# DETAILED PROJECT REPORT

# (DPR)

## PAYYANNUR BLOCK PANCHAYATH

## INTEGRATED WATERSHED MANAGEMENT PROGRAMME (IWMP)

# CHAPTER- 1
# INTRODUCTION

Watershed management has evolved and passed through several developmental stages. In the initial stages, it was a subject of forestry and forestry-related hydrology. The involvement of people was not an issue. It was solely an affair of government forest departments. During the second stage, it became land resources management-related, including activities with an eye on economic benefits. At this stage, the focus was on beneficiaries. It is now "participatory and integrated" watershed management, with involvement and contribution from local people.

Watershed Management relies on the participation of the population in planning, utilization and monitoring and thus supporting the building of democratic structures. Moreover, this concept is suitable for providing a framework for the utilization of traditional social structures and traditional knowledge for development.

In the formulation of (watershed management) plans, both the attributes of the land and water resources and the socio-economic factors which affect the development of the human beings in the area in general, and land-use practices in particular, should be taken into account. Moreover, there should be provision for perpetual operational support. Without adequate social control of the use of the world's land and water resources, their technological overdevelopment can lead in the long run to regional or national underdevelopment. Furthermore, there must be an awareness of the total soil and water resources system, both upstream and downstream, and of the interrelated benefits that can be obtained by the wise application of modern technology.

While different people may define integration differently, a common approach is to emphasize the integration of disciplines ***(technical, social and institutional dimensions)*** or objectives ***(conservation, food security, income generation).*** While it is increasingly clear that the success of watershed management programs rests on the integration of conservation with livelihood goals, technical with institutional interventions, few programs have effectively achieved such integration in practice. It is therefore essential that any approach at integration integrate an understanding of the principles operating within natural and social systems.

## CHAPTER – 2
## INTEGRATED WATERSHED MANAGEMENT PROGRAMME – IWMP

**Integrated Watershed Management Programme (IWMP)** is a modified programme of erstwhile Drought Prone Areas Programme (DPAP), Desert Development Programme (DDP) and Integrated Wastelands Development Programme (IWDP) of the Department of Land Resources. This consolidation is for optimum use of resources, sustainable outcomes and integrated planning. The scheme was launched during 2009-10. The programme is being implemented as per Common Guidelines for Watershed Development Projects 2008. The main objectives of the 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.

This project involves watershed planning over a few thousand hectares of land in the Kadannappally – Panapuzha Grama Panchayat (in Thaliparamba Block) and Ermam – Kuttur Grama Panchayat in Payyanur Block in Kannur district, which include both off-farm and on-farm interventions to improve the productivity of farm lands as well as the commons. Enhanced biomass and water availability through appropriate soil and moisture conservation measures, and re-vegetation of common lands would go a long way in boosting agricultural productivity and animal husbandry. Further, this project aims to assist communities in effectively integrating agriculture and natural resource management, and regulating the demand for biomass and water through rules, regulations and mechanisms evolved by community institutions at village and inter-village levels. PIA's efforts are directed towards building and strengthening the institutional processes at the habitation, village, Panchayat and federation levels to set in place processes of local self governance. Special focus is on enhancing the participation of community members, especially the poor and marginalized, in the planning and implementation of watershed development work in the region.

### Objectives of IWMP

The general objective of the IWMP is to restore the degraded rangeland and improve the production in the watersheds of Payyanur Block Panchayat by more efficient utilization of natural resources through the proper and effective implementation of Integrated Watershed Management Programme plan. The NRM technique will control the surface runoff, increase the soil moisture content, conserve the soil, improve the natural plant cover, and improve the vegetation production.

### Specific objectives include:

- Restoring and rehabilitating the degraded rangelands of the targeted eacosystems through the effective use of soil and water resources and improve livestock production.
- Improving the capacity of communities' to manage common natural resources.
- Enhancing the efficiency and effectiveness of rainwater and runoff use, improve vegetative cover and reduce soil erosion through better rainwater management.
- Spreading the use of water harvesting structures as a sustainable and renewable water resource to help in ecosystem restoration and maintain the land and livestock productivity.
- Increasing the productivity of natural vegetation and shrubs in order to decrease feed demand for livestock animal in the watershed areas and increase the income of the participating livestock owners.

- Disseminating appropriate water harvesting techniques for restoration of water table, risk management and drought mitigation.
- Improving on-site infiltration/soil-moisture.
- Reducing on-site soil erosion/soil loss.
- Reducing sediment delivery at downstream areas.

**Need of the IWMP Project**

Development of rainfed /degraded areas through participatory watershed approach is the focal area of the Government. Planning Commission and National Rainfed Area Authority (NRAA) framed Common Guidelines, 2008 for watershed programmes for all Ministries/Departments based on the Parthasarathy Committee Report, other Committee's observations and past experiences. The provisions in the Common Guidelines and the observations of the Parthasarthy Committee have necessitated modifications in the watershed schemes of the Department of Land Resources.

