous practices or skills which are existing and which were in vogue and slowly vanishing from the minds and memory of the rural community and the different actors involved – both women and men farmers, labourers, rural artisans, rural medical practitioners etc.

Necessary steps to collect and preserve the left over devices and parts of devices used in many of the traditional practices and skills is to be urgently taken up by Heritage Museums, Cultural History Boards, Kerala Agricultural University and other academic centres. Programmes for cultural exchange and experience sharing through interaction of different age groups in the rural area would be of much impact to transfer the value of traditional wisdom to the future generations. The need of introducing the culture of farming and indigenous farming knowledge as part of agricultural education also cannot be exaggerated here. This acquaintance can very well orient the future development personnel to the old sustainable systems, respect the farmers' wisdom and to learn the potentials of applied research..

Another important action point is the essential approach and initiative to be taken by the research system- the scientists involved in research in the farming systems should validate and rationalise the principles and technologies involved in the important and relevant farm practices and skills. Many of the practices can be identified as the starting point of re appropriation and adaptation of sustainable agricultural technologies. Such efforts lead to the best mix of the approaches of modern and traditional integration, which is the need of the hour.

The most important effort that is to be taken up by the local self governments in the context of endangerment and loss of farm culture is to identify the skill owners of the farm practices, identify the relevant skills and train the present farm youth so that this accumulated 'treasure' passed on by our foreparents are not lost for ever.

APPENDICES

5.1 References

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5.2 List of Blocks and Panchayats in Thrissur Distirct

I Chavakkadu Block

1. Kadappuram Panchayat
2. Orumanayur
3. Pookodu
4. Punnayur
5. Punnayurkulam
6. Thaikkad
7. Vadakkekkadu

II. Chowwannur Block

8. Althat
9. Choondal
10. Chowannur
11. Kadavallur
12. Kandanissery
13. Kattakambal
14. Porkkulam

III. Vadakkanchery Block

15. Desamangalam
16. Erumapetty
17. Kadangode
18. Mundathikode
19. Malloorkkara
20. Thekkumkkara
21. Varavoor
22. Velur
23. Vadakkanchery

