CHAPTER 4
DEVELOPMENT POTENTIAL OF BACKWATER RESOURCES

4.1 Profile of the Region

“People are affectionate but they do not know the purpose of life. They are hardworking people. The diversity of culture is worth to be mentioned. The farmers are trying to cultivate the barren lands and to expand their harvesting territory. The novel methods adopted in the farm areas provide good results.”

The quote of Reverend Joseph Peet, who published the first Malayalam text in geography speaks loudly about the then prevailed inhabitation of Kuttanad ranging from Kanneeti to Aroor and Parur.

Earlier Kuttanad was a wider area than at present. The expanse of Kuttanad was from Kanneeti (Karunagapally) to Alwaye. In early Tamil literature like ‘Venpai’ and ‘Tholkappiyom’, Kuttanad is mentioned as one of the 12 ‘nadus’ (ancient principalities) where people spoke ‘Kodumtamil’. There are references to ‘Kuttanad’ in the great Tamil work ‘Thiruvaymozhi’ written in the 8th Century A.D. by the renowned Vaishnavite Saint Nammalvar and in ‘Periyapuranom’ of the 11th century A.D.

There are also certain legends connected with Kuttanad. It is said that the Khandava Vana mentioned in the epic Mahabharatha was situated in Kuttanad and that the remnants of that burnt forest still lie deep under the
fields. Logs of burnt and charred wood are still seen in the Kariniloms of Thakazhi, Thuravoor, Vaikom etc. The legend goes that after the forest was completely burnt down, mud set in gradually and gave rise to the fields existing at present. As such, it is said that this place was originally known as ‘Chutta nadu’ which later on became Kuttanad.

Geologists point out Kuttanad was once an extensive bay of the Arabian Sea into which are discharged the waters of many rivers. The silt carried by the rivers and deposited at their mouths gradually gave rise to the present sea coast, converting the shallow bay into an extensive backwater tract. The lagoons and lakes gradually silted up and gave rise to sedimentary formations which lands by gradual process of reclamation.

According to another theory, millions of years ago these lands were forest areas abounding in different varieties of trees. In the succeeding geological age, the Arabian Sea advanced and engulfed not only these lands but extended in many places up to the foot of the Western Ghats. Years later, the sea receded exposing the land which now forms part of the midland and coastal regions of Kerala. During these upheavals, the entire forest areas were submerged far below the ground level and thereafter were silted up to varying levels giving rise to saline marshes and the low-lying lands of Kuttanad. Soils in these areas have vast organic deposits as also fossils of timber and shell-fish in varying depths, reminiscent of submersion under the sea for geological periods.
4.2 Population, Society and Culture

The population of Kuttanad for 1971 as 1,698,000 and the density of population in Kuttanad (1,021.6 persons per sq. km) is twice higher than that of Kerala (549 persons per sq. km) as against the India’s average (182 persons per sq. km). Thus it can be seen that Kuttanad was perhaps the most thickly populated region in the entire country as per the 1971 Census figures.

The population characteristics of the region are the following:

1. The region is a predominantly rural area
2. It is a region with one of the highest unemployment rates in the state,
3. The population thickly concentrated in a small patch of land
4. The population is almost entirely dependent on agriculture for their livelihood,
5. The per capita land available in the region is only 0.095 hectares and the per capita cultivable land even less (0.084 hectares).

The work participation rate and the distribution of the labour force engaged in agriculture based on the Census figures for 1971 are given below:

Table 4.1: Work Participation by Agricultural and Non-agricultural categories for Kuttanad, Alappuzha and Kerala, 1971

<table>
<thead>
<tr>
<th>Area</th>
<th>Total workers</th>
<th>Workers in agriculture</th>
<th>Workers in non-agricultural occupations</th>
<th>Percentage of workers in agriculture to total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kuttanad</td>
<td>469,000</td>
<td>302,000</td>
<td>167,000</td>
<td>64.4</td>
</tr>
<tr>
<td>Alappuzha</td>
<td>598,468</td>
<td>279,279</td>
<td>319,189</td>
<td>46.7</td>
</tr>
<tr>
<td>Kerala</td>
<td>6,216,459</td>
<td>3,014,777</td>
<td>3,201,582</td>
<td>48.5</td>
</tr>
</tbody>
</table>

Source: Tharamangalam (1981), p.21
Out of the total 4,69,000 workers, the workers engaged in agriculture was 3,02,000 as per the 1971 census. This is 64.4 per cent as against 46.7 per cent in Alappuzha and 48.5 per cent in Kerala as a whole. This reveals the excessive dependence of the people of Kuttanad for employment on agriculture and the isolation of the region from the mainstream.

Table 4.2: Percentage Distribution of the Labour force engaged in Agriculture in Kuttanad, Alleppey and Kerala, 1971

<table>
<thead>
<tr>
<th>Area</th>
<th>Kuttanad</th>
<th>Alleppey District</th>
<th>Kerala</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultivators</td>
<td>30.46</td>
<td>34.3</td>
<td>36.7</td>
</tr>
<tr>
<td>Agricultural Labourers</td>
<td>69.54</td>
<td>65.7</td>
<td>63.3</td>
</tr>
<tr>
<td>Total workers in agriculture</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Tharamangalam (1981), p.21

These figures indicated the acute nature of the agrarian problem in Kuttanad. The estimates prepared by the Kuttanad Enquiry Commission on the basis of census figures of 1961 and 1971, showed that out of the total 16,99,275 population in Kuttanad only 4,69,000 persons, or 27.6 per cent of the total population of Kuttanad, were in the labour force, the rest of the population being dependent on them for their livelihood. This when compared with a labour participation rate of 28.9 per cent for the state as a whole, demonstrated a relatively greater burden of dependency per worker in Kuttanad.

Kuttanad is having the highest rate of land utilisation in the state. So there is no scope for bringing any new land under cultivation. The only
possibility is further reclamation from the lake, which is not advisable due to the adverse ecological repercussions.

### 4.3 Ancient Demarcations

Prior to 1855, land in Kuttanad was mainly held by the Brahmin families known as ‘brahmaswoms’. The temple authorities called ‘devaswoms’ constituted of Brahmins, and by a few Nair chieftains. The tenants who leased in land from the Brahmins and Nair chieftains belonged mostly to the Nair and Syrian Christian communities. The tenant holdings of Kuttanad generally ranged above 10 acres and this relatively large to very large size of tenant holdings was the source of power of the Nair and Syrian Christian tenant cultivators. The scheduled castes who included Pulayas and Parayas were prevented from leasing in land. But they generally got small parcels of land on sub-lease basis from the Nair or Syrian Christian tenants.

Kuttanad can be viewed as a region composed of two segments – old Kuttanad (upland Kuttanad) and new Kuttanad (low land Kuttanad). The land in old Kuttanad was partly a natural formation in the backwater caused by the deposit of silt and sand by the rivers while certain other parts were developed through reclamation of shallow portions of the backwaters. Landless Pulayas were the original inhabitants of the region. They occupied new-formed lands and reclaimed swamps and very shallow portions of the Vembanad kayal / backwaters for growing rice. The landlords of old Kuttanad were Nairs and Malayali Brahmins (Nambudiris). They date back to pre-Travancore days.
when Kuttanad was under two rulers perennially at war – the chieftains of Chempakasseri and Kayamkulam. Nairs, as providers of militia, were in the close circle of power of one or the other of these chieftains. They were granted land, often tax-free, in return for their services in war. A few Ezhavas also obtained land for similar services. Nambudiri Brahmins were granted land for undertaking priestly tasks. Besides them, temples owned land. The Kidangoor temple and its subsidiary temples, for instance, owned large areas of wetland in Pulinkunnu and surroundings. More land grants to Nayars and Brahmins – both local and Tamil – were made by the Travancore King Marthanda Varma towards the mid-18th century. Christians newly entered the region dealing in coconut oil, supplying it to temples and landlord households, and buying back rice and coconut.

From the late 19th century, with the reclamation of deeper backwaters and the emergence of new Kuttanad, the composition of the landlord class underwent change. Professionals like lawyers and teachers located in small towns on the fringes of the backwaters invested in reclamation and became owners of vast rice-growing tracts. It was not merely the nearness to the site of reclamation that explains the entry of professionals. The state was an important actor in the reclamation process for agricultural purpose. Backwater was state property and permission of the government was necessary to reclaim it.
From the 1880s, besides granting permission, the state offered loans at concession rate of interest at four per cent and allowed exemption from land-tax for the first five years. After this, a minimal rate of tax – annual assessment equivalent to one-half of the quantity of seed sown – was levied till the revenue settlement survey was conducted. The proposition was attractive but accessing it hinged on nearness to governmental authority. Rather than landless peasants far removed from the citadels of power, the already influential sections – as derived from their social and economic status – had much greater chances of getting the initial permission and concessions and taking up reclamation.

4.4 Emerging Social Links

The social relations of the region and the active role of the state can be understood from the stories of reclamations in Kuttanad. The pioneer in Vembanad reclamation was Eravi Kesava Panikkar belonging to the Chalayil family, one of the leading landed aristocrats in Kuttanad. He was an unusual person who commanded great respect and influence. His very first effort bears an eloquent testimony to his innovating genius. It was a project to reclaim that portion of Vembanad which was situated at the mouth of Chennankari river. He proceeded to erect a barrier across the river at its mouth with local materials and manual labour. He had to face the opposition of the local population who filed a case against him for diverting the course of the river. Sir Raja Rama Rao, the then Dewan Peishkar, conducted an enquiry and
personally inspected the site. But the farsighted Peishkar was more impressed with the potentialities of development, which this flash of genius had opened up than outraged by the offence of law. Fully alive to the problem of land shortage and food scarcity in the State, he saw in this novel adventure a new vista of possibilities. Contrary to all expectations, instead of reprimanding the offender, the legal proceedings against him was stalled. The next block which he reclaimed was named after the statesman Peishkar Raja Rama Rao. This is the beginning of the History of kayal reclamation which is not only highly romantic but from the point of view of economic development one of the most important things in Travancore history. (Pillai and Panicker, 1965:6-17).