Natural Resource Management is very crucial for the survival of any human society. The watershed area is prone to soil erosion and degradation. This area is required to be treated so that further degradation of the soil can be checked. As agriculture and horticulture is the major activity it will help to increase the income levels of the people at the watershed area. The livelihood promotion programmes will help to develop entrepreneurship capacity among the population and serve as an example for the villagers to come up with similar initiatives at their own. It will increase the income levels of the people. There are more than 50% of BPL families in the watershed area. Majority of the BPL households are meeting their livelihood needs from agriculture and horticulture production. Development of sustainable livelihoods for the BPL families in the watershed area is a major objective of the project. The livelihood options and income of all the BPL households will be enhanced once the project is properly implemented. The area under agriculture and horticulture and its productivity will be increased as a result of the increase in irrigation facilities and other activities aimed at expansion of the same. The lack of fodder availability will be addressed by the pasture development and nursery rising. Moreover the households practicing livestock activities will be benefited through the distribution of fodder seeds and fodder plants. The micro enterprises sector will be revived as a result of the implementation of the project. The number of working days will also be increased.

Watershed Development Programme is selected on the basis of thirteen parameter namely Poverty Index, Percentage of SC/ST. Actual wages, Percentage of small and marginal farmer, Ground water status, Moisture Index, Area under rain fed agriculture, Drinking water situation in the area, Percentage of the degraded land, Productivity potential of the land, Continuity of another watershed that has already development/treated, Cluster approach for plain or for hilly terrain, Based on these thirteen parameters a composite ranking was been given to Payyanur Watershed project as in the table given under.

**Organizational Setup**

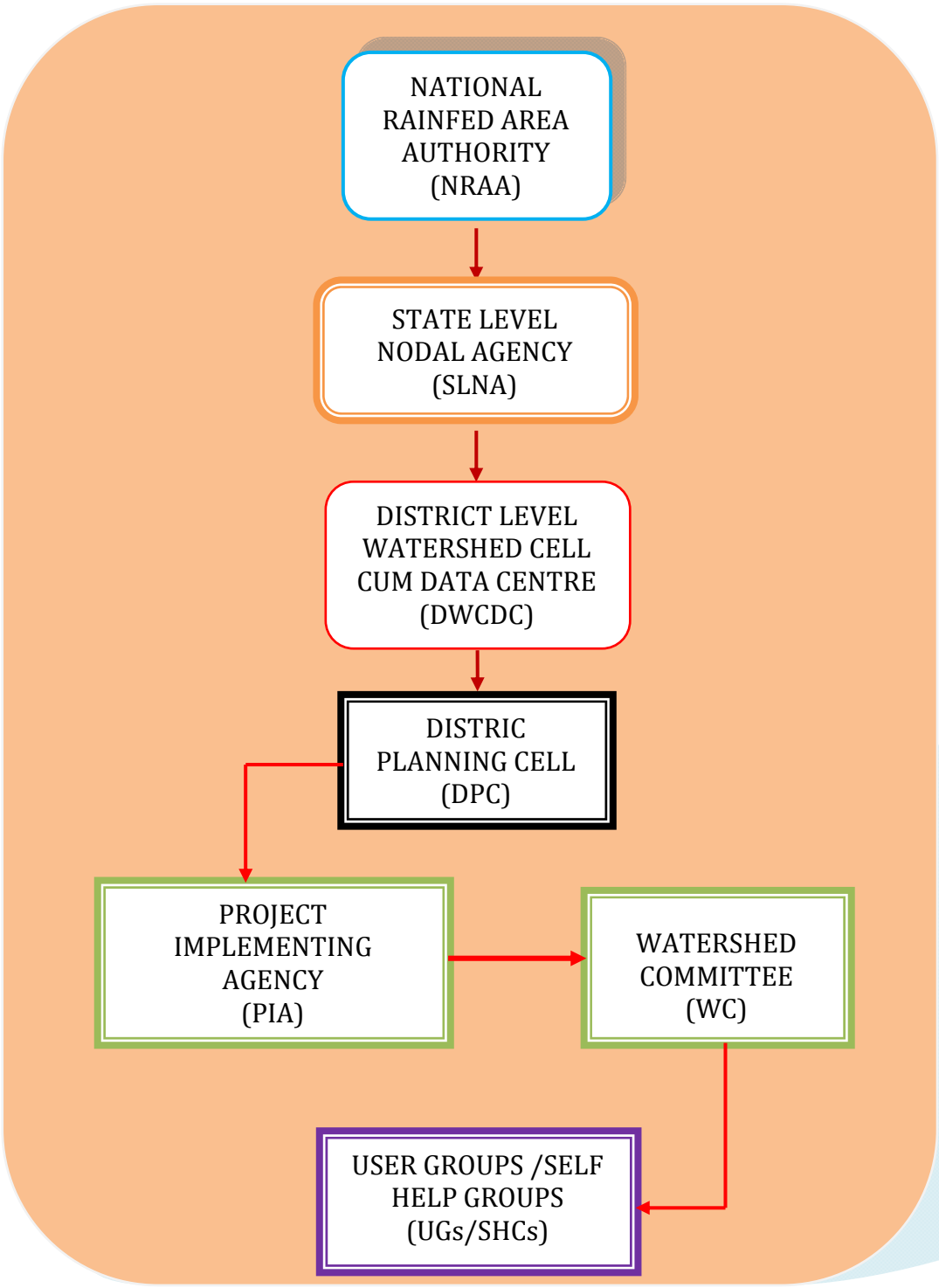
For Implementation of the IWMP watersheds, State Level Nodal Agency (SLNA) has been constituted by the State Government, the Agricultural Production Commisioner being the chairperson and the Commissioner, Rural Development Department as the Full-time CEO of the SLNA having an independent Bank Account. The SLNA consists of representatives from NRAA, Central Nodal Ministry, NABARD, Agriculture, Animal Husbandry & Allied sector, Ground Water Board, eminent Voluntary Organization and two professional experts from Research Institutions. Funds shall be routed through SLNA.

