

Integrated Watershed Management Programme (IWMP)
Thrithala Block Panchayath, Palakkad Dist.



DETAILED PROJECT REPORT
IWMP - 3

Prepared by

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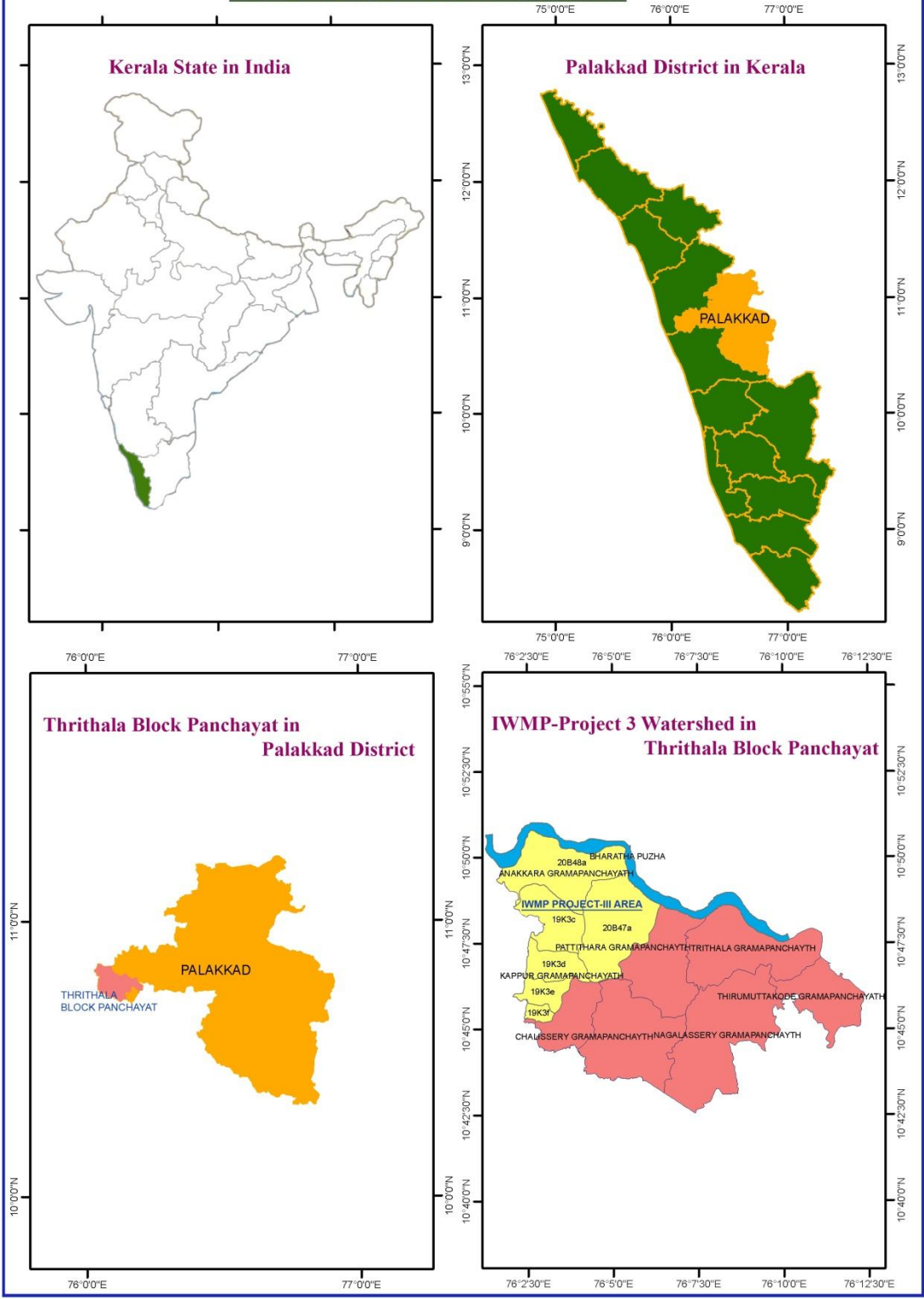
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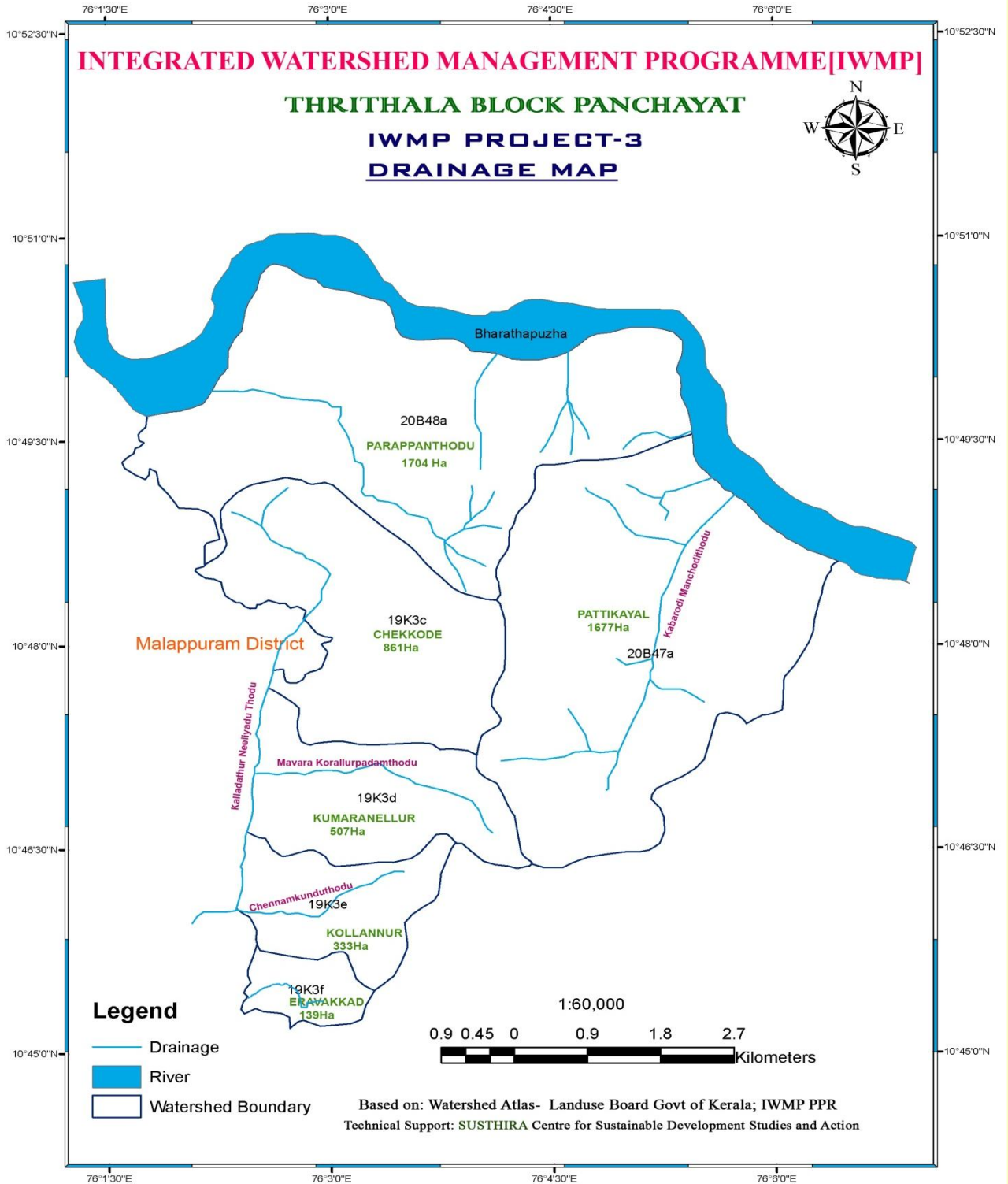
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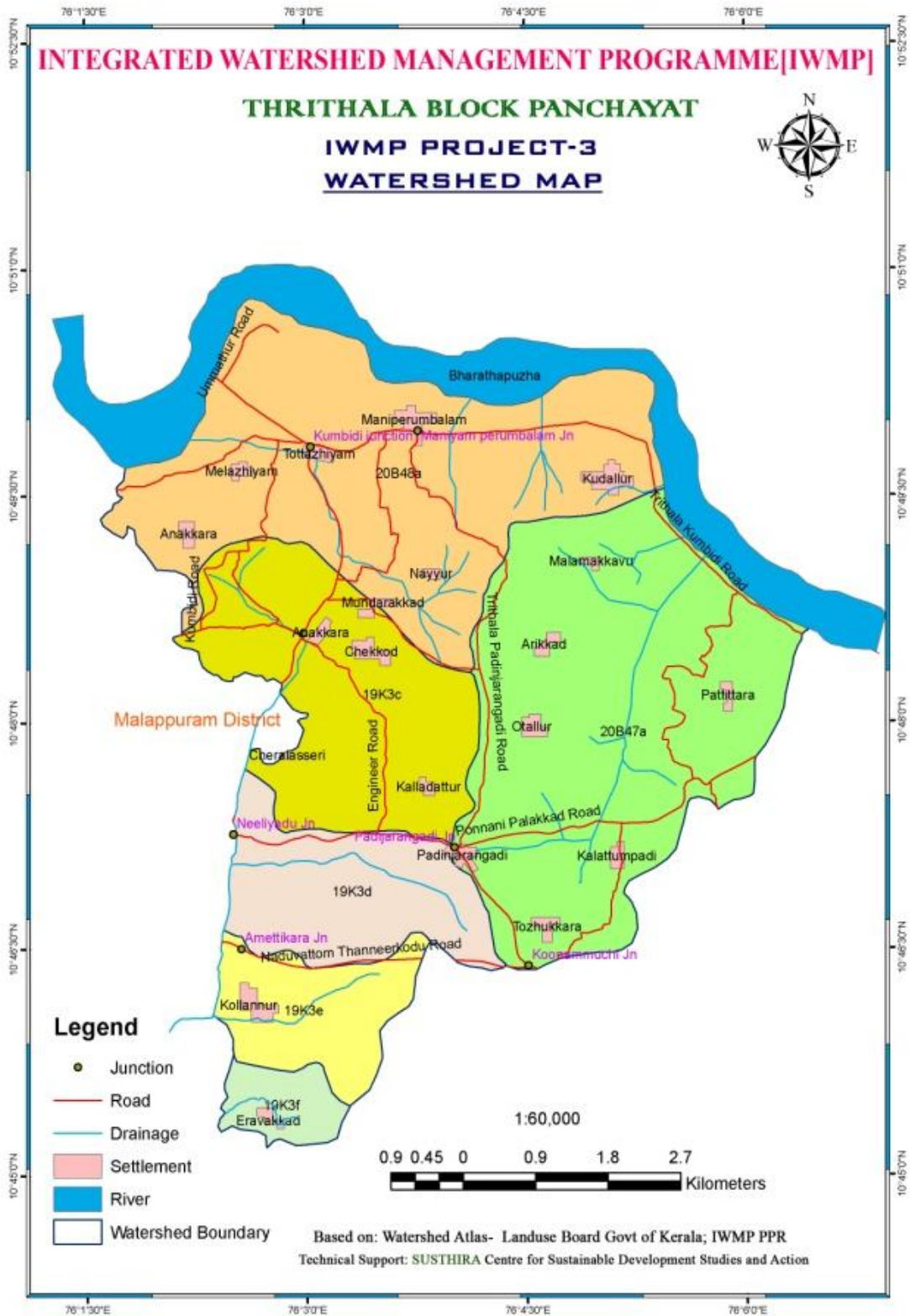
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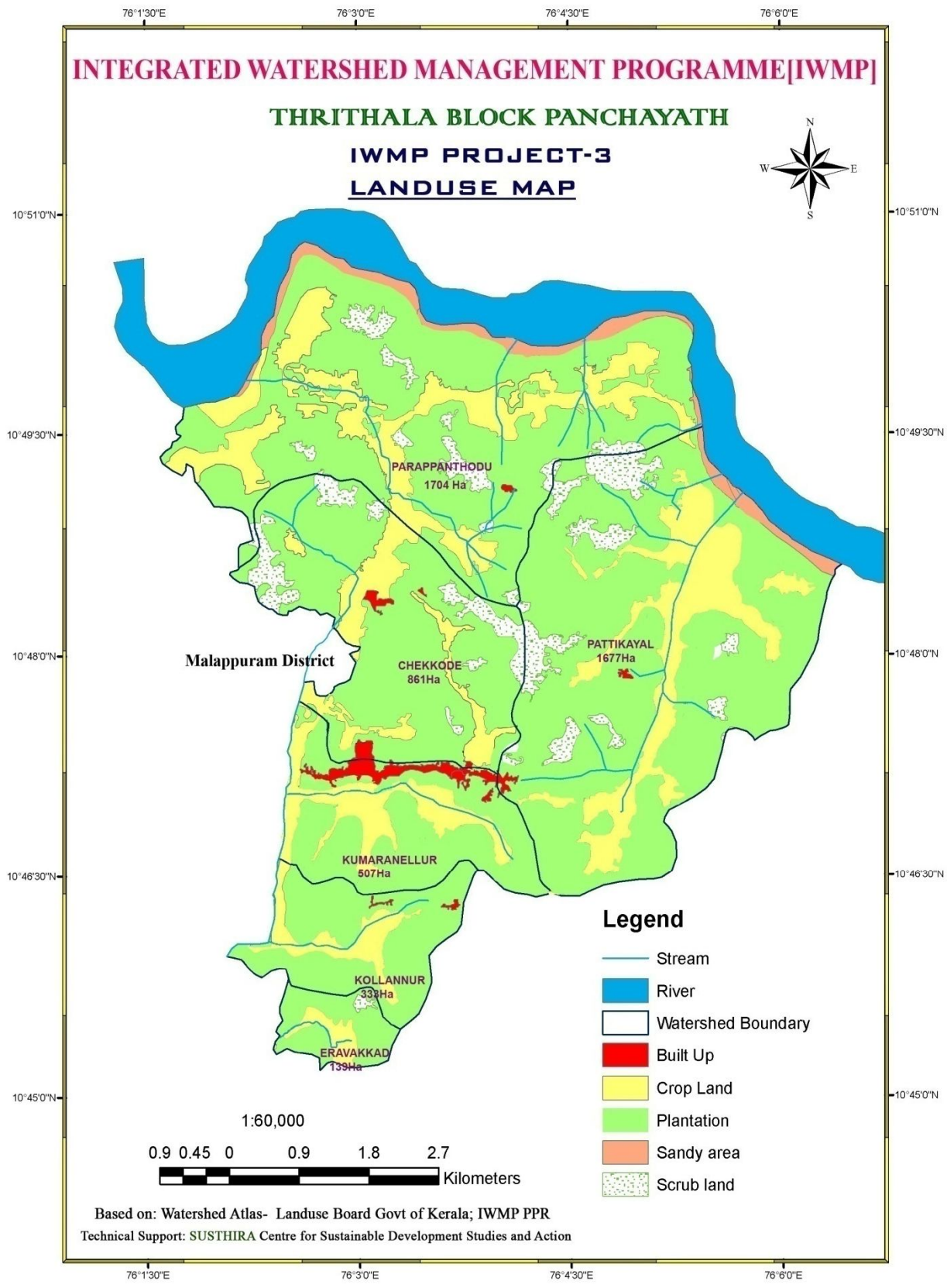


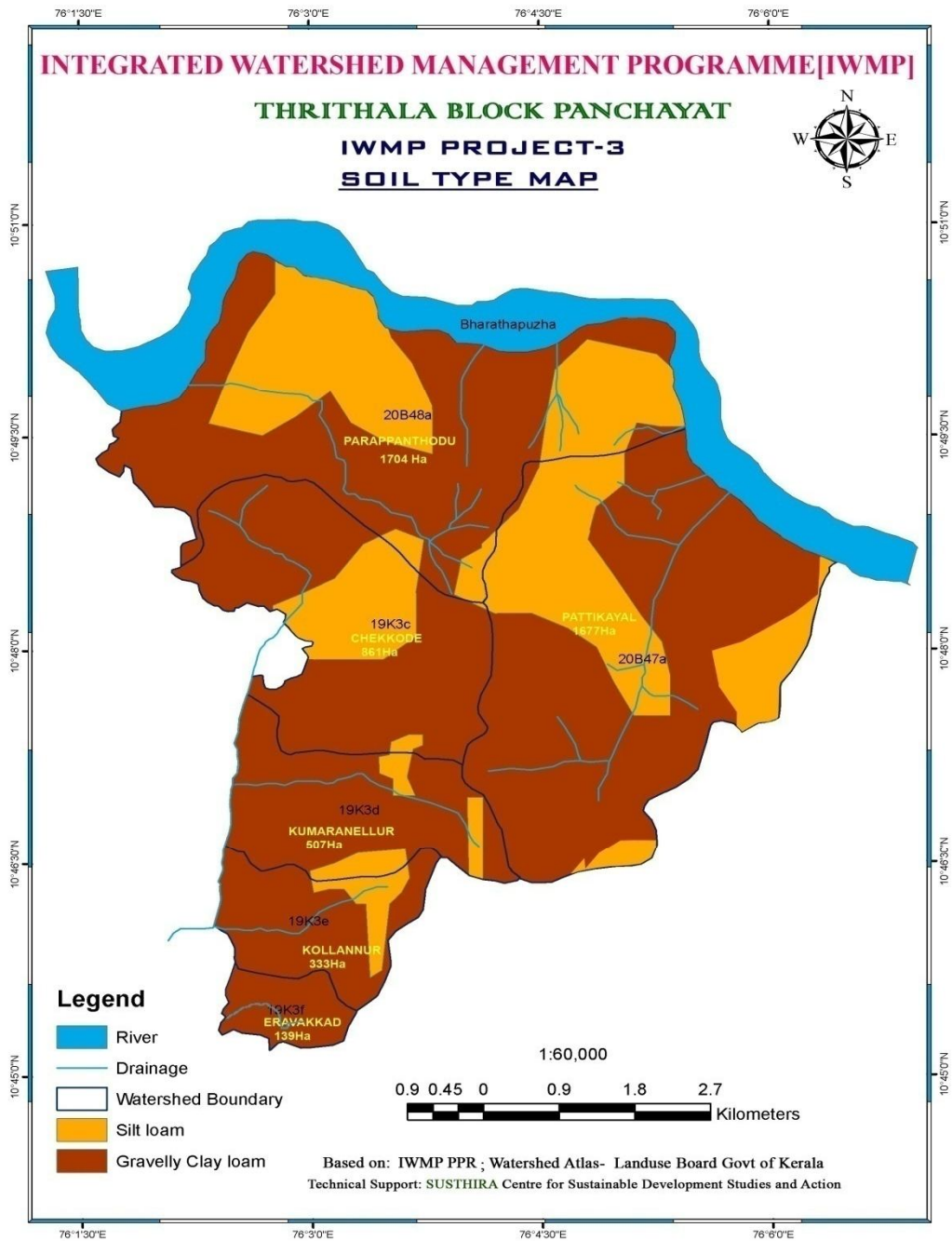
**INTEGRATED WATERSHED MANAGEMENT PROGRAMME[IWMP]
THRITHALA BLOCK PANCHAYAT
LOCATION MAP-IWMP PROJECT 3**











“Transforming Rural Lives”
DETAILED PROJECT REPORT
IWMP –III/2010-11– THRITHALA BLOCK PANCHAYAT

PART – I

1. Introduction

India is one of the major agricultural countries with more than 70% of the population depending on it. Indian agriculture is dependent on monsoon which is not uniform over the years. Nearly three fourth of the cultivable land in India is dependent on monsoon, which is contributing nearly 42% of the total production from agriculture. The productivity of any crops mainly depends upon two natural resources – Land and water, in addition to management practices. Therefore, the conservation of these two natural resources is essential for the sustainability of rainfed agriculture. This could be done using the watershed methods. The concept of watershed development is gaining importance over the years. While the focus of the programme may differ, the common theme amongst these programmes has been their basic objective of land and water resource management for sustainable production.

A watershed is an area of internal drainage above a common point of outlet. The size of the watershed is dependent on the topography of the area. It is bound on all sides by a divide or a ridge line. The watersheds are classified into mini watersheds and micro watersheds depending on the size. The basic components identified in the watershed development are the soil, water and biomass conservation, water resource development, agricultural productivity and most important being the people’s participation in the development interventions in the watershed.

The holistic watershed management programme helps in making the watershed dwellers capable of managing the natural resources for optimal benefits. The management of natural resources with understanding of scientific and technical aspects and with an idea of catering to the needs of the community always has positive impact on the socio-economic and environmental conditions of the community.

Village Watershed Committees and SHGs are formed and micro planning is done for individual families. Along with area treatment, improved agricultural practices, promotion of appropriate agro-horti systems, promotion of support activities like biogas; enterprises by women, agro service centres, etc., are promoted as part of integrated approach towards the programme. The activities are planned, implemented and managed by the community itself through village watershed committees and self help groups. These people’s organizations handle the responsibility of maintaining the area treatment and sustaining the activities initiated in the programme.

1.1. Integrated Watershed Management Programme (IWMP)

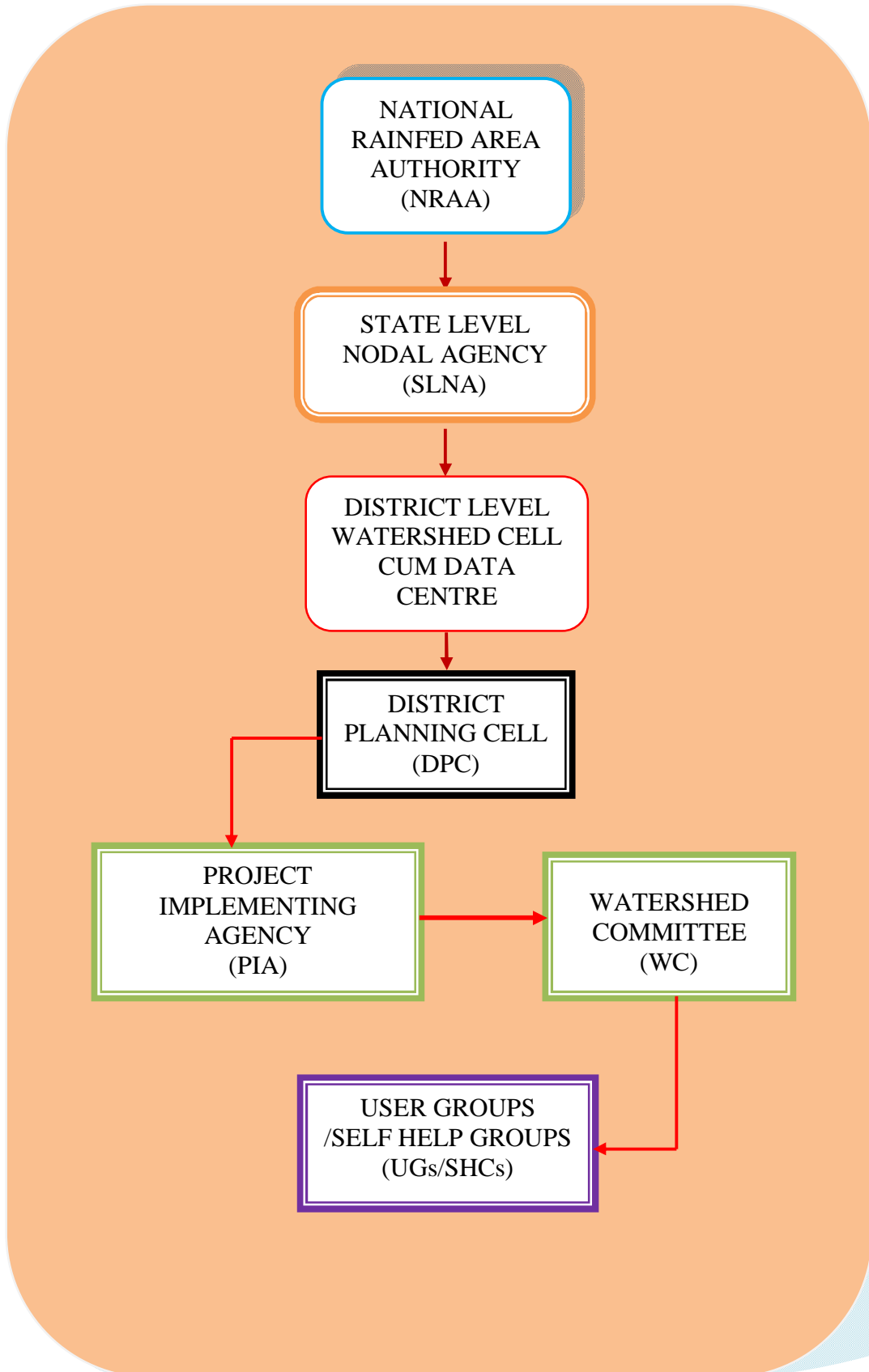
Natural resources play a special role in the life of the poor. People depend on fisheries, forests, and agriculture for employment. While all human societies are linked to ecological processes and healthy ecosystems that produce the requirements for life, rural poor people depend significantly more on natural capital than do other parts of the population. In the context of the view that poverty and natural resource has interaction poverty is sometimes seen as a source or “driver” of biodiversity loss and environmental degradation. **Integrated Watershed Management** is an important activity for development of rural community. It not only helps restore the quality of life of people but also enriches the land, vegetation and helps retain soil moisture in a sustainable manner. The main objectives of **Integrated Watershed Management Programme (IWMP)** are to restore the ecological balance by harnessing, conserving and developing degraded natural resources such as soil, vegetative cover and water. The outcomes are prevention of soil erosion, regeneration of natural vegetation, rain water harvesting and recharging of the ground water table. This enables multi-cropping and the introduction of diverse agro-based activities, which help to provide sustainable livelihoods to the people residing in the watershed area.

1.2. Organizational Setup

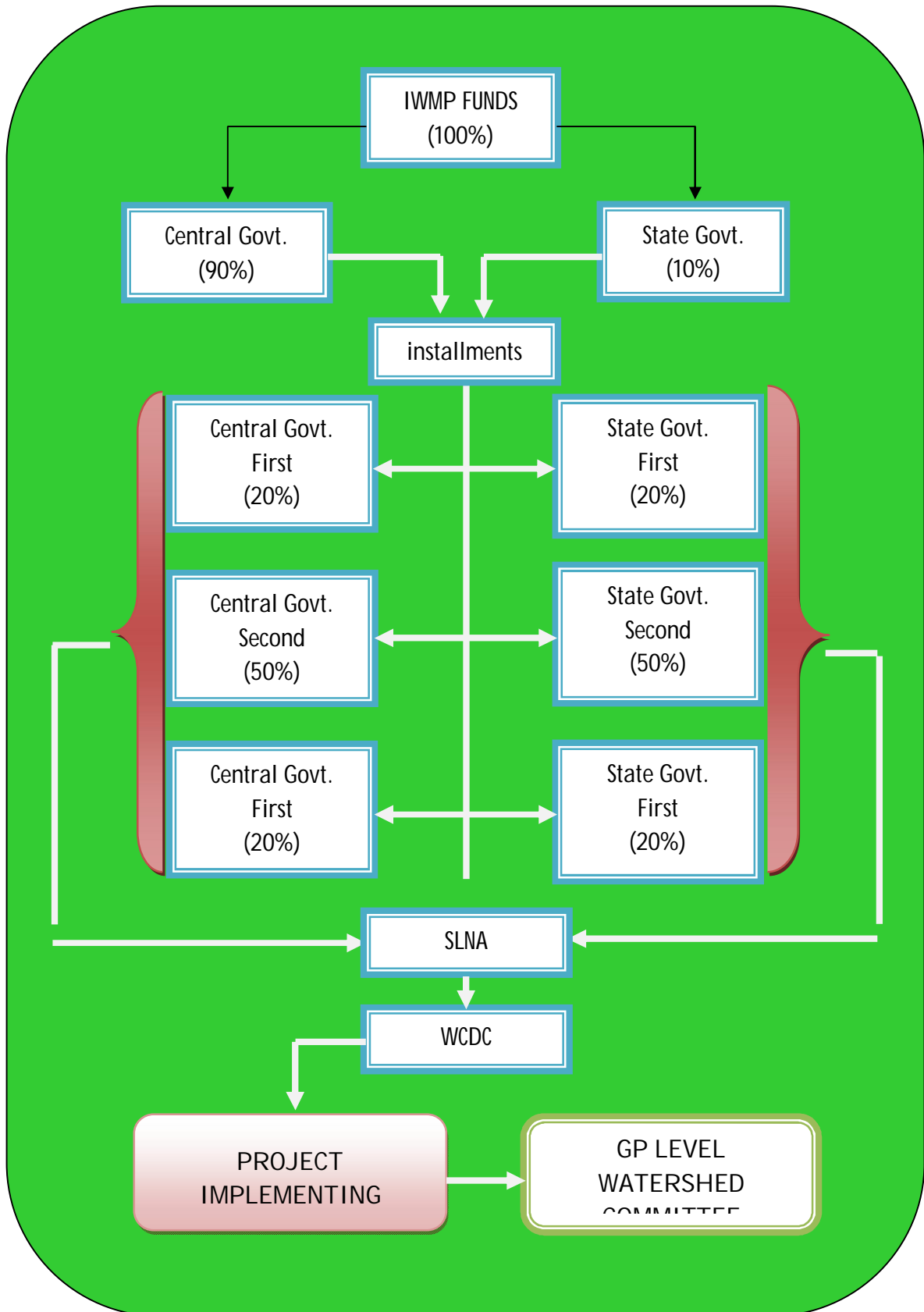
The following are the Institutional arrangements made for the effective implementation of IWMP Project:

1. State Level Nodal Agency (SLNA)
2. District Level Watershed Cell Cum Data Centre(WCDC)
3. Block Level Project Implementation Agency (PIA)
4. Technical Support Organization – to support PIA
5. GP Level Watershed Committees
6. Watershed Level Neighbourhood Groups – NHGs
7. Grass-root level User Groups and Self Help Groups

Flow Chart Showing Organizational Set-Up



1.3. Fund Flow



2. DISTRICT (PALAKKAD)

Palakkad is the land of Palmyrahs and Paddy fields. Along with Kuttanadu, Palakkad is a major Paddy growing area of the state. It is often called as the “Gateway of Kerala” The Sahya Ranges bordering the region and the 32 k.m. long gap in the mountains exert a dominant influence on the climate of the region. This Gap is known as “Palakkad Gap”.

3. BLOCK PANCHAYAT (THRITHALA)

Brief History

Thrithala is known for its historic ruins and monuments that date back to as early as the 9th or 10th century. Thrithala is famous for its Shiva temple that has an interesting story behind it. The Siva temple, probably built during the 9th and 10th century, marks the transition from the Chola to the Pandya style of architecture. According to a legend, the child Agnihotri was bathing in the river along with his mother. He heaped the sand in the form of a mound on a plate ('Thalam' in Malayalam). When the mother tried to remove the sand, she found that it has solidified in the form of a 'Siva Lingam'. Thus the deity is known as 'Thalathilappan', meaning God in a plate. The idol is said to have the constitution of sand. It is believed that the sharp bend in the river in the area was formed due to the river changing its course on its own, to give space for the temple to be built.