4.5 State Assistance

Even with state assistance, own capital was crucial to reclamation. It has been estimated that 16 coconut trunks, 8 bamboo poles, 20 canoes of clay (160 tonnes), 500 cuttings of brushwood, and 80 labourers were needed to construct one dand (10 to 12 feet) of the outer dyke. A dyke comprised thousands of dand (Kamalasanan, 2005:115). The state loans never exceeded Rs. 5000. This could have met only a small share of the actual expenses. Reclamation was economical only in large patches.

During the initial decades of new reclamation, cultivation was carried out only once in three years. Later, by the late 1920s, the frequency of cultivation was increased to once in two years. While half the fields were cultivated, the other half was left fallow to receive the slit washed down by
the rivers and saline water from the sea. This practice of cultivation was called pazhanila krishi (cultivation in old/seasoned fields). It necessarily meant that the cultivator should have enough reserve of grain and cash to cover the period of waiting. The possibility of surplus accumulation in Kuttanad was therefore not only slow but limited as compared to Nanchilnadu, the other important rice-growing tract of Travancore. The average productivity in Kuttanad, known as nervattam, was only ten-fold. Travancore Banking Enquiry Committee Report 1930 noted that while the average yield per acre was 3500 lbs in Nanchinadu, it was less than half, only about 1700 lbs in Kuttanad. Under these conditions, an alternative source of income from garden-land, agriculture, elsewhere, or professional employment was imperative for sustenance and growth as a reclamation agriculturist.

4.6 Agrarian Relations

Crucial to cultivation in the fragile ecosystem was a resident workforce, ready to the master’s call. Both the high caste-landlord-entrepreneurs and tenants therefore maintained a permanent, core body of servile workers. They were originally slaves who could be sold (janmam), leased out for a long period (kanom) or hired out for a year (pattom). They were of Pulaya and Paraya communities, castes considered untouchable by their masters. With the abolition of slavery in Travancore in the mid-1850s, sale of slaves was banned. But with no land of their own, most of them could not leave their masters and therefore continued to live on the master’s land.
These workers were engaged throughout the entire labour process- from the original moment of reclamation to stacking the hay after harvest.

The services of the worker and his family were bound to be available for the master any time of the day or night. In return, the master was bound to protect the worker and ensure the welfare of his family. The relationship was unequal every single way: economic location in terms of ownership of means of production, social location in the hierarchy of caste, and nature of interdependence.

4.7 Wage Structure

The wages in general were paid in paddy. Half a para of paddy was the norm for a day’s work. Women were paid only about two-thirds or even less than the wages for men. Importantly, male and female workers were discriminated not only in wage. While most of the work done by male workers, like ploughing the field or working the garden land, had entitlement to food, those done by female workers lacked this. For harvesting, the wage (patham) was one-eighth of what each worker had harvested. A smaller para than the standard para – called coolie changazhi – was used to measure out wage-grain.

Besides paddy, workers were paid in stalk. Wage besides, the permanent workers were entitled to three para of paddy on Onam, two on Vishu, and two on Karkadaka Vavu (George, 1987: A-144). All this would together add up to 50 to 60 para of paddy (Kamalasanan, 1993: 50). On Onam, the master gave some coconut oil, a small measure of common salt, and clothes. On marriage or
death in the worker’s family, the landlord made one-off payments. On death in the landlord’s family, the servile workers had to cry aloud receiving in return grain, coconut oil, and provisions (John, 2003: 9). Occasionally, loans were extended to workers for special purposes. During the early days of new reclamation, such loans were not strictly accounted for. Supposedly, this was to be adjusted against future wage but more often than not, the master did not anticipate repayment (Pillai, 1985: 51). With the price of rice rising in the post-World War I Period, the situation changed and even interest was brought into such transactions. While the loan was measured out in coolie changazhi the repayment was obtained in the bigger standard para, the difference in volume representing interest.

The attached labour system showed feudal features. It was highly oppressive until 1943. Feudal oppression on attached labourers also took the form of perpetration of physical violence. The attached labourers were made to consider that the `thampurans’ had the power to beat them or even kill them.

4.8 Caste Inhibition

In Kuttanad the social disabilities of caste were used to subjugate the attached labourers as they belonged to the pulaya and paraya castes. The pulayas and parayas could not walk on public pathways. They were not allowed to enter the village tea shops either. The doors of the educational institutions remained closed to them. The harijan children began to attend schools in the 1940s and 1950s. They faced the open displeasure of the
landlords. The pulayas and parayas were barred from wearing clean clothes. They had to soil clean clothes with carbon before wearing them. Dress itself had to be limited to a piece of cloth around the waist. Blouses and sarees which had by then become symbols of modernity were not supposed to be worn by the pulaya and paraya women.

4.9 Systemic Changes

The substitution of water wheels with pump-sets, besides redefining the physical geography of production by expanding cultivation through reclamation of deeper and larger expanses of backwater, redefined the social geography of labour. While water wheels were operated by servile or semi-servile labour, the pump-sets were operated by the company’s men, mostly Anglo-Indians. They were called maistries (foreman). The pump-set maistries were regarded as people with unique powers and treated with great respect. The pump-set hiring farmers invited them over to their homes and served them excellent food and beverages. The hirer provided them accommodation and paid their wage. Besides, during the initial days, they were entitled to all fish that came out through the outlet of the pump-set as also fish that gathered around the inlet (Abraham, 1980: 25). While pump-sets performed the same function as the water wheels, the status of the workers thus widely diverged. Over time, as farmers, individually or jointly, began to own pump-sets, Ezhavas replaced Anglo-Indian operatives.
Another interesting outcome of the technological change was the expansion of the credit market. While no landlord or tenant might have invested in pump-set availing credit from the usurer, the reclamation of deeper and larger expanse of backwater using pump-set increased the demand for and size of credit. As pump-sets gained wider spread, Ezhavas and Christians increasingly replaced Anglo-Indian operatives.

The Depression seems to have brought economic issues to the forefront, prompting the workers to seek, incrementally, the support of ideologies and organisations espousing the question of class. Further, by the late 1930s, some of the worst disabilities arising from caste had been reduced.

In 1942, an agricultural workers’ union was formed in Kuttanad at the initiative of the communist party. The leadership of the union comprised prominently the Ezhavas, with Pulayas joining in large numbers, with the result that the public meetings of the communist party were referred to by upper-caste, anti-communists as ‘Pulaya meeting’ (Possibly such branding was also aimed to dissuade non-Pulayas from joining the communist party and the union).

In short, the story of Kuttanad and its people has a long and dynamic time line and; it exhibits the interdependencies among the constituents of its evolution.
4.10 Occupation

4.69 lakhs of persons out of the total population of 16.98 lakhs in Kuttanad are in the labour force, based on 1961 census. The labour force participation rates thus works out to 27.6 per cent as against the State figure of 28.9 per cent. The immediate inference is that in Kuttanad the burden of dependency per worker is more compared to the State as a whole. There about 92,000 cultivators and 2,10,000 agricultural labourers in the region. In other words, out of the total labour force, 20 per cent are cultivators and 44 per cent are agricultural labourers. For Kerala as a whole, only 31 per cent of the total labour force are agricultural labourers. In the three regions of Kayal, Karappadoms and Kari lands, the cultivation operations commence after the harvest of the previous crop in January-February every year.

In the upper reaches of Kuttanad, where the fields are shallow, a deep water variety of paddy called ‘kolappala’ is also cultivated. The area under this system of cultivation varies annually depending on the conditions.

Though there existed underemployment among the agricultural workers in general in the State, it is more acute in the case of the agricultural labourers in Kuttanad. On an average, a male agricultural worker in Kuttanad gets about 100 to 120 days work in an year and a woman worker gets 80 to 100 days of work. This would show that, for the major part of the year, the agricultural worker here remains practically unemployed. The main reason for
this is that the bulk of the paddy area in Kuttanad in single-cropped and the area lacks in industries to provide sufficient employment.

4.10.1 Agricultural Labour

The characteristics of the agricultural labourer in Kuttanad in the past can be made out. These are listed below:

1. Labour played a significant role in Kuttanad.
2. Cultivation operations in the reclaimed lands required the services of a huge army of labourers.
3. Labour force consisted of scheduled castes mostly.
4. The entire labour was hired.
5. Work involved was an arduous nature and had to be carried out in the most unhygienic conditions with considerable risks to life.
6. Labourers were mostly attached to their landlords along with his family members.
7. Each landlord had one head labourer who is mainly responsible for the conduct of the cultivation, had to keep constant vigil day and night against breaches of bunds etc.
8. Labourers were loyal and faithful.
9. Migration of labour from neighbouring places with new reclamations occurred.
10. Labourers used to live in the reclaimed area during the entire season.

11. Harvesting charges were paid in two instalments namely pathom and theerppu.

12. Pattern of working hours wage rates varied from place to place and region to region.

13. Pattern of working hours were lowest in kayal lands.

14. During the period when not much work is available, women engage themselves in weaving of mats.

15. For cultivation of paddy, women are preferred because of lower wage rates. Lack of adequate opportunities for employment including self-employment forced the labourers to work for wage rates below the stipulated minimum wages.

4.10.2 Fishing

The fishing community is perhaps the major group whose interests and livelihood seldom received any attention in all the developmental work carried out in Kuttanad. There are 46 fishing villages but no reliable estimates are available on the number of persons engaged in fishing; it is believed, however, that their number may come to 20,000.

4.10.3 Coir

Apart from cultivation of paddy and fishing, there are three more important occupations in Kuttanad: lime-shell collection from the Vembanad
lake, toddy-tapping, and retting and defibring of coconut husks to cater to the raw material requirement of coir industry. The last two occupations are based on the cultivation of coconut.

4.10.4 Lime-shell Collection

Lime-shell collection: The fishing resources of the Vembanad lake in Kuttanad also include what are called molluscs (lime-shells). The living and the dead remains of species known as Ostrea, Velorita and meretrix. Supp. Are the abundant resources in the Kuttanad area. Nearly 50 per cent of the lime-shell deposits consists of shells of Velorita supp. The sub-soil deposits if of the nature of a layer of 30 cm thickness. The largest species is Valerita cornucopia which Is abundant in the South-west part of Vembanad lake and prefers a depth of 1 to 1.25 km and a muddy bottom. Species of Meretrix prefers a sandy bottom. Ostrea Cuculeata is present in moderate quantities in this area. All these species of molluscs require optimum ranges of salinity are sure to adversely affect their life cycles.