At the District Level Watershed Cum Data Cell (WCDC) shall be responsible for the implementation, monitoring and follow-up. District Planning Cell will be the structure that approves the projects and this body is headed by the District Collector. Block Panchayat is the

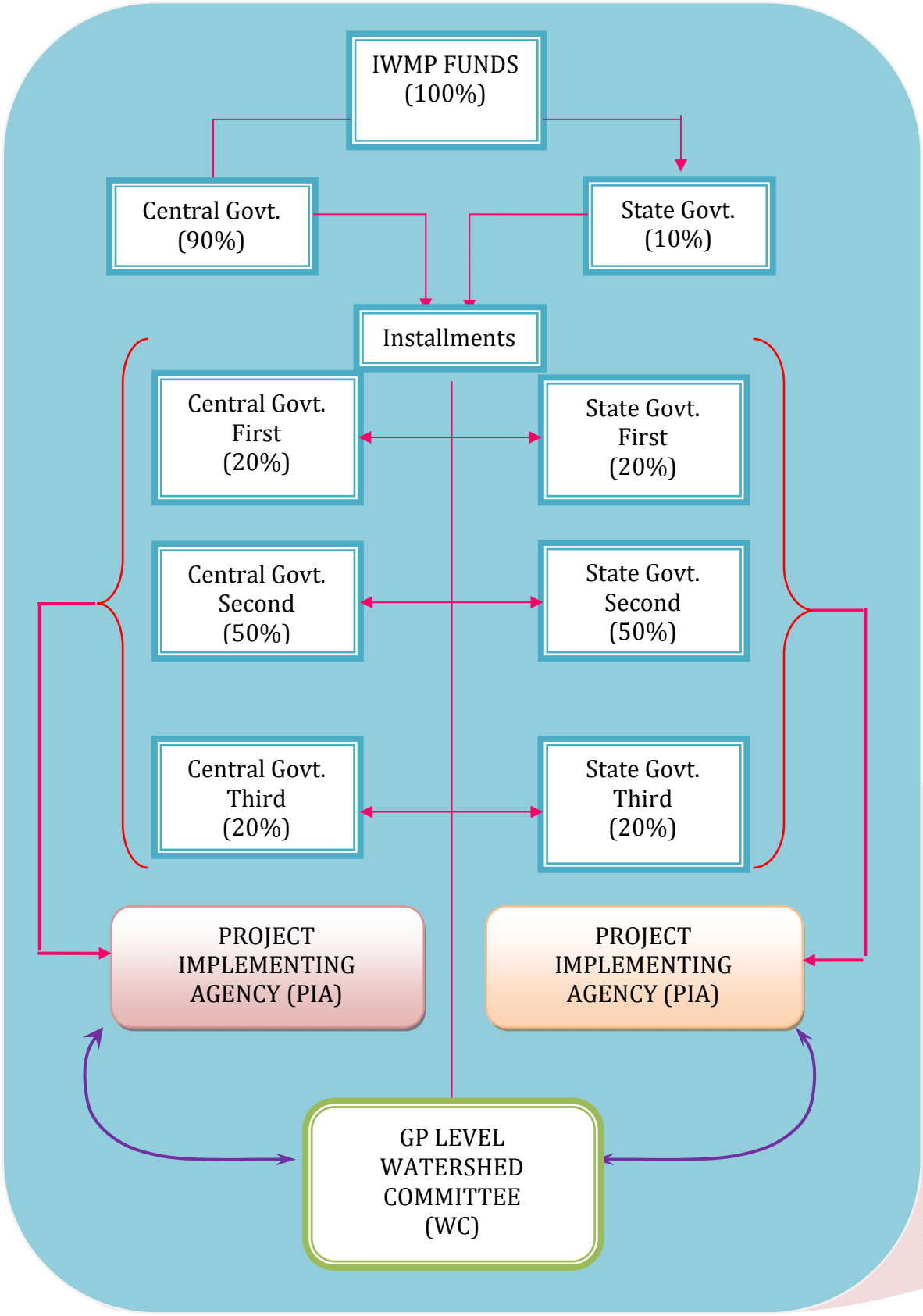
ProjectImplementing Agency (PIA). One Project Officer shall be positioned for 2-3 IWMP clusters with a team of two Technical Officers (Agriculture/Horticulture & Civil Engineering) for each project.