The population consists of mainly Muslims and Hindus. A large number of people are employed in the Arab countries, who have made the area prosperous by their remittances from abroad. Thrithala is well known for the excellent traditional Ayurvedic treatment. The Vaidyamadhom Hospital, situated at Mezathur, is the most famous of them. Another hospital is CNS Ayurveda Chikitsalayam, which specializes in the treatment of children.

Even though Thrithala is a part of Palakkad district, people prefer to go to Trissur town for their purchases due to its nearness compared to Palakkad town. Water for the needs of Guruvayur Municipality and the nearby Panchayats of Trissur district is pumped from Thrithala. There is a big pumping station at Thrithala with a storage tank at Kootanad. The *Paakkanaar Memorial* built in honour of a Pariah saint, stands near *Thrithala-Koottanad Road*. Thrithala is also the native place of renowned writer and social reformer, V. T. Bhattathiripad. "MT Vasudevan Nair" The great writer born in Kodallur, very near to Thrithala village and in Thrithala Block.

Location

Thrithala lies to the east of the district and is the smallest among all the blocks. Thrithala Block is in the Ottappalam Taluk of Palakkad District which consists of seven Grama Panchayats on the banks of the river Bharathapuzha. The total area of the Block Panchayat is 172 Sq. Kms., and is located at the east Longitude between 76°1'30" and 76°12'30" & north Latitude between 10°42'30" and 10°51'0"

Agriculture is the major economic activity and is also a source of employment. The net area sown is over 44 per cent of the geographical area. Paddy is the major crop in the block. The next important crop is arecanut. Presently, irrigation is available to more than 4,400 hectares. Industrially the block is backward.

The nearest Railway station to Thrithala is Pattambi, which is only 8 KMs away. Karipur Airport (Kozhikode International Airport) and Nedumbassery International Air Ports are almost at the same distance from Thrithala. Nearest places of Thrithala are Pattambi, Edappal, Koottanad, Kunnamkulam and Kuttipuram.

4. GRAMA PANCHAYATS INCLUDED IN THE IWMP

Except Thriumittakkode, all the six Grama Panchayats are included in the project area of Integrated Watershed Management Programme (IWMP). Given below is a brief description of the Panchayats coming under the project area.

The block Panchayat area is included in the Midland Agro-Climatic Zone and the height of the area is between 20 to 160 meters from MSL. The topography is undulating with medium sized hills and medium slopes in majority of the parts of the geographic area and a very small portion of the land is with steep slopes. Only in Nagalassery grama Panchayat there is a forest of the size of 71 Ha which is known as Kotharamanakkadu. Given below is a brief description of the Grama Panchayats included in Thrithala Block Panchayat.

1. Aanakkara

Aanakkara has a total geographic area of 20.96 Sq. Kms. The northern boundary of Aanakkara is Bharathapuzha and the southern is Kaapur and Pattithara Grama Panchayats. In its western side it is bounded by Malappuram District and in its eastern side by Pattithara

Grama Panchayats. The Palakkadu-Beyepore road believed to be constructed by Tippu Sulthan is passing through this Grama Panchayat. Aanakkara is the birth place of Shri. M. T. Vasudevan Nair. The Well known Dance artis, Mallika Sarabhai and Mrinalini Sarabhai are also belonging to this place. The famours historian Achyuthan Kudallur is also belongs to this place. Aanakkara Grama Panchayat came into existence on 11th November 1964.

Census 2001 says that The Grama Panchayat consists of 16 wards with a total population of 22601 out of which 10701 are men and 11900 are women. The population density is 957 and the sex ratio is 1082. The total literacy is 90.3. Roads are the main transporting system and the major roads that connect Aanakkara GP to the outside world are Kumbidi – Neeliyadu Road, Kumbidi – Thrithala Road, Kumbidi – Kuttippuram Road, Kumbidi – Edappal Road, Manniyam Perumbalam – Padinharangadi Road, Aanakkara – kalady Road and Aanakkara Engineer Road. All the important government institutions and offices are functioning at Kumbidy.

2. Kappur

The head quarters of the Grama Panchayat is functioning at Kumaranellur. The Grama Panchayat is spreaded over the Kappur village and has a total geographic area of 23.52 Sq. Kms. There are 17 wards in the Grama Panchayat. Though the GP was formed on 1962, the first board of members came only in 14964 January. The GP is bounded in its north by Aanakkara GP and in east by Pattithara &Chalissery GPs. In the South there is Chalissery & Aalamkode (Malappuram District) GPS and in its west there are Aanakkara, Aalamkode and Vattakkulam Grama Panchayats. Kappur is in the western tip of Palakkadu District which shares its boundary mainly by Malappuram District.

Geographically the area can be divided into hill plains, slopes, plains and paddy fields. On the slopes coconut is the main cultivation. Among the coconut, pepper is cultivated as a secondary crop. Rubber is slowly coming up to the place. Paddy fields are naturally cultivated with two crops Puncha and Mundakan. On the plains, arecanut, coconut, and plantain etc., are also cultivated. People are of the practice of cultivating tubers, pepper, vegetables etc. at a consistent but subsistent level

3. Pattithara

The total area of the Panchayat which is situated in Pattithara revenue village is 27.2 Sq. Kms. There are 18 wards in the Grama Panchayat and is bounded in its North by Aanakkara & Paradur GPs, in the south by Nagalassery & Chalissery GPs, in the east by Thrithala, Paradur & Nagalassery GPs and in the west by Kappur & Aanakkara GPs. The Panchayat came into existence on 1.1.1962. The panoramic view of the Panchayat was rich with rivers, streams, ponds and the land was very fertile. It was known for its agricultural produce from time immemorial. The land was owned by devaswoms and Brahmaswoms and later during the land reforms taken place in Kerala state had helped the farmers to occupy major part of

the fertile land. According to 2001 census, Pattithara has a total population of 26968 amongst which 12864 are men and the rest 14104 are women. A woman outwits men in the Grama Panchayat in number. The Sex Ratio is 1096. Total literacy is 87.61. Male literacy is 91.27 and female literacy is 84.35. The population density is 991.

As said earlier, Pattithara has rich traditional background in Agriculture. In earlier days, cultivation was mainly done depending upon the rain and irrigation from ponds and streams. The farmers were doing pucha very successfully by making use of the traditional wheels for transferring water from the streams and ponds to the paddy fields. They were using different varieties of seeds like – Muthira, Chama, Beans and Uzhunnu (Bengal Gram) etc. for cultivation besides paddy. The other major cultivation was coconut and arecanut and Pattithara was known for its arecanut which were marketed at Chalissery. Besides, farmers were cultivating, ginger, turmeric, yam etc. not for sale but for their own use. Now the land use pattern had changed very much. Some of the paddy fields have converted for Banana cultivation and the higher lands were cultivated by rubber.

5. General Features of the watershed Area **Criteria and weightage for selection of watershed**

S. No.	Criteria	Maximum score	Ranges & scores			
			Above 80 % (10)	80 to 50 % (7.5)	50 to 20 % (5)	Below 20 % (2.5)
i.	Poverty index (% of poor to population)	10	Above 80 % (10)	80 to 50 % (7.5)	50 to 20 % (5)	Below 20 % (2.5)
ii.	% of SC/ ST population	10	More than 40 % (10)	20 to 40 % (5)	Less than 20 % (3)	
iii.	Actual wages	5	Actual wages significantly lower than minimum wages (5)	Actual wages are equal to or higher than minimum wages (0)		
iv.	% of small and marginal farmers	10	More than 80 % (10)	50 to 80 % (5)	Less than 50 % (3)	
v.	Ground water status	5	Over exploited (5)	Critical (3)	Sub critical (2)	Safe (0)
vi.	Moisture index/ DPAP/ DDP Block	15	-66.7 & below (15) DDP Block	-33.3 to -66.6 (10) DPAP Block	0 to -33.2 (0) Non DPAP/ DDP Block	
vii.	Area under rain-fed agriculture	15	More than 90 % (15)	80 to 90 % (10)	70 to 80% (5)	Above 70 % (Reject)
viii.	Drinking water	10	No source (10)	Problematic village (7.5)	Partially covered (5)	Fully covered (0)
ix.	Degraded land	15	High – above 20 % (15)	Medium – 10 to 20 % (10)	Low- less than 10 % of TGA (5)	
x.	Productivity potential of the land	15	Lands with low production &	Lands with moderate production &	Lands with high production &	

			where productivity can be significantly enhanced with reasonable efforts (15)	where productivity can be enhanced with reasonable efforts (10)	where productivity can be marginally enhanced with reasonable efforts (5)	
xi.	Contiguity to another watershed that has already been developed/ treated	10	Contiguous to previously treated watershed & contiguity within the micro watersheds in the project (10)	Contiguity within the Micro watersheds in the project but non contiguous to previously treated watershed (5)	Neither contiguous to previously treated watershed nor contiguity within the micro watersheds in the project (0)	
xii.	Cluster approach in the plains (more than one contiguous micro-watersheds in the project)	15	Above 6 micro-watersheds in cluster (15)	4 to 6 micro watersheds in cluster (10)	2 to 4 micro watersheds in cluster (5)	
xiii.	Cluster approach in the hills (more than one contiguous micro-watersheds in the project)	15	Above 5 micro-watersheds in cluster (15)	3 to 5 micro watersheds in cluster (10)	2 to 3 micro watersheds in cluster (5)	
	Total	150	150	90	41	2.5

According to the above criteria, the weightage obtained for the watersheds in Thrithala Block Panchayat selected for treatment under IWMP is tabled below:

Sl. No.	Watershed	Poverty Index	% of SC/ST Population	% of Small & Marginal Farmers	Ground Waters Status	Rain-fed Area	Drinking Water	Degraded Land	Contiguity	Cluster Approach	Total
1.	19K3c	5	3	10	3	15	7.5	5	0	10	59
2.	19K3d	5	3	10	3	15	7.5	0	10	10	64
3.	19K3e	5	3	10	3	15	7.5	5	10	10	69
4.	19K3f	5	3	10	3	15	7.5	0	10	10	64
5.	20B47a	5	5	10	0	15	7.5	5	0	10	58
6.	20B48a	5	5	10	2	15	7.5	10	0	10	65
7.	19K7b	5	3	10	3	15	7.5	5	10	15	74
8.	19K7c	5	3	10	3	15	7.5	5	0	15	64
9.	19K7d	5	3	10	3	15	7.5	0	10	15	69
10.	20B46a	5	5	10	2	15	7.5	5	0	15	65
11.	19K8a	5	3	10	3	15	7.5	5	0	15	64
12.	20B20a	5	3	10	5	15	7.5	10	0	15	71
13.	19K10a	5	3	10	3	15	7.5	0	0	15	59
Grand Total		65	45	130	36	195	97.5	55	50	165	845

5.1. Physiography, Relief & Drainage

The physiographic condition of a region refers to the sculptures on the natural landscape and ongoing changes by several natural processes of geomorphic agents like water, glacier, wind etc. Many of these agents are controlled by the prevalent climatic conditions of the region and the internal dynamic functional mechanism of the earth system. Therefore for any watershed management project, the study of physiographic condition of the watershed is very crucial as it has a strong control on water availability and sediment load supplied to the drainage system. A major land resource area is a broad geographic area that has a distinct combination of climate, topography, vegetation, land use, and general type of farming.

Thrithala block is a small area with a total geographic extension of 139.85 Sq. Kms. Based on the physical features, Palakkadu district is divided into two natural divisions-midland and highland. The midland region consists of valleys and plains. Thrithala block in Ottappalam taluk lies completely in the midland region with altitude type I, rainfall type I & II, topography model IIa and soil type laterite. There is no low land or very high lands in Thrithala Block. (*Courtesy: Kerala State Land Use Board*). The midland forms an area of gently undulating topography with hillocks and mounds. Laterite capping is commonly noticeable on the top of these hillocks. The low, flattopped hillocks forming the laterite plateau range in altitude from 30-200m and are observed between coastal low-land and the foothills.

The watershed area is mainly drained by Bharathapuzha (Nila) and Kanhirakkunnu River and by their tributaries. Besides this, there a number of (about14) small and large streams in the watershed boundary of Thrithala Block. The list is given below:

- | | |
|----------------------------------|----------------------------------|
| 1. Parappan Thodu | 8. Kavukattu-Ottakkalikkal Thodu |
| 2. Kalladathur-Neeliyad Thodu | 9. Muttippalam Thodu |
| 3. Padamthodu | 10. Alikkara Thodu |
| 4. Mullankunnu-Kundippadam Thodu | 11. Kannanur Thodu |
| 5. Chenamkundu Thodu | 12. Puliappattakkayal |
| 6. Kokkattithodu | 13. Kabarodi-Manchodi Thodu |
| 7. Kunupadam Thodu | 14. Koombra Thodu |

5.2.Rainfall

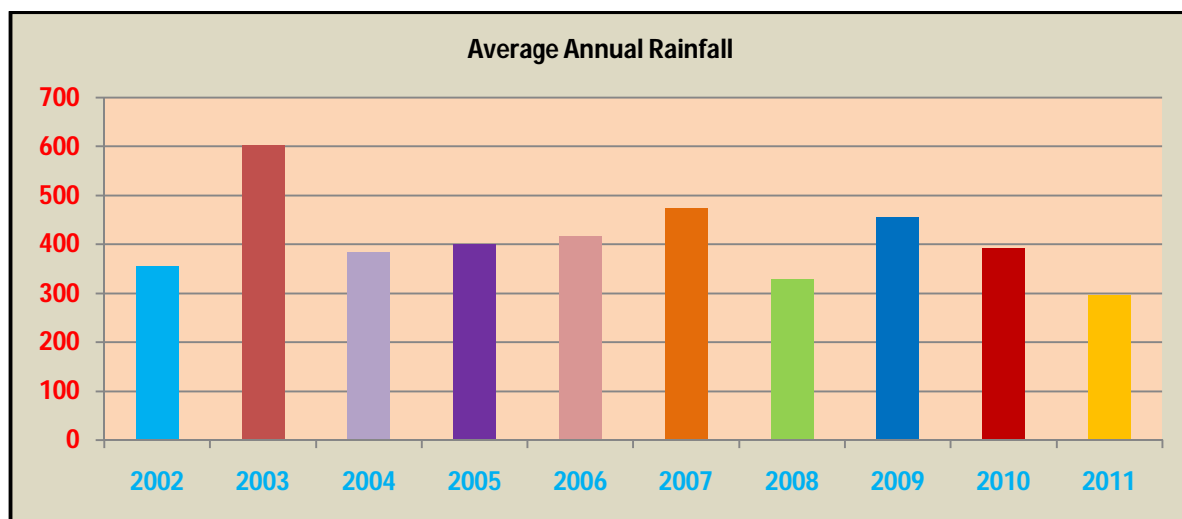
The Block receives maximum rainfall during the south west monsoon followed by the north east monsoon. The other months receive considerably less rainfall. The temperature is pleasant from December to February. The annual rainfall varies from 1757.6 to 2849.5 mm based on long term normal .The Thrithala Block receives on an average 2348 mm of rainfall annually. Major rainfall is received during June to September in the southwest monsoon (71%). The northeast monsoon contributes about 18%. The last 10 years of data is presented below and in Figure.

Rainfall Data (CMs)

Year & Month	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
January	0	0	0	21	0	0	0	0	0	0
February	51.6	90.6	0	45	0	0	46.9	0	0	20
March	0	62.6	4.1	0	36.1	0	117.5	141.9	0	21
April	155.3	182.4	105	238.3	16.7	53.9	13.6	52.5	114.5	172.2
May	142	19.8	463.3	101.4	369.6	184.8	73.2	158.6	130.5	108.4
June	791.2	503.6	729.7	567.6	688.4	728.4	533.1	378.9	681.2	759
July	497.8	403.6	347.1	736.6	470.4	1307.5	322.7	1076.2	572.5	456.9
Aug	225.8	232.4	486.7	271.8	426.7	483	175.1	286.5	273.4	0
Sep	162.5	81	122.2	453.7	500.6	629	302	294.8	174.1	0
Oct	239.8	3584.6	305.2	121.1	352.9	247.4	345.7	760	430.9	0
Nov	0	44.8	42.8	126.2	133.9	34.4	7.6	262.8	245.1	0
Dec	0	19.2	0	112.9	0	6	0	28.8	70.5	0
Average	355.58	602.3	384.18	400.05	416.78	473.45	328.78	454.17	391.90	295.71

Source: RARS - Pattambi

Figure: Average Rainfall variations (2000-2010)

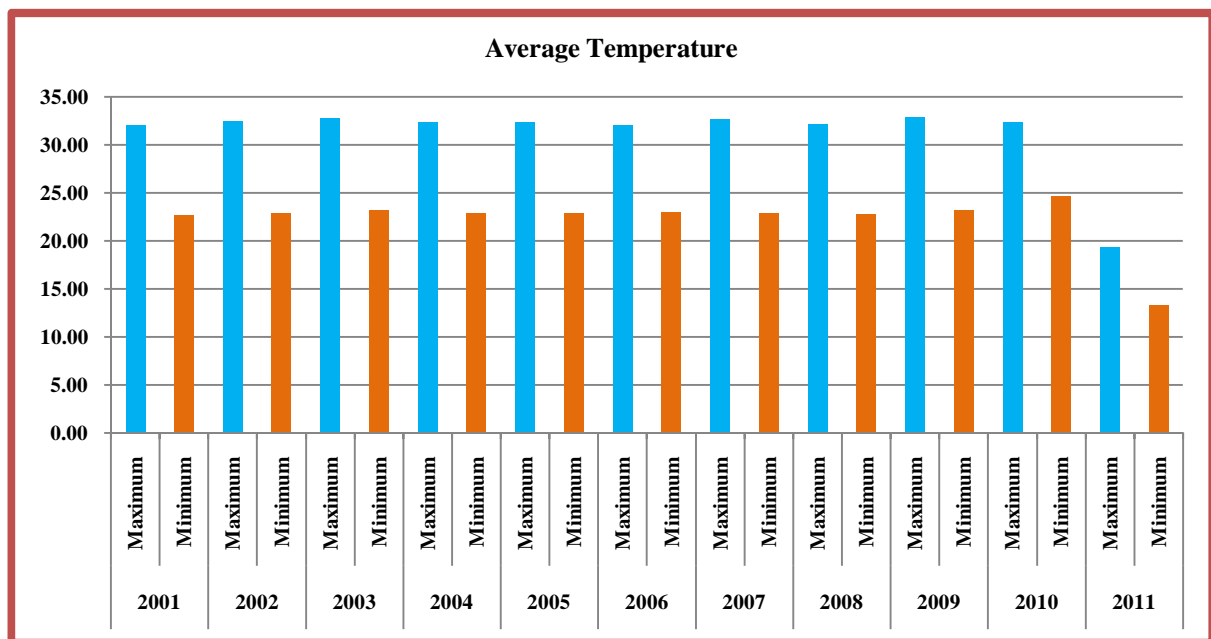


The climate is hot and humid for most part of the year. There is sufficient rainfall. The district is blessed with many small and medium rivers, which are tributaries of the Bharathapuzha River. Based on climatic classifications Thrithala Block experiences humid type of climate. The climate of the watershed has no difference from that of the whole district which is tropical. During dry weather, hot winds blow from the plains of Coimbatore through the Palakkad gap. Maximum & Minimum Temperature of the area is tabulated below:

5.3. Temperature Data

Month Year	M/M	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2001	Maximum	33.1	34.2	35.2	34.5	33	29.4	29.3	29.5	31.6	31.1	31.8	31.9
	Minimum	21.1	22.1	23.2	24.2	23.7	22.8	22.5	23.3	23.3	23.2	22.6	20.7
2002	Maximum	33.1	34.2	37	35.6	33.6	30.1	30.1	28.8	31.5	31.2	31.9	32.9
	Minimum	21.2	21.6	23.8	24.8	24.3	22.6	23.4	23.3	23.2	23.7	23.2	19.7
2003	Maximum	33.5	34.8	35.2	37.8	33.7	31.3	29.5	30.2	31.1	31.3	31.9	32.6
	Minimum	21	22.8	23.9	24.5	25.7	24	23.4	23.8	23.2	23.6	22.5	20.4
2004	Maximum	33.6	35.2	36.3	37.8	30.3	29.7	29.3	29.3	30.9	31.3	32	32.9
	Minimum	20.8	21.3	23.7	25.1	24.2	23.3	23.3	23.2	23.5	23.2	22.3	20.9
2005	Maximum	33.9	35.5	36.3	34	34.1	30.6	29	30	29.8	31.1	31.5	32.2
	Minimum	20.7	20.9	23.7	24.3	24.6	23.7	23.3	23.1	23.4	23.5	22.5	20.9
2006	Maximum	33.5	35.1	33.3	35.2	33.1	30.3	29.3	30.1	30	31	31.4	32.1
	Minimum	21	20.5	23.3	24.5	24.8	24	23.5	23.5	23.4	23.5	23.2	21.1
2007	Maximum	33.1	39.8	36.5	36.4	34	30.3	28.5	29.6	29.4	30.3	32.1	32.1
	Minimum	20.2	20.6	23.8	24.7	24.7	24.1	23.4	23.4	23.6	23.2	21.6	21.1
2008	Maximum	32.7	34.5	33.9	34.1	33.9	30.3	29.6	30.1	30.4	31.8	32.5	32.3
	Minimum	19.6	21.6	22.1	24.8	24.9	23.8	23.7	23.4	23.6	23.3	21.6	21.1
2009	Maximum	33.3	33.9	35.6	39.6	33.4	31	28.9	30.7	30.4	32.2	32.1	32.8
	Minimum	19.9	20.8	23.7	24.8	24.3	23.7	22.9	22.9	23.7	23.8	23.8	23.4
2010	Maximum	33.7	35.7	37.1	35.7	33.9	30.8	29.3	29.4	30.7	30.3	30.7	31
	Minimum	21.4	22.9	24.2	25.3	25.7	24.2	35	23.6	25.6	23.4	23.1	21.1
2011	Maximum	33.1	35.8	35.6	34.5	33.7	29.8	29.4					
	Minimum	20.8	19.8	23.2	24.3	24.7	23.8	23.3					

Source: RARS - Pattambi



5.4. Geology

Thrithala Block Panchayat is situated in Ottappalam Taluk of Palakkadu District which is exclusively in the midland portion. Geologically the area can be divided into three, small hills, slopes and plains. The elevation of the landforms varies from 20 to 120 meters MSL. Most part of the Block consists of alluvial sandy soil and some part is with laterite soil (red soil mixed with pebbles). The classification of the land can be as follows: Low lying terrains, moderately undulating midland terrain and comparatively high undulating terrain.

The land is underlain by Archaean metamorphic complex. They include the granulites group, the gneisses and the schist. Intrusives of pegmatites and quartz veins are also common. The general geologic succession encountered in the area is given below. (SOURCE: CGWB)

Recent	Top soil, valley fill and riverine alluvium
Sub-recent	Laterite
Archaean	Pegmatite, quartz vein, dolerite, gabbro, Granites, quartz-mica schist, hornblende biotitic gneiss, ultramafics, charnockite, khondalites and calc-granulites.

The Archaean crystallines are the major rock types encountered in the area. This includes Charnockites, khondalites, calc-granulites, hornblende gneiss, migmatites and gneisses.

5.5.Groundwater Scenario

Groundwater occurs in all the geological formation from Archaean crystalline (hard rock) to recent alluvium (soft rock). Groundwater occurs in phreatic condition in the laterite, alluvium and weathered crystallines. It is in semi confined to confined condition in the deep fractured rocks. Valley fills are noticed along the valley portion and along the river terraces/banks. These are mainly seen in Thrithala blocks along with Mannarghat, Ottapalam and Pattambi. The water level ranges from 2- 12 m bgl (premonsoon) and 1- 6 m bgl (post monsoon). The fluctuation is generally high up to 5 m. The yield of dug well ranges from 5 to 20 m³/ day.

The laterite province is limited in extent, as noticed in Thrithala block. The water level ranges from 4 to 11.0 mbgl during pre monsoon and post monsoon water level ranges from 3 to 8 m mbgl. The fluctuation between pre and post monsoon varies between 2 to 6 m. The yield ranges from 5 to 30 m³/ day. In these areas the extraction is less. The specific capacity ranges from 10- 125 l/min/mdd. (*Courtesy: Central Ground Water Board*)

The groundwater assessment was done block wise by Central Ground Water Board using GEC-1997 methodology and is computed based on the data as on March 2004. The assessment on Thrithala Block is shown below in a tabular format.

Comparison of gross draft for all uses of 1999 with 2004

Name of Block	Net annual Ground water Availability (MCM)	Existing gross ground water draft for irrigation (MCM)		Existing gross ground water draft for domestic & industrial works supply (MCM)		Existing gross ground water draft for all uses (MCM)	
		As on 31.03.99	As on 31.03.04	As on 31.03.99	As on 31.03.04	As on 31.03.99	As on 31.03.04
Thrithala	28.12	13.81	14.24	6.67	6.88	20.48	21.12

Details of categorization for ground water development done by the board as on 31.03.2004 shows that there is a significant decline of pre-monsoon and post monsoon water table levels in Thrithala block and the Block is categorized “critical” for the future ground water development. The Board recommends that large scale ground water development schemes need to be restricted in Thrithala Block. Another finding of the Board is that Thrithala Block, especially Kappur, Aanakkara and Thrithala Villages are water scares.

5.6. Water Supply and Irrigation

The major irrigation cum water supply scheme is the Regulator cum bridge at Thrithala built on the Velliyankallu Bridge. The main objective of the regulator is drinking water supply. The shutter height of the regulator is 5 m and it can contain a huge quantity of water. This irrigation cum drinking water supply scheme is to provide irrigation facilities to 3997 ha.(gross) in Ottappalam Taluk, drinking water facilities to Kunnamkulam, Chavakkad and Guruvayoor Municipalities and 18 panchayats in the project area and to connect the Kozhikode-Guruvayoor road which would help to reduce the distance by 11 KM.

5.7. Socio-Economic Details

As in any other part of the State, the social and economic status of the people in the district is undergoing changes. The breaking up of the joint family system and the increasing partition of old *tharavads* has led to the disappearance of the importance of high-caste Hindus in the society. A survey of the social and economic scene shows that the values based on caste and land have been replaced in recent times by those of education, employment, trade, commerce and industry. Thrithala Block is not different from this general situation of the district.

Thrithala Block is predominantly known for its agrarian economy. However, the low agricultural wage rate, decline in the area under paddy cultivation, rising operational cost of farming, fall in yield per acre, issues related to collection and storage of produce, uneconomical returns, mechanization of operations, etc. prevailing in the area need a closer look in the context of the launching the IWMP.

As the Block has an agrarian economy a good number of people are indulged in agriculture and related jobs. Almost all the families depend on paddy fields, coconut estates and

areacanut orchards for their daily life. 100 % of people are literate. Muslims and Hindus reside here in an almost equal number.

5.8. Population details

Population Details	data	Population Projected on the Basis of Census 2001 All Communities
Male (Scheduled Castes)	15146	13
Male (Scheduled Tribes)	07	11
Male (Others)	63255	86805
Total Male	78408	86829
Female (Scheduled Castes)	15846	17270
Female (Scheduled Tribes)	6	13
Female (Others)	69996	96329
Total Female	85846	113612
Scheduled Castes Total	30990	17283
Scheduled Tribes Total	13	24
Others Total	133251	183134
Grand Total	164254	383575
Population Density	954	-
Sex Ratio	1095	-
Total literacy	87.49	-
Literacy (Male)	91.36	-
Literacy (Female)	84.04	-

The population consists of mainly Muslims and Hindus. A large number of people are employed in the Arab countries, who have made the area prosperous by their remittances from abroad.

5.9. Educational Institutions

Thrithala Block has adequate number of educational institutions to provide basic education as well as Higher Secondary education. The educational institutions play an important role in moulding the new generation in their growth and development. The government had taken enough steps to improve the educational system in the state and as a part of the policy the educational institutions are entitled to provide adequate modern facilities including IT in the institutions. A latest Detail of Total Schools is given below:

THRITHALA	School	LP Only	UP Only	LP attached UP	LP attached HS	UP attached HS	HS only	Total

	Govt.	21	0	4	2	5	1	33
	Aided	21	1	8	0	2	1	33
	Unaided	2	0	0	1	0	0	3
Total		44	1	12	3	7	2	69

5.10. Medical Institutions

- Royal Dental collage, Iron Hills, Chalissery
- Vaidyamadom Vaidyasala & Nursing Home, Mezhathur
- CNS Ayurveda Chikitsalayam, Mezhathur
- Govt. Hospital Thrithala

5.11. Transport & Communication

The main transportation is through the roads. Conveyance is available throughout the block Panchayat through roads. Bus service is available from all the important places within the block area which connects to major townships like Ottappalam, Palakkadu, and Thrissur. Train service is also available from Pattambi Railway Station which is only 9 Kms. away from the Block Head Quarters. The important road that pass through the Block Panchayat are Pattambi – Guruvayoor Road, Palakkadu-Ponnani Road, Thrithala – Kottanadu Road and Ponnani – Guruvayoor Road. Another important road is Thrithala – Chalissery Road

5.12. Credit Facilities

Thrithala block is rich with the presence of State Bank of India and its subsidiaries along with branches of Nationalized Banks. There are scheduled banks also in the Block limit. All the banks in the Public and private sector including Cooperative sector are beneficial to the populace and in fact the banks are competing each other to provide credit facilities to the people. Details of banks in the Block are tabled below:

Sl. No.	Type of Banks	Number
1.	State Bank of India	2
2.	Scheduled Banks	3
3.	Nationalized Commercial banks	5
4.	Branches of District Cooperative Bank	2
5.	Service Cooperative Banks/Credit Sanghoms	7
Total		19

Courtesy: Panchayat Level Statistics 2001, Department of Economics & Statistics, Thiruvananthapuram

5.13. Recreation Facilities

PRANAVAM Arts and Sports Club is the premier association for connecting the people of Thrithala Block. The institution stands for fostering community spirit, connecting with the cultural heritage and providing a forum for social service to the human. Main activities are focused in the areas of Arts, Sports, Social Services and Charity.

Thrithala is famed for its Shiva temple. Kattilmadom temple on the Pattambi-Guruvayoor road has archaeological importance. The small granite structure, a testimony of Buddhist influence, built probably during the 9th or 10th century. In Aanakkara Grama Panchayat the Nayyur arts & sports club, Priyadarshini Arts & Sports Club and Chaithanya Arts & Sports Club are some of the means of recreation for the people in the concerned Grama Panchayat. In Malamakkavu, Priyadarshini arts & sports club is a major recreation centre. The cultural centre at Kumbidi is also contributes to its part to build up the culture of the people. Other centres are: Prathibha Youth Club in Mamalakkavu, Chandrodayam Reading Room & Library, Arunodayam Reading Room & Library in Kudallur, and Yuvashakthi Reading Room & Library in Panniyur. The festivals and traditional celebrations are all opportunities for the people in Thrithala Block for their recreations

5.14. Wage Rate

In order to ensure comparability, the term 'Wage Rate', has been defined as the sum of basic wage and dearness allowance in respect of workers who receive both these components, while for other workers the actual consolidated amount of earnings represent wage rate. The wage rates were collected for all the occupations. The monthly, fortnightly or weekly wages actually paid are divided by the actual number of mandays worked to arrive at the daily wage rates.

From reliable sources and from interview with the farmers at the time of PRA (FGD and Economic Ranking) it was revealed that the Maximum wages for male workers ranges from Rs. 150 – 180 and for that of the female is Rs.80 – 100/- per day.