Usually lime-shells are collected during September and May, i.e. except during the south-west monsoon season. The annual output, estimated in 1970, is reckoned to be 1.7 lakh tonnes. Of the total number of workers engaged in lime-shell collection only half of them belong to licensed cooperative societies.
Though lime-shell collection is largely carried out manually by persons going out into the lake in country boats, the method of lime shell collection on a large scale by dredging is also being used by the state-owned Travancore Cements and Travancore Electro-Chemical industries ltd.

4.10.5 Toddy Tapping

Toddy-tapping: In the garden lands extending over 304 sq.kms. Coconut is the principal crop. A large proportion of the trees is used for toddy-tapping. The toddy-tappers themselves do not own coconut trees as many of them own no loan than a few cents where their homesteads are put up. The then rent payable to the owners varies from Rs. 7 to 45 per month depending on the quantity and quality of toddy obtained. On an average the then daily earnings of a tapper varies from Rs. 8 to 12. They are employed throughout the year and hence are better off than other workers-agricultural labourers, fishermen or coir workers. They are well organised under trade unions.

4.10.6 Retting

Retting and defibring of coconut husks: Processing of coir mainly an agro-based occupation and about 95 per cent those engage in defibring and spinning are women. Coir processing in Kuttanad is confined to a few villages. Retting has been adversely affected because of the operation of
Thanneermukkam Regulator. While retting of raw husks takes three months in saline water, it takes 10-12 months in fresh water.

Many tasks such as the soaking and preparation of husks were done mostly at home and only the manufacture of mats and matting was carried out in the factories. Hence, there were always more workers employed in the coir cottage industries than in the factories themselves.

4.11 Disputes

In 1939, a board of conciliation of trade disputes appointed by the Travancore Government estimated that there were about 27,000 workers employed in the coir factories. The attached labour system of Kuttanad collapsed as a result of the unionisation of attached labourers. This was not a mechanistic outcome of the development of capitalist investment in Punja cultivation. It was only with the arduous and intensive efforts of a group of activists of the Communist Party of Travancore that the attached labourers were unionised in 1943. The unionised attached labourers of Kavalam in Kuttanad struck work, raising the demands of settling of work accounts without manipulations and an increase in the quantity of paddy which was as ‘Adayam’ from 25 paras to 100 paras. The strike which lasted for 17 days was settled only on the condition that the union leaders would be allowed to check the work accounts kept by farmers and that 75 paras of paddy would be paid as ‘Adayam’. The success of the strike in Kavalam inspired the attached labourers in other parts of Kuttanad also to come to the fold of Travancore
Karshaka Tozhilali Union. Once the chances of manipulating the work accounts were gone and the paddy paid as ‘Adayam’ increased three fold, the farmers lost the economic attractiveness of the system of attached labour. The farmers could no longer enforce continued attachment by creating indebtedness through manipulation of work accounts. They therefore began to cut the number of attached labourers under them and this process initiated the collapse of feudal system of attached labour in Kuttanad.

The backward castes and the dalits were drawn into socio political movements in the region. The Ezhavas were drawn into the social and political movements that began to appear in Travancore towards the end of the nineteenth century and have been profoundly affected by them. The appearance of great religious leader and charismatic teacher named Sree Narayana Guru gave great momentum to their movement. Drawing on the higher religious teachings of Hinduism itself, the guru attacked the caste system and urged his followers in subtle ways to disregard its rules. An often-quoted saying of the guru is: “One Caste, one religion, One God for man; Man must progress whatever his religion.” He soon gathered many able and devoted disciples, among whom was Kumaran Asan, who was to become one of the greatest lyric poets of Kerala in this century, a great scholar and social reformer among the Ezhavas. With a number of other concerned Ezhavas, Kumaran Asan founded in 1903 the Sree Narayana Dharma Paripalanayogam (SNDP), which became a great force in the struggle against
caste discrimination and later in articulating the interest of the Ezhavas as a whole. Under the leadership of the SNDP, the Ezhavas conducted many struggles during the first half of this century. The best known among these was the Vaikom Satyagraha which demanded the rights of the Ezhavas and other lower castes to worship in the temples of the state and which was staged at Vaikom, on the border of Kuttanad. In 1937 the Maharaja of Travancore made an historic proclamation which opened the doors of the temples to the low-caste Hindus of Travancore.

Although there are toddy-tappers, small cultivators, and agricultural labourers among the Ezhavas of Kuttanad, the conditions of their lives have improved greatly. Toddy-tappers have one of the best organised and most effective unions in Kerala, and Kuttanad being an important area of toddy production, the union is very strong and active in the area. They earn relatively high wages and receive other fringe benefits today. It may be interesting to note here that since toddy tapping is an occupation traditionally associated with the Ezhava caste and a trade secret among the members of the caste, the toddy-tappers’ union is at once a labour union and a caste association.

The political organisation and awakening of the Harijans has been among the major aspect of social changes in Kuttanad. But unlike the Ezhavas and the Nairs of Kerala who conducted their struggles for social and economic betterment through their caste associations, the Harijans have been drawn into class based trade unions and political parties. Although in the
following sections we shall be dealing directly only with the agricultural labourers, it must be borne in mind that those Harijans engaged in non-agricultural occupations also have their trade unions under the auspices of the same political party, and further that many of them are as sympathizers or as sympathizers or as part-time agricultural labourers, members of the agricultural labourers’ union.

Unionisation has been very extensive and workers’ struggles and bargaining are very common. Collective bargaining in Kuttanad agriculture is structured as in any other organised employment. Joint Industrial Relations Committees (IRC) have been set up to facilitate joint consultations between farmer’s associations and farm labour unions. Minimum wages have been periodically revised. Registration of farm labour under the Agricultural Worker’s Act, the setting up of the Labour Welfare Fund and the grant of old age pension to farm labour are indicative of the tremendous influence of the organised working class in agriculture has on society and Government. Sometimes, one feels that agricultural labour in Kerala and their politically strong unions are overdoing things by totally ignoring the impact of their policy on the economics of cultivation and availability of person day-employment to their men. Cost of cultivation studies give some evidence about the high rate of labour absorption in Kerala agriculture and particularly of wage labour. A recent unpublished study by Viswanathan showed that the cost of cultivation per acre of paddy in Kuttanad was Rs. 2,047.52 as against a
return of Rs. 1,619.75, thereby leaving a loss of Rs. 427.77. If this is valid, paddy cultivation is no longer economic. Perhaps the high wage rates due to unionisation and employment of more labour than what is required may offer an explanation. Due to excess supply of labour the person day-employment available to labour is around 70-75 days. Field studies by Joan Mencher have shown that the lot of farm labour in Kuttanad has worsened over the years. This suggests that both the cultivator and farm labour are not benefited.

Farm labour was also subject to other forms of exploitation. One such case was based on the use of different paras for measuring paddy for each type of transaction. The most popular measure in Kuttanad is the ‘kaloorkadan para’ which was less than the standard para of ten edangizhhis. The variants of the kaloorkadan paras were known as ‘pathappara’ for paying harvest wages, ‘coolippara’ for paying other wages, ‘polikkada’ para for giving paddy loans to a class called Onapanikkars and ‘paattappara’ for collecting the paattam or rent from tenants. The size of these paras was fixed in such a way that in all transactions, the jenmi got the advantage. The paddy loans were at usurious rates of interest. On all important occasions like marriages, deaths etc., in the jenmis’s household, the pattakkaran had to present offerings. Against this the jenmi used to give the paattakkaran one mundu and neriathu during Onam. By 1941 farm labour in Kuttanad organised unions to fight against all forms of exploitation. The trend was encouraged by working class movement in the coir factories of Alleppey and
Shertallai. Class polarisation was becoming sharp. The bargaining power of farm labour in Kuttanad was stronger than that of farmers because the farmers were unable to cultivate even small plots without wage labour due to the peculiarities of cultivation in waterlogged land. The caste-based hierarchy in Kuttanad and the protected land market which kept out low castes from acquiring land helped the mobilisation of the rural proletariat by communists.

The rural class scenario was also influenced by extensive reclamation of kayal land mainly by Christians. The area under cultivation increased and consequently the demand for wage labour also increased. The transition from attached labour system to casual labour system was quicker. However, the introduction of new technology consisting of electric pump in the place of oil engines, permanent bunds in the place of temporary bunds and tractor ploughing in the place of animal ploughing created significant changes in the production relations and social relations and the structure of wages. The decline in person-day-employment of farm labour became complicated when migrant labour from the languishing coir industry was looking for employment in Kuttanad. Thus arose the problem of excess labour which began to depress the wage rates. But thanks to unionisation, money wages only rose further. However, the reduction person-day-employment was faster than the rise in money wages, so that in real terms farm labour continued to be poor.
4.12 New Demands

The unions began to demand higher wages and noon rest, reduction in working hours, stopping of abuse by jenmis and the supervisory workers and protection against tractor ploughing and migrant labour. In 1957 the unions unilaterally decided to ask their members to work only for six hours and start and end work when the union agents showed red flags as signals. This was resented by farmers who took the tissue to the IRC. However the IRC decided to install sirens in the place of red flags and that too at the expense of the farmers. This was a positive gain to labour.

4.13 Tractor Ploughing

Considering the reduced turnover of work from farm labour, their recalcitrant attitude and frequent interference by union agents, a few rich farmers decided to introduce tractor ploughing. The Kuttanad Uzhavu Thozhilali Union (Ploughmen’s union) resented this. The issue went to the IRC. It decided that those who have their own tractors could plough their land with them. But taking into consideration the benefits of ploughing with animals and employment it provides, farmers were advised to avoid the use of tractors.