IV. Pazhayannur Block

24. Chelakkara
25. Vallathole
26. Kondazhy
27. Panjal
28. Pazhayannur
29. Thiruvilwamala

V. Ollukkara Block

30. Kolazhy
31. Madakkathara
32. Nadathara
33. Ollukkara
34. Pananchery
35. Puthur
36. Vilvattom

VI. Puzhakkal Block

37. Adatt
38. Arimbur
39. Avanoor
40. Ayyanthole
41. Kaiparambu
42. Mulamkunnathukavu,(Killannur)
43. Tholoor

VII. Mullassery Block

44. Elavally
45. Mullassery
46. Pavartty
47. Venkidangu

VIII. Thalikkulam Block

48. Engadiur
49. Vadanappally
50. Thalikkulam
51. Nattika
52. Valappadu

IX. Anthikkad Block

53. Anthikkadu
54. Thaniam
55. Chazhur
56. Manaloor

X. Cherpu Block

57. Avinissery
58. Cherpu
59. Koorkkanchery
60. Ollur
61. Paralom
62. Vallachira

XI. Kodakara Block

63. Alagappa Nagar
64. Kodakara
65. Mattathur
66. Nenmanikkara
67. Puthukkad
68. Thrikkur
69. Varantharappilly

XII. Iringalakuda

70. Karalam
71. Kattoor

72. Muriyad
73. Parappookkara
74. Porathissery

XIII. Vellangalore Block

75. Padiyoor
76. Poomangalam
77. Puthenchira
78. Vellangallur
79. Vellookkara

XIV. Mathilakam Block

80. Edathuruthy
81. Kaippamangalam
82. Mathilakom
83. Perinjanam
84. Sree Narayanapuram

XV. Kodungalore Block

85. Edavilang
86. Eriyad
87. Methala

XVI. Mala Block

88. Aloor
89. Annamanada
90. Koozhoor
91. Mala
92. Poyya

XVII. Chalakkudy Block

93. Karukutty
94. Kodassery
95. Koratty
96. Meloor
97. Pariyaram
98. Athirapilly

5.3 Glossary of terms

<i>Aattin koodu</i>	Shed for goat
<i>Achar Bharani</i>	Pickle jars
<i>Adappalaka/ Adachootti</i>	Sieve Plate
<i>Aduppu</i>	Traditional hearth
<i>Adichil</i>	Rodent death trap
<i>Ambum, Kuzhalum</i>	Pipe and Arrow
<i>Appam, Puttu, Dosa</i>	Breakfast items
<i>Ara</i>	Wooden walled rooms
<i>Arakallu / Ammikallu</i>	Stone devices used to grind coconut and spices
<i>Aattukkallu</i>	Stone device for grinding rice and black gram
<i>Arikondattam</i>	Rice fryums
<i>Arippetti</i>	Wooden rice box
<i>Arippodi</i>	Rice powder
<i>Arival</i>	Sickle
<i>Arivalthotti</i>	Knife fixed at one end of a long slender bamboo pole
<i>Avil</i>	Rice flakes
<i>Ayamodakam</i>	Ajowan
<i>Chadi or Thony</i>	Pickle jars
<i>Chakiri / thondu</i>	Coconut husk
<i>Chakkavaratti</i>	Ripe jackfruit candy prepared with jaggery
<i>Chakram</i>	Wheel and box used for draining paddy fields
<i>Chala</i>	Sardine – a fish species
<i>Chandrakaran</i>	A mango variety famous for pickling
<i>Charakku</i>	Vessel used for boiling
<i>Chatti</i>	Mud vessel for cooking
<i>Chazhyvilakal</i>	Binding of Rice bug
<i>CheenaBharani</i>	Big porcelain jars
<i>Chembu kalam</i>	Large brass vessel used for boiling rice grains
<i>Cherukazhama</i>	Traditional variety of rice
<i>Chethukathi</i>	Knife used for toddy tapping
<i>Chettuvitha</i>	Germinated seeds grown in wet condition
<i>Chirava</i>	Coconut grater
<i>Choodi</i>	Coir
<i>Choolu</i>	Brooms
<i>Choonda</i>	Gear for inland fishing
<i>Chukku</i>	Dried ginger
<i>Chumaduthangi</i>	Load support
<i>Copra</i>	Dried coconut
<i>Copra kealam</i>	Floor used for drying coconut after halving

<i>Earthen pot trap</i>	A Rodent trap device
<i>Eerkekil</i>	Coconut leaf midribs
<i>Elippetti</i>	Box trap
<i>Idavam</i>	Malayalam month corresponding to the month of May
<i>Idichakka</i>	Early stages of unripe jackfruit used to prepare dishes
<i>Irikkappalaka</i>	Wooden seat
<i>Janmi</i>	Landlord
<i>Kadakolu</i>	Churning rod
<i>Kadivellam</i>	Rice water
<i>Kaittha</i>	Pandanus plant
<i>Kaitthayola</i>	Leaves of pandanus
<i>Kalakkaran</i>	Manual bullock plough operator
<i>Kalam</i>	Threshing floor
<i>Kalappa or Karu</i>	Country plough drawn by a bull or a buffalo
<i>Kalathbekku</i>	Self emptying type rope and bucket lift
<i>Kali</i>	Slurry
<i>Kalippakku</i>	Dehusked raw arecanuts cut into pieces and boiled with jaggery water in copper vessels
<i>Kallasari</i>	Stone artisans
<i>Kallu Chethal</i>	Toddy Making
<i>Kalluchakku</i>	Country mill used to crush oil from copra
<i>Kalluthalli</i>	Clod breaker
<i>Kallu chakku</i>	Country Mill used to crush nuts and kernels
<i>Kaambu</i>	White spot seen at the center of paddy seed
<i>Kandam kathrika</i>	Saw toothed scissor trap
<i>Kaanikka</i>	Special gifts
<i>Kanji</i>	Rice gruel
<i>Kanjivellam</i>	Rice water
<i>Karikathi</i>	Knife used for cutting vegetables
<i>Karikole</i>	Wooden pole of plough
<i>Karippidi</i>	Handle
<i>Karizhu</i>	A plant variety
<i>Karkidakom</i>	Malayalam month corresponding to the month of August
<i>Kathirkula</i>	Ear head bunch
<i>Katta</i>	Bundle of rice plants harvested
<i>Kattamethikkal</i>	Threshing of rice
<i>Kattamutti or Kattamaram</i>	Rectangular wooden block with long handle tied to the yoke, used to break the clods and level the fields
<i>Kattathalli</i>	Clod breaker
<i>Kavu</i>	Device for transportation of goods
<i>Kayil</i>	Wooden spoon
<i>Kazhama</i>	Traditional variety of rice