5.15. Land Use

The details of the Land use in watershed area in the Thrithala Block Panchayat covered by Integrated Watershed Management Programme – IWMP is shown below in a tabular format

Watershed Identification	Total Area	Forest	Water Bodies	Built Up Area	Area under crops	Cultivable waste	Treatable area
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Thrithala II	5221	Nil	24.95	25.00	4635.05	536	5221
Total	5221	Nil	24.95	25	4635.05	536	5221

5.16. Animal Husbandry

Observations and study of statistics disclosed that People in Thrithala Block are interestingly taking up animal husbandry as one of the subsidiary income source as well as a supplementing venture that foster their agriculture. Data available according to “Panchayat Level Statistics 2001, Dept of E&S, GoK, the details of Animal Husbandry (livestock) in the Block Panchayat is given below:

Sl. No.	Particulars	Number
1.	Hybrid Variety Cattle (Male)	816
2.	Hybrid Variety Cattle (Female)	859
3.	Traditional Male (Breed not known)	696
4.	Traditional female (Breed not known)	7705
5.	He - Buffalo	553
6.	She - Buffalo	78
7.	He-Goat	3622
8.	She-Goat	10097
9.	Pigs	22
10.	Domestic Dogs	3924
11.	Fowl (Indigenous Variety)	19498
12.	Fowl (Hybrid Variety)	421
13.	Duck	18
14.	No. of Milk Societies	7
15.	No. of Butcher Shops	9
Courtesy: Panchayat Level Statistics 2001, Department of Economics & Statistics, Thiruvananthapuram		

5.17. Soils

The soil of Palakkad district is mainly of four types, namely, peaty (Kari), laterite, forest and black. Peaty soil is found only in Thrithala block of Ottappalam taluk. Laterite is also seen in the major portions of Thrithala, especially in the midlands. Laterite is typical kaolinitic weathering products of gneissic and granitic rocks developed under humid tropical conditions. Heavy rainfall and high temperature prevalent in the area are conducive to the process of laterisation. The surface soil, which is reddish brown to yellowish red, is mostly gravelly loam to gravelly clay loam in texture. The profiles have well-developed B-horizon with abundant ferruginous and quartz gravels. The plinthite is characterized by a compact

vesicular mass below the B-horizon, composed essentially of a mixture of hydrated oxides of iron and aluminum. The plinthite includes quarriable type that breaks into blocks and also non-quarriable type that breaks into irregular lumps. Laterites are in general poor in available nitrogen, phosphorus and potassium and are low in the bases. They have poor water-holding capacity, CEC and high P fixing capacity with low organic matter content. They are generally acidic with pH ranging from 4.5 to 6.2. Laterite cover about 65 per cent of the total area of the watershed, occupying a major portion of the midland and mid-upland regions and are the most extensive of the soil groups found in Thrithala Block Panchayat area. (*Source: CGWB*)

Generally very deep moderately drained clayey soils in nearly level narrow valleys with slight erosion associated with very deep imperfectly drained clayey soils are found in some areas of the watershed. On gently sloping midland very deep, well drained gravelly clay soils associated with well drained clayey soils with coherent materials. The nature of the land is undulating with small hills, valleys and plains. The hills are not too high nor are the valleys too steep. The slopes are moderate and are used for cash crops cultivation. Very deep, very poorly drained Clayey soil in nearly level broad valleys associated with very deep imperfectly drained clayey soils are found in the watershed area. Another type of soil found in the watershed is very deep well drained gravelly clay soils associated with deep well drained clayey soil with coherent materials (*Source: PRA & Direct Observation*)

5.18. Problems of Special Mention

Healthy soils are essential for the production of crops used to feed humans and livestock. In addition to providing a stable base to support plant roots, soils store water and nutrients required for plant growth. Unfortunately, industrial agriculture (agri-business) practices continue to damage and deplete this valuable natural resource. While intensive plowing and mono-crop agriculture systems have caused nutrient depletion and wide-scale soil erosion, over-application of fertilizers and pesticides have contaminated the soils and polluted the waterways.

Soil erosion is one of the most important issues in all the watersheds. The rate of erosion is highest when soil is not covered by a protective layer of plants or decaying organic matter. Industrial farmland (Cash Crop Land) is particularly susceptible to erosion due to intensive tillage (plowing), which eliminates protective ground cover from the soil surface and destroys root systems that help hold soil together. Many parts of the individual watershed is converted to rubber plantations and banana cultivation and top soil is eroded from such lands. These land face degradation.

Since soil formation is an extraordinarily slow process, erosion poses a serious problem; soil erosion can quickly cause fertile farmland to become unsuitable for agriculture. In extreme cases, erosion can lead to desertification, a process which causes arid soil to become barren and incapable of sustaining plant growth for many years.

Traditionally, agricultural soils were fertilized using livestock manure, which is rich in nutrients and organic matter. Farmers also practiced crop rotation, regularly alternating the types of crop grown in various fields and periodically allowing fields to remain unplanted.

This process enables organic matter to accumulate and decompose, thus restoring nutrients to the soil. But unfortunately the once fertile soil in the watershed has become over fed with nutrients by applying enormous quantity of chemical fertilizers and pesticides. Shift in cultivation – from food crops to cash crops – has increased the tempo of over feeding the soil with nutrients.

Other serious issues as presented by the watershed community during the PRA, especially during the transect are as follows:

- Drastic reduction in soil fertility and productivity
- Soil Erosion
- Inadequate soil conservation measures enhances the loss of fertile soil
- Leveling of paddy fields for mixed crops has reduced food crops.
- Indiscriminate application of chemical fertilizers and pesticides contaminated the soil and soil humus is reduced
- Acidic nature of the soil prevents seed germination and plant growth

6. METHODOLOGY ADOPTED FOR PLANNING

6.1. Base line Survey

Baseline information and data on natural resources, human resources, agro-socio-economic details, infrastructure etc are collected at Village levels through secondary sources of information. Primary information and data are also collected from households. All the households in the villages are covered under the baseline census survey. The information and data are found to be comprehensive and encompassing all the relevant socio-economic aspects pertaining to the people of the village. The data collected from primary sources are by adopting interview method with the help of specific format prepared specifically for the purpose. The information are collected by well trained volunteers under the supervision and guidance of TSO. The data thus collected are compiled and analyzed under the strict supervision of the Director of TSO and the findings are made use for formulating the project proposal. Besides the consolidated data sheets are kept as a bench mark for further monitoring and evaluation.

6.2. Focus Group Interviews (FG):

The Focus Groups for each community are identified based on the information obtained. Each FG constitutes a sample of households which represent each livelihood system. Focus groups typically are formed on the basis of wealth ranking (WR) categories or livelihood groupings. They usually are desegregated by gender. In the watersheds the focus group discussions helped the project planning to identify the crucial problems the community face in terms of agriculture, land degradation, low production, less prize, irrigation facilities,

climate change and its effect etc in the livelihood of the watershed community. The sharing were all recorded and documented. To a certain extent, the feedback from the FG discussion helped the project team to plan appropriate activity in the individual watershed.

6.3.Participatory Rural Appraisal (PRA)

PRA is basically an exercise for ensuring participation and enabling of the stakeholders. An exhaust PRA exercise was conducted in the watershed villages, by the watershed development team to collect the required information and data for developing the DPR. The PIA & WDT members along with the technical experts have visited the watershed villages and made much informal discussion with the people before starting the PRA exercise. The different technical tools used in PRA exercise help to identify the problems faced by the watershed villagers to analyze the situation which varies from one another.

6.3.1. Social Mapping:

The villagers prepared a social map of the village on the ground using different rangoli powder to reveal the social and physical structure like house structure, different caste groups, and village infrastructure etc. to analyze the opportunity which can be derived after discussions with different groups of people.

6.3.2. Seasonality:

Study of seasonal pattern of the rain fall, farming practice availability of opportunity and different types of seasonal problems and benefit discussed and marked in chart to solve the problems in due course of time.

6.3.3. Resource Map:

It has been prepared by the villagers themselves on the ground using rangoli colures, leaves etc indicating different land types like - upland, midland, low land, grazing land, forest land, water bodies etc. Resource map is used to prepare treatment plan for soil and water management, forestry etc.

6.3.4. Transect:

Transect is one of the most important tools which was drawn up by transverse the watershed area with a group of people from upper reaches to lower reaches to study present land status, soil type, present land use pattern, Crop yield, present problems and suggestive measures.

6.3.5. Study of literature

The TSO team had undertaken a study on different literature available with the Grama Panchayats, Block Panchayat, Land Use Board, Soil Survey department and other government department concerned with land use and agriculture to collect secondary data regarding the situation of each and every watershed. MGNREGS Watershed Master Plan of

the Thrithala Block Panchayat, Aanakkara, Thrithala, Nagalassery, Kappur, Pattithara and Chalisserry Grama Panchayats are also studied seriously and relevant data are collected to incorporate in this plan document.

6.4.The SWOT Analysis

SWOT analysis links each of the perceived “threats” to related organizational “weaknesses”, the “weaknesses” to related “opportunities”, and the “opportunities” to related “strengths”. The items at which the most lines (links) converge indicate the priority threats to be mitigated, weaknesses to be corrected, opportunities to be seized, and strengths to be reinforced. In Thrithala IWMP projects, the SWOT analysis helped to identify the serious problems that the watershed communities are facing and to chalk out plans to overcome such situations. Mitigation of adverse conditions that may come across the way during the implementation of the project is very crucial.

6.5.Formation of Watershed Neighbourhood Clusters

Neighbourhood clusters are formed in every watershed combining 50 families each living as clusters. These 50 families have further divided into clusters of seven from which a person/leader had been selected to represent these seven families in the watershed committee. The list of the families had been prepared by visiting individual watershed by the TSO members along with the people’s representatives, (in most cases they were the ward members). Grouping had been made with the assistance of the ward members and their suggestions were also taken as a directive guideline for the selection of group leaders.

Besides this, the existing Self Help Groups under the Kudumbasree Mission in each watershed shall also be fostered and promoted to take up programmes coming under PSM and LHS. The SHGs are functioning properly and in a most effective manner under the supervision of the Grama Panchayats. If it is found necessary, new SHGs can also be formed, especially for men in the watershed. The existing farmers groups can also be considered as Self Help groups.

6.6.Formation of Watershed Committees

Watershed committees are formed in all the watersheds taken for treatment under IWMP. The watershed Committee comprises the representatives of watershed communities and nominated representatives from the elected members of the Grama Panchayat in which the watershed is included. The General Structure of the Watershed Committee is as follows:

Sl. No.	Name	Designation	Position	Phone No.
1.		GP President	Chairperson	
2.		Ward Member/s	Vice Chairperson	
3.		Appointed by the GP	Convener	

4.		Elected member from UG	Jt. Convener	
5.		GP Secretary	Secretary	
6.		Elected member from UG	Jt. Secretary	
7.		Elected member from UG	Treasurer	
Ex Officio- Members				
1.		President – Co-Op. bank/s	Member	
2.		Block Panchayat Member/s	Member	
3.		Nominated Officer (GP)	Member	
4.		ADS Chairperson/s	Member	
5.		Nominated WDT member/s	Member	
6.		Representative of TSO	Member	

Besides this, the existing Self Help Groups under the Kudumbasree Mission in each watershed shall also be fostered and promoted to take up programmes coming under PSM and LHS. The SHGs are functioning properly and in a most effective manner under the supervision of the Grama Panchayats. New SHGs can also be formed, especially for men in the watershed, if found necessary. The existing farmers groups can also be considered as Self Help groups.

6.7. NRM steps followed for planning:

Various steps are followed for NRM planning and resource mapping during boundary line delineation and geographical transect in watershed area. The summarized steps are given below:

The boundary line of the watershed is delineated as the very first step with the help of village cadastral map and Toposheet. Then geographical transect is being done through survey by moving from plot to plot in upper reaches, middle reaches and lower reaches. During the transect the major nalas, gullies and drainage lines are identified. Lands are surveyed on the basis of land type, soil type, erosion class and slope. Various resources like different water bodies, wells and farm ponds are identified. The present land use is also studied during transect. In the individual patch identified, the various treatments required are also finalized in consensus with the villagers.

Finally the strategic action plan on Natural Resources Management perspective for the whole watershed during the entire project period is formulated. Major activities of the Watershed project:

- Soil & moisture conservation measures like terracing, bunding, trenching, vegetative barriers etc.
- Rain water harvesting activities like farm ponds, percolation tanks, check-dams etc.
- Planting & sowing of multi-purpose trees, shrubs, grasses, legumes and pasture land development

- Encouraging natural regeneration
- Promotion of agro-forestry and horticulture
- Training, extension and creation of a greater degree of awareness among the participants
- Encouraging peoples' participation
- Livelihood activities for assetless people
- Production system and micro-enterprise

7. CONVERGENCE WITH MGNREGS

Integrated Watershed Management Programme (IWMP) of the Department of Land Resources (DoLR) has been identified as an important scheme for convergence with NREGS. As more than 50% of the NREGS works relate to soil and water conservation. Based on several discussions, the modalities of convergence were identified.

Convergence is an evolving process and while broad principles can be laid out at the centre, the actual contours of convergence will be determined by the resources at the central, state, district and the project level. Also to fully identify the possibilities of convergence, it may be necessary to make a beginning with select programmes, so that the experience of implementation may further inform and refine strategies for convergence.

The objectives of this convergence will be to switch-over to sustainable agriculture specifically organic agriculture in all IWMP villages before end of the project period; and to double the income of the farmers by decreasing cost of cultivation and reaping premier prices due to the pesticide-free products.

Under NREGS almost all the activities required for watershed development are permitted. Convergence between NREGS and Watershed Programmes of DoLR will be mutually beneficial for rainfed areas. Parameters also had been set for convergence with NREGS and IWMP. The parameters are:

- a) The cost of material component of projects including the wages of the skilled and semi skilled workers taken up under the scheme shall not exceed 40% of the total project cost.
- b) As far as practicable, a task funded under the scheme shall be performed by using manual labour and not machines
- c) No contractors shall be engaged in the execution of the works.
- d) Where convergence between NREGS and watershed programmes funded by DoLR is envisaged, the tasks/structures/activities to be undertaken by NREGS will be identified by the Programme Implementation Agency (PIA) preparing the DPR for the watershed Programme.

In IWMP, if convergence is to be effected, the works should be carried out by landless people and self help group members. Under MNREGA all activities required for watershed development are permitted.

Accordingly, the following categories of works are proposed for convergence under IWMP of Thrithala Block Panchayat:

- Construction of check dams
- Deepening and de-silting of ponds
- Extension and renovation of existing irrigation projects
- Flood protection works
- Lift irrigation works
- Construction of new drains and renovation of existing drains
- Removal of vegetation growth.

There is possibility of convergence with many other programmes within the control of the Grama Panchayat. These programmes can be converged as and when it is found necessary. It is not possible to specify such programmes at present because, every year programmes are either changed or reworked according to government orders and plans. The concerned Grama Panchayats can inculcate those programmes which are found to be keeping line with NRM , Livelihood Promotion and Production System management

8. CAPACITY BUILDING

Capacity Building also referred to as Capacity Development is a conceptual approach to development that focuses on understanding the obstacles that inhibit people, governments and non-governmental organizations from realizing their developmental goals while enhancing the abilities that will allow them to achieve measurable and sustainable results.

Under IWMP Capacity Building is proposed at different levels as follows:

- **Individual level-** Capacity-building on an individual level requires the development of conditions that allow individual participants to build and enhance existing knowledge and skills. It also calls for the establishment of conditions that will allow individuals to engage in the “process of learning and adapting to change.”
- **Institutional level-** Capacity building on an institutional level should involve aiding pre-existing institutions in the watershed. It involves creating institutions and modernizing existing institutions and supporting them in forming sound policies, organizational structures, and effective methods of management and revenue control.
- **Societal level-** Capacity building at the societal level should support the establishment of a more “interactive public administration that learns equally from its actions and from feedback it receives from the population at large.” Capacity building must be used to develop public administrators that are responsive and accountable.

No doubt, capacity building has a crucial role in the success of the implementation of the Project and acquiring its defined short-term and long-term results. Top priority has been given to this component. The TSO conducted a capacity need assessment among different stakeholders and based on the findings a detailed Plan of action towards Capacity Building has been drawn much earlier to the commencement of the project in the watershed areas. Different Capacity Building Training Programmes had been planned for different stakeholders at different level for different durations so that they may effectively take up their stake in the programme implementation. The Plan is furnished below:

Part- I

Sl. No.	Title of the Programme	Duration/ Month	Target Groups	Training Objectives	Implementing Authority
1.	Orientation Program on Participatory Watershed Development (Residential)	2 days	Members of District Level Coordination Committee	To orient the participants on different dimensions of participatory watershed management	SLNA
2.	Orientation & Capacity Building on Conceptual , Technical and managerial aspects (Residential)	4 days	Members of WCDC	To familiarize the participants about various dimensions of participatory watershed development	SLNA
3.	Orientation & Capacity Building on Conceptual and managerial aspects (Residential)	2 days	BDO/J.BDO, HSC,UDC	To familiarize the participants about various dimensions of participatory watershed development	SLNA
4.	Orientation & Capacity Building on Conceptual ,Technical and non Technical, managerial aspects (Residential)	3 days	WDT Members	To Empower the technical knowledge regarding Watershed development	SLNA
5.	Orientation & Capacity Building on Conceptual ,Technical and managerial aspects	1 day	BLCC & BLTAG	To familiarize the participants about various dimensions of participatory watershed development	PAU
6.	Orientation & Capacity Building on Community Level Watershed Management	1day	Block President ,GP President ,Block Members	To orient the participants on different dimensions of participatory watershed management	PAU

7.	Orientation & Capacity Building on IWMP	1day	District and Block Level Various Department Officials	To orient the participants on different dimensions of participatory watershed management	PAU
8.	Orientation & Capacity Building on Technical , non Technical and Managerial aspects (Residential)	5days	WDT& Watershed Convener	To orient the participants on different dimensions of participatory watershed management	PAU
9.	Awareness Training Programme	1day	NHGS	To orient the participants on different dimensions of participatory watershed management	PIA
10.	Capacity Building on Project Implementation	2days	Watershed Committee General body	To orient the participants on different dimensions of participatory watershed management	PIA
11.	Exposure visit	3days	Watershed Committee	To visit other state to understand different methodology used in watershed management	PIA

PART – II: Skill Development Training Programme

Title of the Programme	Client Groups	Training Objectives	No. of expected participants	coverage/topics	Training methodology
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<p>1.Agricultural 2.Horticulture 3.Animal Husbandry 4.pisci Culture 5.Remote Senses 6.Water conservation 7.Livelihood 8.Entrepreneurship development</p>	<p>Selected Beneficiaries</p>	<p>▶ To provide skills and techniques of various activities</p>	<p>22500 (325 trainings X 50 person in each Batch)-</p>	<ul style="list-style-type: none"> ▶ Cow rearing ▶ Hybrid varieties of cows ▶ High yielding varieties ▶ Fodder cultivation ▶ Nutrient requirements of cows ▶ Health & Hygiene in Cow sheds ▶ Prevention and treatment of diseases ▶ Trading of products ▶ EDP ▶ Problems faced by the fish farmers 	<ul style="list-style-type: none"> ▶ Lecture-cum-discussions ▶ Demonstration ▶ Video film show
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Part- III: General Awareness Generation Programme: IEC Materials

Title of IEC Material	No. of Copies	Type of IEC Material	Mode of Implementation by Quotation	Methodology Adopted for use
Systematic and scientific practices in watershed management	30000	Leaflets	PAU	Circulation among the watershed communities through watershed clusters
Livelihood promotion and food security	30000	Leaflets	PAU	Circulation among the watershed communities through watershed clusters
An overview on IWMP	75000	Brochure	SLNA	Circulation among the watershed communities through watershed clusters
Publicity material IWMP	5000	Wall poster	SLNA	Circulation among the watershed communities through watershed clusters
Project details for community awareness	75000	Hand Book	PIA	Empowering the Watershed Community

9. PROJECT ACTIVITIES PROPOSED

The statistics calls for a well planned intervention to make the people aware and take part in the rejuvenation of the farm land by conserving soil, water and biomass which is urgently required for the sustenance of human beings on this planet earth. Different types of programmes are planned under IWMP in Thrithala Block which listed below:

9.1. Entry Point Activities (EPA)

Introducing watershed development program to the community has always been recognized as an important activity. This is done through what is called '**Entry Point Activity (EPA)**' in the parlance of watershed literature. The main purpose of entry point activity (EPA) is to develop a rapport with the people and to meet a part of community needs such as de-silting nallahs, repairing common wells, constructing footpaths and common stages. EPA was also undertaken to build the capacity of associations/groups formed through a participatory approach. In all the watersheds selected for IWMP in Thrithala Block Panchayat one EPA each is identified with people's participation. The identification process is facilitated by the concerned Grama Panchayat Presidents and Standing Committee Chair persons. In the Discussion meetings the user groups' and community's leaders participated and involved effectively to select the most appropriate EPA which will draw the attention of the people and will develop a knowledge base in the community.

A Bird's Eye View of EPAs

Sl. No	Name of Grama Panchayat	Name of Watershed	Ward No.	Problems to be solved	Name of EPA	Location	Objective
1.	Kappur	Eravakkadu	8	Drinking Water Scarcity	Mullamkunnu Water Supply Scheme Pipe Extension	Mullamkunnu	To provide drinking water for 53 households in Mullamkunnu area
2.	Kappur	Chekkodu	3	Drinking Water Scarcity	Vayalathra Drinking Water Project	Kalladathur	Drinking water ensured for 100 households
3.	Kappur	Kollannur	11	Inadequate water availability for other domestic use	Cholakkulam Pond Renovation	Kollannur	Adequate water ensured for washing and bathing
4.	Kappur	Kumaranellur	15	Inadequate water availability for irrigation purposes	Pond Renovation- Puthenkulam of Kumaranellur Padashekharan	Kumaranellur	To improve the yield from the paddy fields by improving irrigation
5.	Aanakkara	Parappanthodu	15	Non functional irrigation scheme due to no water in the tank constructed for the purpose	Perumalam Minor Lift Irrigation Project	Perumbalam	Improve paddy cultivation in the Perumbalam Padashekharan and increase the income of the farmers
6.	Pattithara	Pattikkayal	17 & 18	Non functional Water Supply scheme due to dilapidation of the well and absence of pumping and distribution system	Othallur Vattaparamba Drinking Water Supply Scheme	Othallur	Drinking water supply for about 300 households (150 upstream and 150 downstream) ensured

Individual Schemes under EPA – IWMP-III/2010-11

THRITHALA

1. **Eravakkadu Watershed** in Kappur Grama Panchayat consists of 139 ha. of land. The EPA identified is “**Mullankunnu Water Supply Scheme – Pipe Extension**” which aims at ensuring drinking water for about 53 household in Mullankunnu area. The scheme is only partially functional and there is no distribution system for the families in Mullankunnu area. At present the 53 households in the locality experience severe drinking water scarcity. The FGD organized under the chairmanship of the Grama Panchayat President Shri. C. M. Ali Master suggested that a mere extension of pipe line to the proposed location will ensure pure drinking water for about 53 households. These households are in very difficult situation and the women have to walk a long distance in search of potable water. The completion of this scheme will certainly be a favour for the families.

The group has also suggested that further extension of the pipe line to some other places is also possible and can think of in the future, provided the scheme converted into a user group running scheme in which the user groups **Operate and Maintain** (O&M) the scheme. At present the Watershed Neighbourhood formed in the locality will see to the O&M.

2. **Chekode watershed** in Kappur grama Panchayat is 861 ha. It is one of the biggest watersheds under IWMP. The proposed EPA is to be implemented at a location where there is severe drinking water scarcity, and, of course, it is a drinking water supply scheme. The location is **Kalladathur** and the salient feature of the location is drying wells and streams immediately after the rains. The EPA is named as **Valiyathara Drinking Water Project**.

The project aims at ensuring drinking water supply for about 100 families living around the locality. Construction of a new well, OH Tank, pump house, laying of pumping system, and Distribution system are all envisaged under the scheme. In a sense it is a new community based water supply scheme and it is decided that the Beneficiary Group will operate and maintain the scheme in the future.

- 3. Kollannur Watershed** has land coverage of 333 Ha. It is in Kappur Grama Panchayat. About 150 families in the watershed area find it difficult to get water for their domestic use other than cooking and drinking. Cholakkulam in the watershed had been a favour for them for long period. But due to lack of timely maintenance and negligence from the part of authorities and the users, the pond became dilapidated and with sediment. This situation had been, for a long time, an agitation among the people.

Discussion with GP President and the watershed community has decided to renovate the pond and make it useful for the whole community, especially the targeted 150 families. The renovation of the pond will definitely a fulfillment of their long cherished dream.

- 4.** In another watershed in Kappur Grama Panchayat, **Kumaranellur**, this has a total area of 507 Ha. This watershed is located in the 15th ward of the Grama Panchayat. The EPA proposed for the watershed is the “Renovation of Puthenkulam” which ensures irrigation for the Kumaranellur Padashekham. The activity consists of renovation of retaining wall, providing weir (an outlet) to allow over flow of water, construction of a pump house and installation of pump and cleaning whole of the pond by de-silting.

It is observed that the renovated well and newly installed pumping system will help the farmers to improve the paddy cultivation and vegetable cultivation in the paddy field even during the non-rainy season. 10 ha of land will be made suitable for the second crop of paddy cultivation or for vegetable cultivation. This will bring economic gain for the farmers.

- 5.** In Aanakkara Grama Panchayat a non-functional Minor Irrigation scheme is situated in **Parappanthodu Watershed** in Perumbalam. The scheme became defunct because of no water in the pond. This irrigation project had been bringing water to Karuvan Padashekham for years. But this project and the allied pump house and motor is not working due to lack of water.

Unavailability of water enhances the drying up of paddy (second crop) in the Padashekham which is mind blowing the poor farmers who involve cultivation in the Padashekham. Therefore, the watershed committee has decided to propose a new pond with 40m x 20M x 4 meters in Bharathapuzha near Thurayattil kunnu with side wall

construction. The existing pump house needs to be maintained and fixed with adequate electric circuit meters and switches.

6. The non- functioning Othallur Vattaparamba Drinking water supply scheme had been a pain among the people in Pattikkayal Watershed in Pattithara Grama Panchayat and had a long history of 40 years. In the course of time, this scheme had been neglected and the once flourish well with 7 meters radius and 3.5 m depth has dilapidated and left unused. If properly functioned and cared, this scheme must have been pioneer in ensuring drinking water supply for about 150 families up-stream and 150 families downstream. But unfortunately this scheme had been overlooked by many governing councils of the Panchayats and now the discussion held with the watershed community, they suggested that this scheme could be renewed and made use of for supplying drinking water for the 150 families living upstream.

Therefore, the scheme aims at ensuring drinking water for about 300 families, 150 in the first phase and another 150 families in the second phase. The present work includes renovation of the well, pump house, installation of pump and pumping main along with distribution system. **(Detailed Plan & Estimates are attached as Appendix)**

9.2. NATURAL RESOURCE MANAGEMENT (NRM) ACTIVITIES:

Natural resource management refers to the management of natural resources such as land, water, soil, plants and animals, with a particular focus on how management affects the quality of life for both present and future generations (stewardship). Details of Activities common to all the watershed areas for sustainable Natural Resource Management are given below:

9.2.1. Soil Conservation:

Soil is a thin layer of material on the Earth's surface in which plants have their roots. It is made up of many things, such as weathered rock and decayed plant and animal matter. Soil is formed over a long period of time. Soil Formation takes place when many things interact, such as air, water, plant life, animal life, rocks, and chemicals.

The activities proposed for soil conservation to address the soil related issues are: Contour Bunding

- Earthen Bunding
- Bench terracing
- Stream Bank Stabilization
- Gully Plugging

- Construction of Check Dams
- Promoting soil literacy classes

9.2.2. Water Conservation:

Water conservation can be defined as any beneficial reduction in water loss, use or waste as well as the preservation of water quality or as reduction in water use accomplished by implementation of water conservation or water efficiency measures; or, as improved water management practices that reduce or enhance the beneficial use of water. A water conservation measure is an action, behavioral change, device, technology, or improved design or process implemented to reduce water loss, waste, or use. Water efficiency is a tool of water conservation that results in more efficient water use and thus reduces water demand.

The following activities are proposed towards water conservation:

- Roof water harvesting and recharging the wells
- Construction of Rainwater Harvesting structures to collect, store and reuse the rainwater for domestic as well as commercial purposes
- Renovation & reconstruction of dilapidated ponds and drinking water wells in the watershed.
- De-siltation of ponds to remove sedimentation
- Construction of Check-dams specifically to store water for irrigation purposes
- Repairing of existing check-dams and VCBs

9.2.3. Biomass Conservation

Poverty, lack of sustainable alternative livelihoods and absence of financial /social incentives for resource dependent communities, along with lack of integration of biodiversity and livelihood consideration in development planning around biodiversity-rich areas, have been identified as some of the root causes of threats to biodiversity.

Whatever be the levels of degradation in the bio-diversity, the watershed communities in the identified watersheds under IWMP project, especially the indigenous community suffer very much from it because most of them are peasants and depends on the nature for their livelihood in one way or another. As scientists put it, even the sustenance of agriculture is depending upon the sustenance of bio-diversity even in the light of available hybrid varieties. Therefore, many activities have proposed to undertake to rejuvenate and revamp the ecosystem diversity and bio diversity in the watersheds. The activities are as follows:

- Promoting Environmental Education among the stakeholders and younger generations
- Promotion of horticulture in each watershed
- Promotion of medicinal herbs and shrubs
- Application of organic fertilizers in the farm to retain micro organisms

- Promotion of rearing of indigenous varieties of cows, goats and fowls along with hybrid varieties
- Promotion of re-cultivation of plants that are disappeared from the watershed
- Prevention of cutting of trees from the watershed
- Promotion of live fencing as a means of promotion of green diversity.

10. ACTIVITIES FOR LIVELIHOOD PROMOTION (LHS ACTIVITIES)

The PIA (Thrithala Block Panchayat) selected SUSTHIRA (Centre for Sustainable Development Studies & Action) as the Technical Support Organization (TSO) and entrusted the responsibility of carrying out preliminary works leading to Detailed Project Report (DPR) preparation. SUSTHIRA, in the initial stage of identifying the watershed boundaries of each micro watershed took special interest, though mandatory, to form groups and clusters among the watershed communities. In this process, SUSTHIRA keenly observed that the women folk of the watershed communities are very weak and discriminated and they were not allowed to speak in the formation meetings. This situation had been an eye-opener for SUSTHIRA and the Grama Panchayat authorities. SUSTHIRA, in consultation with the Kudumbasree Mission of the Grama Panchayat had organized a situational analysis of the Self Help Groups formed and facilitated by Kudumbasree and the women members of the NHGs formed as a part of IWMP project. The methodology adopted was Focus Group Discussion (FGD) and Problem Tree Analysis. These two tools have applied in special session other than PRA, though during PRA a general observation was made in the situation of women.

To start with, the Kudumbasree units in the concerned watershed areas are approached. Self Help Groups under Kudumbasree Mission are small homogenous groups formed, motivated, and sustained through highly successful credit and thrift activities. Self help group initiative especially for women helps to uplift their livelihood. Generally self help group includes landless and marginal sized farm women, BPL household, SC/ST women.