4.14 Alternate Ploughing

At the same time it was decided that the traditional ploughmen should plough the fields properly and under this expectation, the use of tractors would be stopped. But when it was discovered that there was an acute shortage of healthy animals for ploughing, the possibility of accepting both
tractors ploughing and animal ploughing side by side was discussed. It was then decided that tractors would be used to do the first round of dry ploughing and the animals would be used for the wet ploughing twice. The ploughmen demanded that they should be given a guaranteed minimum amount of work extending to three rounds or six channels of ploughing.

### 4.15 ‘Nilam Orukkal’ - Preparation of Land

Dewatering work in each padasekharam is regularly auctioned off by the Punja Special Officer appointed by Government. The person or contractor who takes up dewatering work on auction engages specialist pumping workers. The wages for them consist of several components like: (a) nadathu sambalam, (b) menakkedu sambalam, (c) ennakkasu and (d) kidappu pani sambalam. Nadathu sambalam refers to the regular wage. The driver of a 15 h.p motor gets about Rs. 250/- a month a nadathu sambalam. Ennakkasu is a payment fixed as so many rupees for every 100 units of electricity used. Formerly enna or oil was used in oil engines. But even after electric pumps replaced oil engines, the pumping workers continue to get ennakkasu due to their union by strength. For a month a workers gets about Rs. 50 as ennakkasu. Menakkedu sambalam is a peculiar creature. This is a payment given to pump operators who, sometimes, have to idle their time at the pump house when there is no need to operate the pump. The prevailing rate of menakkedu sambalam is equal to the nadathu sambalam. The fourths component of wages paid to pumping workers is for overnight stay in the
pump house and it is called ‘kidappu pani sambalam’. In March 1981 the C.I.T.U led Pumping Motor Driver’s Unions submitted a memorandum to Government on their immediate demands which consisted of the following: (a) Places where pumping motors are installed should be declared as places of employment and the pumping workers there should be registered as regular workers; (b) Working hours should be fixed as eight and above eight hours they should be paid overtimes wages; (c) minimum wages should be fixed at Rs. 500 a month and, in addition, a dearness allowance linked to the cost of living index should be given; (d) Bonus at 25 percent of total earnings; (e) provision for accident protection and benefits; (f) supply of cotton waste, grease, castor oil, cylinder oil bulb, gloves, tester and two sets of uniforms; (g) appointment of a helper in each pump house, and (h) Retirement benefits.

14.16 Pumping Operations

Now-a-days the pumping operations are conducted under the general supervision of the Padasekharam committees. They fix what is called nerma. It is the pumping charge per acre that the farmer has to pay the contractor which is expected to cover the auction charges.

For some time the pumping workers have been looking at pumping contractors, farmers and Government for help and they want that appropriate safeguards and conditions have to be incorporated in the pumping contract itself. They demanded that they should be treated as skilled workers and licensed by the Electricity Board.
4.17 Harvesting

The structure of harvest wages is unique in Kuttanad and it reflects the impact of unionisation. In the early days, harvest work meant cutting of earheads, stacking of katta, transporting them to the farmer’s kalam, threshing, winnowing and drying and preparation of paddy. All this work was performed by the same group of harijan workers. But now workers of all castes and sages participate in harvest work due to unemployment caused by surplus labour. Due to large number of unemployed labour, swarms of workers enter the farmer’s field to do harvest work whether the farmer liked it or not. He is thus forced to employ more wage labour than what he really needs for getting the harvest work completed. Despite surplus labour seeking employment the farmers were unable to bring down wages because of unionisation of labour. A climate of tension prevails during harvest season in Kuttanad. In certain areas in Kuttanad the workers cut the earheads only, leaving the hay stalk to be cut by another section of workers. This was to the disadvantage of small farmers who attached a great value to the hay. But the big farmers never cared for the hay stalk left in the field.

4.18 Harvest Wages

Harvest wages consist mainly of three components: (a) Patham at one-eighth of the produce; (b) Theerpu at one fourth of the patham; and (c) Vaaru. In the early days when feudal relations existed, harvest workers enjoyed certain customary benefits. The present day system of theerpu is a payment
given in lieu of such benefits, as farm labour unions wanted to convert them into a definite component of harvest wages. Formerly, theerpu was given for every two days of continuous harvest. To avoid the payment of theerpu, the jenmis arranged harvest work only on alternate days. This led to agitation by farm labour. One jenmi was reportedly kept surrounded by a group of female farm labour in the middle of a kayal for several hours. This was perhaps the first gherao in Kuttanad and it was part of the theerpu agitation. The theerpu was not in vogue for the second crop, but due to union power the workers began to get it, despite an IRC decision to the contrary. The argument of the union is that the harvesting work in the second crop is more arduous and so they have every right to get theerpu for it. Vaaru was in the form of a supplementary payment but it does not exist now. All harvest wages are paid in kind using a specific para measure known as pathappara. Over the years the rate of patham and theerpu has been rising and today both of them together come to about 21 percent of the produce.

4.19 Post Harvest Activities

After harvest, the katta are taken to the kalams. Since Kuttanad is a water logged area and the kalams may be far away from the fields, catamarans or valloms have to be used for transportation of katta. Some big farmers have their own valloms and vallom workers while others have to hire valloms and engage their own harvest workers for loading, transporting and unloading of katta. Since negligence by workers may cause some loss during transit, the
workers engaged in these operations are given valla katta as an extra incentive payment over and above the regular harvest wage. The valla katta usually come to 1 ½ to edangizhis of paddy per each standard bundle of katta. Sometimes disputes arise throughout the harvest season in Kuttanad due to political reasons. The time may not be far off when for loading and unloading operations, the militant head load workers started interfering in Kuttanad.

4.20 ‘Nellu Orukkam’ – Rice Processing

At the kalams, threshing, winnowing and drying of paddy are done. In certain cases the farmers provide tarpaulins and workers do all these operations in the harvest field itself. In the olden days winnowing was done with the help of natural wind, but now winnowing machines are in use. For winnowing by machine, the worker is paid about Rs. 5 per 100 paras of paddy. For drying and preparation of paddy called nellorukku, the workers are paid about 1 ½ paras of paddy per day’s work. Today its market value comes to about Rs. 15.

4.21 Workers and their Land Allegiance

Adiyans played an important role in the agricultural practices of Kuttanad. They did most of the supervisory work for the jenmis. By tradition, they enjoyed certain rights like Idavakkadom, Onakkadom and Makakkadom. On suspicious days like Onam and Vishu, the adiyans received coconut oil, rice etc. from jenmis. The mootha pulayan used to get about 2 paras of paddy for supervising a 100 para kandom or plot which measures 10 acres. Over and
above this, they were given a full 8 ton catamaran load of hay, an umbrella and some free food. It was alleged by farm labour unions that the supervisory workers were being paid less than other workers and were being exploited. The unions argued that their work was a responsible one, since “like a doctor the supervisory worker has to inspect the crop, report pests, take on-the-spot decisions and arrange for immediate action.” The adiyans and paniyals have to stay in the kayal land and look after the crop. So the unions demanded that they should be provided with free food three times a day, good residential quarters on the kayal bunds, clean drinking water, besides wages for any specific work rendered by them. An adiyan is often not entrusted with more than 15 acres or 150 paras of land and as such he has some idle time. Unions, therefore, demanded that they should be paid either menakkedu sambalam or alternative paid employment. Since the size of the land holdings has come down perceptibly and feudal relations have vanished, no farmer is willing to engage a permanent adiyan to look after the crop.

Narayanan N C (2003), gives a timeline of agricultural workers’ mobilisation

1930s: Congress Socialist Party (CSP) began organizing industrial workers in Alleppey town which then extended to the mobilisation of agricultural workers in Kuttanad.

1940: Formation of Travancore Karshaka Thozhilali Union (TKTU), but declared illegal by the government.
1946: Punnapra Vayalar revolt.

1950: Sickle-holding demonstration of TKTU through Kottayam town.

1951: TKTU meeting in Kavalam where a charter of 44 demands was formulated.

1953: Strike during harvest, the tri-partite committee (landlords, workers and government (representatives) decides on wage hike, limiting of working hours and lunch break.

1954: 18 day strike coinciding with the harvest to implement the tri-partite agreement.

1955: Strike during the harvest season for theerpu (rice given as advance to tide over the harvest season).

1956: Minimum wage committee recommends wage hike, but no official notification made.

1957: Election of first Communist government, minimum wage notification, formation of industrial relations committee, prevention of eviction of tenants, hutment dwelling rights and non-interference of police in labour disputes.

1958: Agrarian Relations Bill.

1959: Liberation struggle and dismissal of the ministry.
1964: CPI splits, but newly formed CPI (M) holds most of the agricultural workers.

1968: Formation of KSKTU.

1969: Land Reforms (Amendment) Bill passed. Half a million people attended the rally in Alleppey that decided that hutment dwellers will de facto assert their rights on land as per the provisions of the bill. ‘Land grab’ agitation of forcible occupation of land mainly to bring to the notice of the government the availability of surplus land force-distribution (lasted for 80 days). State-wide strike call by KSKTU to which half a million workers responded.

1971: 200,000 hutment dwellers asserted their rights on homesteads the counter offensive by landlords with the help of police. 32 persons were killed and 50,000 arrested.

1975: Kerala Agricultural Workers’s Act passed – provisions for security of employment, provident fund scheme, limited hours of work, prescribed wages, procedures for settlement of disputes etc.

1976: 15 day strike in Kuttanad against the attempt of landlords to reduce the wages.