<i>Kazhchakula</i>	Banana bunch used for gifting
<i>Kinnam, Vattaka, Kuzhiyal</i>	Kitchen vessels made of brass and copper used for serving food
<i>Kodali</i>	Axe
<i>Koduvaal</i>	Big Knife
<i>Kollappanicker</i>	Blacksmith
<i>Kole land</i>	Typical waterlogged marshy paddy fields of Central Kerala
<i>Kondattom</i>	Dried vegetable preparation
<i>Koodavatti</i>	Bamboo basket
<i>Kooja</i>	Vessel made of mud, used for cooling of water
<i>Koova</i>	Arrowroot
<i>Koovappodi</i>	Arrowroot powder
<i>Korika, Charuwam</i>	Vessels made of brass and copper, used for food serving
<i>Koruvala</i>	Hand net
<i>Koru cheli</i>	Silt of river basins
<i>Kottadakka</i>	Dried Areca nuts
<i>Koyithu</i>	Harvesting of rice
<i>Kozhimarunnu</i>	Medicinal preparation out of chicken, given to cattle
<i>Kozhu</i>	Plough Blade
<i>Kudam</i>	Round Vessel made of mud used for fetching water
<i>Kudiyar</i>	Contract labour / tenant
<i>Kumbam</i>	Death trap to catch <i>Bandicota bengalensis</i> (rat)
<i>Kundakoottal</i>	Bundled paddy seedlings huddled together one above the other forming a pyramid shaped hill
<i>Kundamuram</i>	Triangular basket made of bamboo used for catching leaf roller caterpillar of paddy
<i>Kurutbi, Koruvala</i>	Fishing devices
<i>Kutta</i>	Bucket with metal or leather used in irrigation devices
<i>Kutta, Muram</i>	Round Bamboo baskets
<i>Kuttakayar</i>	Lengthy strong rope attached to the <i>kutta</i>
<i>Kutti</i>	Traditional seed variety
<i>Kuttumundakan</i>	Traditional variety of rice
<i>Ladam</i>	Bullock shoe
<i>Lotta, Montha, Ottuglass and Kindi</i>	Vessels made of brass and copper: devices used for drinking purpose
<i>Malar</i>	Rice product Obtained by oil free frying of dry paddy grains
<i>Marakkari</i>	Wood coal
<i>Maruthu</i>	A plant species
<i>Mathu</i>	Churning rods
<i>Medam</i>	Malayalam month corresponding to the month of April
<i>Medanja Ola</i>	Woven mat like structure made of coconut leaves
<i>Methikkal</i>	Threshing