The Watershed Committee (WC) is formed at the grass roots level to help the User Groups and Self Help Groups. In a sense, the UGs are the end users of benefits provided under IWMP. The PIA directly has contacts with the WCs which is formed under the Chairmanship of theconcerened Grama Panchayat Presidents and with the VEO as the secretary. Therefore, the GP will have direct involvement in the implementation of the IWMP project in watersheds coming under their jurisdictional area. The flowchart showing the organizational set up is given below:

**Flow Chart Showing Organizational Set-Up**



**FLOW CHART SHOWING Fund Flow**



**Components of IWMP**

Components include the conservation, development and optimal utilization of the natural resources within a watershed area. This is achieved by addressing the following:

- Soil and land management (Conservation, development and use)
- Water management (Conservation, development and use);
- Afforestation
- Pasture development
- Agricultural development
- Livestock management
- Rural energy management

**Mandate of the IWM Project**

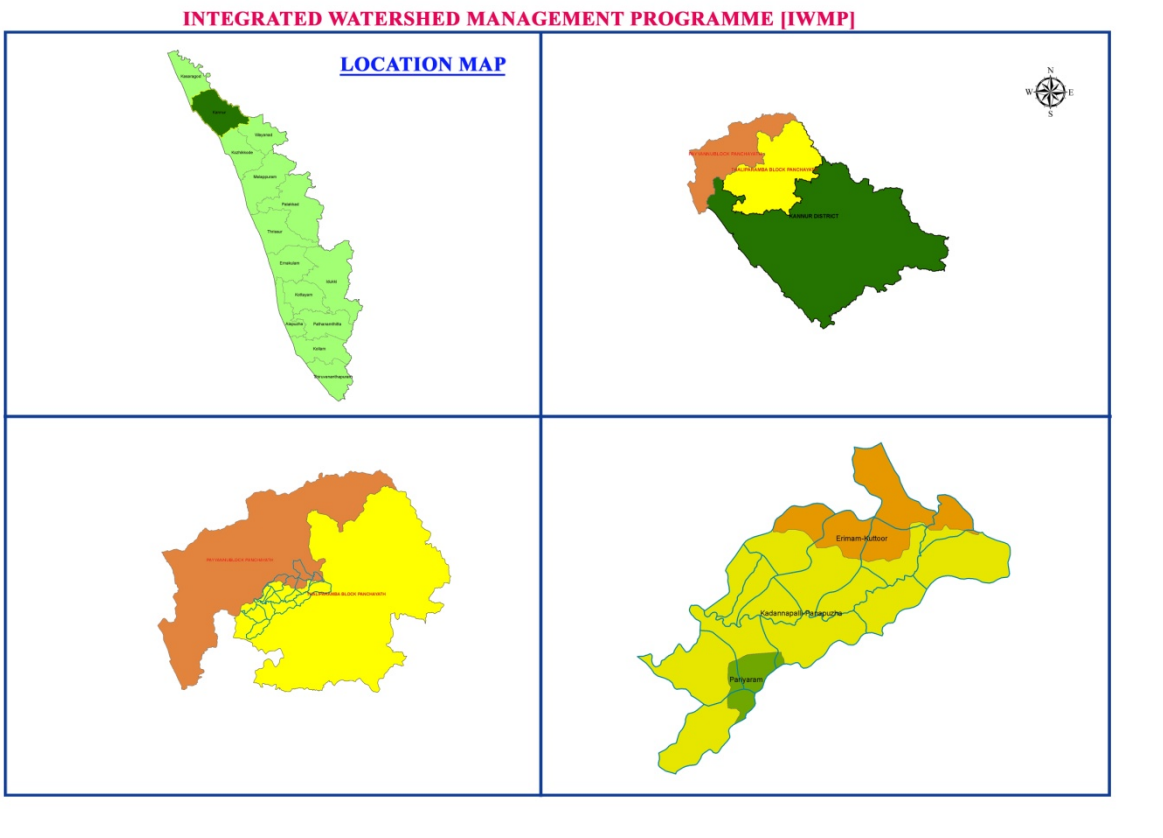
The mandate of the project is Natural Resource Development via self help promotion. The approaches developed to address the problems within the mandate of the project are also useful to address all other problems.

Natural capital assets such as land and water are an obvious linkage between watershed management and livelihoods. However, watershed programmes that focus only on natural resources have limited impacts on livelihoods and poverty. It is difficult for people affected by landlessness, illiteracy and disease to use natural resources sustainably. Partnerships between watershed management programmes and other institutions working on livelihoods, poverty alleviation, land reform, education and health issues make it easier to address environmental and socio-economic issues effectively. And this type of a convergence of all the line departments that are responsible for the welfare and well being of the people are also mandatory in implementing the IWMP programmes, as the project aims at an overall sustainable development.

## CHAPTER –3
## DESCRIPTION OF THE PROJECT AREA

### 3.1. KANNUR DISTRICT

District was formed in January 1, 1957. The district id flanked by the Western Ghats in the east and Lakshadweep sea in the west. Calicut & Wayanad District in the south, Kasargode in the north and the foarmy blue Lakshadweep Sea in the south. It is rich in natural resources and has a flourishing traditional handloom industry. It is also the centre for production of cashew nut, copra, rice, tiles, electric bulb, hard board and plywood. Kannur is a place of historical importance, earlier a premier port. Folkdance, Kalaripayattu and Theyyam add color to its broad canvas. Other towns are Thalassery, Koothuparamba, Mattannur, Payyannur, Iritty and Thaliparambu etc. Kannur is the most urbanized district in Kerala, with more than 50% of its residents living in urban areas. Kannur has an urban population of 1,212,898, which is the second largest in Kerala after Ernakulam district. The district lies between latitudes 11° 40' to 12° 48' North and longitudes 74° 52' to 76° 07' East and covers an area of 2,996 $km^2$ . Kannur can be geographically divided into highland, midland and lowland regions. The district has a humid climate with an oppressive hot season from March to the end of May. This is followed by the South-West monsoon which continues till the end of September. October and November form the post-monsoon [North-East Monsoon] or retreating monsoon season. According to the 2011 census Kannur district has a population of 2,525,637 and has a population density of 852 inhabitants per square kilometer. Its population growth rate over the decade 2001-2011 was 4.84 %. Kannur has a sex ratio of 1133 females for every 1000 males, and a literacy rate of 95.41 %.