1980: First SRFA (Save Rice Field Agitation)

4.22 Village based Labour Organisation

By the mid-1950s, the trade union leaders managed to build an elaborate network of village-based organisations, and the agricultural labourers emerged as a militant group capable of bargaining on equal terms with their employers (Jose, 1979:10). The earlier farmer tactic of unleashing organised repression on militant labourers via various social and economic sanctions was no longer possible. Governments (especially the leftist) interfered to diffuse agrarian tension in Kuttanad and to make decisions favouring labourers (Oommen, 1985:16). This led to the emergence and consolidation of the contrary interest on the agrarian scene – the response by the landed/farmer interests. The emergence of a class of capitalist farmers in Kuttanad was explained earlier and they naturally considered the trade unions a threat from the early days of mobilisation. The use of police to repress trade union activities and the use of physical force were the initial forms of resistance by the landed class. In spite of such confrontations and coercive strategies by farmers, they found that the trade unions were growing in strength. With a pro-labour government in place in 1957, the farmers’ position became more precarious, especially with the policy of non-interference of police in labour disputes. The farmers also were forced to organize. The strategies of the farmers to counter the ‘menace’ of labour ‘militancy’ are presented in this subsection.
4.23 Socio-Political Organisations

The greatest problem for farmers is to identify themselves as a class as did the agricultural labourers. What made them come together and when? Oommen explains this phenomenon as, ‘in an area where one category of population is organised to assert rights, it is almost inevitable that the categories which are adversely affected will also organize themselves either as a defence mechanism or as a counter-offensive’ (1985:194). The first farmer’s association, the Kuttanad Karshaka Sangham, started functioning in 1932. A federation of farmers’ associations emerged in the 1960s called the Akhila Kuttanad Karshaka Sangham (AKKS) in the wake of the threat from organised labour unions sponsored by the communist parties. The Upper Kuttanad Karshaka Sangham (UKKS) was the biggest and was formed in 1958. They were very active in 1958-59 and then dormancy came with the dismissal of the Communists in 1959. It picked up momentum again in the wake of the next Communist government in 1967. Most of the primary members are middle and small cultivators with associate members drawn from the agricultural labour force providing muscle power. The labourers are mostly upper castes mobilised along communal lines. However, when the threat vanishes, there is no common goal, interest or ideology that cements them together.
4.24 Role of Major Parties

The political affinity of UKKS with the Kerala Congress was clear (it represented their interests in the state legislature) and a primary incentive for educated younger members was that this is a channel towards a Kerala Congress political career. Conflicts of interests within the amorphous class of farmers, result in differential political affiliations too. There are farmers’ associations (‘poor peasants’) for the CPI and CPI (M) and there are agricultural workers’ unions for the Kerala Congress. However, the majority of the middle and rich farmers are under Kerala Congress and most landless agricultural labourers, especially of lowest castes, belong to the CPI(M) sponsored KSKTU.

The study gives a detailed account of the changes in farmer tactics and trade union strategies from the mid-1960s to the late 1970s. Farmers retrenched paddy field workers those who had been in long-term employment with them. They resorted to casualisation of employment and a policy of hire and fire. Physical violence broke out in several rice fields especially during harvest time. Several instances of workers forcibly harvesting rice were reported. Farmers tried strong-arm tactics by hiring mercenaries but it did not last long since the government was not always behind them. When pro-labour governments were in power, the scales titled in favour of unions since the police would not be used to interfere in what was called ‘labour disputes’.
4.25 Farmers’ Resistance

One of the major strategies of farmers’ resistance to trade union activity in the 1980s was the shifting away from labour-intensive crops like rice. There were some long-standing grievances around which Kuttanad farmers could organize/consolidate also. The historical emphasis on food production forces the state to insist on rice cultivation and the Land Utilisation Order (1967) prohibited by law any conversion of land to other uses. As a consumer-friendly policy, a specific quantity of rice at controlled prices as a ‘quota’ used to be collected from 1942-1953 from rice farmers to be distributed through ration shops. This practice was stopped, but restarted in 1964 and continued until 1978 as ‘levy’. The pumping subsidy was another consistent demand by the farmers. The important victories of Kerala Congress inside and outside the legislature were the rationalisation of the paddy procurement system (levy) and the subsidy protection, especially the pumping subsidies.

Major arguments from the farmers’ perspective were:

- There is no sense in the argument that the farmers facing losses in cultivation nevertheless have to take care of the food security and agricultural labour jobs.

- Rice can be bought from anywhere and insistence on food self-sufficiency is unnecessary.
The Kerala Land Utilisation Order has to be withdrawn and farmers allowed to cultivate any crop they desire.

- Scarcity of timely labour and the need for mechanisation.
- Nucleation of families has triggered housing problems that demand the reclamation of rice lands.
- There are no special environmental attractions of rice lands since these are just agricultural lands.
- SRFA is violence and cannot be tolerated. The agricultural labourers have no right to insist on rice cultivation.
- Farmers affected by SRFA have to be compensated

### 4.26 Political Economy

The economy of Kuttanad has been paddy based. It has the stories of land reclamation and Green Revolution. In 1962-63, Alleppey and Palghat districts in Kerala were chosen to come under the Intensive Agricultural District Programme (IADP). These were the two “rice bowls” of Kerala and the programme in Kerala concentrated mainly on paddy production. It seems certain that paddy cultivation in Kuttanad was fairly advanced even before the advent of the programme and that its relatively progressive farmers had already been using such improved strains of paddy. The existence of rice research station at the heart of Kuttanad at Mankompu and its work with some
improved strains had created a certain amount of willingness and enthusiasm among the farmers to experiment with new varieties of seed.

Although new varieties of paddy were introduced into Kuttanad in 1966, their real adoption can be said to have begun on a significant scale only with the wide-spread use of IR-8 in 1967-68. The results were very encouraging though short-lived. Since then a large number of high-yielding varieties have been introduced, and their reception has been very quick and widespread. The amount of land under cultivation with the new varieties grew rapidly, and today it is the rare farmer in Kuttanad who is still using the traditional local variety. Chemical fertilisers and pesticides have also been adopted very widely and on a relatively large scale. Since fertilisers are an essential component of the Green Revolution package, these were provided at subsidised rates in Alleppey district. The number of fertiliser depots in Alleppey district increased from 249 in 1961-62 to 403 in 1969-70. It is estimated that per hectare consumption of fertilisers has increased from 61kg in 1961-62 to 190 kg in 1968-69. This represents an annual growth rate of 30 per cent as against 14 percent in the developing countries. Pesticides are also part of the package and have been widely adopted. Moreover, it has now become evident that the new varieties and the vastly increased use of fertilisers have themselves contributed greatly to the vulnerability of paddy to pests and diseases. The brown hopper, in particular, is becoming an increasing menace to paddy cultivation in Kuttanad.
After 1970, however, the enormous rise in the cost of the pesticide seems to have made them more sparing and calculating in its use. In any case, they believe that there can be no going back to the old local variety.

4.27 Yield of Paddy

The mean yield of paddy in the Kuttanad region rose to 3,378 kg per hectare in 1968-69, against the mean yield of 2,262 kg per hectare for the Alleppey district as a whole. In 1969-70 the region registered even further increase in productivity. Paddy production increased by 152.3 percent between 1958-59 and 1969-70 in Kuttanad taluk alone. It seems that the average for the district as a whole was considerably brought down by the submarginal coastal belt and Onattukara region where productivity remained at a low level.

During 1974-75 when the price of paddy went up to Rs.14 per para a Kuttanad farmer could make a profit of Rs.3500 or more per hectare. It was not uncommon in Kuttanad for a relatively large landowner to make a profit of Rs.1,00,000/- or more from the first crop alone, having additional income from his coconut gardens, from a second crop, and from other investments.

Given the great pressure on land one may expect that at least some portion of the labour force would be pushed out of agriculture and would be absorbed in the industries of the surrounding towns, especially Alleppey. But as the agrarian crisis has deepened in Kuttanad, the surrounding region, particularly Alleppey has passed through what may be described as a process
of deindustrialisation. Once known as the Venice of India, Alleppey was the principal commercial and industrial town of the relatively prosperous princely state of Travancore. Alleppey’s economic importance and prosperity rested on its coir industry, its oil mills, and its port. All three have been steadily declining during the post-war period. Its coir industry, which once produced the largest exports of the state, has almost collapsed, its oil mills have gone elsewhere, especially to Bombay, which has among other things more modern technology and more efficient machinery; its port has substantially declined in importance and has been replaced at least in part by the bigger port at Cochin. Some smaller industries such as cashew nut processing have also declined.

4.28 Coir Industry

The coir industry which had a pride of place in Alleppey declined and reached a stage of near collapse. The coir industry in Alleppey is more than a hundred years old; the first coir factory there was built in 1859 by an Englishman from Calcutta where he had already seen manually manufactured coir yarn from Alleppey. The principal raw material for the industry is coconut husk, which is abundant in Alleppey and the surrounding areas. As the industry expanded, labourers were recruited from the rural area near Alleppey. During the period between the two wars branch factories, as well as small independent factories, sprang up all along the coastal strip of the backwater area. Between 1932 and 1937 Travancore exported more than 10 million rupees worth of coir goods annually. In 1939 there were a total of 290
factories in Alleppey and the surrounding regions and Alleppey town still housed the main factories and office of nearly all the big manufacturers.

4.29 Governmental Role

By the early 1960s factories began to close down on a massive scale. The district labour officer estimates that in Alleppey alone at least 45000 workers lost their jobs, jeopardizing the livelihood of their families. Some of them seem to have found employment in the “feeder factories” subsequently started by the former factory employees either as co-operative ventures or as individual enterprises. These factories are kept small, a typical one employing only about 5 to 7 persons and manufacturing coir products to be sold to merchant exporters. By keeping these factories small the employers can escape the provisions of the Factories Act keep the workers “under control”. It is estimated that by 1981 there are nearly 2000 such factories in operation in and around Alleppey town. Those workers who have managed to find employment in these factories appear to have suffered not only a substantial decline in their wages but also job insecurity, as well as the loss of fringe benefits such as bonuses, Employees State Insurance, and Provident Funds.

While it is difficult to provide an adequate explanation for the decline of the coir industry, many upper-class persons, particularly land owners in Kuttanad, attributed it to the unrest and “lawlessness” unleashed by the coir workers and their Communist-dominated union. The decline in the coir industry was caused by many factors, economic and political, some of which
had their source outside Alleppey and Kerala, and even India. The collapse of the United Kingdom and western European markets and competition from synthetic products seems to have had disastrous effects on the industry.