<i>Mulakkutti</i>	Mature bamboo piece of one foot length, used for feeding medicines to cattle
<i>Mundakan</i>	II nd crop of paddy
<i>Muthirachoru</i>	Horse gram mixed with rice, a preparation for cattle
<i>Nayadis</i>	A particular tribe, who are specialists in catching rats
<i>Naattumanga</i>	Mangoes with special aroma for pickling
<i>Neervalam</i>	<i>Croton liguim</i> – a plant species
<i>Nellu Koythu</i>	Harvesting of rice
<i>Nellu puzhungal</i>	Parboiling of rice grains
<i>Nilavilakku, Kuthuvilakku,</i> <i>Thookuvilakku, Attavilakku,</i> <i>Kozhevilakku, Mangalyavilakku</i>	Different types of brass lamps
<i>Njara</i>	A plant species
<i>Njarukettu</i>	Pulled out paddy seedlings tied into bundles
<i>Njouri</i>	Levelling board
<i>Nukam</i>	Yoke
<i>Nuri vitha</i>	Method of seeding behind the plough
<i>Oduku</i>	A plant species
<i>Ola</i>	Coconut leaf
<i>Ola medayal</i>	Weaving of coconut leaves
<i>Orpandi</i>	Black pandi- traditional variety of rice
<i>Ottal</i>	Fishing device
<i>Padashekbara Samithi</i>	Farmers group of a contiguous paddy tract
<i>Painga pandal</i>	Arecanut Pandals
<i>Pakkuvetti</i>	Nut Cracker
<i>Pala</i>	Arecanut leaf petiole
<i>Palathoppi</i>	Caps made of Arecanut leaf petiole
<i>Palathotti</i>	Small buckets made of arecanut leaf petioles stitched with midribs of coconut leaves to lift water
<i>Panniyeli</i>	<i>Bandicota indica</i>
<i>Panthal / pandal</i>	Special shed set up for making <i>Kalippakku</i>
<i>Para, Idangazhi, Nazhi</i>	Measuring devices made of wood and rimmed with iron
<i>Parakam</i>	A thorny plant whose twigs are rolled over rice plants to expose leaf roller caterpillars
<i>Paraya / Mulaya</i>	A community which makes bamboo products
<i>Pathazham / Pathayam</i>	Big wooden boxes to store well dried paddy seeds
<i>Paattom</i>	Land on Lease
<i>Pavatta</i>	A plant species
<i>Paya</i>	Mat made of pandanus leaves
<i>Payaneythu</i>	Weaving mat out of pandanus leaves
<i>Payasam</i>	Sweet Pudding
<i>Pazhamanga</i>	Tender mangoes stored in brine solution

<i>Pazhukkadakka</i>	Soaked arecanuts
<i>Petti & Para</i>	Large scale water pumping devices common use in Kole fields of Thrissur district (mainly used for drainage)
<i>Pezhu</i>	A plant species
<i>Plavila kayil</i>	Jack fruit tree leaf
<i>Podivitha</i>	Dry sowing method
<i>Polimanthi; polavi</i>	Wooden implements used for spreading /heaping seeds on mats
<i>Poovan</i>	A banana variety
<i>Pori</i>	Fluffed rice
<i>Priyor</i>	A delicious mango variety
<i>Pukarakkari</i>	Charcoal powder collected from kitchen roofs and walls
<i>Pulthotti</i>	Feeding basket of cattle sheds
<i>Puncha</i>	III rd crop of paddy
<i>Punna</i>	A plant species
<i>Raamacham</i>	Vetiver, a plant species
<i>Raamachappaya</i>	Mat made of vetiver root
<i>Ranthal</i>	Kerosene lamp
<i>Swarnapandi</i>	Traditional variety of rice
<i>Sheelanti</i>	A plant species
<i>Thalappu</i>	Strings made into ring shapes for climbing on palms
<i>Thattika</i>	Frame made of wooden mat to weave vetiver mat
<i>Thavi</i>	Wooden spoons
<i>Thazhappaya</i>	Mat made of pandanus leaves used for drying rice
<i>Thekkenna</i>	Teak oil
<i>Thekkkupattu</i>	Songs sung during ploughing
<i>Thekkukotta</i>	Swing basket used to lift shallow pond water to irrigate garden land or paddy fields
<i>Thengai</i>	Coconut
<i>Thenginpookkula</i>	Coconut inflorescence
<i>Thirika</i>	Rings made of plaited leaves
<i>Thirikallu</i>	Thread mill - device used for powdering & crushing pulse, ragi etc
<i>Thiruvaathira</i>	Hindu festival in the months of December - January
<i>Thodali</i>	A plant species
<i>Tholu</i>	Green manure
<i>Thondi</i>	<i>Sterculia urens</i>
<i>Thoomba</i>	Spade
<i>Thorappan</i>	<i>Bandicota bengalensis</i> – rat species
<i>Thozhuthu</i>	Cattle shed
<i>Thudam</i>	Measuring units for liquids (ghee, oil, etc)
<i>Thulakutta</i>	Counter poise bucket suspended at the long arm of the lever