## 3.2. BLOCK PANCHAYATS

### A. PAYYANUR BLOCK PANCHAYAT (PIA)

Payyanur Block Panchayat is situated in the northern end of Kannur District which is included among the northern midland as per classification based on MSL, Rainfall intensity and soil type. Geographically it is slanting from east to west and comprises lands more than 1000 meters height from the sea level. The total area of the Block Panchayat is about 375.24 Sq. Kms. There are 15 revenue villages in the Block Panchayat limits – Ramanthali, Kadannappally, Peralam, Alapadamba, Vellora, Perinthatta, Thirumeni, Vayakkara, Kuttur, Pulingome, Panapauzha, Karivellur, Kankol, Eramam and Peringome. Payyanur Block Panchayat is bounded its north by Nileswar Block, in the south by Kallyasseri & Thaliparamba Block, in the east by Karnataka State and in the West by Arabian Sea. There 13 wards in the Block Panchayats. Payyanur Block Panchayat embeds 7 Grama Panchayats in its geographical area – Karivellur-Peralam, Kankol – Alappadamba, Peringome – Vayakkara, Cherupuzha, Eramam – Kuttur, Kunhimangalam and Ramanthali.

Payyanur Block is in the Peruvamba River Basin in which almost all the streams of the watersheds selected for treatment under IWMP. In this sense the Peruvamba watershed lies between $12^{o}$ 0' to $12^{o}$ 15' north latitude and $75^{o}$ 10' to $75^{o}$ 20' east longitude located in Kannur District. Major rock type upper region are quartz – feldspar hypersthenes granulite, pyroxene granulite, dolerite and sand stone with lignite intercalation. The major rock types of middle region are also similar to that of the upper region. But in the lower regions the formations are sand stone and clay with lignite intercalation sand and alluvium and pegmatite and quartz vein.

#### The climate & Rainfall

The area experiences an average annual rainfall of 3226 mm of which 2476 mm received from the South-West Monsoon (June to August) and 515 mm is received during North – East monsoon. Data of average Rainfall, Relative Humidity and Maximum and Minimum Temperature are shown in the tables below:

**Average Temperature, Relative Humidity & Rainfall Data (last 10 years)**

| Year | Temperature | | RH % | Rainfall (mm) | No. of rainy days |
|---|---|---|---|---|---|
| | Maximum | Minimum | | | |
| 2001 | 32.72 | 22.41 | 89.82 | 294.19 | 12 |
| 2002 | 32.97 | 17.50 | 88.83 | 280.28 | 11 |
| 2003 | 33.39 | 25.36 | 87.44 | 237.18 | 9 |
| 2004 | 32.83 | 24.00 | 88.78 | 336.71 | 12 |
| 2005 | 33.19 | 24.76 | 88.03 | 256.07 | 11 |
| 2006 | 33.36 | 24.36 | 86.93 | 355.88 | 11 |
| 2007 | 32.89 | 24.73 | 72.29 | 385.88 | 11 |
| 2008 | 32.20 | 24.43 | 88.43 | 273.04 | 11 |
| 2009 | 32.93 | 25.10 | 92.20 | 308.13 | 12 |
| 2010 | 32.04 | 24.75 | 67.65 | 232.48 | 13 |
| **Average** | **32.85** | **23.74** | **85.04** | **295.98** | **11** |

**Vegetation**

The land use and land cover of the area can be broadly classified into agricultural land and waste land. Nearly 90% of the upper region is agricultural land which is mainly under mixed agricultural/horticultural plantations. Rest of the area is wasteland which is land with or without scrub. Nearly 70% of the middle region is mainly under mixed agricultural/horticultural plantations. About 10% of the middle region is under double cropped paddy. Rest of the area is wasteland which is land with or without scrub. Nearly 100% of the lower region is agricultural land which is mainly under mixed agricultural/ horticultural plantations.

**Water Resources**

The major drain of the Block Panchayat is Pervamba River which is perennial in nature. As said earlier, the Vannathipuzha (which is a combination of Eriampuzha and Panapuzha from the IWMP area) is a tributary of this river. Besides, the Ramapuram River also joins with Peruvamba River. In total there are 8 tributories for Peruvamba River. The combine annual total yield and annual utilizable yield of Kavvayi, Peruvamba and Ramapuram rivers are 1143$m^{3.}$ The area falls in the category of 'white' which means that only less than 65% of the ground water is utilized. There is no restriction for further development of the water bodies. The upper region of the block is suitable for domestic wells only. The middle region is suitable for large diameter dug-wells or ponds. A smaller portion in the south of the lower region is suitable for filter point wells where as the rest of lower region is suitable for large diameter dugwells and ponds.