The government has also set up a glass factory and a pharmaceuticals factory, both near Alleppey. But Alleppey does not seem to be recovering. Today, it strikes a visitor as a dying town, with its closed factories, its stinking and mosquito-emitting canals, and its dilapidated hotels and office buildings. Although it is difficult to assess the impact of the deindustrialisation of Alleppey on Kuttanad and its agriculture, there is little doubt that it has greatly contributed to ease the pressure on the land. The Kuttanad region had been an important supplier of the labour force for the coir industry. Now, increasingly its labour force is compelled to fall back on agriculture for its livelihood.

4.30 Constraints to Development

The natural constraints on agricultural operation have provided little scope for higher cropping intensity. The secondary and tertiary sectors have not been properly developed. There was almost a complete absence of any noteworthy industry in the deltaic tract. As a result, the scope of employment generation is not only meager, but almost nil.

The notable industries are Travancore Electro Chemicals(now closed) and Travancore Cements, situated in the eastern transitional zone. Cherthala, in the western coastal plain possesses major industries, namely 1) The
Pallathara Bricks Limited, 2) The Steel Industries Kerala Limited, (SILK), and 3) The McDowell’s Distillery. Repairing and servicing are the main secondary sector occupation. In the coastal plain, coir industry has flourished well but the central part of the region is completely deprived. The region is considerably under-developed with respect to other economic activities also.

The major problem of the region is related to accessibility. Though almost all parts of the region are accessible within a distance of 5 km from a metalled road, the mobility is handicapped by innumerable channels and waterways. On the other hand, the waterways have not been so developed as to meet the deficiencies. Waterways at present do a good service but their frequency and speed fall far short of the total requirements of the entire region. Another problem is that the existing transport system links up the villages with the urban centres but inter linkage among the villages is poor which impair the hierarchical development. Effective and speedy means for hauling commercial good are yet to be improved.

4.31 Educational Services

As far as educational facilities are concerned the villages are well served up to the High School Standard, although the pressure on each school is very high. The 64 High Schools, 102 Middle Schools and 254 Primary Schools have to cater to nearly 5 lakh students in the rural areas. But regarding the collegiate and professional education, the facilities are not satisfactory. There are only 8 colleges situated at Kadapra, Pallipad,
Kozhimukku, Sherthalai South, Mararikulam north and Athirampuzha Villages. But all the rural colleges have only the Arts faculty. So the students have to go to urban centres for other disciplines or study in the Arts Colleges. Commercial and training institutes are few in number. The region has only one Industrial Training Institute, situated at Kozhimukku village. Therefore, students have to depend on the urban centres for higher education. The inaccessibility of a number of villages has posed serious problems to the students of low income group.

4.32 Health Services

Health service system of the region is not up to the standard. Hospitals with impatient facilities are only 20 in number. These 20 hospitals have to serve a large population of 15 lakh which means that each hospital has to cater to 75000 people on an average. According to the Mudaliar committee, Government of India, for every 10000 population there should be one hospital. The limitation of hospital facilities is further aggravated due to its unequal distribution. 20 hospitals are located in 15 villages.

In the western coastal plain, 7 hospitals are located excluding the urban centres. The villages in the eastern transitional zone possess 8 hospitals. The central part of upper and lower Kuttanad is served by two hospitals located in Kozhimukku village. The size of population of the villages is so high that each village requires one hospital. Medical services are mainly met though dispensaries – Allopathic, Ayurvedic and Homoeopathic the total number of
which is 320. Almost all the villages have dispensaries of more than one type. Other health services like child welfare and maternity welfare are marginal.

The region has to face extreme problems regarding veterinary services. The number of livestock and poultry populations especially ducks is very high but veterinary services are available only from 6 dispensaries located in the villages of Kaipuzha, Punnapra, Ambalapuzha, Veliyanad, Muttar and Mararikulam north. There is not a single veterinary hospital in the whole region. Farmers suffer considerable loss due to lack of this facility.

Inadequacy of drinking water is the most serious problem faced by the people of this region. The surface and subsurface water of this region is saline. In some places of lower Kuttanad, excessive sulphur smell has prevented the domestic use of water. The places surrounding urban centres have facilities of drinking water supply from pipeline. But a number of villages in the lower and upper Kuttanad have no provision for drinking water except the artificial ponds and wells. The depth of wells and ponds cannot exceed 2 metre in most cases to avoid direct intrusion of saline water. After the completion of Thanneermukkam barrage, the river water and inland kayal water are used for domestic purposes. This is one of the important aspects which command people’s support towards the construction of the barrage. The scarcity of drinking water is one of the major problems to be tackled with utmost urgency.
The problems arising from manmade alterations in the backwater environment were manifold. There is a grave concern on the drastic alterations in the ecology of backwaters by developmental activities. They called for effective intervention in order to save the perpetual death of this wetland system.

4.33 Developmental Interventions

The developmental interventions in the region include the reclamation since 1880s, institution of Punja Special Officer, the Thanneermukkam Regulator, Thottapally Spillway, the concrete bund construction, improvements to the leading channel to Thottapally spillway, protective works to the bunds affected by the operation of the Thottapally spillway and diversion of Idukki tailrace waters from the Muvattupuzha river basin to Kuttanad under Kuttanad Development Project, the Alleppey –Changanassery Road and construction by the locals in the region.

Though the reclamation of land from the backwaters of Kuttanad has a long history behind it, the reclamation of Vembanad lake was a relative new development. It is now difficult to ascertain when exactly the reclamations in the backwaters began. But the records show that from 1834, if not from an earlier period, reclamations have been going on. It is seen from the Travancore Land Revenue Manual that in the earlier years, such reclamations were encouraged by the ‘Ninthom’ (Exemption from tax for some years) system and subsequently by granting loans. By Notifications No. R. 505 dated
8\textsuperscript{th} Mithunom 1063 M.E. (20\textsuperscript{th} June 1888) a sum of Rs. 50000 was set apart by the Government of Travancore to be advanced to the ryots as means for reclaiming and bringing under cultivation portions of Vembanad backwater along the shore within the taluks of Ambalapuzha, Changanacherry, Kottayam, Ettumanoor, Vaikom and Cherthalla. The amount of individual loan was not to exceed Rs. 5,000 and an interest of 4 per cent was charged on this loan. The borrower as to begin work as soon as possible after receiving the loan and if he did not commence work within 12 months from the date of the loan, interest was to be charged at 12 per cent per annum. Also, by notification No. 984 dated 9\textsuperscript{th} Mithunam 1064 M.E. (July 1889), it was ruled that “all such lands should, henceforward be registered free of tax for five years, after which an assessment to be equal to one-half of the quantity of seed required to sow the lands reclaimed (vitharapattom). This tax was to stand good until the Revenue element”.

4.34 Some Developmental Schemes

Further, by notification dated 25\textsuperscript{th} June 1888, it was announced that, with a view to bringing under cultivation some of the extensive tracts in North Travancore which were lying uncultivated owing to the influx of brackish water from the adjoining back-waters. Government had sanctioned a sum of Rs. 2 lakhs for reconstruction of embankments and other protective works. The following were the schemes thus sanctioned for the benefit of the cultivators.
• Puthenvelikara scheme
• Parur Reclamation scheme
• Oomika and Kuttamangalom scheme
• Munambom scheme
• Kaipuzha scheme

On the strength of these inducements, people from different parts of North Travancore started investing sums of money in reclaiming lands wherever possible after obtaining registry in their names. Among these reclamations, the Vettikkad Bund scheme was the most enterprising and important one.

In this manner, by the dawn of the 20th century, about 5,500 acres in the Vembanad lake had been reclaimed. But, by a notification in the Gazette dated 16.12.1903, the State Government interdicted all further reclamations of land within the Vembanad lake. The Government was forced to adopt this measure due to the strong pressure from the Madras Government who apprehended that these reclamations would be injurious to the port of Cochin. It was pointed that “the encroachment of the backwater lessened the ebb and flow at the opening of the Cochin port and increased the formation of the bar there which would ultimately cause damage to the port and affect its future development.”
4.35 Land Reclamations

From the following discussions the historical development of the reclamation activity in the Vembanad Lake can be traced. The very early reclamation prior to the year 1888 and continued till 1903 when the unexpected set back to the reclamation activities occurred as detailed earlier. Some of the well-known reclamations during this period were Venad, Attumuttathu Kayal, Rajaramapuram, Mathikayal etc. This is the second stage. The third stage commenced with the revival of the activities in 1912 even though it got momentum only after 1931 during which period nearly 13000 acres of kayal were reclaimed. The reclamations during the period 1940-1973 are as follows.

Q, SandT blocks – Among the recent reclamations the most outstanding ones are those undertaken in the Q, S and T blocks. Quoting from the records of the State Government of Travancore, Thomas (1972) recorded that the Government sanctioned these blocks covering an area of 1454 acres in the joint names of Mr. M.T. Joseph, Murukkummoottil and his father Ocknada Thommen of Kavalam in Pulinkunnu village. The conditions stipulated in the sanction were that tharavila would be fixed at Rs. 10 per acre to be recovered in 10 equal installments and that no tax would be levied for the first two years of registry and that thereafter a tax on the whole area have to be paid. It was laid down that if adequate progress in the matter of reclamation was not made within two year registry, the registry was liable to be cancelled by the Government. Consequent on this Sri. M.T. Joseph executed an agreement
with the Government in July 1941 in which the extent of the three block was mentioned as follows:

<table>
<thead>
<tr>
<th>Block</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block Q</td>
<td>555</td>
</tr>
<tr>
<td>Block S</td>
<td>584</td>
</tr>
<tr>
<td>Block T</td>
<td>315</td>
</tr>
</tbody>
</table>

Total 1454 acres

The reclamations in the Block Q were taken up in 1941 and it was complete within a period of one year. With the permission of Government, this block was named Chithira after the name of ruling Maharaja of Travancore. Subsequently blocks S and T were also reclaimed and were named as Marthandam and Rani respectively.

R Block – Construction of permanent bunds – The construction of permanent bunds in the R block is unique in Kuttanad Kayal reclamation. The actual work was started in 1961. The permanent non submersible bunds were constructed at a top level of 6 ft. above mean sea level with top width of 10ft. The total length of bunds comes to 6.5 miles and an area of 1540 acres is benefited by this. Though the scheme was evolved for raising a second crop of paddy in the entire area, it could not be achieved. The major portion of the block is cultivated under cash crops like coconut, sugarcane etc.