NHG initiative in the project area was being organized by having a focused group discussion between various homogenous communities of women based on their livelihood. Each group discussed their basic problems with their facilitators. **The major problems identified are:**

- a) Mentality of majority of the women to remain at home as house-wives
- b) Inadequate technical training
- c) Absence of counseling facilities to direct the poor and women to appropriate enterprises
- d) Lack of interest to enter into enterprises
- e) Lack of proper credit facilities due to low intervention of formal financial credit institutes.
- f) Excessive exploitation of weaker section by money lenders
- g) Lack of attitude of saving among poor people due to complex and rigid conventional financial institution structures.
- h) Lack of small micro-loans without collaterals and high interest rates.
- i) Lack of knowledge on credit, Thrift activity and banking.

- j) Less knowledge of record keeping due to lack of guidance and training
- k) There is no specific goal and vision
- l) Women are discriminated both in the family and in the society
- m) Women are not having a say in the decision making processes.
- n) The problem of gender justice continues to be intimately related to many issues in development.
- o) Distinct gender roles & responsibilities restrict opportunities & resources available to women & men
- p) Within the household there is a clear division of labour based upon gender. The man is the breadwinner and the woman is the mother and housewife.
- q) Women's work is unpaid housework, not crucial to the survival of the family
- r) Women's productive work is often less visible and less valued than men's.

The specific objectives are:

- 1) To promote food and income security in SHG members by developing micro-enterprises among them.
- 2) To build capacity of entrepreneurs by giving required technical inputs.
- 3) To mobilize and make available micro-credit facilities to SHG members for creating alternate and sustainable means of livelihood.
- 4) To restore people's dignity and ensure adequate living conditions, and to promote an environment conducive to respect for the rights of individuals in accordance with the relevant laws.

The Aims and objectives of the proposal clears that this proposal has two distinct parts:- The capacity Building and the second promotion of livelihood skills and schemes among the watershed community for inclusion

10.1. Capacity Building for Livelihood Promotion

For the inclusion and effective participation of rural poor in the growth process, it is imperative that they have the requisite means in terms of productive assets, access to credit and necessary skills. Lack of capacity (productive as well as skill) has proved to be a greatest barrier for the rural poor in managing an enterprise successfully. In the last 10 years of implementation of NSDM, about 1/4th of SHGs were able to access bank credit for income generating activities including micro-enterprises which indicates that for credit absorption and credit worthiness of the SHGs, there is need for augmenting the training and long term handholding of swarozgar is including skill up-gradation and entrepreneurial guidance.

The real community participation and future sustainability of this integrated watershed management mainly depend on capacity building events at different levels for different

people in the watershed management. The PIA believes that intensive trainings to the people can create as well as sustain their enthusiasm. In the IWMP guidelines for livelihood promotion some specific capacity building programmes are made mandatory and these programmes are as such adapted to be included in the Capacity Building Schedule. Certain programmes and its objectives proposed under this section is listed below:

Sl. No.	Name of Training	No. of Trainings proposed	Objectives of the programme
1	Training on Basics of Microfinance	13	<ul style="list-style-type: none"> To build capacity of NHGs in Microfinance programming and operation <p>The course content include specific sessions on Group Sustainability, basics of saving and credit, book keeping, accounting, insurance, portfolio management, bank linkage procedures and micro enterprise and livelihood finance.</p>
2	Training on Accounts Management	13	<ul style="list-style-type: none"> To enhance accounts management capacities of the Neerthada Ayalkoottams (Watershed Neighbourhood groups)
3	Basic orientation on Organic Agriculture	13	<ul style="list-style-type: none"> To develop technical capacities of watershed communities engaged in agriculture promotion & extension work.
4	Training on Livelihood Promotion (Wadi Model)	6	<ul style="list-style-type: none"> To build capacities of watershed NHGs working in the areas of NRM based livelihood promotion. <p><i>WADI model is developed by BAIF and has been found effective in developing livelihood opportunities for poor and marginalized farmers</i></p>
5	Training on Community Based Participatory Irrigation Management (Tank Irrigation)	13	<ul style="list-style-type: none"> To enhance applied understanding of farmers in the field of participatory irrigation management (PIM).
6	Exposure Visit by Watershed Committees	13	<ul style="list-style-type: none"> To provide learning opportunity to the farmers in the area of institutional building processes
7	Workshop on National Rural Employment Guarantee Act (NREGA)	13	<ul style="list-style-type: none"> To develop operational understanding of farmers on the NREGA act
8	Interface on Community-NGO-Public-Private Partnership	13	<ul style="list-style-type: none"> The workshop provided a platform of discussion to different stakeholders interested in social development processes.
9	Procedures of Meetings	13	<ul style="list-style-type: none"> To provide knowledge and skill for the office bearers of the NHGs in maintaining minutes and records
10	Entrepreneurial skill development Training Programme		<ul style="list-style-type: none"> To train the Prospective entrepreneurs

Here we feel that it is necessary to mention the Entrepreneurship Development Programmes (EDP) specifically, because it is so important in the livelihood promotion programme. Women must be specifically equipped with the skills of enterprise management and

continuation in a most beneficial and profitable manner. Therefore, the objectives of EDP training are:

- ☛ Exploring themselves as the facilitators of livelihood promotion for the community
- ☛ Building an understanding on the concept of livelihoods, livelihood promotion and their dynamics
- ☛ Appreciating tools and techniques to know the profile and the livelihood basket
- ☛ Understanding market and demand condition of local economy
- ☛ Understanding tools and techniques for identifying intervention points
- ☛ Developing micro and macro level design of Livelihood Promotion strategies
- ☛ Building collaboration with other government and non-government initiatives for linking the poor to value chains
- ☛ Appreciating project cycle management in livelihood promotion
- ☛ Understanding the process of aggregation for better bargaining power and hence better price to the small producers
- ☛ Understanding potential conflicts arising out of aggregation process and their effective management
- ☛ Understanding the dynamics of the interrelationships among various components in a livelihood project

Intended benefits to the beneficiaries

The capacity building training programme are planned to bring about change in the mentality of the women and the whole community. The trained women will act as catalysts to realize the objectives by involving physically and intellectually in the family and in the society to establish human dignity to the women folk. The following are the immediate and long term benefits to the beneficiaries of the capacity building training programme:

- ☛ Building capacity in skills such as entrepreneurial/business management skills, leadership skills.
- ☛ Empowering beneficiaries economically towards self-sufficiency to enable beneficiaries generate enough income for their households.

- Social emancipation of rural women (they will learn leadership skills and group organization and management) to enable them participate fully in the social and economic life of this country.
- Acquisition of literacy and functional skills, credit with education will equip functional skills and literacy skills to needy women since this will be incorporated as a training component. They will be able now to identify, buy or grow and provide nutritious foods for their children to combat malnutrition and marasmus and feed a balanced diet to their households.
- They will mobilize savings, build and internalize a culture of savings and develop financial discipline through systematic and spontaneous savings under the credit programme.
- Young women with no capital or incomes who would otherwise resort to a life of crime e.g. prostitution would now become economically productive and escape temptations of promiscuity and risking HIV/AIDS

We believe that, when community capacity building is directed at communities which are socially and economically disadvantaged (or, in some cases, communities which are simply socially disadvantaged) indirect benefit to the public arises in terms of:

- The increase in skills, competencies and self confidence on the part of members of such communities;
- The more effective, efficient and sustainable delivery of services to such communities
- The promotion of social cohesion.

Therefore the ingredients of capacity building for livelihood promotion can be a kind of life coping skills which are as follows:

10.2. Livelihood Promotion Programmes

An analysis of livelihood assets of the watershed community has been carried out during the PRA aiming at the planning process of the livelihood promotion plan for them. All the livelihood promotion programmes planned under this project are aiming at developing the existing assets to be more beneficially make use of the improvement of life and means of livelihood of the watershed communities. The capacity building programmes stated and explained above will address the human asset development and personal assets development, enhancing the skills and knowledge base of the watershed communities. The SHG approach adopted to organize and facilitate the watershed community encourages the poor self potential through promoting saving and creating access for internal loan among them. The groups also mobilized external resources to meet their members' interest. Furthermore,

- Marginalized women are organized into SHG/NHGs and form their apex body
- Individual capacity building efforts are necessary
- Through collective actions, organized women improve their social and economic life
- SHG/NHGs become vibrant local development partners
- The program has the power to replicate itself in other areas

Programmes planned under Livelihood promotion are mainly to address the other asset base of the watershed communities. Livelihood promotion programmes are planned to be implemented with the general objective of enhancing the social and economic empowerment of the rural poor in the watersheds included in the IWMP project being implemented by Thrithala Block. This has another three more objectives:

- Creating self managed community institutions of participating households.
- Enhancing income through sustainable livelihoods.
- Increasing access to social protection including food security by enabling the rural poor to articulate a more effective voice in the implementation of such schemes.

In short, the objective of the livelihood initiative is to enhance sectoral size and productivity growth in key livelihood sectors for employment generation of the poor. This will be achieved by making investments in technical assistance, service provision and setting up of market support mechanisms.

The following are the promotional livelihood programmes/schemes proposed for the watershed communities in different watersheds under IWMP programme of Thrithala Block Panchayat. Each and every programme has its own specific objectives, besides the common objectives stated above.

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- **Marginalized women are organized into SHG/NHGs and form their apex body**
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The people in the operational watershed communities are peasant farmers who have been involved in all their lives in livestock (cows, goats, poultry, duckery, etc.). The technology is not new; it is part of the way of life of the people. The people are familiar with raising of cows, goats, fowls and ducks, and the breeds that would be selected and bought are suited to the areas. Also cows, goats, fowls and ducks are easy to raise involving little or no cost and use of locally available materials for food and housing which ensures continuity needs external support.

a) Backyard Poultry

Backyard poultry was selected as a feasible activity for “poorest of the poor” like landless, handicapped, widows, and old people and non-SHG members. The livelihoods of marginalized women should be supported with a viable, economic enterprise on a small scale and provide a subsidiary income, improving the household economics.

Additionally, the skills and knowledge of the women should be increased. Chicken rearing is traditionally a women-managed activity and requires only low investment. Traditional practices can be re-activated. Interestingly the villagers themselves (or at least some leaders) suggested backyard poultry as the desired livelihood activity. Each such family selected can be provided with 20 birds (3 cocks and 17 hens) along with a rearing cage. Feed for a period of one month shall also be needed. It is proposed that 100 beneficiaries each from a watershed shall be considered.

Joint venture shall be in large scale with both revolving fund and bank linkage. In such cases, the local veterinary department shall be consulted to identify a proper location, for purchase of birds in large scale, for technical support and health care aspects. The vaccinations and later the sale of eggs and meat would be organized jointly both for individual ventures as well as group ventures, generating an income that could not be possible by individuals alone. One group each in a watershed shall be selected based on an aptitude test to avail financial support in the form of revolving fund from the project provision. If more amounts are required alternate means shall be the resort.

b) Small holder dairy farming

It has been observed during the PRA many farmers in the watershed were having adequate livestock and they were traditionally carrying out cattle rearing. As the pastures and common grazing lands were converted for other land use, there was no alternative than giving up the practices. Moreover, unavailability of adequate green and dry fodders due to change in agriculture added farmers giving up animal husbandry.

The plan is to select 20 small holder farmers from each watershed within a period of three years and avail financial support to purchase either a heifer or a milch animal with adequate

knowledge input. The total number of farmers who will then be supported within the project provision will be 260.

c) Stall-fed Goat Rearing

Stall-Fed Goats can ideally fit into the intensive integrated farming system. The small animals are the most efficient converters of farm and crop residues into excellent organic manure. Several farmers have successfully run stall-fed goat farms, and they have found that such an integrated farming venture was more productive and profitable as well.

Goat farming needs less capital when compared with dairying, and the animals can be raised in small farms. The floor space requirement per adult animal is about one square metre. Stall-fed goat farming is an ideal occupation for the small, marginal and landless agricultural labourers. A properly fed and managed milch goat will yield at least as much milk (on average two liters per day) as low yielding desi cows. The she-goat will deliver 2-4 kids per parturition after a short gestation period of 150 days. The watershed community expressed their willingness to take up goat rearing as a source of supplementary income and a source that supplement and boost the agriculture in the watershed. Moreover, goat rearing would ensure food security of marginalized families in the watershed. The proposal is to avail funds for 35 small farmers and landless families each in a watershed in a year. The total number of families that will be benefited by this proposal is then 455.

d) Soap Making Unit/Detergent Making

The proposed livelihood activity for the watershed community is for the manufacturing of LAUNDRY SOAP. The soap is the major consumable product after the vanaspati Ghee. In the watershed and in the surroundings the major population is the middle class. So the Laundry soap is the best product for the washing of cloths. This is the most popular product in the middle class for the washing of cloths. The most important factor for its popularity is its cost because it is the cheap in rates as compared to the other washing products. Now a day it is also used commercial and industrial use. The wastage is used in the manufacturing for cheap class of lubricants. So as the commercial, point of view it is highly profitable business because the demand is always more than the supply.

e) Japanese quail rearing

Quail farming can be a profitable income generation activity suitable for the countryside. While bringing a considerable profit as a livelihood the scheme enriches the farm land with its residues from the farm, thus helps improving the agriculture.

f) Distribution of tailoring machine

The main objective of this component is to provide women with basic equipment to start a job and support them to become organised in community-based working units to effectively manage and run their businesses.

g) Tailoring unit

Promotion of tailoring units among the unemployed and those who are trained will be a suitable intervention to improve the non-farm income of the watershed community.

h) Mushroom

The programme on mushroom cultivation and production technology as an off-season occupation and income generator shall be organized to capitalize on the increasing consumer market for mushrooms.

The demand for the product has been increasing by the day providing new vistas for income generation for individuals, SHGs, and rural households. According to KVK sources, the market for mushrooms is dispersed covering both urban and rural markets.

The proposal to promote mushroom cultivation is also aiming to supply nutritious food to the rural people and income generation through mushroom cultivation, the main activities of this section are standardization of feasible production method, training of rural people on mushroom production, organization of production by supplying quality spawn and organizing market. The watershed communities will definitely find Mushroom Cultivation as a very easy way of augmenting their income.

11. PRODUCTION SYSTEM MANAGEMENT

Adoption of Production System Management activities in a watershed allows to be reached to new integrated approach to alleviate rural poverty especially on a watershed basis. The objectives of PSM are:

- a) Promote diversified production/farming systems based livelihood activities/ interventions, and.
- b) Encourage farmers to adopt and up-scale successful experiences of proven technologies, integrated farming systems and improved farming practices for livelihood augmentation.

Production System Management (PSM) is made an integral part of the watershed management programme to address the challenges of increasing food production and improving rural livelihoods while safeguarding other critical ecological functions. The goal is the development of sustainable production systems of the whole watershed, which allows intensification and diversification of the lowland production system and stabilizing improved production systems on the upland as it is necessary to enhance the food production base for

food security in the selected watershed area, due to future population increase. It is therefore important to explore the lowlands of the inland valleys from its use status.

1. Organic Farming

Organic farming takes the best of the natural farming and combines them with modern scientific knowledge. Organic farmers do not leave their farms to be taken over by nature; they use all the knowledge, techniques and materials available to work with nature. In this way the farmer creates a healthy balance between nature and farming, where crops and animals can grow and thrive. The produce from the Organic Farming itself is considered a value added product and this brings added income for the farmers. There is more demand for organic produce and consumers who are concerned with their health and nutrition are ready to purchase the produce at any rate. The activity can be promoted as a group venture as well as individual undertaking. As group venture, the group can lease a suitable land which is adequate in area and use only organic methods for cultivation. Seeds and seedlings can either be collected from the government seed farms or from the Farm Nursery in the watershed.

Thus the organic farming will supplement the growth and improvement of the farm bringing substantial income both for those who involved in Farm Nursery and Organic Farming. **The objectives of Organic Farming shall be:**

- ☛ Facilitate farming communities to return back to traditional organic farming
- ☛ Promote sustainable and traditional means of livelihood

2. Vermin compost units

Vermi compost is the product or process of composting utilizing various species of worms, usually red wigglers, white worms, and earthworms to create a heterogeneous mixture of decomposing vegetable or food waste, bedding materials, and vermicast. Vermicast, similarly known as worm castings, worm humus or worm manure, is the end-product of the breakdown of organic matter by a species of earthworm. Containing water-soluble nutrients, vermin compost is an excellent, nutrient-rich organic fertilizer and soil conditioner. The process of producing vermin compost is called *vermin composting*.

In fact this has to be strictly promoted among the farmers, especially those who are interested in organic farming because this is a supplementing component of organic farming. Families selected for organic vegetable cultivation must strictly have a vermin compost production unit. Groups and individuals may be selected, trained and assisted to start vermin compost production even if it is at subsistence level. The proposal is to construct a compost pit of affordable size and supply of adequate quantity of red wiggler worms. This scheme can be widely spread all over the watershed. 15 small farmers can be selected every year from each watershed and assisted with financial aid to start the scheme. This is also a method for disposing the solid kitchen and farm waste produced in the households.

Vermin Composting is generally considered as a means of income generation. At the same time, it helps the farmers to dispose the wastes safely and convert it as manure. This is possible when the wastes are organic in nature. If not properly disposed, these may pollute the soil and water and converting such wastes into organic manure may help the farmers to maintain their means of production, i.e., land. This is the reason for the scheme included among the production system management programmes

3. Homestead Vegetable garden

Homestead vegetable gardens which are developed organically are capable of improving food security and nutritional status. Since the input requirement is very low and easy to afford for even families below poverty line and each every family expressed their interest to have such nutrition gardens in their household premises, it is important that as much as units needed to be promoted in the watershed. But the limited finance in the provision compels us to limit the number of units in a watershed 100 within a period of three years.

4. Biogas Plants

Sustainable waste management and energy conservation are the objectives, of promoting installation of biogas plants in every house, which has a landholding of more than seven cents in the watershed area. Besides Sustainable energy, removal of indoor air pollution, conservation of forests, waste management, sanitation, health, additional income, child health and education, soil fertility, sustainable agriculture, environment protection, employment generation, prevention of migration to urban areas and women empowerment are other important aspect.

The households in which a bio-gas plant is installed, the byproducts like slurry which is a high organic nutrient concentrate from the plant can also be utilized for organic cultivation. Now a household bio-gas plants had made mandatory by the state government as per order GO (MS) No. 73/2011/LSGD, issues on 01.03.2011. Therefore, promotional work on biogas plants in the watershed area under the IWMP projects shall also be a promotional work of the State Government.

Though the watershed Development Committees propose a biogas plant in each and every household in the watershed with project provision, we know that it is ambitious and could reach. Therefore, each watershed will have 10 biogas plants each, thus reaching a total of 130 biogas plants in the whole IWMP area.

Organic manure covers manures made from cattle dung, excreta of other animals, rural & urban composts, other animal wastes, and crop residues & last but not the least green manures. Organic manure is time tested materials for improving the fertility & productivity of soils. Organic manure improves soil fertility, Supply a part of Nutrient requirement of crops

(particularly N). Green manure refers to fresh matter added to the soil largely for supplying the nutrient contained in the Bio-mass. This can either be grown in sites & incorporated or grown elsewhere & brought in for incorporation in the field to be manured. Any plant cannot be used as a green manure in practical farming. Leguminous plants are largely used as green manure due to their symbiotic N fixing capacity, some non-leguminous plants are also used due to local availability, drought tolerance, quick growth and adaptation to adverse conditions.

The traditional system of shifting cultivation in most farm lands is giving way to continuous system of cropping on the same land, resulting in gradual depletion of soil fertility and crop yield. Harsh climatic conditions have also contributed to the declining soil fertility in the watersheds. The solution to the decline in soil fertility by farmers under these conditions is the application of fertilizer, both organic and inorganic sources. Inorganic fertilizer types are easier to use and we have more control over the content of nutrients in these sources, this allows nutrients to be applied more accurately.

Organic fertilizers also re-emphasize the role of humus and other organic components of soil, which are believed to play several important roles as follows:

- Mobilizing existing soil nutrients, so that good growth is achieved with lower nutrient densities while wasting less
- Releasing nutrients at a slower, more consistent rate, helping to avoid a boom-and-bust pattern
- Helping to retain soil moisture, reducing the stress due to temporary moisture stress
- Improving the soil structure
- Helping to prevent topsoil erosion (responsible for desertification and the Dust bowl)
- Organic fertilizers also have the advantage of avoiding certain problems associated with the regular heavy use of artificial fertilizers
- The necessity of reapplying artificial fertilizers regularly (and perhaps in increasing quantities) to maintain fertility
- Extensive runoff of soluble nitrogen and phosphorus, leading to eutrophication of bodies of water (which causes fish kills)
- Costs are lower for if fertilizer is locally available

In order to bring back the PH and fertility of the soil in the watershed area it is proposed to make best available organic nutrient to the farmers even if it is at a small scale. The application of organic fertilizer will stabilize the production system and improve the economic status of the family through improved yield.

5. Fodder Cultivation

The availability of fodder is one of the limiting factors in animal husbandry. Animal husbandry should be mainly based on the fodder produced on the farm itself. As is the case with humans, there is a direct link between the food and the health of the animals. If farm animals are to be productive (milk, eggs, meat etc.), it is important that they get suitable food

in sufficient quantities. If the fodder production of one's farm is limited (which usually is the case), it might be economically valid to keep less animals but supply them with sufficient food.

The appropriate quantity and the mix of feed items will of course depend on the type of animal, but also on its main use (e.g. chicken for meat or egg production, cattle for milk, meat or draft etc.). In milk production for example, cows producing milk should be given fresh grass and possibly other feed items of sufficient protein content. On the same diet, draught animals would rapidly become exhausted. A balanced diet will keep an animal healthy and productive. Whether or not a farm animal receives the appropriate amount and kind of fodder usually can be seen by the shine of its hair or feathers.

For ruminants, a majority of the fodder should consist of roughage (grass, leaves). If concentrates or supplements are used (e.g. agricultural by-products and wastes), they should not contain growth promoters and other synthetic substances. Instead of buying expensive concentrates, there are a variety of leguminous plants rich in protein which can be grown in the farm as cover crop, hedges or trees. Besides, the leguminosae plants play another important role of nitrogen fixing in the soil. This is the principle behind the rotating cultivation which was once prevalent among the farmers.

DETAILS OF WATERSHEDS COMING UNDER THRITHALA BLOCK:
(THRITHALA B7)

Sl. No.	Name of watershed	Watershed Code	Geographic Coordinates	Total Area	Treatable Area	Project Cost
1.	Chekod	19K 3c	76°1'30" & 76°4'30" E 10°46'30" & 10°49'30" N	861	861	10332000
2.	Kumaranallur	19K 3d	76°1'30" & 76°4'30" E 10°46'30" & 10°48'0" N	507	507	6084000
3.	Kollanoor	19K 3e	76°1'30" & 76°4'30" E 10°45'0" & 10°46'30" N	333	333	3996000
4.	Eravakkadu	19K 3f	76°1'30" & 76°4'30" E 10°45'0" & 10°46'30" N	139	139	1668000
5.	Pattikkayal	20B 47a	76°3'0" & 76°6'0" E 10°46'30" & 10°49'30" N	1677	1677	20124000
6.	Parappanthodu	20B 48a	76°1'30" & 76°4'30" E 10°48'0" & 10°51'0" N	1704	1704	20448000

Total	5221	5221	62652000
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PANCHAYAT –WISE DETAILS OF MICRO WATERSHEDS IN THRITHALA B7

Sl. No.	Watershed Code#	Name of watershed	Name of PIA	Ward Nos. & Grama Panchayat in which watershed lies	Geographic Area (Ha)
1.	19K 3c	Chekod	Thrithla Block Panchayat	Kappur GP (Ward Nos. 1, 2, 3, 16, 17 and 18)	861
				Aanakkara GP (Ward Nos. 12 & 13)	
2.	19K 3d	Kumaranallur		Kappur GP (Ward Nos. 4, 13, 14, 15 and 16)	507
3.	19K 3e	Kollanoor		Kappur GP (Ward Nos. 9, 10, 11 and 12)	333
4.	19K 3f	Eravakkadu		Kappur GP (Ward Nos. 8, 9 and 12)	139
5.	20B 47a	Pattikkayal		Pattithara GP (Ward Nos. 1, 2, 3, 4, 5, 6, 7, 13, 14, 15, 16, 17 and 18)	1677
			Aanakkara GP (6 and 7)		
6.	20B 48a	Parappanthodu	Aanakkara GP (1, 2, 3, 4, 5, 6, 8,9,10,11, 14, 15 and 16)	1704	
		Total			5221

DESCRIPTION ABOUT INDIVIDUAL WATERSHEDS

1. CHEKODE WATERSHED

The total geographic area of the watershed is 876.95 Ha out of which 291.52 ha are in Aanakkara Grama Panchayat and the rest 585.43 Ha are in Kappur Grama Panchayat. In Kappur GP the watershed covers 1st, 3rd and 14th wards fully and 2nd, 14th wards partially. In Aanakkara GP the 12th and 13th wards included in the watershed. The average height of the watershed from MSL is in between 20-100 meters.

Chekode watershed is located between east longitude 76°1'30" & 76°4'30" and north latitude 10°46'30" & 10°49'30" It is bounded in the north by Pushpamkunnu, in south by Kumaranellur School and Sariga Theatre, in the east Padinharangadi – parakkulam Road and in the west by Malappuram District

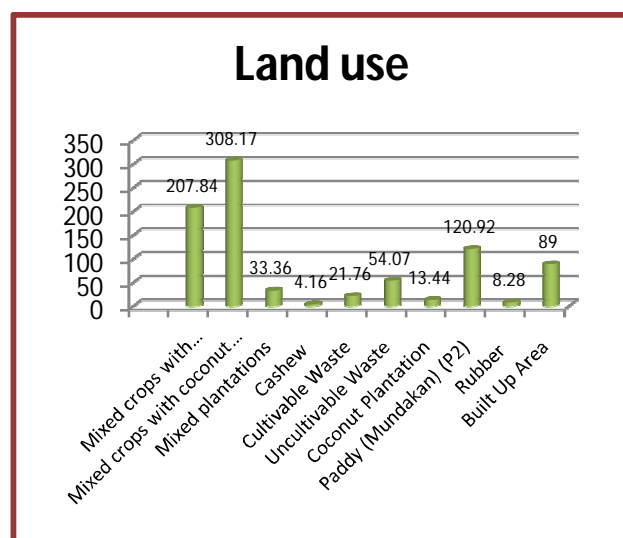
Physical Features

The common nature of the land is undulating with hills, slopes and valleys. In some places the nature of the land is of narrow valley type and in some other loations slope is found to be very steep. Lower portions of the land comprise paddy fields and plains. Generally very deep moderately drained clayey soils in nearly level narrow valleys with slight erosion associated with very deep imperfectly drained clayey soils are found in some areas of the watershed. on gently sloping midland very deep, well drained gravelly clay soils associated with well drained clayey soils with coherent materials.

Land Use

We can see rubber and cashew in upper reaches of the watershed and a kind of mixed crop with coconut, arecaut and plantain in the lower reaches. In the paddy fields certain area has single cropping and certain other areas have double cropping. In most part of the watershed mixed cropping is found to be dominating. There is around 20 ha of cultivable waste and 40 ha uncultivable waste in the watershed. More details are given in the table below:

Sl. No.	Land use	Area in Ha
1.	Mixed crops with coconut, arecanut & Plantain	207.84
2.	Mixed crops with coconut as the main crop	308.17
3.	Mixed plantations	33.36
4.	Cashew	4.16
5.	Cultivable Waste	21.76
6.	Uncultivable Waste	54.07
7.	Coconut Plantation	13.44
8.	Paddy (Mundakan) (P2)	120.92
9.	Rubber	8.28
10.	Built Up Area	89
	Total	861



Water Sources in the watershed

The important drains in the watershed are Kalladathur thodu which originates from vattapparamba hills and Vellalur Stream which originates from kavumpurathu hills. Besides, there are around 1160 wells, 41 ponds and 5 quarries. More than half of the wells are seasonal and this cause severe water scarcity in the watershed area. Details are given in tabular format.

Streams

No	Name of Stream/Canal	Length	Water Availability
1.	Kalladathur Thodu	3764 Meters	5 months
2.	Vellalur Thodu	1870 Meters	4 Months

Ponds

Sl. No.	Name	Survey No.	Ownership	Length (M)	Width (M)	Total Area Cents	Water availability (Months)	use
1.	Kulam	7	Private	9	4	0.8	12	Irrigation
2.	Kulam	7	Private	15	6	2.2	12	Irrigation
3.	Kulam	15	Private	16	6	2.3	12	Irrigation
4.	Kulam	18	Private	12	8	2	12	Irrigation
5.	Thazhathethil kulam	27	Private	12	7	2	12	Irrigation
6.	Kulam	21	Private	7	5	0.8	12	Irrigation
7.	Kulam	135	Private	30	7	5	12	Irrigation
8.	Kulam	129	Private	32	7	5.5	9	Irrigation
9.	Puthenkuzhi Kulam	128	Private	51	6	7.5	12	Irrigation
10.	Iliyathra kulam	109	Public	166	30	123	12	Irrigation
11.	Kavumpurathu Kulam	127	Private	20	8	3	12	Irrigation
12.	Kulam	51	Private	8	8	1.5	12	Irrigation
13.	Quarry	85	Private	53	33	43.2	12	Irrigation
14.	Quarry	82	Private	40	13	12	12	Irrigation
15.	Kulam	92	Private	13	8	2.5	12	Irrigation
16.	Kulam	25	Private	14	8	2.5	12	Irrigation
17.	Kulam	232	Private	6	9	1.3	12	Irrigation
18.	Kulam	250	Private	10	5	1.5	12	Irrigation
19.	Kulam	250	Private	21	10	5	12	Irrigation
20.	Kulam	11	Private	13	67	21	12	Irrigation
21.	Quarry	19	Private	25	23	14	12	Irrigation
22.	Kulam	216	Private	7	4	0.5	12	Irrigation
23.	Kulam	225	Private	5	4	0.5	12	Irrigation
24.	Kulam	215	Private	6	7	1	12	Irrigation
25.	Kulam	225	Private	8	7	1.5	12	Irrigation
26.	Kulam	200	Private	7	5	1.5	12	Irrigation
27.	Kulam	200	Private	8	3	1	12	Irrigation
28.	Kulam	188	Private	8	7	1.5	12	Irrigation
29.	Adimaparambil Kulam	170	Private	10	6	1.5	10	Irrigation
30.	Karyappalliaykulam	168	Private	12	9	2.5	12	Irrigation
31.	Kulam	215	Private	12	12	3.5	12	Irrigation
32.	Kulam	217	Private	13	13	4	12	Irrigation
33.	Kulam	197	Private	3	2	-	3	Irrigation
34.	Kulam	197	Private	6	5	0.5	3	Irrigation
35.	Kulam	196	Private	3	2.5	-	7	Irrigation
36.	Quarry (Mambra Gopalan)	212	Private	18	13	6	12	Irrigation
37.	Valiyakulam	156	Private	25	20	12	12	Irrigation
38.	Quarry	183	Private	-	-	8	12	Irrigation

39.	Koran Kulam	306	Public	38	29	27.23	10	Abandoned
40.	Chathankulam	294	Public	20	20	-	10	Domestic
41.	Punchakkulam	284	Private	19	17	-	10	Domestic

Wells

Total Wells	- 1160	Seasonal	- 561
Perennial	- 599	Common Wells	- 21

General Socio-economic situation

50% of the total population in the watershed is either farmers or farm labourers. More than 15% depends the Middle – East countries for their livelihood. 10% are in the construction sector and traditional labour sector. Only a very few are found to be government employees.