**General Socio-Economic Status**

The general socio-economic condition of the block is more or less of the middle class nature with all types of communities like agrarian and business class. 51.09% of the total population in the block is coming under the category of working class. In the upper and middle region of the area, as said earlier, is under cultivation and hence the major part of the population earn their livelihood from Agriculture. This does not mean the people depend on agriculture alone for their livelihood. Among the agrarian communities, there are also farm labourers, wage labourers, artisans, technicians and traditional workers. In such a case the community is considered to be mixed and the income is from various sources. There are neither too rich nor too poor in the block area.

| Panchayat | Marginal Workers | | | Marginal Cultivators | | | Marginal Agricultural Labourers | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | Male | Female | Total | Male | Female | Total | Male | Female |
| Kadannappalli-Panapuzha | 2250 | 1346 | 904 | 99 | 58 | 41 | 1034 | 522 | 512 |
| Eramamkuttoor | 2721 | 1409 | 1312 | 313 | 125 | 188 | 569 | 272 | 297 |
| **Total** | **4971** | **2755** | **2216** | **412** | **183** | **229** | **1603** | **794** | **809** |

The general living conditions of the people are comparatively good as majority attained good education and occupation. A very good percentage of the block population have acquired collegiate education as there is the Payyanur College in cooperative sector and many other private institutions. Almost all the households are having good sanitation facilities and hence the health situation is satisfactory. Payyanur Municipality, Kadannappally, Kankole, and Eriam villages in the block Panchayat limitation show the highest literacy rate and the rest of the area has poor literacy rate. Women population outwits the men population; however, the full strength and potential of the women population is not yet utilized. There are Kudumbasree units under the direct control of the Grama Panchayats and efforts are being taken to bring the female population in forefront of the mainstream social life. There are several colonies of Scheduled Caste communities of whom the socio-economic situations still exhibit the poor

conditions, though the government and Block Panchayat Authorities along with the Grama Panchayat Authorities have taken many steps for their welfare and well being. They are educationally poor and occupationally not worthy. They are still remaining in their traditional works for which they suffer from lack of opportunities.

## B. THALIPARAMBA BLOCK PANCHGAYAT

Taliparamba is a city and a municipality in Kannur district in the Indian state of Kerala. It is also the HQ of Thaliparamba Block Panchayat. It consists of 47 villages which are spread over an area of 1330.56 square kilometres. The total geological area of the Thaliparamba Block is 530.95 Sq. Kms., and is located at 12.05°N 75.35°E. It has an average elevation of 56 metres (183 feet).

**Socio-economic situation:** As of recent census of the Dept of Economics & Statistics, Taliparamba Block had a total population of 237390 living in about 49290 households. Males constitute 48.85% (115966) of the population and females 5.15% (121424). There are 14944 SC population (8089 male & 8306 female) and 116 ST populations (45 male & 71 female). Taliparamba block has an average literacy rate of 90.10%, higher than the national average of 59.5%: male literacy is 85%, and female literacy is 78%. In Taliparamba, 12% of the population is under 6 years of age.

## CHAPTER –4
## DESCRIPTION OF THE PROJECT AREA –GRAMA PANCHAYATS

There are two Grama Panchayats included in the present IWMP project and we feel that it would be good to give a small brief of these two Grama Panchayat. Given below are the descriptions about the Grama Panchayat.

### 4.1. KADANNAPPALLY – PANAPUZHA GRAMA PANCHAYAT

Kadannappally – Panapuzha Grama Panchayat was formed on 20th December 1963 has a total area of 53.75 Sq. kms and forms one of the greenest villages in Thaliparamba Block. Rich with water bodies, the terrain is suitable for agriculture, both food crops and cash crops. One can witness the flourished and cherished greenery in the every look and corner of the Grama Panchayat which makes it bountiful.

The Grama Panahcyat embeds two villages, Kadannapplly and Panapuzha. It is bounded in its north by Ermam – Kuttoor Panchayats, in the east by Chapparappadavu & Pariyaram Grama Panchayats, in the west by Cheruthazham Panchayat and Payyanur Municipality and in the south by Cheruthazham Grama Panchayat. The terrain is sloppy from east to west and is full of hills and valleys, springs and streams, river side plains and paddy fields. Geographically, the whole area can be divided into four categories: High rocky land, hill slopes, Paddy fields with alluviam and riverside plains. Out of the total area about 70-80% is high rocks and hill slopes.

The Grama Panchayat area is categorized among the northern midland agricultural climatic region. The land is generally suitable for cash crops. The land use pattern shows that rubber, cashew, pepper and tapioca are flourishingly cultivated in the hill slopes.

**General geographic & demographic Features of the Grama Panchayat**
Total Geographic Area: 53.75 Sq. Kms., No. of Wards: 15

**Population Details**

| **Total Population** | **19535** | | |
|---|---|---|---|
| Male | 9482 | Male Literacy | 94.49 |
| Females | 10053 | Female Literacy | 82.33 |
| Population Density | 363 | Total Literacy | 88.18 |
| Sex Ratio | 1060 | | |