Possibilities of utilizing the weed as a raw material for industrial purposes or as organic fertilizer are rather remote. The moisture content of the
weed is over 90 per cent and the cellulose content is only 2 per cent. The NPK content is less than 2 per cent and so it can hardly be used as a fertiliser. In short the spread of African Payal has affected every aspect of human life of all the sections of people in Kuttanad.

4.36 Studies and Enquiries on the Region


Their area of interest varied from the society and culture, economy and livelihoods, history, land reclamation impact of developmental initiatives, agrarian relations, trade unionisation and its impact social movements, demography and gender issues in the region.

The 3 major agencies which made elaborate studies were KSSP, FAO and MSSRF.

4.36.1 KSSP Study

The Kerala Sasthra Sahitya Parishad (KSSP-1978) analysed the impact of developmental measures namely Thottapally Spillway, Thanneermukkam
salt water barrier, permanent bunds constructed under KDP and Changanassery Alleppey construction on the region. It can be claimed that such a detailed disclosure of the impact of developmental measures on the Kuttanad region is scarcely available. FAO studied among other aspects, the peasants, their organisations and suggested policy option.

**4.36.2 MSSRF Study**

M.S.Swaminathan(MSSRF 2007) was appointed by the Government of India to suggest measures to mitigate the agrarian distress in Alappuzha and Kuttanad Wetland system. The Government of Travancore had used data generated through their team of hydrographers, geologists and engineers to suggest and even set aside developmental initiatives.

**4.36.3 KEC Study**

In the post state formation period the Government of Kerala appointed a 4 member Kuttanad Enquiry Commission (KEC) chaired by Thomas C in 1972 to suggest measures to develop the region.

**4.36.4 KDP Study**

In 1972 itself the government appointed another team under the project Kuttanad Development Project (KDP) to help paddy cultivation from floods and salinity occurrences on such lands.

Though many studies were conducted for the region at different levels one feels that much is needed to be done to help Kuttanad from the present developmental mess.
4.37 Developmental importance of Kuttanad Backwaters

Major developmental aspects of Kuttanad region constitutes:

- Tourism
- Fisheries
- Agriculture
- Transportation
- Industries
- Ecological importance
- Utilisation of wetlands
- Agriculture
- Pisciculture
- Reclamation for housing and industrial purposes
- Disposing of waste materials
- Discharging industrial effluents and municipal waste water
- Wood seasoning
- Feeding water for ducks
- Dumping dredged soil
- Coir setting
- Recreational purposes like hunting, fishing
4.38 Some Inferences

The inference drawn from the analysis of the data is given below.

4.38.1 The Development Significance of the Kuttanad Region

The development significance in the Kuttanad region can be studied from housing facilities and from the behaviour of migrants in the Kuttanad region.

4.38.1.1 Ownership of the House

Chi-square test for independence of attributes is done to study whether there is any significant difference between the nature of ownership of the house in the upper Kuttanad, lower Kuttanad and north Kuttanad region.

<table>
<thead>
<tr>
<th></th>
<th>Rented</th>
<th>Joint family</th>
<th>Own</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Kuttanad</td>
<td>14</td>
<td>8</td>
<td>118</td>
<td>140</td>
</tr>
<tr>
<td>Lower Kuttanad</td>
<td>14</td>
<td>6</td>
<td>120</td>
<td>140</td>
</tr>
<tr>
<td>North Kuttanad</td>
<td>26</td>
<td>9</td>
<td>85</td>
<td>120</td>
</tr>
<tr>
<td>Total</td>
<td>54</td>
<td>23</td>
<td>323</td>
<td>400</td>
</tr>
</tbody>
</table>

Source: Survey

The test statistic, $\chi^2 = 11.73604$

Degrees of freedom = 4

P-value = 0.019426

Since the P-value is small, nature of ownership of the house depends upon the region classifications namely, upper Kuttanad, lower Kuttanad & north Kuttanad. In the upper Kuttanad region 84.29% of people have their
own house, 10% are in rented house and the remaining 5.71% are in the joint family.

In the lower Kuttanad region 85.71% of people have their own house, 10% are in rented house and the remaining 4.29% are in the joint family. In the north Kuttanad region 70.83% of people have their own house, 21.67% are in rented house and the remaining 7.5% are in the joint family.

4.38.1.2 Type of House

Chi-square test for independence of attributes is done to study whether there is any significant difference between various types of houses in the upper Kuttanad, lower Kuttanad and north Kuttanad region.

<table>
<thead>
<tr>
<th></th>
<th>Pacca</th>
<th>Kutcha</th>
<th>Hut</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Kuttanad</td>
<td>24</td>
<td>40</td>
<td>76</td>
<td>140</td>
</tr>
<tr>
<td>Lower Kuttanad</td>
<td>27</td>
<td>42</td>
<td>71</td>
<td>140</td>
</tr>
<tr>
<td>North Kuttanad</td>
<td>32</td>
<td>36</td>
<td>52</td>
<td>120</td>
</tr>
<tr>
<td>Total</td>
<td>83</td>
<td>118</td>
<td>199</td>
<td>400</td>
</tr>
</tbody>
</table>

Source: Survey

The test statistic, \( \chi^2 = 4.708229 \)

Degrees of freedom = 4

P-value = 0.318566
Since the P-value is large, the various types of houses and regions are independent. So 20.75% of the people in the Kuttanad region have Pacca houses, 29.5% have Kutcha houses and the remaining 49.75% are in Huts.

4.38.1.3 Source of Energy for Lighting

Chi-square test for independence of attributes is done to study whether there is any significant difference between sources of energy for lighting in the upper Kuttanad, lower Kuttanad and north Kuttanad region.

Table 4.5: Source of Energy for Lighting

<table>
<thead>
<tr>
<th>Source of Energy for Lighting</th>
<th>Upper Kuttanad</th>
<th>Lower Kuttanad</th>
<th>North Kuttanad</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity</td>
<td>128</td>
<td>130</td>
<td>110</td>
<td>368</td>
</tr>
<tr>
<td>Solar</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Kerosene</td>
<td>12</td>
<td>9</td>
<td>9</td>
<td>30</td>
</tr>
<tr>
<td>Total</td>
<td>140</td>
<td>140</td>
<td>120</td>
<td>400</td>
</tr>
</tbody>
</table>

Source: Survey

The test statistic, $\chi^2 = 1.541408$

Degrees of freedom = 4

P-value = 0.819282

Since the P-value is large, there is no association between the source of energy for lighting and regions. So 92% of the people use electricity, 0.5% use Solar and the remaining 7.5% use Kerosene as the source of energy for lighting.
4.38.1.4 Fuel used for Cooking

Chi-square test for independence of attributes is done to study whether there is any significant difference between fuel used for cooking in the upper Kuttanad, lower Kuttanad and north Kuttanad region.

<table>
<thead>
<tr>
<th></th>
<th>Firewood</th>
<th>Kerosene</th>
<th>Cooking gas</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Kuttanad</td>
<td>107</td>
<td>4</td>
<td>68</td>
<td>179</td>
</tr>
<tr>
<td>Lower Kuttanad</td>
<td>101</td>
<td>5</td>
<td>65</td>
<td>171</td>
</tr>
<tr>
<td>North Kuttanad</td>
<td>96</td>
<td>4</td>
<td>61</td>
<td>161</td>
</tr>
<tr>
<td>Total</td>
<td>304</td>
<td>13</td>
<td>194</td>
<td>511</td>
</tr>
</tbody>
</table>

Source: Survey

The test statistic, $\chi^2 = 0.175194$

Degrees of freedom = 4

P-value = 0.99638

Since the P-value is large, there is no association between the fuel used for cooking and regions. So 59.49% of the people use firewood, 2.54% use kerosene and the remaining 37.97% use cooking gas for cooking.

4.38.1.5 Source of Water

Chi-square test for independence of attributes is done to study whether there is any significant difference between various sources of water in the upper Kuttanad, lower Kuttanad and north Kuttanad region.
Table 4.7: Source of Water

<table>
<thead>
<tr>
<th>Region</th>
<th>Own well</th>
<th>Neighbour’s well</th>
<th>Public well</th>
<th>KWA connection</th>
<th>Public Tap</th>
<th>Public pond</th>
<th>River</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Kuttanad</td>
<td>36</td>
<td>12</td>
<td>16</td>
<td>20</td>
<td>16</td>
<td>16</td>
<td>24</td>
<td>140</td>
</tr>
<tr>
<td>Lower Kuttanad</td>
<td>36</td>
<td>16</td>
<td>12</td>
<td>16</td>
<td>16</td>
<td>20</td>
<td>24</td>
<td>140</td>
</tr>
<tr>
<td>North Kuttanad</td>
<td>32</td>
<td>16</td>
<td>16</td>
<td>20</td>
<td>16</td>
<td>8</td>
<td>12</td>
<td>120</td>
</tr>
<tr>
<td>Total</td>
<td>104</td>
<td>44</td>
<td>44</td>
<td>56</td>
<td>48</td>
<td>44</td>
<td>60</td>
<td>400</td>
</tr>
</tbody>
</table>

Source: Survey

The test statistic, $\chi^2 = 10.60114$

Degrees of freedom = 12

P-value = 0.563374

Since the P-value is large, there is no association between the various sources of water and regions. So 26% of the people have their own well, 11% of the people use neighbour’s well, 11% use public well, 14% of the people use KWA connection, 12% of the people depend on public tap, 11% of the people depend on public pond and the remaining 15% depend on the river as the source of water.