50% of the total population in this watershed is either farmers or farm labourers. This means that the economy of the community is built upon agriculture and fertility of the soil. A parallel economic system had been built up in the watershed area by the employees in Middle East, which will come to 15% of the total workforce of the watershed. 10% of the total workforce is working in construction and indigenous sectors. Very few are employed in government services.

The general social condition of the people watershed seems to be good as they have good houses with adequate sanitation facilities to live in. But educationally they are not in high standards but acquired primary and secondary education. This could be because of the agricultural background of majority of the families and they are reluctant to send their children for higher education. Agriculture being their traditional practices, education got little interest among the population.

The main source of income of the watershed community is agriculture. But as the agriculture became non-profitable, people. Especially small scale farmers began to turn against it and go to wage labour especially in the construction sector. Now most of the people earn their secondary livelihood from wage labour. Educational level of the watershed is average and there are a few working in the Middle East and they support the economy to a certain extent. A minority has involved in commercial trading and some employed in shops.

Watershed Committees

Sl. No.	Name	Designation	Position	Phone No.
1.	C.M.Alimaster	GP President	Chairman	9745208521
2.	Karthyani	Ward Member	Vice Chairman	

3.	Ajith Mohan	Agriculture Officer	Convener	9447618416
4.	V.K.Balakrishnan	Watershed NHG Member	Jt. Convener	9846990163
5.		WDT Member	Secretary	
6.	Abhoobakar Siddique	Watershed NHG Member	Jt. Secretary	9845028847
7.	Saroja Devi	Watershed NHG Member	Treasurer	9048682270
8.	C.Raman	Watershed NHG Member	Member	9846904221
9.	Nabeesa Valiyaparambil	Watershed NHG Member	Member	8943992818
10.	Chandhini	Watershed NHG Member	Member	9539515199
11.	Rughiya.K.K	Watershed NHG Member	Member	9656971768
12.	Mohanan	Watershed NHG Member	Member	9744019697
13.	Shanmuganadhan	Watershed NHG Member	Member	9846904221
Ex Officio- Members				
14.	Sabira Teacher	District Panchayath Member	Member	9037088944
15.	Noorul Ameen	Block Panchayat Member	Member	9846883792
16.	Haseenabhan.T	Grama Panchayat Member	Member	9846822530
17.	Rajan Kundukattil	Grama Panchayat Member	Member	9645469281
18.	Jayan.P Panangavil	Grama Panchayat Member	Member	9895451668
19.	Pushapa Kalathil Veedu	Grama Panchayat Member	Member	
20.	Sivadasan Kalladathur	Grama Panchayat Member	Member	9846789466
21.	Ummakulsu Kolath	Grama Panchayat Member	Member	8943992818
22.	Valsala	Grama Panchayat Member	Member	9746293619
23.	Basheer	Grama Panchayat Member	Member	9846958156
24.	Janaki	ADS Chairperson	Member	9497704341
25.	Rathnam	ADS Chairperson	Member	9846429128
26.	Devi	ADS Chairperson	Member	
27.	Panga	ADS Chairperson	Member	9048147290
28.	Sylaja	ADS Chairperson	Member	9645008293
29.	Asha	ADS Chairperson	Member	
30.	Jothy	ADS Chairperson	Member	9746731456
31.	Karthayani	ADS Chairperson	Member	
32.	Abdhulla Master	President – Co-Op. bank	Member	9898740856
33.	Sunny Asariparambil	Director Susthira	TSO	9744888122

Problems Identified

The analysis was done taking four different areas separately- soil, water, Agriculture and livestock. Area-wise problems were listed out and prioritized. The Problems in different areas are listed below:

Soil related Issues:

- Once fertile soil has deteriorated and the Productivity has drastically decreased
- The fertile top soil is washed off
- Inadequate soil conservation measures enhances the loss of fertile soil
- Change in land usage
- Indiscriminate application of chemical fertilizers and pesticides
- Acidic nature of the soil prevents seed germination and plant growth

Water related issues:

- Fast drying water sources
- Poor water conservation measures
- Poor water literacy among the watershed community
- Over utilization of water
- Ground water deterioration/lowering of water table
- Sedimentation of sources like streams and ponds
- Land mining

Agro-biodiversity related issues

- Over cultivation of mono crops
- Absence of crop rotation
- Disinterest in food cultivation
- Alienation of women from agriculture
- Eco-destruction resulted in reduction in plant & animal diversity
- Un expected plant diseases and pest attacks

Animal Husbandry related issues

- Poor interest in indigenous varieties
- Lack of grazing land and pastures
- Compartmentalization of land
- Mono crops do no supplement livestock
- Unavailability of good varieties of animals
- Lack of interest in animal husbandry
- Poor returns and inadequate marketing facilities.

Activities Proposed for the watershed

Sector	Activities
Entry Point Activity (EPA)	Vayalathra Drinking Water Project
Natural Resource Management (NRM) Common Activities	Reconstruction of Perumannur – Chekode Stream
	Construction of 100000 litre capacity RWH tank at GHSS, Aanakkara
	Construction of VCB – Chekode Pdashekham
	Construction of RWH tank at Choolali Colony
	Construction of RWH tank at Madathikuzhi Colony
	Stream Bank Stabilization – Mullappally Stream, Kallada Stream, Chekode Stream, Neeliyadu Stream and Perumannur – Chekode Stream
	Construction of Shutter Check-Dam in Vellanur Pulloonnipadam Stream
	Check dam construction in Chola Meppadam Stream
	Renovation , retaining wall construction and shutter construction of Valiyannur Pond
	Construction of Pond near Perumannur Temple
Construction of Ramp at Mullappalli stream, Changanarikulam	

Natural Resource Management (NRM) Individual Activities	Well recharging, Contour Bunding, Live fencing, Rain water Harvesting, well retaining wall, Well deepening,
PS & Micro-Enterprises (PS & M)	vermin composting, Banana planting, Organic Vegetable Cultivation, biogas plant
Livelihood Support System (LHS)	Cow rearing, Goat Rearing, Poultry, Duckery and enterprises in secondary sector

2. KUMARANELLUR WATERSHED

The watershed is exclusively in Kappur Grama Panchayat. It spreads fully over 4th, 13th, 14th and 15th partly over 16th wards of the GP. The total area of watershed in is 507 ha. The watershed is formed around Marava-Neeliyadu thodu. The height of the watershed from MSL is between 20- 54 meters.

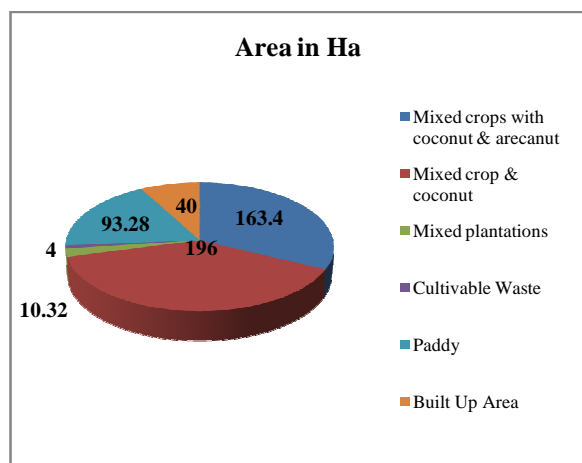
Kumranellur watershed is bounded in its north by Kumaranellur School, Sariga theatre and parts of Engineer road, in its south by Tippu Sulthan Road and Mayankunnu, in its east by Padinharangadi area of Pattithara GP and in the west by Kuttippala – Neeliyadu area of Malappuram Distruict. Geologically the watershed is situated between the east longitude 76°1'30" & 76°4'30" and in the north latitude 10°46'30" & 10°48'0".

Physical Features

Generally the topography is undulating with hills and valleys, paddy fields, dry lands with different cropping pattern, uncultivated lands and quarries. Generally very deep moderately drained clayey soils in nearly level narrow valleys with slight erosion associated with very deep imperfectly drained clayey soils are found in some areas of the watershed. on gently slopiing midland very deep, well drained gravelly clay soils associated with well drained clayey soils with coherent materials.

Land use

Major part of the farm land, especially dry land, in Kumaranellur watershed is with mixed crops. Important crops in the dry land are coconut, arecanut, plantains and pepper. In higher reach pineapple and cashew are planted. Single crop is being done in paddy fields. There are no intercrops. Details are given below:



Sl. No.	Land use	Area in Ha
1.	Mixed crops with coconut & arecanut	163.4
2.	Mixed crop & coconut	196.00
3.	Mixed plantations	10.32
4.	Cultivable Waste	4.00
5.	Paddy	93.28
6.	Built Up Area	40.00
	Total	507

Hydrology

The main drainage of the watershed is Mavara – Neeliyadu stream and water is available only for about three months a year. Main water sources for domestic as well as irrigation purposes are wells and ponds. There are about 27 ponds and around 1323 wells in the watershed and majority of them are perennial. The table given below will provide a complete depiction of the water sources in Kumaranellur watershed.

Sl. No.	Name	Survey No.	Ownership	Length (M)	Width (M)	Total Area Cents	Water availability (Months)	use
1.	Kattukunnu Kulam	-	Private	15	12	6	10	Irrigation
2.	Kandamkulam	373	Private	8	13	2.5	5	Irrigation
3.	Thurayilkulam	-	Private	8	8	1.5	12	Irrigation
4.	Kulam	243	Private	3	3	0.22	12	Irrigation
5.	Kulam	350	Private	12	12	3	12	Irrigation
6.	Kulam	354	Private	10	10	2.5	12	Irrigation
7.	Kulam	238	Private	10	10	2.5	12	Irrigation
8.	Kulam	426		2	2	0.09	12	Irrigation
9.	Kulam	413	Private	10	10	2.5	12	Irrigation
10.	Kulam	413	Private	3	7	0.5	12	Irrigation
11.	Kulam	413	Private	5	7	0.86	12	Irrigation
12.	Kulam	358	Private	6	7	1.03	12	Irrigation
13.	Kulam	420	Private	12	13	4	12	Irrigation
14.	Thottupadam kulam	286	Private	14	7	2.8	10	Irrigation
15.	Thottupadam kulam	287	Private	10	7	1.5	10	Irrigation
16.	Thottupadam Quarry	287	Private	30	18	13	12	Irrigation
17.	Parappuram kulam	323	Private	10	9	2	12	Irrigation

18.	Kumaranelur kulam	335	Private	18	9	5	12	Irrigation
19.	Kodikkamkunnu Kulam	394	Private	12	9	2	12	Irrigation
20.	Marayamkunnu Kulam	395	Private	13	6	2	12	Irrigation
21.	Kulam	337	Private	3	8	0.5	12	Irrigation
22.	Ametikkara Ambalakulam	291	Private	3	4	-	12	Irrigation
23.	Kulam	294	Private	18	12	5	12	Irrigation
24.	Kulam	298	Private	4	4	0.39	12	Irrigation
25.	Kulam	297	Private	20	8	4	12	Irrigation
26.	Kulam	333	Private	11	8	2	12	Irrigation
27.	Kulam	317	Private	6	5	0.5	12	Irrigation
28.	Quarry (Razak)	404	Private	45	30	34	12	Irrigation
29.	Quarry (Khader)	414	Private	81	35	70	12	Irrigation
30.	Quarry (Velayudhan)	404	Private	21	15	7	12	Irrigation
31.	Kulam	405	Private	10	8	2	12	Irrigation
32.	Kulam	238	Private	8	8	1.5	12	Irrigation
33.	Kodikkamkunnu Kulam	394	Public	12	9	2.5	12	Irrigation
34.	Kulam	289	Public	52	22	28	12	Irrigation
35.	Kulam	306	Private	8	5	1.0	12	Irrigation
36.	Kulam	2	Private	10	8	2	12	Irrigation
37.	Kulam	268	Private	9	3	0.6	12	Irrigation
38.	Kulam	315	Public	12	5	1.5	12	Irrigation

Details regarding the main canals/streams in the watershed are given below:

No	Name of Stream/Canal	Length	Water Availability
1.	Mavara – Neeliyadu thodu	3166 meter	4 months
2.	Ammettikkarathodu	1300 Meter	4 Months

Wells

Total Wells	– 1323	Seasonal	– 347
Perennial	– 976	Common Wells	– 7

General Socio-Economic Situation

Demographic details shows that 50% of the total population are either farmers or farm labourers and around 15%, are employed abroad, especially in the Middle East. There are about 10% employed in the construction sector. A very small percentage is Govt. employees.

More than 75% of the total households in the watershed are depending on agriculture for their economy. Few are employed in Middle East and they support their families to a great extent which also contributes to the general economy of the watershed. The nature of the houses speaks the economic situation of the people to a certain extent.

Though not highly educated, most of the people in the watershed had obtained High School level Education and they form the mixed community of farmers, agricultural labourers and those who are working in the construction sector.

Very few are found to be employed in Government Services. This will only come to 2 to 3.5 % of the total population in the watershed. Almost all the families have good houses to live in and the sanitation facilities attached to the houses are also seems to be good and scientific.

Watershed Committees

Sl. No.	Name	Designation	Position	Phone No.
1.	C.M.Alimaster	GP President	Chairman	9745208521
2.	Shantha	Ward Member	Vice Chairman	9747967147
3.	Ajith Mohan	Agriculture Officer	Convener	9447618416
4.	GopalaKrishnan Master	Watershed NHG Member	Jt. Convener	9747937604
5.		Gp Secretary	Member Secretary	
6.	Arya	WDT Member		
7.	Ali.M.V	Watershed NHG Member	Jt .Secretary	9745067687
8.	Naseema	Watershed NHG Member	Treasurer	9995311180
9.	Velayudhan	Watershed NHG Member	Member	9846834848
10.	Bhaskaran	Watershed NHG Member	Member	9745183434
11.	K.Abhul Rasag	Watershed NHG Member	Member	9400776646
12.	A.P.Muhamad	Watershed NHG Member	Member	9744917365
13.	Musthafa	Watershed NHG Member	Member	9645515552
Ex Officio- Members				
14.	Sabira Teacher	District Panchayath Member	Member	9037088944
15.	Sivadasan.A.P	Grama Panchayat Member	Member	9846417260
16.	Rabiya	Grama Panchayat Member	Member	9567518053
17.	Shantha	Grama Panchayat Member	Member	9747967147
18.	Ummakulsu	Grama Panchayat Member	Member	8943992818
19.	E.P.Rasag	Grama Panchayat Member	Member	9946461350
20.	Sindhu	ADS Chairperson	Member	9142024695
21.	Bindhu Mohan	ADS Chairperson	Member	9846676382
22.	Sindhu	ADS Chairperson	Member	9142024695
23.	Panka	ADS Chairperson	Member	9048147290
24.	Abdhulla Master	President – Co-Op. bank	Member	
25.	Sunny Asariparambil	Director Susthira	TSO Director	9744888122

Problems Identified

A focus group discussion involving some of the participants who can contribute to issues identification was held during the PRA in Kumaranellur Watershed. The group has discussed serious problems the farmers face and the major problems are consolidated as follows:

Soil Related Problems in the watershed

- ▶ Erosion of top soil
- ▶ Soil Degradation
- ▶ Lower Crop Production
- ▶ Increased cost of Production
- ▶ Poor Biological Fertility of the soil
- ▶ Drying & Shrinking of clay
- ▶ Very low soil PH
- ▶ Poor water infiltration

Water Related Issues

- ▶ Lowering water yield in the catchments
- ▶ Deforestation
- ▶ Poor vegetative cover on the soil surface
- ▶ Bank erosion
- ▶ Poor Ground water Recharging
- ▶ Sedimentation of Water Sources
- ▶ Ground water scarcity
- ▶ Water depletion
- ▶ Water Pollution

Agricultural Related Issues

- ▶ Declining Food crop Cultivation
- ▶ Increasing mono crop (rubber)
- ▶ Shift to non-agricultural work
- ▶ Non-agricultural land use
- ▶ High Wages & High cost of living
- ▶ Changing food habits
- ▶ Fragile land mass
- ▶ Inadequate marketing facilities
- ▶ Low price

Animal Husbandry Related issues

- ▶ Degradation of common property resources
- ▶ Poor biomass availability
- ▶ Unavailability of indigenous varieties
- ▶ Disappearing ethno veterinary techniques
- ▶ Poor performance of Veterinary department/hospitals
- ▶ Poor service of Agricultural Department/Krishibhavans
- ▶ Poor dairy Education
- ▶ Poor interest of the farmers

Activities Proposed for the watershed

Sector	Activities
Entry Point Activity (EPA)	Pond Renovation- Puthenkulam of Kumaranellur Padashekham
Natural Resource Management (NRM)	Construction of protection bund for Mavarapadam Stream

Common Activities	Renovation and protection of Amettikkara Panchayat Well
	Renovation and protection of Well at Amettikkara SC Colony
	Retaining wall construction for Padinhare Stream
	Protection of Puthenkulam Pond
	Construction of Shutter Check-dam for Poonoolpadam Stream
	Construction of Irrigation canal at Palakkal Thazham
	Construction of RWH Tank (10000 Litre Capacity) at Marayamkunnu Anganwadi
	Retaining wall construction for Parakkulam
	Retaining wall construction for Neeliyadu stream
	Retaining wall construction for Pullooni stream
	Construction of RWH Tank (50000 Litre Capacity) at GLP School, Kumaranellur
	Construction of RWH Tank (50000 Litre Capacity) at GHS School, Kumaranellur
	Construction of RWH Tank (50000 Litre Capacity) at Primary Helath Centre, Kumaranellur
Natural Resource Management (NRM) Individual Activities	Well recharging, Contour Bunding, Live fencing, Rain water Harvesting, well retaining wall, Well deepening,
PS & Micro-Enterprises (PS & M)	vermin composting, Banana planting, Organic Vegetable Cultivation, biogas plant
Livelihood Support System (LHS)	Cow rearing, Goat Rearing, Poultry, Duckery and enterprises in secondary sector

3. KOLLANNUR WATERSHED

Kollannur watershed lies exclusively in Kappur Grama Panchayat. It spreads over fully in 10th, 11th and 12th wards and partly in 9th ward of the watershed. The watershed is formed around Kollannur thodu otherwise known as Chennamkundu thodu. The streams originate from kanhirathani Side of the watershed and flows towards the District of Malappuram which flows for a total distance of 2.5 Kms. The watershed has a total area of 333. Ha and the height from the MSL is between 20 – 42 meters.

Kollannur watershed is bounded in its north by Tippu sulthan Road, in its south by Eravakkadu School, in its east by Kokkur – Kanhirathani Road and its west by Malappuram District. Geographically watershed is located between 76°1'30" and 76°4'30" E and 10°46'30" & 10° 48'0" N. Generally, the land is undulating with hills, valleys and paddy fields.

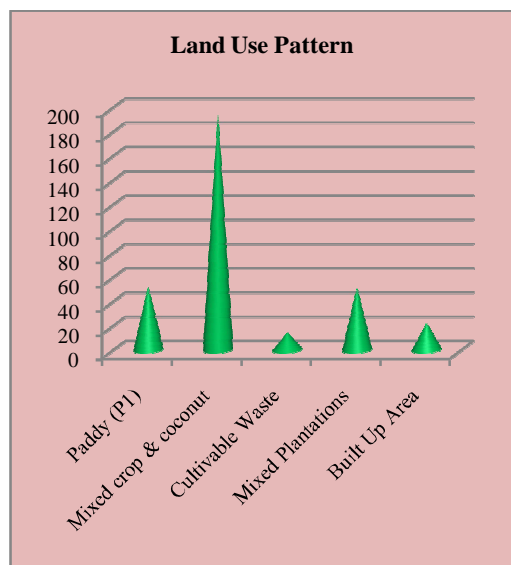
Physical Features

Generally very deep moderately drained clayey soils in nearly level narrow valleys with slight erosion associated with very deep imperfectly drained clayey soils are found in some areas of the watershed. on gently sloping midland very deep, well drained gravelly clay soils associated with well drained clayey soils with coherent materials.

Land use and cropping pattern

Major part of the watershed has mixed crops with coconut, arecanut and cashew. Pepper and Pnatain are found as intercrops. 20% of the total land available in the watershed is cultivable paddy fields. Single crop cultivation is applicable to the paddy land. There are some granite

quarries in the hilly area. There is 14 ha of cultivable waste in the watershed. Details are given below in a tabular form.



Sl. No.	Land use	Area in Ha
1.	Paddy (P1)	52.00
2.	Mixed crop & coconut	193.74
3.	Cultivable Waste	14.38
4.	Mixed Plantations	50.88
5.	Built Up Area	22.00
	Total	333

Water Sources

It has already been stated above that the main water body and the drainage is Kollannur Thodu. There is a tributary (sub – stream) to the main drain. In this stream water availability is only around 4 months. There are 11 ponds including the two perennial ones in this watershed. In addition there are 486 wells including two community wells amongst which 258 are perennial. Details of the water bodies are shown below:

Streams

No	Name of Stream/Canal	Length	Water Availability
1.	Kollannur Thodu	2025 Meters	5 months
2.	Sub-stream	225 Meters	4 Months

Ponds

Sl. No.	Name	Survey No.	Ownership	Length (M)	Width (M)	Total Area Cents	Water availability (Months)	use
1.	Kalluvettukulam	115	Private	11	5	1.5	10	Irrigation
2.	Pazhayapallikkulam	66	Private	15	13	5	6	Irrigation
3.	Puthiyapallikkulam	66	Private	15	9	4	10	Irrigation
4.	Kulam	74	Private	7	2	0.34	10	Irrigation
5.	Kulam	74	Private	14	11	4	10	Irrigation
6.	Kulam	59	Private	0	0	0	10	Irrigation
7.	Quarry	52	Private	50	20	24	NA	--

8.	Kulam	61	Private	5	9	1	12	Irrigation
9.	Kulam	61	Private	15	10	3.7	12	Irrigation
10.	Cholakkulam	37	Public	29	23	16	10	Irrigation
11.	Kulam	97	Private	10	3	0.75	10	Irrigation

Wells

Total Wells	– 580	Seasonal	– 320
Perennial	– 260	Common Wells	– 2

General Socio-Economic Situation

Majority of the people are farmers and some others are earning their livelihood from secondary source of income like wage labour in construction sector. About 20% are working in Middle East.

Majority of the people are depending on agriculture for their economy. Few are employed in Middle East and they support their families to a great extent which also contributes to the general economy of the watershed. The nature of the houses speaks the economic situation of the people to a certain extent.

Though not highly educated, most of the people in the watershed had obtained High School level Education and they form the mixed community of farmers, agricultural labourers and those who are working in the construction sector.

Very few are found to be employed in Government Services. This will only come to 2 to 4.5 % of the total population in the watershed. Almost all the families have good houses to live in and the sanitation facilities attached to the houses are also seems to be good and scientific.

Formation of Watershed Committees

Sl. No.	Name	Designation	Position	Phone No.
1.	C.M.Alimaster	GP President	Chairman	9745208521
2.	Moithunni Pathil	Ward Member	Vice Chairman	9048341991
3.	Ajith Mohan	Agriculture Officer	Convener	9447618416
4.	Prabhakara Menon	Watershed NHG Member	Jt. Convener	04943259114
5.		WDT Member	Secretary	
6.	Abdhul Khadar.C.M	Watershed NHG Member	Jt .Secretary	9645094184
7.	Devi Krishnan	Watershed NHG Member	Treasurer	9745620563
8.	P.Hameed Pilakkal	Watershed NHG Member	Member	9745250250
9.	Shanmughan Kunnath	Watershed NHG Member	Member	9645698371
10.	Kunjumhammad Malapurath	Watershed NHG Member	Member	9846683965
11.	Faisal Panthalingal	Watershed NHG Member	Member	9946033180
12.	Sainalavi Koya Thangal	Watershed NHG Member	Member	9846448657
13.	Shihab Vakayil	Watershed NHG Member	Member	

Ex Officio- Members				
14.	Sabira Teacher	District Panchayath Member	Member	9037088944
15.	RadhaKrishnan	Block Panchayat Member	Member	9746190964
16.	Fathima	Grama Panchayat Member	Member	9995960779
17.	Aminakutti	Grama Panchayat Member	Member	9048288552
18.	Sujitha	Grama Panchayat Member	Member	9048444295
19.	Abdhulla Master	President – Co-Op. bank	Member	9895740856
20.	Rukmini	ADS Chairperson	Member	8129129998
21.	Usha Sadanandhan	ADS Chairperson	Member	9645633255
22.	Leena Girish	ADS Chairperson	Member	9539275159
23.	Shantha Kumari	ADS Chairperson	Member	9645589478
24.	Sunny Asariparambil	Director Susthira	Member	9744888122

Besides this, the existing Self Help Groups under the Kudumbasree Mission in each watershed shall also be fostered and promoted to take up programmes coming under PSM and LHS. The SHGs are functioning properly and in a most effective manner under the supervision of the Grama Panchayats. If it is found necessary, new SHGs can also be formed, especially for men in the watershed. The existing farmers groups can also be considered as Self Help groups.

Problems Identified

The analysis was done in groups taking four different areas separately- soil, water, Agriculture and livestock. Area-wise problems were listed out by each group and prioritized. The Problems in different areas identified by the groups are listed below:

First Group on Hydrology

- Immediately after the rain almost all the water sources are drying up
- Water table is reducing drastically year after year
- Severe drinking water scarcity experienced for more than 6 months a year.
- Change in land use resulted in the depletion of water sources
- Storage capacity of the soil reduced considerably
- There are no control/conservation measures taken up to protect water.
- Streams rich and fat with water in the rainy season become poor and shrink due to heavy sedimentation
- Poor awareness on soil conservation measures

Second Group on Soil

- Soil fertility drastically reduced
- Heavy soil erosion enhanced the sedimentation of water sources reducing water availability
- Heavy runoff forms gullies by washing off the loose topsoil
- No vegetative cover on the surface of the soil
- Traditional agricultural practices like mulching etc are extinct

- Shifting to mono-crop has changed the soil condition.
- Poor and inadequate soil conservation measures taken up and implemented by the farmers
- Inadequate knowledge on soil conservation measures

Third Group on Agro-biodiversity

- Traditional/medicinal herbs extinct
- Disappearance of many plants which were once in plenty in the watershed.
- Wide spreading mono crops in the place of once flourished multi crops.
- Many birds/ butterflies and amphibians disappeared
- Leveling of paddy fields to convert for mono-crops/multi crops
- Change in eco-system changed the living conditions of many plant and animal varieties.
- Alienation of women from agriculture resulted in ignoring backyard kitchen gardens

Fourth Group on Animal Husbandry

- Poor animal husbandry among the watershed community
- Cow rearing/goat rearing and even poultry had almost given up by the farmers
- Poor returns from animal husbandry
- Inadequate marketing facilities
- Poor motivation from the authorities
- Non-availability of good breed of animals.
- High rearing cost

Activities Proposed for the watershed

Sector	Activities
Entry Point Activity (EPA)	Cholakkulam Pond Renovation
Natural Resource Management (NRM) Common Activities	Construction a new pond (Chola Kulam)
	Construction of Shutter Type Check Dam
	Construction of VCB 1 (Thottupalam Stream)
	Construction of VCB 2 (Thottupalam Stream)
	Construction of RWH Tank (50000 Litre Capacity) for K.A.M.A. L. P. School Kappur
	Retaining wall Construction for Thottupala Stream
	Stream Protection (Ayyappanpara Thodu)
Natural Resource Management (NRM) Individual Activities	Well recharging, Contour Bunding, Live fencing, Rain water Harvesting, well retaining wall, Well deepening,
PS & Micro-Enterprises (PS & M)	vermin composting, Banana planting, Organic Vegetable Cultivation, biogas plant
Livelihood Support System (LHS)	Cow rearing, Goat Rearing, Poultry, Duckery and enterprises in secondary sector

4. ERAVAKKADU WATERSHED

Eravakkadu watershed has a total area 193.56 ha out of which 139 ha are taken for treatment. This area proposed for treatment under IWMP Thrithala lies in Kappur Grama Panchayat. The watershed covers 8th ward fully and 9th & 12th wards partly. The average height of the watershed from MSL is 20 – 36 meters.

Eravakkadu watershed is bounded in its north by Eravakkadu School, in its south by Mullankunnu and west by Kakkidipuararam and its east by Kozhikkara (Kundippadam). Geographically watershed is located between 76°1'30" E and 76°4'30" E and 10°46'30" N and 10°48'0". Generally, the land is undulating with hills, valleys and paddy fields. Laterite, red soil mixed with gravel, granite and clay are the type of soil found in the watershed

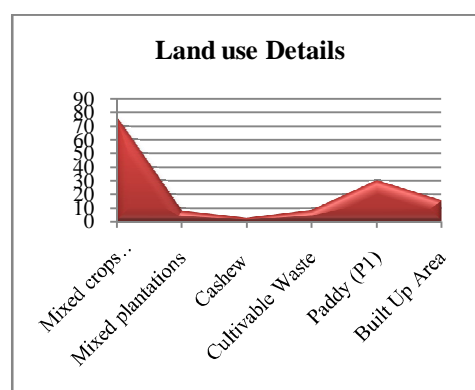
Physical Features

The nature of the land is undulating with small hills, valleys and plains. The hills are not too high nor are the valleys too steep. The slopes are moderate and are used for cash crops cultivation. Very deep, very poorly drained Clayey soil in nearly level broad valleys associated with very deep imperfectly drained clayey soils are found in the watershed area. Another type of soil found in the watershed is very deep well drained gravelly clay soils associated with deep well drained clayey soil with coherent materials

Land Use Pattern

In the hill tops the land is bench terraced and cashew along with coconut are cultivated. In the moderately slope areas coconut, arecanut and plantain are found to be cultivated. In the paddy fields, which is liowest layer of lands single crop cultivation is practiced. A certain area (nearly 8 ha) is considered to be cultivable waste in the watershed. A detailed depiction of the land use pattern is tabled below:

Sl. No.	Land use	Total area
1.	Mixed crops with coconut & arecanut	76.32
2.	Mixed plantations	7.52
3.	Cashew	2.4
4.	Cultivable Waste	8.00
5.	Paddy (P1)	29.76
6.	Built Up Area	15.00
	Total	139



Water sources

Eravakkadu watershed is formed based on the mainstream – Kundippadam - Eravakkadu Stream which is originating from Kundippadam, one of the biggest clusters of paddy field in the watershed. The stream is flowing for a distance of 800 meters. Water availability in the stream is around 7 months. There are 293 wells out of which 102 are seasonal. Details of the ponds are shown below:

Sl. No.	Name	Survey No.	Ownership	Length (M)	Width (M)	Total Area Cents	Water availability (Months)	use
1.	Kulam	129	Private	12	5	1.48	-	Irrigation
2.	Kulam	129	Private	15	10	3.7	-	Irrigation
3.	Kulam	110	Private	40	20	19	11	Irrigation
4.	Manikandankulam	145	Private	14	14	5	11	Irrigation
5.	Erinhipurathukulam	136	Private	20	14	7	11	Irrigation
6.	Thurakkulam	202	Private	10	10	25	10	Irrigation
7.	Koladikkulam	197	Private	26	22	15	12	Irrigation
8.	Vadakumpattukulam	188	Private	20	20	10	10	Irrigation

Details of Wells

Total Wells – 417

Perennial – 271

Seasonal Wells – 146

Community Wells – 4

General Socio-Economic Situation

Majority of the people are depending on agriculture for their economy. Few are employed in Middle East and they support their families to a great extent which also contributes to the general economy of the watershed. The nature of the houses speaks the economic situation of the people to a certain extent.