**Main working groups (Labour Classification)**

| | | | |
|---|---|---|---|
| Male Agriculturists | 498 | Agricultural Labourers (Male) | 1110 |
| Female Agriculturists | 304 | Agricultural Labourers (Female) | 896 |
| **Total** | **802** | **Total** | **2006** |
| Livestock/forest/fisheries/plantation labourers (Male) | 258 | Quarry labourers (Male): | 151 |
| Livestock/forest/fisheries/plantation labourers (Female) | 17 | Quarry labourers (Female) | 44 |
| **Total** | **275** | **Total** | **195** |

| | | | |
|---|---|---|---|
| Home appliances and allied service labourers (Male) | 22 | Labourers other than home appliances and allied service (Male) | 210 |
| Home appliances and allied service labourers (Female) | 11 | Labourers other than home appliances and allied service (Female) | 51 |
| **Total** | **33** | **Total** | **261** |
| Construction workers (Male) | 163 | Commercial Industrial labourers (Male) | 422 |
| Construction workers (Female) | 8 | Commercial Industrial labourers (Female) | 19 |
| Total | 171 | **Total** | **441** |
| Laboureres in other service sector (Male) | 739 | Unemployed (Male) | 3759 |
| Laboureres in other service sector (Female) | 207 | Unemployed (Female) | 1559 |
| **Total** | **946** | **Total** | **5318** |

**Livestock**

| **Description** | **Numbers** | **Description** | **Numbers** |
|---|---|---|---|
| Hybrid Variety Cows (Male) | 202 | He- Buffalo | 21 |
| Hybrid Variety Cows (Female) | 1239 | She-Buffalo | 28 |
| Cows with Unknown traits (Male) | 248 | **Total Buffalos** | **49** |
| Cows with Unknown traits (Female) | 1965 | Pork | 35 |
| **Total Cows** | **3654** | Dog | 537 |
| He-goats | 125 | Duck | 3 |
| She-goats | 649 | Desi Chicken | 544 |
| **Total Goats** | **774** | Hybrid chicken | 23 |

**Distribution of residences based on roof type**

| | | | |
|---|---|---|---|
| No. of RCC roofed Houses | 800 | No. of Thatched Houses | 46 |
| No. of Tile/asbestos roofed houses | 4254 | **Total Houses** | **5100** |
| Electrified Houses | 2100 | Non-electrified | 3000 |

In general the community belongs to the middle class, but there are few families in the watershed who are comparatively rich and another group of families comparatively poor. Educational statistics shows that the Grama Panchayat has acquired high standards and majority of the population is well educated. The GP is noted for its population of higher castes especially that of Namboodiris. The well known Malayalam lyric writer Kaithapram Damodaran Namboodiri belongs to the Grama Panchayat and several other veterans has taken birth from this place.

### 4.2. ERAMAM – KUTTOOR GRAMA PANCHAYAT

Eramam – Kuttoor Grama Panchayat is situated in Taliparamba Taluk of Kannur District. It is included in the Payyanur Block Panchayat which encompasses three revenue villages – Ermam, Kuttoor and Vellora.

Eramam- Kuttoor Panchayat came into existence in January 1962. In 1962 two existing Village Panchayats – Kuttoor (Estd. 1955) and Eramam (Estd. 1956) combined together to form the new Grama Panchayat – Eramam-Kuttoor. The total combined Geographic area of the present Panchayat is 75.14 Sq. Kms. And 17 wards.

In literary sense the Panchayat can be explained as an agricultural village. Productive agricultural land is the most fundamental resource for all rural communities and nations. An agriculture which forms a basis for rural and national self-reliance in food production depends upon equitable distribution of this resource. Without secure access to land, the tenant farm family is not in a position to carry out many of the long-term improvements (such as terracing, composting, and tree planting) that may be needed, nor are they in the position to benefit from the multitude of small farm programs sponsored by national agriculture departments and international and bilateral aid agencies.

The landless farm labourer is often ignored entirely, though he or she is most vulnerable to unemployment from mechanization. Participation in agricultural production, it has been repeatedly demonstrated, is the only clear guarantee of participation in food consumption.

**General Demographic Features of the Grama Panchayat**

Total Male Population: 12238
Total Female Population: 12798 Total **Population: 25036**
Population Density: 333, Sex Ratio: 1046
Male Literacy: 93.97, Female Literacy: 82.38, Total Literacy: 88%

**Animal Husbandry/Livestock**

| Description | Numbers | Description | Numbers |
|---|---|---|---|
| Hybrid Variety Cows | 1475 | Pork | 69 |
| Cows with Unknown traits | 1833 | Dog | 1239 |
| **Total Cows** | **3308** | Duck | 51 |
| Buffalo | 13 | Desi Chicken | 1089 |
| Goats | 1057 | Hybrid chicken | 1924 |

**4.3. IWMP AREA - Panchayat Wise Secondary Data of Demographic Particulars**

Demographic details of the Project area based on the latest statistics by Kannur District Economic and Statistics Department which had been published recently. Details are given in tabular form below:

**Data regarding Households, Population Density and sex ratio with effective literacy rates**

| Panchayat | Grade | Area (in sq. Km) | No of wards | No. of occupied residential houses | No. of households | Density of Population | Sex ratio | Effective literacy rate |
|---|---|---|---|---|---|---|---|---|
| Eramam – Kuttur | 1st | 75.14 | 16 | 4958 | 6124 | 360 | 1079 | 80.22 |
| Kadannapally Panappuzha | 2nd | 53.75 | 15 | 5100 | 4459 | 394 | 1060 | 88.18 |
| **Total/Average** | | **128.89** | **31** | **10058** | **10583** | **377** | **1069** | **84.2** |