4.38.1.6. Sanitary Facility

Chi-square test for independence of attributes is done to study whether there is any significant difference between sanitary facilities in the upper Kuttanad, lower Kuttanad and north Kuttanad region.
Table 4.8: Sanitary Facility

<table>
<thead>
<tr>
<th>Region</th>
<th>Open air</th>
<th>Covered pit</th>
<th>ESP type</th>
<th>Flush</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Kuttanad</td>
<td>4</td>
<td>12</td>
<td>44</td>
<td>80</td>
<td>140</td>
</tr>
<tr>
<td>Lower Kuttanad</td>
<td>4</td>
<td>12</td>
<td>56</td>
<td>68</td>
<td>140</td>
</tr>
<tr>
<td>North Kuttanad</td>
<td>4</td>
<td>8</td>
<td>32</td>
<td>76</td>
<td>120</td>
</tr>
<tr>
<td>Total</td>
<td>12</td>
<td>32</td>
<td>132</td>
<td>224</td>
<td>400</td>
</tr>
</tbody>
</table>

Source: Survey

The test statistic, \( \chi^2 = 6.651206 \)

Degrees of freedom = 6

P-value = 0.354311

Since the P-value is large, the various sanitary facilities and regions are independent. So 3% of people use open air, 8% use covered pit, 33% use ESP type sanitary facility and 56% flush facility.

4.38.1.7 Migration Status

Chi-square test for independence of attributes is done to study whether there is any significant difference between migration status in the upper Kuttanad, lower Kuttanad and north Kuttanad region.

Table 4.9: Migration Status

<table>
<thead>
<tr>
<th>Region</th>
<th>Migrants</th>
<th>Natives</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Kuttanad</td>
<td>44</td>
<td>96</td>
<td>140</td>
</tr>
<tr>
<td>Lower Kuttanad</td>
<td>52</td>
<td>88</td>
<td>140</td>
</tr>
<tr>
<td>North Kuttanad</td>
<td>40</td>
<td>80</td>
<td>120</td>
</tr>
<tr>
<td>Total</td>
<td>136</td>
<td>264</td>
<td>400</td>
</tr>
</tbody>
</table>

Source: Survey

The test statistic, \( \chi^2 = 1.052542 \)

Degrees of freedom = 2

P-value = 0.590804
Since the P-value is large, there is no significant difference in the migration status in the region classification namely, upper Kuttanad, lower Kuttanad and north Kuttanad region. 34% of the people are migrants and the remaining 66% are natives in the Kuttanad region.

4.38.1.8. Nature of Migration

It is to be tested whether the region has any influence on the nature of migration. For this Chi-square test for independence of attributes is done to know whether the upper Kuttanad, lower Kuttanad and north Kuttanad region has any influence on the nature of migration.

**Table 4.10: Nature of Migration**

<table>
<thead>
<tr>
<th>Region</th>
<th>Surrounding districts of Kuttanad</th>
<th>Other districts of Kuttanad</th>
<th>Outside Kerala</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Kuttanad</td>
<td>20</td>
<td>8</td>
<td>16</td>
<td>44</td>
</tr>
<tr>
<td>Lower Kuttanad</td>
<td>24</td>
<td>16</td>
<td>12</td>
<td>52</td>
</tr>
<tr>
<td>North Kuttanad</td>
<td>20</td>
<td>12</td>
<td>8</td>
<td>40</td>
</tr>
<tr>
<td>Total</td>
<td>64</td>
<td>36</td>
<td>36</td>
<td>136</td>
</tr>
</tbody>
</table>

Source: Survey

The test statistic, $\chi^2 = 4.285664$

Degrees of freedom = 4

P-value = 0.368724

Since the P-value is large, the migration is independent of the upper Kuttanad, lower Kuttanad and north Kuttanad region. It can be said that 47.06% of migrants are from the surrounding districts of Kuttanad, 26.47% of
migrants are from other districts of Kuttanad and the remaining 26.47% of migrants are from outside Kerala.

4.38.1.9. Reason for Migration

Chi-square test for independence of attributes is done to know whether the reasons for migration have any association to the region classifications namely, upper Kuttanad, lower Kuttanad and north Kuttanad region.

Table 4.11: Reason for Migration

<table>
<thead>
<tr>
<th>Region</th>
<th>Agricultural purposes</th>
<th>Employment purposes</th>
<th>Marriage</th>
<th>Better location to stay</th>
<th>No specific reason</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Kuttanad</td>
<td>32</td>
<td>10</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>44</td>
</tr>
<tr>
<td>Lower Kuttanad</td>
<td>32</td>
<td>17</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>52</td>
</tr>
<tr>
<td>North Kuttanad</td>
<td>22</td>
<td>12</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>40</td>
</tr>
<tr>
<td>Total</td>
<td>86</td>
<td>39</td>
<td>6</td>
<td>1</td>
<td>4</td>
<td>136</td>
</tr>
</tbody>
</table>

Source: Survey

The test statistic, $\chi^2 = 6.52483$

Degrees of freedom = 8

P-value = 0.588655

Since the P-value is large, the reason for migration is independent of the upper Kuttanad, lower Kuttanad and north Kuttanad region. It can be inferred that 63.23% of inhabitants migrated to Kuttanad for agricultural purposes, 28.68% migrated to Kuttanad for employment purposes, 4.41% are married to the Kuttanad region, 0.74% migrated to Kuttanad for a better location to stay and the remaining 2.94% migrants have no specific reason.
4.38.1.10. Duration of the Stay in the Kuttanad Region

Chi-square test for independence of attributes is done to test whether there is any association between the duration of the stay in the Kuttanad region and the region classifications namely, upper Kuttanad, lower Kuttanad and north Kuttanad region.

**Table 4.12: Duration of the Stay in the Kuttanad Region**

<table>
<thead>
<tr>
<th>Region</th>
<th>0≤x&lt;2 (years)</th>
<th>2≤x&lt;5 (years)</th>
<th>5≤x&lt;8 (years)</th>
<th>x≥8 (years)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Kuttanad</td>
<td>10</td>
<td>22</td>
<td>64</td>
<td>44</td>
<td>140</td>
</tr>
<tr>
<td>Lower Kuttanad</td>
<td>18</td>
<td>18</td>
<td>64</td>
<td>40</td>
<td>140</td>
</tr>
<tr>
<td>North Kuttanad</td>
<td>10</td>
<td>16</td>
<td>48</td>
<td>46</td>
<td>120</td>
</tr>
<tr>
<td>Total</td>
<td>38</td>
<td>56</td>
<td>176</td>
<td>130</td>
<td>400</td>
</tr>
</tbody>
</table>

Source: Survey * x- Here x denotes the duration of the stay in years.

The test statistic, $\chi^2 = 5.708287$

Degrees of freedom = 6

P-value = 0.456648

Since the P-value is large, the region classification, upper Kuttanad, lower Kuttanad and north Kuttanad region has no influence on the duration of the stay in the Kuttanad region.

9.5 % of the people in the Kuttanad region have been lived in between 0 and 2 years duration, 14 % of the people in the Kuttanad region have been lived in between 2 and 5 years duration, 44 % of the people in the Kuttanad region...
have been lived in between 5 and 8 years duration, and the remaining 32.5% of the people in the Kuttanad region have been lived more than 8 years.

4.38.1.11 The Nature of Change in Location of the Stay within Kuttanad Region

Chi-square test for independence of attributes is done to test whether there is any association between the region classifications namely, upper Kuttanad, lower Kuttanad and north Kuttanad region and the number of times change in location within the Kuttanad region.

Table 4.13: The Nature of Change in Location of the Stay within Kuttanad Region

<table>
<thead>
<tr>
<th></th>
<th>Nil</th>
<th>x=1</th>
<th>2≤x≤4</th>
<th>x≥5</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Kuttanad</td>
<td>40</td>
<td>48</td>
<td>36</td>
<td>16</td>
<td>140</td>
</tr>
<tr>
<td>Lower Kuttanad</td>
<td>32</td>
<td>56</td>
<td>36</td>
<td>16</td>
<td>140</td>
</tr>
<tr>
<td>North Kuttanad</td>
<td>28</td>
<td>44</td>
<td>36</td>
<td>12</td>
<td>120</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>148</td>
<td>108</td>
<td>44</td>
<td>400</td>
</tr>
</tbody>
</table>

Source: Survey * x- Here x denotes the location of stay in times.

The test statistic, $\chi^2 = 2.454943$

Degrees of freedom = 6

P-value = 0.873476

Since the P-value is large, the region classification, upper Kuttanad, lower Kuttanad and north Kuttanad region has no influence on the number of times of change in location within the Kuttanad region.
25% of the people in the Kuttanad region have not changed their location within Kuttanad region, 37% of the people in the Kuttanad region have changed their location once, 27% of the people in the Kuttanad region have changed their location in between 2 and 4 times and the remaining 11% of the people in the Kuttanad region have changed their location more than 5 times.

4.38.1.12 Reason for Change in Location

Chi-square test for independence of attributes is used to analyse whether the reason for change in location are significantly different in upper Kuttanad, lower Kuttanad and north Kuttanad region.

Table 4.14: Reason for Change in Location

<table>
<thead>
<tr>
<th></th>
<th>Flood</th>
<th>Lack of pure water</th>
<th>Diseases</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Kuttanad</td>
<td>52</td>
<td>20</td>
<td>28</td>
<td>100</td>
</tr>
<tr>
<td>Lower Kuttanad</td>
<td>44</td>
<td>32</td>
<td>32</td>
<td>108</td>
</tr>
<tr>
<td>North Kuttanad</td>
<td>52</td>
<td>20</td>
<td>20</td>
<td>92</td>
</tr>
<tr>
<td>Total</td>
<td>148</td>
<td>72</td>
<td>80</td>
<td>300</td>
</tr>
</tbody>
</table>

Source: Survey

The test statistic, $\chi^2 = 6.2728$

Degrees of freedom = 4

P-value = 0.179681

Since the P-value is large, the region classifications namely, upper Kuttanad, lower Kuttanad and north Kuttanad region has no influence on the reasons for change in location.
49.33% of the people change their location due to the flood in the Kuttanad region, 24% of the people change their location due to the lack of pure water in the Kuttanad region and 26.67% of the people change their location due to the diseases in the Kuttanad region.

The backwater resources are considered to be the reservoir of economic development. The growth and quality components have been continuously interacting and provide a multiplier effect in almost all economic endeavours. The life giving mechanisms of backwaters are to be harnessed. The fullest utilisation of existing infrastructure is a must for evading cultural seclusion and alienation in society. It is also essential to have a sound management policy with regard to the utilisation and distribution of resources as well as the preservation of backwater resources.