Though not highly educated, most of the people in the watershed had obtained High School level Education and they form the mixed community of farmers, agricultural labourers and those who are working in the construction sector.

Very few are found to be employed in Government Services. This will only come to 2 to 4.5 % of the total population in the watershed. Almost all the families have good houses to live in and the sanitation facilities attached to the houses are also seems to be good and scientific.

Formation of Watershed Committees

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1.	C.M.Alimaster	GP President	Chairman	9745208521
2.	Aminakutti	Ward Member	Vice Chairman	9048288552
3.	Ajith Mohan	Agriculture Officer	Convener	9447618416
4.	Madhavan.N.V	Watershed NHG Member	Jt. Convener	04943259114
5.		WDT Member	Secretary	
6.	Bhasheer.V	Watershed NHG Member	Jt .Secretary	9745166080
7.	Jameela.N.V	Watershed NHG Member	Treasurer	9048956367

8.	Muhammadhulla	Watershed NHG Member	Member	9846566210
9.	Kunjunni Nair	Watershed NHG Member	Member	
10.	Raveendran.K.P	Watershed NHG Member	Member	04662279817
11.	Sudheer	Watershed NHG Member	Member	9447516184
12.	Soorya Narayanan	Watershed NHG Member	Member	9645515552
13.	Abdhulla	Watershed NHG Member	Member	9446880905
Ex Officio- Members				
14.	Sabira Teacher	District Panchayath Member	Member	9037088944
15.	RadhaKrishnan	Block Member	Member	9746190964
16.	Fathima	Grama Panchayat Member, Kappur	Member	9995960779
17.	Saraswathi	ADS Chairperson	Member	9048517620
18.	Leena	ADS Chairperson	Member	9539275159
19.	Anitha.P.T	ADS Chairperson	Member	
20.	Abdhulla Master	President – Co-Op. bank	Member	9895740856
21.	Sunny Asariparambil	Director Suthira	Member	9744888122

The joint convenor and treasurer are exclusively from the representatives of individual watershed user groups and the post of the treasurer is reserved for women.

Besides this, the existing Self Help Groups under the Kudumbasree Mission in each watershed shall also be fostered and promoted to take up programmes coming under PSM and LHS. The SHGs are functioning properly and in a most effective manner under the supervision of the Grama Panchayats. If it is found necessary, new SHGs can also be formed, especially for men in the watershed. The existing farmers groups can also be considered as Self Help groups.

Problems Identified

The analysis was done taking four different areas separately- soil, water, Agriculture and livestock. Area-wise problems were listed out and prioritized. The Problems in different areas are listed below:

Soil related Problems

- Severe and heavy soil erosion
- Reducing productivity of the soil
- Deterioration of the soil humus
- Change in the chemical structure of the soil and reducing storage capacity of the soil
- Heavy water drain from the soil
- Soil Pollution due to indiscriminate use of Chemicals

Water related Problems

- Severe drought
- Drying up of water sources in the beginning of summer
- High velocity runoff in the monsoon season
- Over consumption of water
- Increasing number of bore-wells threatening the ground water storage

- Lowering water yield in the catchment affecting the groundwater recharge.
- Sedimentation in Ponds, Streams and paddy fields has affected summer flow and some perennial streams have become seasonal
- introduction of plantation crops in highlands replacing the natural vegetation reduced the storage capacity of soil
- Contamination of stream side aquifer due to polluted stream
- Contamination due to direct disposal of waste
- Drinking water contamination increasing waterborne diseases especially during monsoon.

Problems related to Agriculture/Bio-diversity

- Unavailability of seeds with ensured germination
- Reluctance to cultivate food crops
- Unavailability of quality organic fertilizers and bio-repellants
- Poor awareness on the importance and relevance of Organic Farming
- Alienated/extinct medicinal plants
- Destruction/deterioration of holy grooves (Kavus)
- Shift from multi crops to mono crops
- Deterioration of natural grazing land/pastures
- Reducing Paddy fields
- Poor vegetable cultivation
- Reducing freshwater fishes

Problems related to Livestock/Animal Husbandry

- Reduction in cow rearing
- Reduction in poultry
- Poor performance of the veterinary hospitals
- Absence of sub-centers which results in lack of insemination services
- Unavailability of green fodder/dry fodder
- Inadequate returns
- Lack of Interest in Animal Husbandry
- New generation reluctant to enter into the field of animal husbandry.

A serious discussion among the group members helped to distinguish the core problem and the causes and effects of such problems. They were asked to prioritize the problems and identify one core issue for analysis in each sector. The core problems identified by the groups in each sector are:

Activities Proposed for the watershed

Sector	Activities
Entry Point Activity (EPA)	Mullamkunnu Water Supply Scheme Pipe Extension
Natural Resource Management (NRM) Common Activities	Well Recharging – A.J.B School Retaining wall construction of the stream
Natural Resource Management (NRM) Individual Activities	Well recharging, Contour Bunding, Live fencing, Rain water Harvesting, well retaining wall, Well deepening,
PS & Micro-Enterprises (PS & M)	vermin composting, Banana planting, Organic Vegetable Cultivation, biogas plant

5. PATTIKKAYAL WATERSHED

The catchment area of Thalakkassery – Ootterippadam Naduthodu is known as Pattikkayal watershed which has an area of 1677 ha. It covers the whole of ward No. 1, 2, 3 & 13 in full and 4,11 & 14 wards in part of Pattithara Grama Panchayat and a small portion of Aanakkara Grama Panchayat. This watershed consists of the Koomanthodu, which originates from northern part of the Pattikkayal and ends in Bharathapuzha, Ootterippadam naduthodu, Thalakkasserythode and pulerithodu. The highest elevation of the area is 115 meters and the lowest is 20 meters from MSL. Geographically Pattikkayal watershed area lies between the east longitude 76°3'0" and 76°6'0" & North latitude 10°46'30" & 10°49'30"

The boundaries of the watershed are as follows:

- North** – Banks of Baharathapuzha upto Kootakaadavu Bridge
South – Thrithala – Edappal Road
East – Karanaprakkunnu to A. M. U. P. School – Aaloor Chamunnikkavu
West – Padinharangadi – Parakkulam Road

Topography

The watershed is undulating in nature. Pulerikkunnu which formed joining Neertenkunnu, V.P. Kundukunnu and Cholakkarakunnu is the main hill in the watershed. Besides this there are other small and medium sized hills in the watershed. On the Pulerikkunnu, there is an uncultivated waste which measure 200 meters length and 193 meter width. All the three types of slopes are also identified in the watershed.

Physical Features

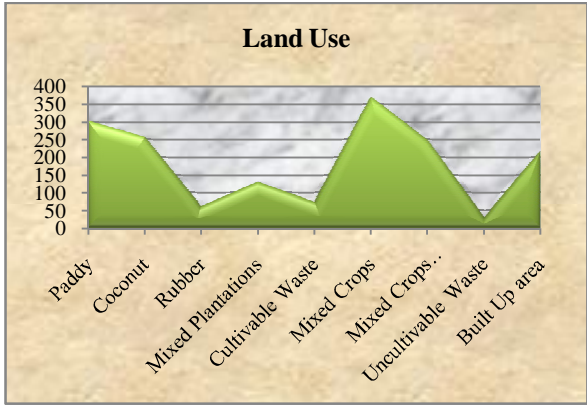
It is observed that very deep moderately drained clayey soils in nearly level narrow valleys with slight erosion associated with very deep imperfectly drained clayey soils are found in some areas of the watershed. on gently sloping midland very deep, well drained gravelly clay soils associated with well drained clayey soils with coherent materials.

Land Use

The main cultivation is paddy. Approximately 30% of the total geographic area is used for paddy cultivation and this belongs to S1 type of slopes. 13% of the land in medium slope is cultivated with coconut trees along with rubber, plantain, arecanut and other mixed crops. Tubers are another cultivated item in the watershed. A very big portion of the land is with mixed plants. Details are given below in the table

Sl. No.	Land Use	Total Area
1.	Paddy	300.48
2.	Coconut	254.49
3.	Rubber	60.32
4.	Mixed Plantations	129.6
5.	Cultivable Waste	72.96
6.	Mixed Crops	367.48
7.	Mixed Crops with	245.35

	Coconut as main crop	
8.	Uncultivable Waste	29.32
9.	Built Up area	217.00
	Total	1677



Hydrology

One of the major drainage of this watershed is Koomanthodu which originates from Pattikkayal and joins with Bharathapuzha at Koottakkadavu Bridge. During the monsoon based on the water level of the Bharathapuzha, water from the river enters into the Pattikkayal. When the water level is lower in the Bharathapuzha than in Pattikkayal, water flows back from Pattikkayal to the River through Koomanthodu. Another drainage is Pulerithodu which originates from Aloor Kundottypalli and flows downwards along the side of the temple and enters into Pattikkayal. A number sub streams are also found as tributaries to the Pulerithodu. Details of the streams are given below:

Sl. No.	Name of the Streams	Length (M)	Water Availability in Months
1.	Ellathazhamthodu (M/S)	1760	June to December
	a. MS/LS1	300	
	b. MS/LS2	640	
	c. LS/RS1	100	
2.	Pattikkayal – Pulerithodu (M/S)	2040	June to December
	a. MS/LS1	920	
	b. LS/LSS1	400	
	c. LSS1/LS1	80	
3.	Velarachola – Karimbillam, othalur Karimbillathodu (M/S) Thiruvazhiyodu	4480	June to December
	a. Ayanikkundu thodu MS/RS1	600	
	b. MS/LS2	1440	
	c. LS2/LSS1	480	
	d. LSS1/RS1	360	
e. MS/RS1	560		
4.	Nedumthechithode(MS)	900	June to December
5.	Vattaparambuthodu (MS)	860	June to December
6.	Pattikkayalthodu	840	June to December
7.	Pattippadam- Ayyappadam Canal	1760	June to December
8.	Komanthodu	1200	June to December
9.	Chopalthodu	775	June to December

Details of ponds in the watershed

Sl. No.	Name of Pond	Survey No.	Ownership	Length (M)	Width (M)	Area in Cents	Water Availability (Months)	Use
1.	Pond	63	Private	14	8.5	2.76	12	Irrigation
2.	Pond	143	Private	10	8.5	2.10	December	Irrigation
3.	Pond	146	Private	10	3	0.74	12	Irrigation
4.	Pond	110	Private	10	6	1.48	6	Irrigation
5.	Pond	99	Private	10	8	1.97	6	Irrigation
6.	Illathekulam	142	Private	27.8	25	17.17	8	Irrigation
7.	Illathekulam	110	Private	13.70	6.60	2.23	8	Irrigation
8.	Ayanikandappam Kulam	10	Public	22	13	7.06	10	Irrigation
9.	Pond	10	Private	8	6	1.18	8	Irrigation
10.	Pond	10	Private	12	11	3.26	12	Irrigation
11.	Vadakkethil Kulam	8	Private	15	8	2.96	8	Irrigation

12.	Panchayath Kulam	27	Public	33	12	9.78	10	Irrigation
13.	Pond	27	Private	8	8	1.58	10	Irrigation
14.	Pond	25	Private	10	8	1.97	10	Irrigation
15.	Pond	1	Private	7	5	0.86	10	Irrigation
16.	Pond	4	Private	16	5	1.97	10	Irrigation
17.	Pond	4	Private	20	8	9.95	8	Irrigation
18.	Pond	9	Private	10	9	2.22	8	Irrigation
19.	Kadaikulam	9	Private	8	8	1.58	10	Irrigation
20.	Kizhakkeyil Kulam	64	Private	11	10	2.71	10	Irrigation
21.	Namminipurathu Kulam	64	Private	11	10	2.71	10	Irrigation
22.	Pond	57	Private	18	7	3.11	10	Irrigation
23.	Pond	29	Private	8	5	0.98	10	Irrigation
24.	Pond	27	Private	12	8	2.37	12	Irrigation
25.	Pond	28	Private	10	9	2.22	12	Irrigation
26.	Pond	38	Private	10	10	2.47	12	Irrigation
27.	Pond	38	Private	12	6	1.77	10	Irrigation
28.	Pond	39	Private	8	4	0.79	12	Irrigation
29.	Pond	97	Private	7	7	1.21	12	Irrigation
30.	Pond	97	Private	11	6.50	1.76	6	Abandoned
31.	Pathayapurakkal Kulam	97	Private	10	14	3.46	6	Irrigation
32.	Pond	97	Private	18	10	4.44	12	Irrigation
33.	Komathukulam	-	Private	14	11	3.80	12	Irrigation
34.	Pond	97	Private	7	7	1.21	12	Irrigation
35.	Pond	39	Private	15	6	2.22	12	Abandoned
36.	Pond	37	Private	15	8	2.96	12	Irrigation
37.	Pond	29	Private	6	5	0.74	12	Irrigation
38.	Pond	29	Private	11	5	1.35	12	Irrigation
39.	Pond	97	Private	11	8	2.17	2	Irrigation
40.	Pond	33	Private	20	7	3.46	12	Irrigation
41.	Pond	33	Private	15	5	1.85	12	Abandoned
42.	Pond	68	Private	6	6	0.89	12	Irrigation
43.	Pond	322	Private	36.5	20	18.04	12	Irrigation
44.	Pond	322	Private	2	1.5	0.07	8	Irrigation
45.	Pond	318	Private	16	3.5	1.38	12	Irrigation

Details of Wells in the watershed

Description	Wells in Pattithara GP area	Wells in Aanakkara GP area
Total Wells	1283	208
Seasonal Wells	743	115
Perennial Wells	504	95
Community Wells	12	1
Household Wells	1235	207
Private Bore Wells	36	-
Public Bore Wells	36	-

Socio-Economic Situation

Majority of the population are either farmer's or agricultural labourers. 50 % of them are marginal farmers who have below one ha of land. About 20% are Scheduled castes. Another 10 to 15% are working in Gulf countries. 10 % are in the construction sector and a very small percentage (5%) is employed in government services.

The general socio-economic situation of the watershed community is of a middle class. Most of the people have some sort of agriculture as their main source of income. But, people say that as agriculture became non – cost effective, they forced to shift from agriculture to wage labour. Especially in the case of food crops, non-availability of workers, lower price in the market etc, have played an important role in withdrawing farmers from agriculture.

A very few percentage of people are working in the gulf countries and they support the economy of the watershed to a certain extent. Educationally they keep a satisfactory level. At the same time majority did not opt for higher education. Some people earn their income from construction sector. One can observe good RCC roofed houses in the watershed. But this does not mean that they are economically sound. We were told that most of them have constructed their house with bank loans. Each house is attached with adequate sanitation facilities. There is a very few houses, that too in the remote villages, without electricity.

Formation of Watershed Committees

Sl. No.	Name	Designation	Position	Phone No.
1.	C.P.Rasaq	GP President	Chairman	9447654026
2.	A.V.Mohanan	Ward Member	Vice Chairman	
3.		Agriculture Officer	Convener	
4.	Satheesan.P.	Watershed NHG Member	Jt. Convener	98465215178
5.			Member Secretary	
6.	Saithalavi	Watershed NHG Member	Jt .Secretary	9846510777
7.	Vilasini.M	Watershed NHG Member	Treasurer	964502010
8.	Arya	WDT Member	Member	9847921012
9.	Sujatha.P	Watershed NHG Member	Member	9746282849
10.	Mariyam Haneefa	Watershed NHG Member	Member	9645124295
11.	Aboobakar Master	Watershed NHG Member	Member	9846273528
12.	Ashraf	Watershed NHG Member	Member	9744767250
13.	K.Ramachandran	Watershed NHG Member	Member	98957455477
14.	Sajeevan	Watershed NHG Member	Member	96426984789
Ex Officio- Members				
15.	Sabira Teacher	District Panchayat Member	Member	
16.	A.M.Abdullakutty	Block Panchayat Member	Member	9847625910
17.	Ambika Sreedaran	Block Panchayat Member	Member	9745891744
18.	K.P.Radha	Grama Panchayat Member	Member	9747102178
19.	V.P.Jayaprakash	Grama Panchayat Member	Member	9745891008
20.	C.Khadeeja	Grama Panchayat Member	Member	9539430379
21.	M.T.Shamna	Grama Panchayat Member	Member	9809337479
22.	M.S.Radhika	Grama Panchayat Member	Member	9048323448

23.	A.O.Komalavalli	Grama Panchayat Member	Member	9809882210
24.	K.Ramadas	Grama Panchayat Member	Member	9876785571
25.	C.P.Majeed Master	Grama Panchayat Member	Member	9846423210
26.	M.K.Unnikrishnan	Grama Panchayat Member	Member	9846666010
27.	M.Surendran	Grama Panchayat Member	Member	9995106238
28.	P.Divakaran	Grama Panchayat Member	Member	9846535376
29.	Lalitha	ADS Chairperson	Member	9946389821
30.	Karathyani	ADS Chairperson	Member	9895806685
31.	Lalitha	ADS Chairperson	Member	9048516208
32.	Madhavi	ADS Chairperson	Member	9846789589
33.	Sajitha	ADS Chairperson	Member	9847869262
34.	Pathmini	ADS Chairperson	Member	9048016505
35.	Saraswathi	ADS Chairperson	Member	9745574578
36.	Indhira	ADS Chairperson	Member	9048135820
37.	Liji	ADS Chairperson	Member	9946402406
38.	Santha	ADS Chairperson	Member	9946240594
39.	Radha Unni	ADS Chairperson	Member	9744725795
40.		President – Co-Op. bank	Member	
41.	Sunny Assariparambil	Director Susthira	TSO Director	9744888122

Problems Identified

The analysis was done taking four different areas separately- soil, water, Agriculture and livestock. Area-wise problems were listed out and prioritized. The Problems in different areas are listed below:

Soil related Problems

- Severe and heavy soil erosion
- Reducing productivity of the soil
- Deterioration of the soil humus
- Change in the chemical structure of the soil and reducing storage capacity of the soil
- Heavy water drain from the soil
- Soil Pollution due to indiscriminate use of Chemicals

Water related Problems

- Severe drought
- Drying up of water sources in the beginning of summer
- High velocity runoff in the monsoon season
- Over consumption of water
- Increasing number of bore-wells threatening the ground water storage
- Lowering water yield in the catchment affecting the groundwater recharge.
- Sedimentation in Ponds, Streams and paddy fields has affected summer flow and some perennial streams have become seasonal

- introduction of plantation crops in highlands replacing the natural vegetation reduced the storage capacity of soil
- Contamination of stream side aquifer due to polluted stream
- Contamination due to direct disposal of waste
- Drinking water contamination increasing waterborne diseases especially during monsoon.

Problems related to Agriculture/Bio-diversity

- Unavailability of seeds with ensured germination
- Reluctance to cultivate food crops
- Unavailability of quality organic fertilizers and bio-repellants
- Poor awareness on the importance and relevance of Organic Farming
- Alienated/extinct medicinal plants
- Destruction/deterioration of holy grooves (Kavus)
- Shift from multi crops to mono crops
- Deterioration of natural grazing land/pastures
- Reducing Paddy fields
- Poor vegetable cultivation
- Reducing freshwater fishes

Problems related to Livestock/Animal Husbandry

- Reduction in cow rearing
- Reduction in poultry
- Poor performance of the veterinary hospitals
- Absence of sub-centers which results in lack of insemination services
- Unavailability of green fodder/dry fodder
- Inadequate returns
- Lack of Interest in Animal Husbandry
- New generation reluctant to enter into the field of animal husbandry.

A serious discussion among the group members helped to distinguish the core problem and the causes and effects of such problems. They were asked to prioritize the problems and identify one core issue for analysis in each sector. The core problems identified by the groups in each sector are:

1. Reducing productivity of the soil (Soil)
2. Severe drought (water)
3. Reluctance to cultivate food crops (Agro-biodiversity)
4. Lack of Interest in Animal Husbandry

Activities Proposed for the watershed

Sector	Activities
Entry Point Activity (EPA)	Othallur Vattaparamba Drinking Water Supply Scheme
Natural Resource Management (NRM) Common Activities	Construction of RWH Tank (20000 Litre Capacity) – GLP School Areekadu
	Construction of RWH Tank (10000 Litre Capacity) – Aloor Health Centre, Pooleri
	Renovation of community Well, Kunnathazhathu Colony
	Renovation of community Well, Ayil Temple
	Renovation of community Well, Pattithara Pump House
	Construction of protection wall: Pooleri – Pattikkayal Stream
Natural Resource Management (NRM) Common Activities	Construction of Crossbar – Thalakkassery Stream
	Pond Protection works – Chirayamkulam, Kottoppadam
	Construction of RWH Tank (10000 Litre Capacity) – Kottoppadam Cultural Centre
	Renovation of Pond – Vengassery Kallarakkulam
	Renovation of Pond – Kuyil Kulangara Pattikkayal Padashekharam
	Renovation of community Well, Chediyamkundu SC colony
Natural Resource Management (NRM) Individual Activities	Renovation of community Well, Niraparava SC colony
	Construction of RWH Tank (20000 Litre Capacity) – Govt. Ayurveda Hospital Othallur
PS & Micro-Enterprises (PS & M)	Well recharging, Contour Bunding, Live fencing, Rain water Harvesting, well retaining wall, Well deepening, vermin composting, Banana planting, Organic Vegetable Cultivation, biogas plant
Livelihood Support System (LHS)	Cow rearing, Goat Rearing, Poultry, Duckery and enterprises in secondary sector

6. PARAPPANTHODU WATERSHED

a. General Description

This watershed has a total geographic area of 1704 ha and exclusively is in Aanakkara Grama Panchayat. Watershed covers 1, 2, 3, 4, 5, 8 & 19th wards of the Grama Panchayat. The watershed lies between 76°1'30" & 76°4'30" E and 10°48'0" & 10°51'0" N

The watershed is bounded in its north by Bharathapuzha and Malappuram District, in the south by Chekode Waterhed, in the east by Pattikkayal Watershed and Bharathapuzha and in the west by Malappuram District. Topographically the watershed can be divided into three regions – High ranges, Middle plain land (paddy fields and moderately sloppy areas) and Low land (the sandy hills and plain in the river banks). The MSL differs from 20 meters to 110 meters. The highlands are about 110 meters above MSL, the midland about between 100 meters and the low land 20 meters.

Physical Features

Geographically the watershed lies in the Midland Agro-ecological zone. The hilly areas cover about 16.2 ha, valleys cover about 307.3 ha, and the moderately sloppy area and river bank sides are about 259.11ha. It is observed that very deep moderately drained clayey soils in nearly level narrow valleys with slight erosion associated with very deep imperfectly drained clayey soils are found in some areas of the watershed. on gently sloping midland very deep, well drained gravelly clay soils associated with well drained clayey soils with coherent materials.

b. Land use

Drastic change has been observed in the land use pattern over the years in the watershed. The available paddy fields have been reduced very much. This is due to leveling of the paddy fields to use for purposes other than cultivation. But some leveled land is cultivated with banana. Details of the land use pattern in the watershed are given below:

Sl. No.	Land Use	Area (Ha)	Percentage
1.	Paddy Fields (Virippu & Mundakan)	498.53	29.27
2.	Cultivable waste – Paddy Field	26.80	1.57
3.	Leveled (Converted) paddy fields for other purposes	95.09	5.58
4.	Coconut	135.21	7.93
5.	Arecanut	80.08	4.70
6.	Mixed Cultivation	433.68	25.45
7.	Mixed plantations	296.10	17.38
8.	Rubber	19.27	1.13
9.	Miscellaneous Vegetation	12.06	0.70
10.	Water Bodies	5.17	0.30
11.	Cultivable Wasteland	9.27	0.54
12.	Uncultivable Wasteland	65.05	3.82
13.	Built up Area	17.59	1.03
14.	Quarry	10.10	0.59
	Total	1704	99.99

c. Water Bodies

Major drainage of the watershed is Parappanthodu. This is enriched with a number of tributaries and flowing through several areas before it finally join to Bharathapuzha. The main drainage originates from Malamalkkavu hills at Survey No. 112 and flows towards the west to join another stream Kunthithodu. Then the joined canal is flowing through the southern part of the watershed and joining several other canals in the watershed before it enter into Bharathapuzha at Survey No. 188. The other canals in the watershed are tabled below:

Sl. No	Name of Drain	Origination	Areas Drained (Survey No.)	Outlet (Drin into)
1.	Muttippalamthodu	Ummathurkunnu Survy No. 60	29, 182,183	Parappanthodu
2.	Thevarnadathodu	Pushpamkunnu Quarry Pond Survey No. 138	139, 144, 142,	Parappanthodu
3.	Parathekkattuchola	Kuttipilakkunnu	71, 72, 73, 84, 87, 101	Parappanthodu
4.	Panniyurkunnu parappanthodu varichal	Panniyurkunnu Survey No. 59	43, 105	Parappanthodu
5.	Panniyur varichal	Panniyurkunnu Survey No. 59	60, 61, 62, 63	Panniyur - Mundarakkodu Paddy Field
6.	Puramathilssery Parappanthodu chal	Puramathilssery	126, 128	Parappanthodu
7.	Nayyur LPS - Panniyurkunnu Varichal	Panniyurkunnu Survey No. 67	Nayyur Varattappaliyal Paddy field	Parappanthodu
8.	Kurungottuvalappuchal	Parakkulam Kunnu	Varattappaliyal field	Parappanthodu
9.	Pottanpilavu Neerchal	Parakkunnu Colony Survey No. 104	Flowing through the east	Parappanthodu
10.	Kuttiyalchal	Parakkunnu Colony Survey No. 104	Flowing through the east	Parappanthodu
11.	Kodangazhi Neerchal	Survey No. 114	Flowing westwards	Parappanthodu
12.	Kottunilappadam Neerchal	Survey No. 106	Flowing Eastwards	Parappanthodu
13.	Kaithodu	Panniyurkunnu	Flowing southwards	Parappanthodu
14.	Cherumkadu - Kattileparambilchal	Cherumkadu	Flowing westwards	Parappanthodu
15.	Kunthithodu	Kappur	Nayyur Varattappaliyal Paddy field	Parappanthodu
16.	Kodangazhi Panchayat Kulam Chal	Private Pond Survey No. 100	Flowing East southwards	Nayyur Varattappaliyal Paddy field
17.	Kodangazhi Chathayil Kulam Chal	Private Pond Survey No. 100	Flowing southwards	Nayyur Varattappaliyal Paddy field
18.	Cholappuram Padathu Peedikathodu	Thonikkunnu	Flowing westwards	Perumbalam Melazhiyam Paddy fields
19.	Cholaparambilchal	Cholaparambu Quarry pond - Survey No. 149	Flowing northwards	Melazhiyam Paddy fields
20.	Mambattathottuvaram buchal	Noorkadu Survey No. 198	151,158	Parappan thodu at Survey No.157
21.	Kodalil Vishnukshestram Chal	Mabattathoduvarambil chal Survey No. 197	Flowing westwards	Perumbalam Melazhiyam Paddy fields - survey No. 153
22.	Kollikkulamchal	Survey No. 15	Flowing Northwards	Perumbalam

				Melazhiyam Paddy fields
23.	Manoor Kayalthodu	Vattakkulam Panchayat of Malappuram Dt.	Flowing through the west boundary of Perumbalam Melazhiyam Paddy fields	Bharathapuzha
24.	Poolakkaparambuchal	Ummathur Survey No. 37	Flowing through the Ummathur canal	Sustains as a connecting link Bharathapuzha and Ummathur Paddy fields
25.	Nirappu-Narimadachal	Ummathur plains	Flowing westwards	Ummathur Paddy Fields
26.	Kaliyathethilchal	Ummathur plains	Flowing Northwards and joins with the canal coming from Thruakkal to form Pottanthodu	Baharathapuzha

Besides these natural canals, there are two lift irrigation canals in the watershed – Ummathur Lift Irrigation Canal and Aanakkara Lift Irrigation Canal. The former starts from Survey No. 65 and flowing through the western boundary of Ummathur Paddy fields and finally joins with Bharathapuzha at Survey No. 240. The latter starts from Ummathur Main Canal (Survey No. 179) and flowing eastward across Kankapuzha Road to enter finally into Kumbidi Paddy fields at Survey No. 94.

There are also about 38 Ponds in the watershed area the details of which are tabled below:

Sl. No.	Name of the Pond	Survey No.	Ownership	Length	Width	Area	Water Availability	Use
1.	Kulam	223	Private	8	6.5	1.2	12	Irrigation
2.	Kulam	54	Private	18	15	6	12	Irrigation
3.	Kulam	27	Private	6	2.5	0.30	10	Irrigation
4.	Kulam	25	Private	7	-	3	12	Domestic
5.	Kulam	21	Private	4	-	0.30	8	Fish Culture
6.	Kulam	140	Private	4.5	4	0.44	8	Irrigation
7.	Kulam	139	Private	6	5.5	0.82	12	Irrigation
8.	Quarry	149	Private	13	10	3.21	12	Irrigation
9.	Quary	149	Private	44	11.2	12.18	12	Irrigation
10.	Kulam	161	Private	11.6	8	2.3	12	Irrigation
11.	Kulam	157	Private	6	5	0.74	8	Irrigation
12.	Kulam	157	Private	8	7	1.38	8	Irrigation
13.	Kulam	252	Private	8	6.5	1.2	12	Irrigation
14.	Kulam	218	Private	8	7	1.38	12	Irrigation
15.	Kulam	218	Private	12	10	3	12	Irrigation
16.	Kulam	214	Private	20	5.5	2.7	6	Irrigation

17.	Kulam	213	Private	16	15.5	6.13	6	Irrigation
18.	Kulam	214	Private	10	6	1.48	10	Irrigation
19.	Kulam	230	Private	10	8.5	2.1	10	Irrigation
20.	Kulam	151	Public	28	20	13.84	12	Irrigation
21.	Kulam	186	Private	5	-	0.5	10	Irrigation
22.	Kulam	149	Private	8	3	0.59	10	Irrigation
23.	Kulam	141	Private	3	-	7.1	10	Domestic
24.	Quarry	141	Private	28	20	13.84	12	Irrigation
25.	Kulam	103	Private	7.5	6	1.11	6	Irrigation
26.	Kulam	109	Private	6	6	0.89	10	Irrigation
27.	Kulam	72	Private	5	3.5	0.43	12	Irrigation
28.	Kulam	72	Private	7	5.5	0.95	12	Irrigation
29.	Kulam	151	Public	24	23	13.64	12	Irrigation
30.	Kulam	331	Private	19	15	7.04	10	Irrigation
31.	Kulam	30	Private	6	6	0.89	6	Irrigation
32.	Kulam	30	Private	7	6.5	1.12	12	Irrigation
33.	Thenkurissi Padinharekulam	61	Private	24	10	6	10	Irrigation
34.	Parakkulam	63	Public	3	-*	-	12	Irrigation
35.	Puthumanakkulam	49	Private	20	17	8	10	Irrigation
36.	Kulam	38	Private	20	15	7.5	12	Irrigation
37.	Thatcharakulam	47	Private	10	10	2.5	12	Irrigation
38.	Vettakkarakulam	46	Private	5	5	-	12	Irrigation

The following are the springs in the watershed

Sl. No.	Name of Springs	Survey No
1.	Mannarakkundu Chola	29
2.	Gowrikkunnu Chola	219
3.	Cherukunnathu Shivakshethram Chola	58
4.	Srambikkal Chola	61
5.	Sreedhari Madam Chola``	61

Details of the wells	
Total Wells	2393
Seasonal Wells	935
Perennial Wells	1458
Common Wells	38

d. Socio-Economic Situation

There are 3028 households with a total population of 9861 amongst which 2674 belong to SC community. The SC community lives in clusters – colonies and there are 8 such colonies in the watershed. The colonies are – Nellikunuu Harijan Colony, Palliparamba Colony, Nayyur Harijan Colony, Naduvathuparambil Colony, Parakkunnu Colony, Kattilparambil Colony, Karumampurathu Colony and Kurungattuvalappil Colony.