<i>Thulathekkeku</i>	by a long slender bamboo pole
<i>Thumbi</i>	Counter poise bucket lift
<i>Thuru</i>	Leather hose and a pulley
<i>Unakkalari</i>	Straw stored in heaps
<i>Undachempavu</i>	Dried Raw rice
<i>Ural, Ulakka</i>	Traditional variety of rice
<i>Uruli</i>	Wooden devices used for hulling and polishing of rice
<i>Uthala</i>	Vessels made of brass or copper used for cooking
<i>Vallam</i>	Indigenous furnaces of blacksmith
<i>Varikka & Koozha</i>	Large basket made of coconut leaf
<i>Varinellu</i>	Varieties of jack fruit
<i>Varppu</i>	Wild rice
<i>Vatta</i>	Vessels made of brass or copper used for boiling
<i>Vatti</i>	Tree whose leaves are used as green manure
<i>Vattu</i>	Bamboo basket
<i>Vattukappa</i>	Roots of vetiver root after extraction of oil
<i>Veesal</i>	Dried tapioca
<i>Veeshuvala</i>	Winnowing rice after threshing
<i>Veli</i>	Big Fishing net
<i>Vellavi, mukkachur, edachur, ayilan, pandurutti, bodhi, njoli, idiyan, kalippakku</i>	Fence made of woven coconut leaves
<i>Venga</i>	Different preparations of <i>kalippakku</i>
<i>Vethu</i>	A plant species
<i>Vetta murukkal</i>	Device used for irrigation / draining paddy nursery
<i>Vettukathi</i>	Betel chewing
<i>Vettuva</i>	Heavy knife
<i>Virakupura</i>	A community whose traditional occupation is coconut climbing
<i>Virippu, Mundakan</i>	Shed used for storing fire wood
<i>Vishu</i>	Seeds of different duration and season sown together
<i>Vithetti / Polimantbi</i>	Hindu festival on 1 st of <i>Medam</i> (April 15 th)
<i>Vithu kala</i>	Wooden implements used for spreading and heaping of seed on the mat
<i>Wratt</i>	Seed bull for breeding
	Hand operated machine used in preparing coir

5.4 Interview schedule

Semi-structured interview schedule for the farming system survey in the selected Panchayaths.

1. Name of the Panchayat :
Ward No :
House No :
2. Name of the Farmer :
Address
3. Details of land / and animals owned :
(area, wet land, garden land, major crops grown, cattle, poultry etc.)
4. Main occupation
Sub occupation
5. Major component of the farm (one that is providing more than 50% of the total farm income)
6. Practices followed and implements used in farming
Crops
 - a. Seed
 - b. Transplanting
 - c. Water 1. Irrigation, 2. Conservation, 3. Drainage etc.
 - d. Plant protection
 - e. Intercultivation
 - f. Weeding
 - g. Soil conservation
 - h. Processing of produce
 - i. Storage (including by products)
 - j. Implements used**Animals**
 - a. Breeds
 - b. Feeds and feeding
 - c. Precautions against ailments
 - d. Treatments on disease occurrence
 - e. Sanitation of cattle shed and surroundings
 - f. Milking
 - g. Ploughing(any such activity using the animal)
 - h. Breeding
 - i. Processing of products
 - j. Implements used**Poultry**
 - a. Breed
 - b. Feed
 - c. Housing
 - d. Precautions against ailments

- e. Treatment on disease occurrence
- f. Hatching and brooding
- g. Special management practices if any
- h. Processing of produce
- i. Storage of the produce
- j. Marketing of the produce

Fishery unit

- a. Breeds
- b. Ponds/tanks/field
- c. Feeds
- d. Other management practices
- e. Methods of catching
- f. Processing
- g. Storage
- h. Selling
- i. Any traditional practices known, but not practised
- j. Any other farmers/ labourers who practice traditional practices in the panchayat
- k. Any other information