The main source of income of the watershed community is agriculture. But as the agriculture became non-profitable, people. Especially small scale farmers began to turn against it and go to wage labour especially in the construction sector. Now most of the people earn their secondary livelihood from wage labour. Educational level of the watershed is average and there are a few working in the Middle East and they support the economy to a certain extent. A minority has involved in commercial trading and some employed in shops.

Animal Husbandry

Baseline survey conducted in the watershed reveals that only few farmers have livestock. It was told that there were many farmers who had been involved in animal husbandry, especially cattle rearing. But as the price of dry fodder has gone high beyond all limits and the green fodder became rear, farmers forced to abandon cattle rearing. The available data is given below:

Sl. No	Type of livestock	Total Number
1.	Hybrid Variety Cows (Male)	234
2.	Hybrid Variety Cows (Female)	999
3.	Other Cattle of which breed is not known (Male)	112
4.	Other Cattle of which breed is not known (Female)	1348
5.	Buffalo (Male)	57
6.	Buffalo (Female)	44
7.	He – Goats	343
8.	She-Goats	1122
9.	Fouls (Indigenous variety)	9291
10.	Fouls (Hybrid Variety)	65

Formation of Watershed Committees

Sl. No.	Name	Designation	Position	Phone No.
1.	N.Karthayyani	GP President	Chairperson	9539825190
2.	K. Muhammad	Ward Member	Vice Chairperson	9895521406
3.	Jasmin	Agriculture Officer	Convener	8281155112
4.	C.T. Suresh	GP Secretary in charge	Member Secretary	9745067835
5.	Muhammad Basheer.T	Watershed NHG Member	Jt. Convener	8086851018
6.	O.P.Chandrasekaran	Watershed NHG Member	Jt. Secretary	9745624874
7.	C.C.Kunju	Watershed NHG Member	Treasurer	9947043883
8.	C.K.Narayanan	Watershed NHG Member	Member	9495656990
9.	P.K.Balachandran	Watershed NHG Member	Member	
10.	K.P.Muhammadvutty	Watershed NHG Member	Member	
11.	P.Venugopalan	Watershed NHG Member	Member	9447945814
12.	K.Narayanan	Watershed NHG Member	Member	
13.	U.P.Raveendranadh	Watershed NHG Member	Member	9249395611
14.	Arya	WDT Member	Member	9847921012
Ex Officio- Members				
15.	P.N.Mohanan	President – Co-Op. bank	Member	

16.	Ambika Sreedharan	Block Panchayat Member	Member	9745891744
17.	R.Radha	Block Panchayat Member	Member	9961742431
18.	M.K.Pradeep	Gramapanchayat Member	Member	9846350875
19.	K.K.Soumya	Gramapanchayat Member	Member	9946777648
20.	K.Muhammad Basheer	Gramapanchayat Member	Member	9745653394
21.	P.M.Habeeba	Gramapanchayat Member	Member	9745776582
22.	E.Parameswaran Kutty	Gramapanchayat Member	Member	9895999143
23.	M.Jaya	Gramapanchayat Member	Member	9048392579
24.	K.M.Ajitha	Gramapanchayat Member	Member	9745659877
25.	V.P.Beena	Gramapanchayat Member	Member	9539637067
26.	N.K.Subramanian	Gramapanchayat Member	Member	9744728107
27.	K.V.Jaseena	Gramapanchayat Member	Member	9633905932
28.	N.K.Rajani	Gramapanchayat Member	Member	8086345171
29.	Karthyayani	ADS Chairperson	Member	9747633539
30.	Vilasini	ADS Chairperson	Member	9633400273
31.	Baby	ADS Chairperson	Member	8943577415
32.	Bindhu	ADS Chairperson	Member	9995049074
33.	Ambika	ADS Chairperson	Member	8086196805
34.	Nisha	ADS Chairperson	Member	9142517698
35.	P.Geetha	ADS Chairperson	Member	9895947614
36.	Sujatha	ADS Chairperson	Member	9048815611
37.	Mini	ADS Chairperson	Member	9946826984
38.	Bindhu.k.k	ADS Chairperson	Member	9745583569
39.	Subadhra	ADS Chairperson	Member	9446313364
40.	Meenakshikutty	ADS Chairperson	Member	9020431745
41.	Sunny Asariparambil	Director Susthira	Member	9744888122

Besides this, the existing Self Help Groups under the Kudumbasree Mission in each watershed shall also be fostered and promoted to take up programmes coming under PSM and LHS. The SHGs are functioning properly and in a most effective manner under the supervision of the Grama Panchayats. If it is found necessary, new SHGs can also be formed, especially for men in the watershed. The existing farmers groups can also be considered as Self Help groups.

Problems Identified

A focus group discussion involving some of the participants who can contribute to issues identification was held during the PRA in Kumaranellur Watershed. The group has discussed serious problems the farmers face and the major problems are consolidated as follows:

Soil Related Problems in the watershed

- ▶ Erosion of top soil
- ▶ Soil Degradation
- ▶ Lower Crop Production
- ▶ Increased cost of Production
- ▶ Poor Biological Fertility of the soil
- ▶ Drying & Shrinking of clay

- ▶ Very low soil PH

Water Related Issues

- ▶ Lowering water yield in the catchments
- ▶ Poor Ground water Recharging
- ▶ Deforestation
- ▶ Poor vegetative cover on the soil surface
- ▶ Bank erosion
- ▶ Sedimentation of Water Sources
- ▶ Ground water scarcity
- ▶ Water depletion
- ▶ Water Pollution

Agricultural Related Issues

- ▶ Declining Food crop Cultivation
- ▶ Increasing mono crop (rubber)
- ▶ Shift to non-agricultural work
- ▶ Non-agricultural land use
- ▶ High Wages & High cost of living
- ▶ Changing food habits
- ▶ Fragile land mass
- ▶ Inadequate marketing facilities
- ▶ Low price

Animal Husbandry Related issues

- ▶ Degradation of common property resources
- ▶ Poor biomass availability
- ▶ Unavailability of indigenous varieties
- ▶ Disappearing ethno veterinary techniques
- ▶ Poor performance of Veterinary department/hospitals
- ▶ Poor service of Agricultural Department/Krishibhavans
- ▶ Poor dairy Education

Activities Proposed for the watershed

Sector	Activities
Entry Point Activity (EPA)	Perumalam Minor Lift Irrigation Project
Natural Resource Management (NRM) Common Activities	Protection of Mundaram Pond
	Protection of Madathilvalappil Pond
	Renovation and recharging of the community well at Puramathilissery Laksham Veedu Colony

	Construction of RWH System and Well Recharging System for Harijan Welfare School
	Providing Shutter for the VCB at Panniyur Temple
	Protection of Mundaram Pond
	Construction of VCB for Village Junction Stream
Natural Resource Management (NRM) Common Activities (Contd..)	Construction Panniyur Thura Stream
	Renovation public pond at Pandaraparambil
	Side wall construction of the stream - K.M. Abdul Majeed
	Protection of Puramathilissery Temple Pond
	Protection of Kotti Pond
	Renovation public pond at Kallapurakkal Ali
	Renovation pond at Parekulangara Appunni Menon
	Construction of RWH Tank at Guallur High School
	Protection of Kizhakke Thrikkovil Temple Pond and construction of the micro stream
	Construction of RWH Tank and Well Recharging System at GLP School, Melazhiyam
Natural Resource Management (NRM) Individual Activities	Well recharging, Contour Bunding, Live fencing, Rain water Harvesting, well retaining wall, Well deepening,
PS & Micro-Enterprises (PS & M)	vermin composting, Banana planting, Organic Vegetable Cultivation, biogas plant
Livelihood Support System (LHS)	Cow rearing, Goat Rearing, Poultry, Duckery and enterprises in secondary sector

PRAT – III: EXPECTED OUTCOME

The overall expected outcome of IWMP is the strengthening of **Environmental Governance** and **advancing the Environment and Natural Resources Agenda** in the watershed area. The proposed Project will tackle two key issues facing the sector: (i) the need to build strong, sustainable institutions with capacities to manage the sector and investments therein, and (ii) the need to address the issues of agricultural productivity for food security in a sustainable manner.

The expected outcome of the project also include the overall increase in the standard of living of the people in the watershed by mitigating the various constraints in the development of the natural resources which will increase the productivity of various activities. The end result will be increase in the employment and income of the farm households and as well as landless households. Besides, watershed committee and other functionaries to implement and maintain the watershed after the withdrawal government support. One of the parameter to result in the impact was completion of the activities in the given period. Some of the quantifiable indicators are as follows:

Employment

One of the prominent features of watershed program is to create self sustenance to stakeholder in terms of livelihood and increase in employment opportunities. Watershed creates employment opportunities during the work phase for labour intensive activities like construction of gully plug, earthen dam, field bund, check dam, VCBs and through the assets created under watershed program have a direct impact on agriculture and natural resource development. Livelihood for self employed, wage labour and income generating activities where there is an ample scope for employment. As the net employment increases the per-capita income from agriculture, animal husbandry and other allied activities are also sure to increase.

Water table

Due to erratic rainfall and uncovered ground the rain water infiltration to ground is decreasing day by day. It is understood from the villagers that the water table of the dug well in the village before 10 years was about 5.5 mt. during March which is 7.6 mt now. The proposed soil and moisture conservation measures will help in bringing more area under vegetative cover so that velocity of run-off can be reduced which will increase infiltration and thus ground water table.

Ground water structures

There are several water bodies existing in the villages which are for storing ground water. But some of these water bodies are in damaged condition which is in no use at present. These structures are proposed to be renovated through project funds and convergence with GNREGA which will bring these water bodies for irrigating about a considerable quantum of agricultural land.

Ground Water Table

The ground water table of this cluster of villages is approximately 15mt and further goes down in summer and drought seasons. One of the reasons for groundwater depletion and lowering of the water table is over-pumping and unchecked ground water utilization. Due to growing population the demand for water for daily activities and agriculture has increased. This poses a major pressure on the water table. The water travels slowly through layers of soil and rock before finally reaching the water table. Several water harvesting structures are created like percolation tanks, roof water harvesting structures and dug well recharge for recharge of ground water. Hence a strong effort is taken to maintain a balance between usage and recharging of the ground water.

Quality of drinking water

The report collected from KWA sub-division office shows that the drinking water quality is not safe at present in the village. The Iron content of the water is higher and Fluoride content is lower than the recommended quantity. Similarly due to damage of the platform and drains the water sources get contaminated by run-off water. Steps are proposed for repair of the well platforms with drains and soak pit for sanitary point of view. Awareness will be created among the villagers about safe drinking water and causes of water contaminated diseases. After project period it is expected that the each household will get safe drinking water.

Change in cropping and land use pattern

Presently cultivable land is under different type of crops and a very good area of land is under paddy cultivation only, which includes up, medium and low land. Most of the up lands are kept fallow as they are poor in fertility status. As these up lands are suitable for Horticultural crop and the farmers can get a good return after 3-4 years it is proposed to take up planting of fruit bearing trees like Mango and jack in these land. They can take up inter crops. Similarly hybrid plant cultivation is proposed in up lands which will increase not only production but also productivity. This will increase the area under crop in each year. Farmers are not used to vegetable cultivation. Pump sets are proposed to be provided for cultivation of vegetable every year.

Fodder

Although there is a large number of cattle population in the village, availability of fodder for them is scarce. The villagers are not aware of quality fodder crops and its benefits for the animals. Fodder crops are to be taken up on community basis for the benefit of the cattle. Back yard fodder cultivation will also be promoted so that fodders will be available adequately.

Agriculture

Agriculture itself is constraint due to lack of irrigation facilities and total dependence of rain has limited the scope for agriculture. However structures created under watershed opens avenue to take up cropping in any season by utilizing the water stored through check dam, VCBs and, farm ponds. Field bunds are also created to check the run-off and to promote percolation of rain water.

Vegetative cover

A considerable quantum of area will be under vegetative cover preventing the rate of evaporation from the surface of the earth. The vegetative cover will also prevent sheath erosion and wind erosion along with water runoff especially from the slopes. The live fencing, cover crops promoted under the project will ensure the above mentioned functions.

Livestock

The project will help improve the livestock in almost all the watershed by way promoting cattle rearing and other animal husbandry interventions. This will enhance the income level of the assetless poor as well indigenous communities. Increase in milk and meat production will help the communities to become self reliant in food security.

Food Security & safety

The implementation of Transfers of Natural Resource Management to the local communities is expected to promote sustainable farming practices and subsequently increase revenues, create jobs and improve living conditions for local communities.

Self Help Group

Although there are several SHGs in the villages, they are poorly involved in any activities for generating income. These groups are identified and proposed to be assisted for taking group activities for their livelihoods. Similarly more groups can be formed as per the interest of the women community and trained for different activities so that more and more women will be involved in income generation.

Increase in nos. of Livelihoods

At present collection of Agriculture, wage earning and to little extent animal husbandry are the livelihood options for most of the households. All most all the households are involved in combination of these livelihoods. But the income from these livelihoods is not at all sufficient for fulfilling all their needs. Skill up gradation through value addition and marketing in a profitable way are proposed for getting more income from these livelihoods. The poor and very poor households are identified to assist for different other options of livelihood with adequate training and exposure to them.

Increase in Income:

As estimated from the individual household survey it is estimated that the average annual income of the village is about Rs14000/- per family. It varies from Rs 6000/- to Rs 55000/- Introduction of livelihood options for individuals and SHG members and improving cropping pattern and crop production of households will facilitate for increase in annual income for all the households of the village.

Credit linkage

The present SHGs in the village have already being linked with Banks. It is understood that they have been exploited in getting credit and subsidy due to their ignorance. Steps will be taken for organising them, building their capacity, up grading their skills and making them understanding the concept of SHG. After that all the existing SHGs and new SHGs are to be linked with banks for their activities.

Resource use agreement

Steps will be taken for developing the status of common property resources like forest, pasture and water bodies. Awareness will be created among the villagers for using the resources by every family in a systematic manner so that optimum utilisation of these resources can be possible.

Watershed Development Fund

During planning process a general consensus has been brought among the households to contribute for the works executed in private land. The concept and use of WDF is understood by the villagers and agreed to contribute 5% to 10% in case of NRM works and 20% to 40 % for Production system works in their own land.

The project will rationalize land use planning and suitability mapping within a multi-stakeholder and consultative framework. Some of the outcomes are as follows:

Expected Outcome – Component –wise

Institution Building	Natural Resource management		Production System & Micro-Enterprises	Livelihood Support System
	Water Conservation	Soil Conservation		
<ul style="list-style-type: none"> An enhanced institutional capacity to manage natural resource utilization in a sustainable manner. SHGs actively involved in implementation especially production system management and micro-enterprises. Livelihood activities are also implemented. Post operation and maintenance of structures constructed as part of the project 	<ul style="list-style-type: none"> Secured water for livestock of the targeted communities Sustainable water harvesting systems and grazing management for sustainable rangeland/ecosystem restoration implemented by communities Improved rain water conservation and utilization for different purposes (shrubs plantation, livestock watering, and rangeland rehabilitation). Promotion of effective WH techniques. Increased availability of soil moisture and rise in groundwater level by 1.5 meters Change in the water availability , Quality of water Recharge of Groundwater level Drinking water availability 	<ul style="list-style-type: none"> Valued positive changes in soil quality, vegetation cover, biomass production, and rain-water use efficiency Reduction in tank siltation. Increase in the area under different crops – Cropping Intensity Change in the soil loss 	<ul style="list-style-type: none"> Change in cropping pattern and introduction of new crops Increase in area under organic cultivation by growing green manure crops Overall increase in greenery, attributed mainly to plantation of different fruit bearing and non-fruit bearing trees, Improvement in the production systems Increase in feed and fodder availability Increase in the area under Trees 	<ul style="list-style-type: none"> No of livelihood opportunities created Reduction in the out migration No. of man days of employment generated

RATIONALE OF THE ACTIVITIES PROPOSED IN THE DPR

In the most general term Watershed Management is important for the improvement and maintenance of good water quality, good soil quality that ensures high productivity and the existence of sound biomass that help improve sustainability of the environmental conditions in our watershed. In the recent years the water quality standards have come under stress due to increasing population, depleting water resources, bad management practices. Similarly the soil has undergone severe deterioration due to soil erosion, unsustainable agricultural practices, change in land use pattern etc. Addressing all the issues that concerns the water resources of our watershed, in any way, come under the watershed management strategy.

There are three main activities that are recommended for a good watershed management practice:

- Rehabilitating lands that are source of sediment loss and chemical export
- Protecting the sensitive areas in the watershed so that resources can be conserved that may be spent in rehabilitation of the same, otherwise
- Improving the characteristics of water resources that affect the quality of water and the soil that affect the quantity of agricultural production

Watershed management activities should be a conglomeration of scientific structural interventions coupled with awareness and Livelihood Promotion to bring better living standards of the watershed community. The awareness generation is to make the watershed community to understand the importance and help them to maintain what is achieved through the watershed management activities. . The livelihood promotion is mainly to help those without any asset and deprived of means of livelihood. This is also part of the empowerment processes of the poorest of the poor and the women- the vulnerable group. The whole watershed communities along with the management teams with professionals and officials should work on improving and expediting the process of improvement. There might arise a need for the education of the members on complex issues that may require an interdisciplinary approach of education. In that case the members can collaborate on the exchange of information. Public involvement is the key to a good management practice of the watershed. Public can provide useful information and its cooperation will help make the management plan a success. This component will be met by the Capacity Building Programmes and trainings that are formed in the DPR.

There are various ways that one can get involved in the restoration, maintenance, and preservation of the watershed. The first step towards is through responsible attitude. There are many programs planned at different level that are available for participation. Entry Point Activity (EPA) has been planned to persuade the watershed community and individuals or teams can join. EPA also recognizes the teams that have been involved in a watershed.

Water Quantity & Quality management programmes

Watershed Management should include measures to control and convey runoff flow, and to collect and cleanse runoff on-site. These principles might be summarized as “The Four C’s” of watershed management: **control, conveyance, collection and cleansing**. The water conservation measures that proposed in the DPR like check dams, diversion canals, moisture collection pits, etc are all mainly aiming to ensure the four ‘Cs’ with regard to the water conservation. When adequate water is available in the soil aquifer it is undoubtedly help increase the productivity of the soil and bring better income to the farmers.

Similarly, the soil conservation measures proposed in the DPR like contour bunding, live fencing, centripetal bunding, gully control measures etc. are aiming at improving the quality as well as quantity of the soil, especially in the farm lands of the small holder farmers. When soil conservation measures are successfully implemented, the production is improved bringing adequate income to the farmers that will directly affect the living standards and socio-economic situation of the watershed community.

The production system management has direct impact on the quality of water as well as the quality of the soil. The soil fertility will be kept sustained for long if the production system management activities proposed in the DPR is implemented. This will have direct relation to the livelihood promotion based on natural resources. The livelihood of the watershed community is directly related to natural resources. However, when a development plan is formulated it should ensure the well being of all the community members irrespective of their asset base. Hence the PS&M activities as well as Livelihood promotion are aimed to improve the living condition of the watershed community.

All activities that occur within a watershed will somehow affect that watershed’s natural resources, water quality and the life style of the watershed community. New land development, runoff from already-developed areas, agricultural activities, and household activities such as gardening/lawn care, septic system use/maintenance, water diversion and maintenance all can affect the quality of the resources within a watershed. Watershed management planning comprehensively identifies those activities that affect the health of the watershed and makes recommendations to properly address them so that adverse impacts are reduced.

Watershed management activities planned and proposed in this DPR is also important because the planning process results in a partnership among all affected parties in the watershed. That partnership is essential to the successful management of the land and water resources in the watershed since all partners have a stake in the health of the watershed. It is also an efficient way to prioritize the implementation of watershed management plans in times when resources may be limited.

Though, the watershed management program is not the panacea to maintain the sustainable livelihoods, it contributes to the livelihoods outcomes as mentioned in the LFA of this DPR; more income, increased well-being, reduced vulnerability, improved food security and more

sustainable use of natural base. The activities proposed contribute to all assets of the sustainable livelihoods of the local people. The level of extent to which it can contribute to the five assets of the Sustainable Livelihood depends on the approaches and objectives of the program. Participatory group approach followed is encouraging.

The multipurpose benefits of the planned interventions in this DPR are as follows:

Upstream		Downstream		Overall
Direct	Indirect	Direct	Indirect	
<ul style="list-style-type: none"> • Reduced soil erosion • Better water availability • Better quality of water 	<ul style="list-style-type: none"> • Reduced deforestation • Enhanced minor forest produce availability 	<ul style="list-style-type: none"> • Improved water availability • Better crop production • More biomass availability 	<ul style="list-style-type: none"> • Enhanced fuel (biomass) availability • Enhanced cattle milk production • Enhanced other economic activities like vermin composting, sericulture, orchard etc 	<ul style="list-style-type: none"> • Reduced migration • More employment • Improved Health condition • Improved adaptive capacity to climate change • Social development

In addition, Watershed Management activities included in this DPR is an advanced idea of ordinary watershed management which primarily includes:

- Better water management,
- Minor irrigation,
- Drinking water supply,
- Sanitation facilities,
- Forestry
- Micro crediting to use Non Timber Forest products, Aquaculture, orchard maintenance and handicrafts for income generation and livelihood

In short the planned interventions proposed in this DPR shall:

- Consider the total environmental impact of the proposed system.
- Consider water quality as well as water quantity.
- Be consistent with the local Plan of Development and any existing watershed management plan.
- Coordinate with erosion control measures and aquifer protection.

- Minimize disturbance of natural grades and vegetation, and utilize existing topography for natural drainage systems.
- Preserve natural vegetated buffers along water resources and wetlands.
- Minimize impervious surfaces and maximize infiltration of cleansed runoff to appropriate soils.
- Reduce peak flow to minimize the likelihood of soil erosion, stream channel instability, and flooding and habitat destruction.
- Use wetlands and water bodies to receive or treat runoff only when it is assured that these natural systems will not be overloaded or degraded.
- Provide a maintenance schedule for management practices, including designation of maintenance responsibilities.

Two issues are central here: first, an improved natural resource base can contribute to enhanced livelihoods for a growing rural population but is not a panacea; second, even a moderate degree of equity requires high levels of social organization and an ability among women and the poor to articulate their requirements, together with continuing vigilance to ensure that their rights are not overridden. Provisions are left in this DPR to ensure strong and sustainable social organizations.

EXIT PROTOCOL

Withdrawal phase

The following activities are to be taken up during this period.

- 1) Consolidation and completion of various works.
- 2) Building the capacity of the community based organizations to carry out the new agenda items during post project period.
- 3) Sustainable management of natural resources
- 4) Up-scaling of successful experiences regarding farm production systems /off-farm livelihoods, successful experiences related to above aspects through revolving fund under the project as well as credit and technical support from external institutions
- 5) Preparation of project completion report with details about status of each intervention, Documentation of successful experiences

- 6) Formal allocation of user's right over common property resources (CPRs)
- 7) Collection of user charges for CPRs; Repair, maintenance and protection of CPRs
- 8) Sustainable utilization of developed natural resources
- 9) Involvement of gram panchayat/corresponding institutions (as a governance body) in addressing the above aspects and Participatory planning, implementation and monitoring of activities to be carried out
- 10) Terminal evaluation of project as per the expected outcomes.
- 11) Reconstruction/restoration of damaged assets created during the implementation of IWMP project

WITHDRAWAL MECHANISM

Since the beginning of this project the community members are being facilitated to adopt operational strategies in capacity building. The Watershed Committee/Watershed Association will be converted in to a self sufficient, independent institution which will be able to maintain post project activities on its own. The convergence and harmonization of resources of different flagship schemes and programmes will be channeled through this micro watershed development project, in particular. At the end of the project (after saturation) the concerned PIA shall hand over the assets created during the project period, responsibilities and post project management etc. to the Watershed committee through a memorandum of agreement .

Monitoring and Evaluation

Monitoring and Evaluation are the two words often used together are essential ingredients of project planning and management. Monitoring is the processes of observing, measuring and reporting objectively on the benefits that appear during the project's life span. Monitoring is also applied to the systematic measuring of objectively variable project indicators to determine the gains made towards the stated objectives.

Evaluation is the process which seeks to analyse and made sense of the data compiled through monitoring. Project achievement evaluation involves determining project benefits and identifying the reasons why (problems, constraints and impediments) a project may have failed to meet its target.

Monitoring should be specific and done at frequent intervals (Monthly, quarterly, bi-annual, annually) to allow project activities to be adjusted as they go along. All the stekholder institutions that involve in the process of monitoring should have special monitoring tools and systems and adequauate arrangements to record the findings.

A continuous monitoring and periodic evaluation of the implementation of the project activities on the watershed is necessary to assess whether the activity helps to meet the intended goal/objective. Any adjustment to be made has been discussed, agreed and endorsed by the village general assembly before they were implemented. The LFA given below shall be a guiding tool to carry out the monitoring and evaluation process.

As per government guidelines, monitoring & evaluation is an integral part of the IWMP project. Arrangements have been already made to take up the responsibility of monitoring and evaluation. There is an inbuilt GIS based monitoring system in the programme. Apart from this the PIA or the SLNA can make necessary arrangements by making use of the service of the empanelled NGOs, (e.g. SUSTHIRA) Government Agencies/departments, academic and resource agencies, who had the capacity and expertise to conduct monitoring and evaluation study and documentation.

Implementation & Administration

As per the standing orders and guidelines of the government and DoLR, the responsibility of implementation of IWMP project is vested in the Block Panchayat. However, in this decentralized programme management process, implementation by Block Panchayat alone has many limitations. This is because of the size of the project and the size of the project area. Therefore, the Block Panchayat has to be assisted from different corners and by different institutions.

Institutional arrangements had already been made in all the watershed to support Block Panchayat in implementation. These include, the Grama Panchayat, Grama Sabhas, Watershed Committees (WCs), Watershed Development Teams (WDTs) and the Neighbourhood clusters. Apart from this the service of SUSTHIRA, the TSO, can also be made use of wherever found necessary.

Regarding their Administration, institutions formed and facilitated by SUSTHIRA, the TSO, are strong enough and capacitated properly to look into the matter. Besides, the WDT team which consists of three paid staff – an Engineer with B.Tech, A social Engineer (Mobilizer) with MSW and a data entry operator with PGDCA will be the core agency in the administrative process of the project. The Watershed Committee (WC) which has a paid secretary will be shouldering the responsibility of administration at the grass roots level in association with Neighbourhood clusters.

In any stage of implementation if the PIA feel that there should be a technically eligible organization is needed to ensure proper implementation and administration of the IWMP project, the expertise of SUSTHIRA can also be made available. Thus, there will be all arrangements at all levels to ensure that the project is properly implemented and the expected results are achieved.

Documentation

For any development project must be documented properly for generating further knowledge for the future planning and implementation of similar projects. IWMP is an important project which involves several processes and procedures. Every steps, right from the process of planning till the end of consolidation all that have been involved in the project need to be properly registered and documented.

Documentation can be **visual** like video documentation and photographic documentation. Documentation can also be **verbal** like process report making (Process documentation) Charts showing progress and improvements of different situation and project components (eg. Measurement of water table, progress in construction work of bunds and ponds, rainfall data and temperature data etc), display boards to illustrate the project area and project components with budget outlay (this will make the project more transparent) etc.

Since this part of the project is very important and inevitable, expertise and professional capacity is needed to carry out documentation. To meet the purpose, NGOs like SUSTHIRA can be involved and their expertise can be made use of.

**INTEGRATED WATERSHED MANAGEMENT PROGRAMME – THRITHALA BLOCK PANCHAYATH –
(IWMP-III/2010-11)**

**Master plan for Four Years
Funding pattern in Percentage**

Year	Administra- tion	Monitoring	Evaluation	Entry Point Activity	Institution & Capacity Building	DPR preparation	Watershed Development Activities	Livelihood Activities	Production system & Micro Enterprises	Consolidation Phase	Total
1 St	2	0.2	0.2	4	3	1	5.6	2	2	0	20
2 nd	3	0.3	0.3	0	1	0	19.4	3	3	0	30
3 rd	2.5	0.25	0.25	0	1	0	16.5	2	2.5	0	25
4 th	2.5	0.25	0.25	0	0	0	14.5	2	2.5	3	25
Total	10	1	1	4	5	1	56	9	10	3	100

**INTEGRATED WATERSHED MANAGEMENT PROGRAMME – THRITHALA BLOCK PANCHAYATH –
(IWMP-III/2010-11)**

**Master plan for Four Years
BUDJECT (Area: 5221 Ha)**

Year	Administ ration	Monitoring	Evaluation	Entry Point Activity	Institutio n & Capacity Building	DPR preparati on	Watershed Developme nt Activities	Liveliho d Activities	Productio n system & Micro Enterpris es	Consolidati on Phase	Total IWMP project fund
1 St	1566300	156630	156630	3132600	2349450	783150	4385640	1566300	1566300	0	15663000
%	2	0.2	0.2	4	3	1	5.6	2	2	0	20
2 nd	2349450	234945	234945	0	783150	0	15193110	2349450	2349450	0	23494500
%	3	0.3	0.3	0	1	0	19.4	3	3	0	30
3 rd	1957875	195787.5	195787.5	0	783150	0	12921975	1566300	1957875	0	19578750
%	2.5	0.25	0.25	0	1	0	16.5	2	2.5	0	25
4 rd	1957875	195787.5	195787.5	0	0	0	11355675	1566300	1957875	2349450	19578750
%	2.5	0.25	0.25	0	0	0	14.5	2	2.5	3	25
Total	7831500	783150	783150	3132600	3915750	783150	43856400	7048350	7831500	2349450	78315000
%	10	1	1	4	5	1	56	9	10	3	100

INTEGRATED WATERSHED MANAGEMENT PROGRAMME- THRITHALA BLOCK PANCHAYATH
IWMP-II/2010-11 – Budget – Sector I Watershed Development Activities

Sl no	Name of watershed	Year wise	Iwmp fund	Mnregs/other source	Total
1	Chekkodu	1st year	723240	152530	875770
		2nd year	2505510	92880	2598380
		3rd year	2130975	102198	2233173
		4th year	1872675	78300	1950975
2	Eravakkad	1st year	116760	111440	228800
		2nd year	404490	132305	536795
		3rd year	344025	141730	485755
		4th year	302325	188840	491165
3	Kollannur	1st year	279720	111725	391445
		2nd year	969030	79660	1048690
		3rd year	824175	89490	913665
		4th year	724275	125925	850200
4	Kumaranellur	1st year	425880	152530	578410
		2nd year	1475370	194020	1669390
		3rd year	1254825	150198	1405023
		4th year	1102725	121150	1223875
5	Parappanthodu	1st year	1431360	571990	2003350
		2nd year	4958640	511990	5530630
		3rd year	4217400	555990	4773390
		4th year	3706200	118300	3824500
6	Pattikkayal	1st year	1408680	487490	1896170
		2nd year	4880070	697140	5577210
		3rd year	4150575	555990	4706565
		4th year	3647475	118300	3765775
	TOTAL		43856400	5642111	49559101

INTEGRATED WATERSHED MANAGEMENT PROGRAMME - THRITHALA BLOCK PANCHAYATH
IWMP-III/2010-11 – Budget – Sector II Livelihood Activities for Land less/Asset less

Sl no	Name of watewrshed	Year wise	Iwmp nfund	Mnregs/other source	Total
1	Chekkodu	1st year	258300	0	258300
		2nd year	387450	0	387450
		3rd year	258300	90405	348705
		4th year	258300	258300	516600
2	Eravakkad	1st year	41700	0	41700
		2nd year	62550	0	62550
		3rd year	41700	15405	57105
		4th year	41700	42300	84000
3	Kollannur	1st year	99900	0	99900
		2nd year	149850	0	149850
		3rd year	99900	35035	134935
		4th year	99900	100100	200000
4	Kumaranelur	1st year	152100	0	152100
		2nd year	228150	0	228150
		3rd year	152100	53255	205355
		4th year	152100	152900	305000
5	Parappanthodu	1st year	511200	0	511200
		2nd year	766800	0	766800
		3rd year	511200	179080	690280
		4th year	511200	511300	1022500
6	Pattikkayal	1st year	503100	0	503100
		2nd year	754650	0	754650
		3rd year	503100	176915	680015
		4th year	503100	503900	1007000
TOTAL			7048350	2118895	9167245

INTEGRATED WATERSHED MANAGEMENT PROGRAMME
THRITHALA BLOCK PANCHAYATH
IWMP-III/2010-11 – Budget – Sector III Production System & Micro Enterprises based livelihood activities

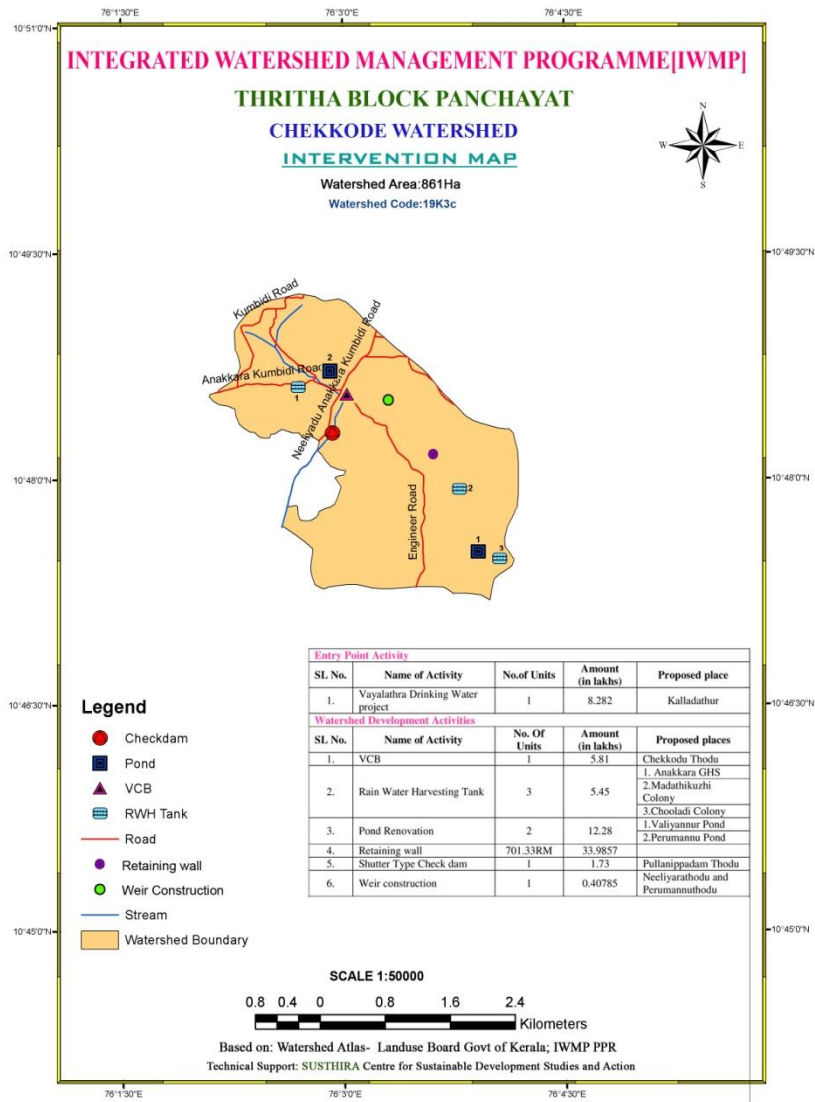
Sl no	Name of watershed	Year wise	Iwmp fund	Mnregs/other source	Total
1	Chekkodu	1st year	258300	900	259200
		2nd year	387450	3050	390500
		3rd year	322875	1125	324000
		4th year	322875	1125	324000
2	Eravakkad	1st year	41700	900	42600
		2nd year	62550	30	62580
		3rd year	52125	3875	56000
		4th year	52125	75	52200
3	Kollannur	1st year	99900	1000	100900
		2nd year	149850	2150	152000
		3rd year	124875	1125	126000
		4th year	124875	1125	126000
4	Kumaranelur	1st year	152100	900	153000
		2nd year	228150	450	228600
		3rd year	190125	65	190190
		4th year	190125	1875	192000
5	Parappanthodu	1st year	511200	800	512000
		2nd year	766800	1200	768000
		3rd year	639000	1000	640000
		4th year	639000	0	639000
6	Pattikkayal	1st year	503100	900	504000
		2nd year	754650	50	754700
		3rd year	628875	3125	632000
		4th year	628875	3125	632000
TOTAL			7831500	29970	7861470

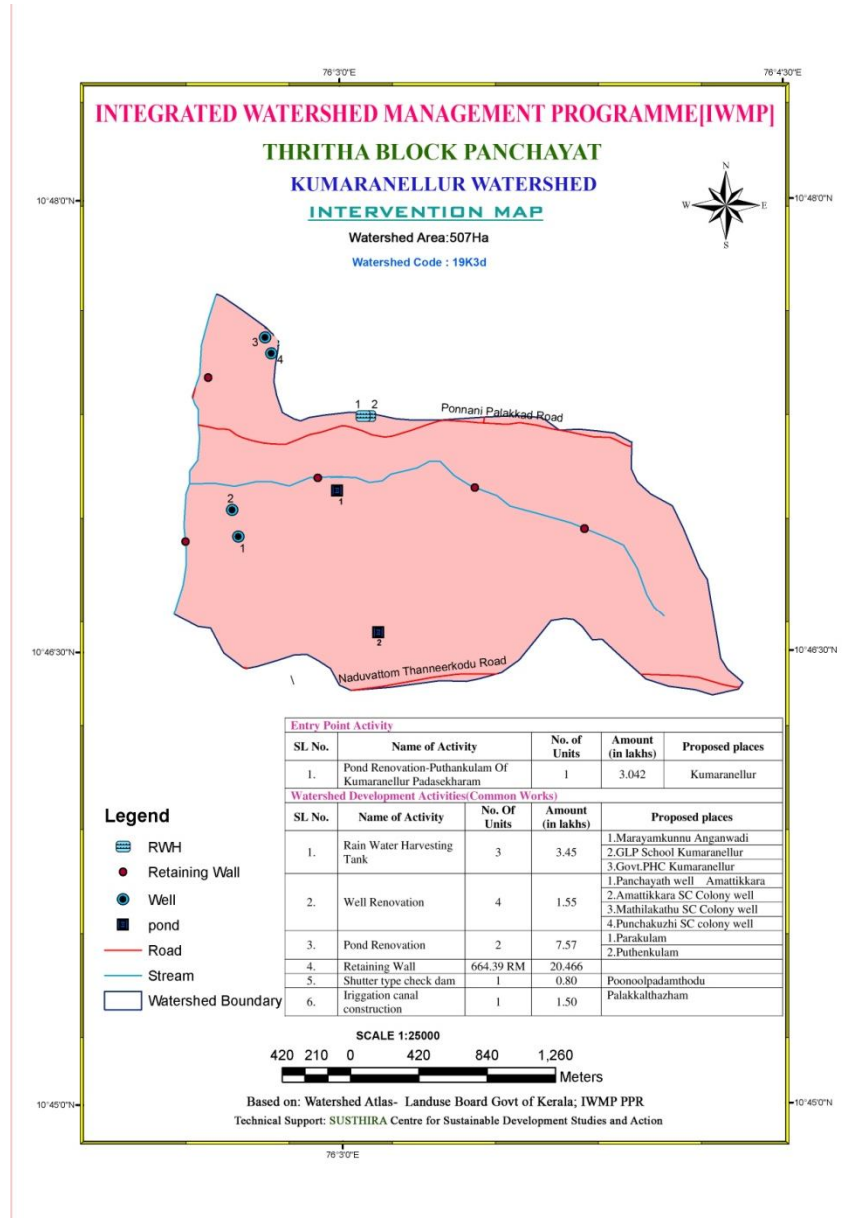
**INTEGRATED WATERSHED MANAGEMENT PROGRAMME
THRITHALA BLOCK PANCHAYATH
IWMP-III/2010-11 – Budget – Sector IV Entry Point Activity**

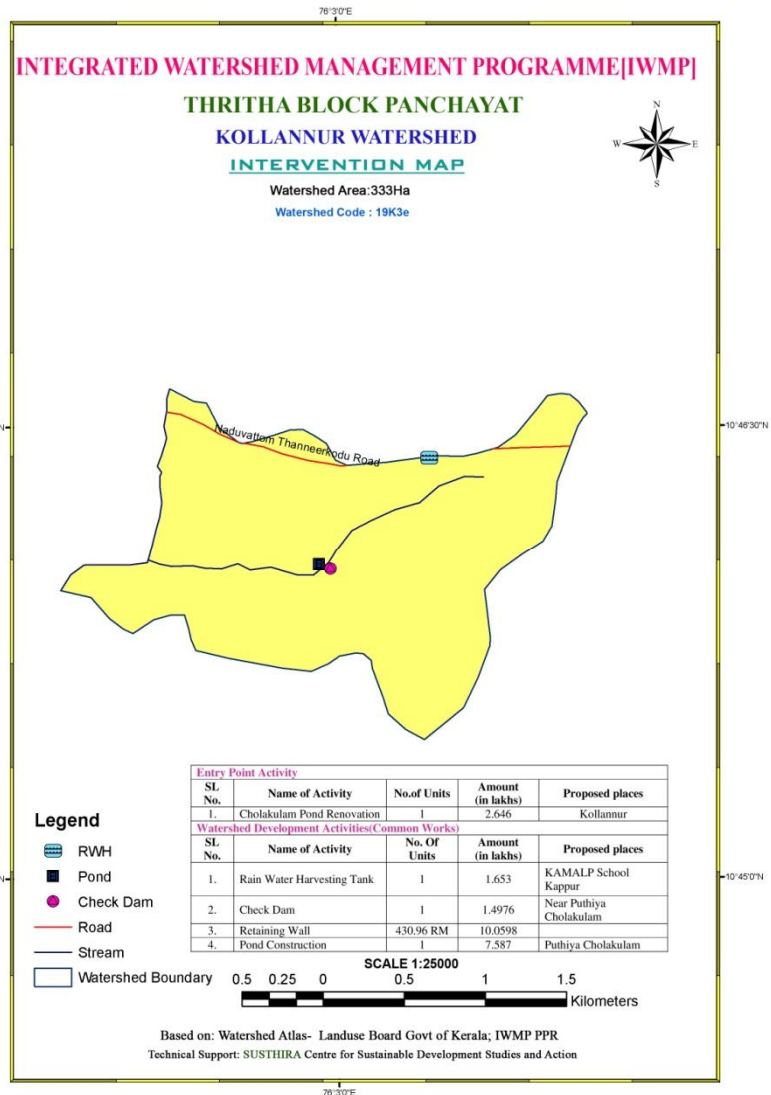
Sl no	Name of watershed	Iwmp fund	Mnregs/other source	Total
1	Prappanthodu Watershed	1022400	149600	1172000
2	Kumaranelur Watershed	304200	-	304200
3	Pattikayal Watershed	1006200	1800	1008000
4	Kollannur Watershed	199800	64895	264695
5	Chekkode Watershed	516600	311685	828285
6	Eravakkadu Watershed	83400	860	84260
TOTAL		3132600	528840	3661440

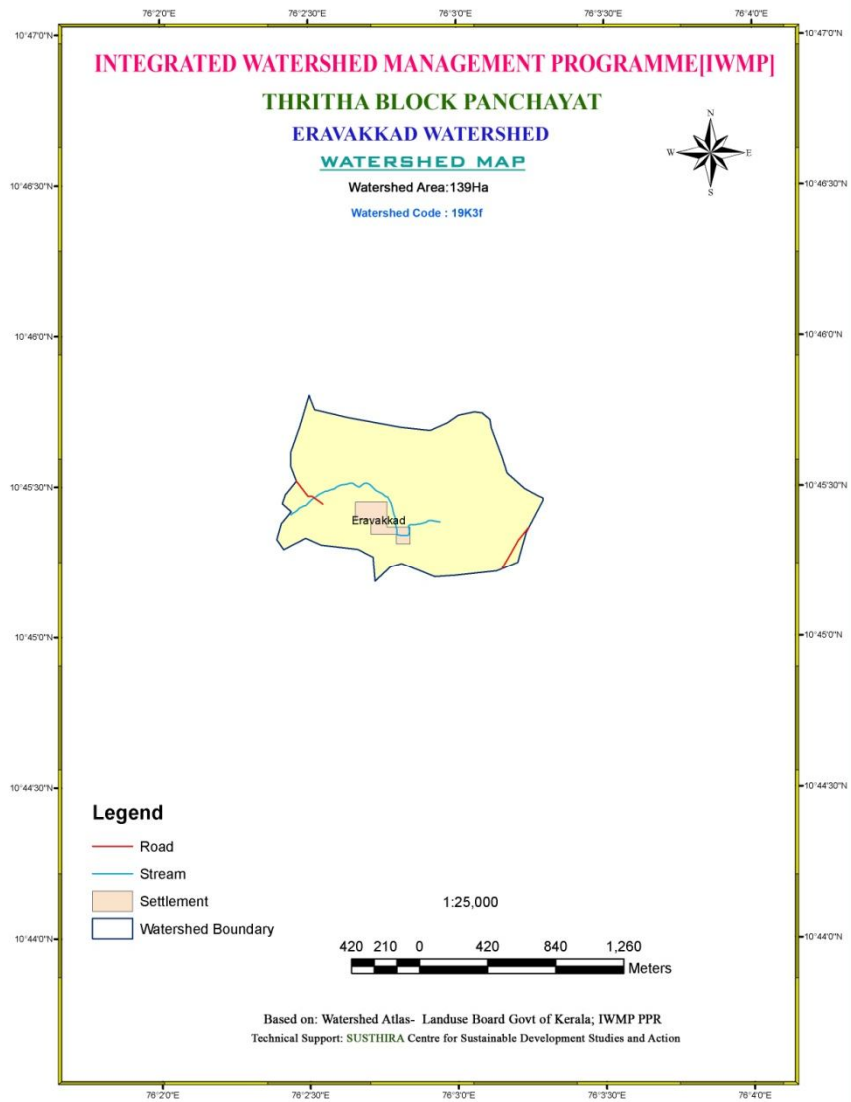
**INTEGRATED WATERSHED MANAGEMENT PROGRAMME
THRITHALA BLOCK PANCHAYATH
IWMP-II/2010-11 – Budget – Sector V Capacity Building Training**

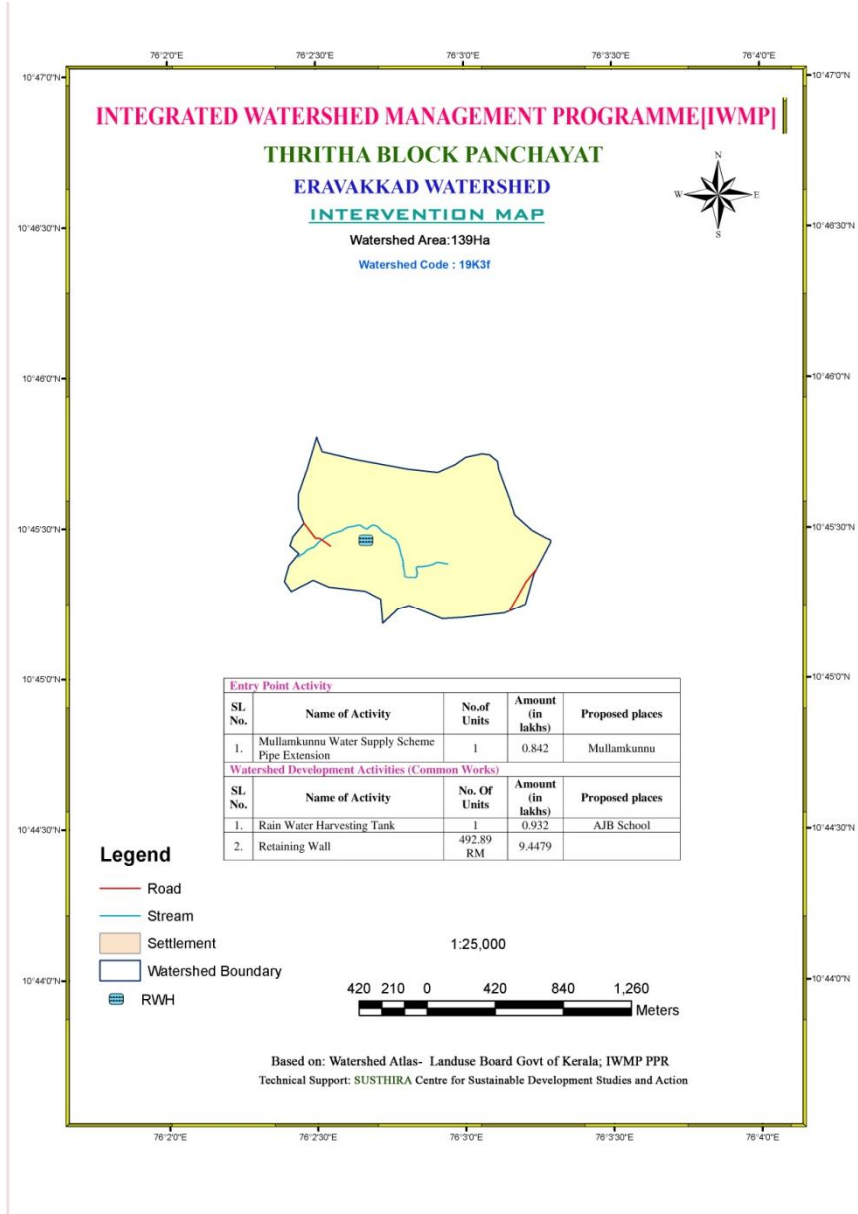
Sl no	Name of watershed	Iwmp fund	Mnregs/other source	WDF	Total
1	Prappanthodu Watershed	1278000	-	-	1278000
2	Kumaranelur Watershed	380250	-	-	380250
3	Pattikayal Watershed	1257750	-	-	1257750
4	Kollannur Watershed	249750	-	-	249750
5	Chekkode Watershed	645750	-	-	645750
6	Eravakkadu Watershed	104250	-	-	104250
	TOTAL	3915750	0	0	3915750

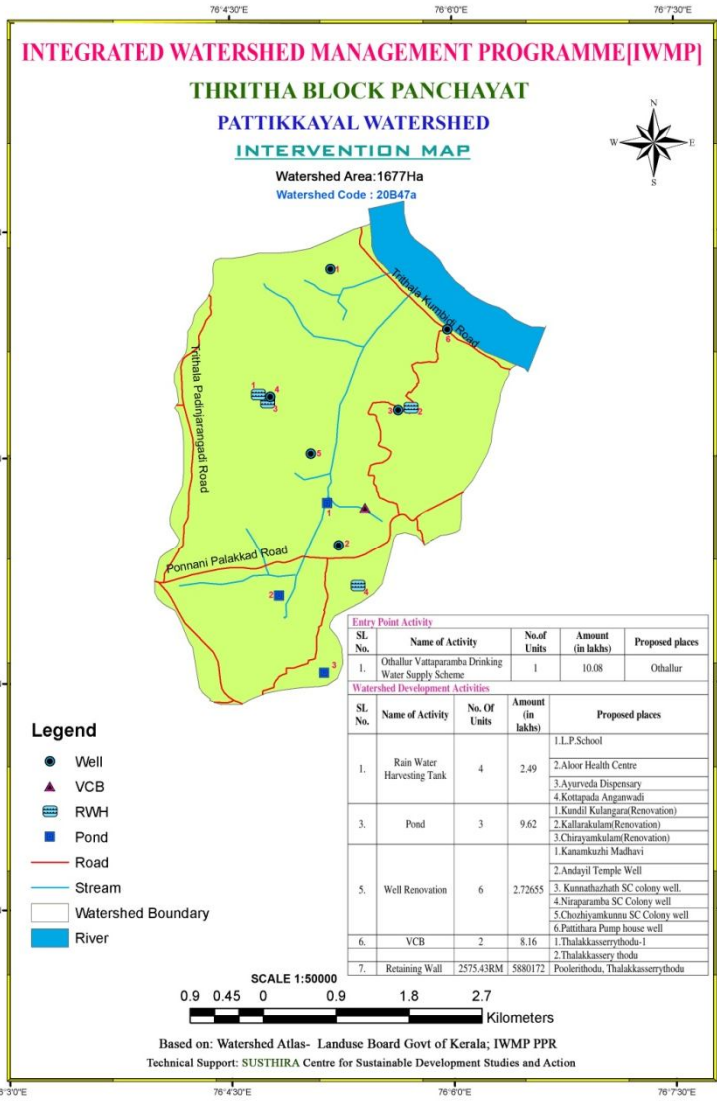


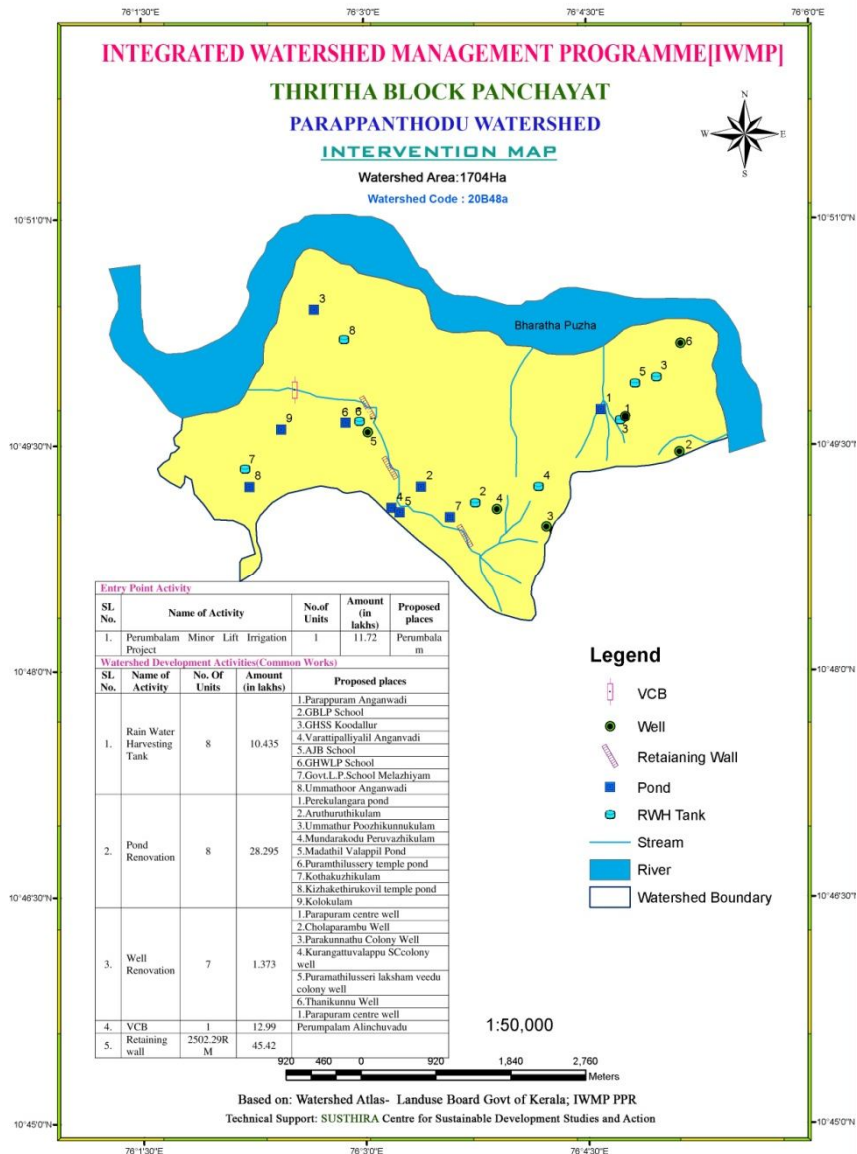












Conclusion

INTEGRATED WATERSHED MANAGEMENT PROJECT (IWMP) is one programme which is making sincere efforts towards the empowerment of the people so that a sense of collective responsibility can be evolved among them. The new guidelines for watershed development provide a paradigm shift in the traditional approach where the role of the Government is changed from that of governance to facilitation. The institutional arrangements envisaged in the Guidelines can be seen as a true reflection of the Agenda 21 where the sustainability comes through the involvement of people & the local bodies. The approach of watershed development in a holistic manner automatically strikes a prudent balance between environmental concerns & developmental aspirations. The efforts being made under the guidelines can be termed as sincere & honest as here the survival of life itself is at stake with the watershed development rather than the quality of life itself as compared to similar situations in the developed countries. In fact, the effective community control has been an integral part of the Indian social fabric which was fragmented by the colonial rule. This programme is an effort towards its restoration & a small step in the achievement of this goal which might turn into a big leap with the support from the people.

It is clear that the watershed development cannot be done in isolation. It is a natural entity and may contain different types of lands namely, forest lands, community lands, government lands or private lands. These lands can be treated on "ridge to valley" approach. A land lying in a valley cannot be improved if the land at upper reaches is not treated. Treatment of land in a scattered manner will not lead to wasteland development. Mere treatment of land is not enough. Land and people cannot and should not be viewed in isolation. So the best possible strategy would be treating the land by empowering the people who live in it. It is watershed plus approach which takes care of holistic development. Therefore, the entire watershed community is to be involved for the integrated development of watershed and the assets created in such an effort are to also be maintained through the people of the watershed community in order to ensure sustainability. People's participation also ensures conservation and development of Common Property Resources. Besides when people decide what they have to do their stake in development become more pronounced leading to their intense involvement. This involvement in decision making is the key to success which brings sustainable development. Hence people's participation is the approach for the purpose.

LOGICAL FRAME WORK ANALYSIS (LFA)

Narrative Summary	Expected Results	Objectively Verifiable indicators (OVI)	Means of Verifications (MOV)	Risk/Assumptions
<p><u>Goal: (Overall Objective)</u></p> <p>The degraded rangeland restored and the production improved in the watersheds of Thrithala Block Panchayat by more efficient utilization of natural resources through the proper and effective implementation of Integrated Watershed Management Programme plan.</p>	<ul style="list-style-type: none"> • The income of families will increase • Living standard will improve • Increase of ground water table • Irrigation during off-season 	<ul style="list-style-type: none"> • Purchase power of villagers will increase • Annual expenditure and saving of households • Household assets • Number of people migrating for employment opportunity • Cropping pattern 	<ul style="list-style-type: none"> • Impact assessment study • Evaluation report • Compare between baseline survey and evaluation report • Physical observation • Physical Verification and FGD with farmers 	<p>Political Intervention</p>
Objective 1	Outcome			
<p>Total agriculture production increased</p>	<ul style="list-style-type: none"> • Modern agriculture techniques for enhancing of agriculture productivity through crop demonstration plot. • Increased Agriculture income • Total agriculture production will increase • Soil moisture content increased 	<ul style="list-style-type: none"> • Net area under agriculture increased • vegetation cover in the project area present • Percentage of farmers cultivating the crops increased 	<ul style="list-style-type: none"> • Impact assessment study • Evaluation report • Discussion with Villagers/Farmers • Trend analysis of crop cultivation 	<p>Maintenance of the Structure after the project completion</p>

Activities to realize the Objective	Outputs			
1. Soil and moisture conservation works	Completion of soil moisture works.	Number of watershed physical structure presents in the project area Diversified farming	Physical verification Discussion with Villagers/Farmers	
2. Use of advance water conservation techniques.	Optimum utilization of available water	Number of households having drip irrigation system of their houses	Physical verification	
3. Modern agriculture techniques for enhancing of agriculture productivity through crop demonstration plot.	Change in the cultivation pattern and adoption of new techniques in agriculture to realize the maximum potential of the land	Number of people migrating for employment	Observations	
Objective – 2	Outcome			
per capita income of BPL and marginal farmers increased through Various livelihood activities	<ul style="list-style-type: none"> • No. of migrating families from the project area reduced • Employment available within the project area. • Unemployment decreased 	<ul style="list-style-type: none"> • Number of people migrating for employment opportunity • Number of people engaged in livelihood activities. • Number of people involved in self employment activities 	<ul style="list-style-type: none"> • Impact assessment study • Physical verification/ Photographs • FGDs and PRA 	
Activities to realize the Objective	Output			
1. Promotion of livelihood activities	People set-up their micro-enterprise on demand based activities.	Number of people showing their interest to set-up micro industry	Observations	
2. Capacity building activities for improvement entrepreneurial skill.	Improved knowledge and enhancement of skills for self development	Number of small enterprise set-up	Impact assessment study	

Objective – 3	Outcome			
Local institutions strengthened	<ul style="list-style-type: none"> • Presence of strong and dynamic local governance • People's participation and representation increased 	<ul style="list-style-type: none"> • Number of meetings initiated by the local leaders. • Number of peoples' organization present in the grass root level 	<ul style="list-style-type: none"> • Impact assessment study • Evaluation report, FGD, Observations 	Interest of the People.
Activities to realize the Objective	Output			
1. Organized training and awareness programme for Village institutions	Quality of local leaders improved and more democratic method of decision making used	Number of case resolved within the locality.	Observations	
2. Capacity building workshops and exposure visits User Group and Watershed Committee	Local leaders taken interest to understand the programmes and schemes utilized for the common benefit of the village.	Number of schemes utilize for the benefit of the villages.	FGDs and PRA	
3. Formation of people's organization in the grass root level	<ul style="list-style-type: none"> • Proper management of available resources by the people's organization Ensured • Projects properly implemented • Participation of deprived section increased • Representation of local people increased 	<ul style="list-style-type: none"> • Activities of the watershed is implementing smoothly without any hindrance • Number of deprived/ poor people participated in the meeting of Gram Sabha • Number of participants represent in the project meeting 		