**IWMP Area - Panchayat wise Total Child Population, Literates & Illiterates**

| Panchayat | Total Population in the age group 0 - 6 | | | Literates | | | Illiterates | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | Male | Female | Total | Male | Female | Total | Male | Female |
| Eramam-kuttoor | 2773 | 1402 | 1371 | 21701 | 11062 | 10639 | 5350 | 1949 | 3401 |
| Kadannappalli-Panapuzha | 2173 | 1115 | 1058 | 16974 | 8517 | 8457 | 4201 | 1578 | 2623 |
| **Total/Average** | **4946** | **2517** | **2429** | **38675** | **19579** | **19096** | **9551** | **3527** | **6024** |

**IWMP Area - Panchayat wise number of Households, Total Population, SC Population, ST Population & Literacy Rate– 2001 Census**

| Panchayat | No. of House-holds | Total Population | | | Scheduled Castes | | | Scheduled Tribes | | | Literacy Rate (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Person | Male | Female | Person | Male | Female | Person | Male | Female | |
| Eramam - Kuttoor | 6124 | 27051 | 13011 | 14040 | 998 | 479 | 519 | 2 | 1 | 1 | 89.39 |
| Kadannappally- Panapuzha | 5100 | 21175 | 10095 | 11080 | 631 | 302 | 329 | 8 | 2 | 6 | 89.33 |
| **Total/Average** | **10583** | **48226** | **23106** | **25120** | **1629** | **781** | **848** | **10** | **3** | **7** | **89.36** |

**IWMP Area – Panchayat wise details of Live Stock Population**

| Name of Panchayat | Cattle | | Buffaloes | Goats | Pigs | Dogs | Fowls | | |
|---|---|---|---|---|---|---|---|---|---|
| | Cross Breed | Non Descript | | | | | Desi | Imp-roved | Ducks |
| Eramam Kuttoor | 1475 | 1833 | 13 | 1057 | 69 | 1239 | 1089 | 1924 | 51 |
| Kadannappally Panappuzha | 1867 | 566 | 10 | 800 | 35 | 537 | 5094 | 544 | 22 |
| **Total** | **3342** | **2399** | **23** | **1857** | **104** | **1776** | **6183** | **2468** | **73** |

**IWMP Area - Panchayat wise details of Public Drinking Water Facility**

| Name of Panchayat | Public Tube Wells | Public wells | Public Tanks/Ponds | Public Taps | Others (Specify) |
|---|---|---|---|---|---|
| Eramam - Kuttur | 10 | 25 | 2 | 4 | - |
| Kadannapally Panappuzha | 15 | 20 | 12 | - | - |
| **Total** | **25** | **45** | **14** | **4** | **-** |

**IWMP Area - Panchayat wise Families below Poverty Line (BPL)**

| Panchayat | Area in sq Kms | No. of house holds | No. of families | | | |
|---|---|---|---|---|---|---|
| | | | S.C | S.T | Others | Total |
| Eramam - Kuttur | 75.14 | 3467 | 77 | - | 3390 | 3467 |
| Kadannapally Panappuzha | 53.75 | 2210 | 92 | - | 2118 | 2210 |
| **Total** | **128.89** | **5677** | **169** | **0** | **5508** | **5677** |

**IWMP Area - Residential Houses according to type of Roof & Electrification**

| Name of Panchayat | Concrete | Tiles/Asbestos | Thatched & others | Total | Electrified | Not electrified |
|---|---|---|---|---|---|---|
| Eramam - Kuttur | 2800 | 2900 | 200 | 5900 | 3300 | 2100 |
| Kadannapally Panappuzha | 800 | 4254 | 46 | 5100 | 2100 | 3000 |
| **Total** | **3600** | **7154** | **246** | **11000** | **5400** | **5100** |

**IWMP Area - Panchayat wise details of Medical Institutions – Allopathic**

| Name of GP | Hospitals | Dispensaries | PHCs | CHCs | FWC |
|---|---|---|---|---|---|
| Eramam Kuttur | 0 | 1 | 1 | 0 | 0 |
| Kadannappally – Panapuzha | 1 | 0 | 1 | 1 | 5 |
| **Total** | **1** | **1** | **2** | **1** | **5** |

## CHAPTER – 5
## GENERAL FEATURES OF THE PROJECT AREA

The project area under IWMP sanctioned for Payyanur Block Panchayat has a total area of 5369 Ha which is considered as land under agricultural use. This includes a total cultivable waste of 1099 ha and the whole area is consideredsas rainfed. The project area is being selected for treatment based on certain criteria such as agro-climatic condition of the projectarea, demography and land distribution, livelihood, availability of irrigation facilities etc. Given below is a table showing the criteria andweightage for selection of watershed.

### 5.1. Criteria and weightage for selection of watershed

| **Criteria** | **Maxi-mum score** | Ranges & scores | | | |
|---|---|---|---|---|---|
| | | Above 80 % (10) | 80 to 50 % (7.5) | 50 to 20 % (5) | Below 20 % (2.5) |
| Poverty index (% of poor to population) | 10 | Above 80 % (10) | 80 to 50 % (7.5) | 50 to 20 % (5) | Below 20 % (2.5) |
| % of SC/ ST population | 10 | More than 40 % (10) | 20 to 40 % (5) | Less than 20 % (3) | |
| Actual wages | 5 | Actual wages are significantly lower than minimum wages (5) | Actual wages are equal to or higher than minimum wages (0) | | |
| % of small and marginal farmers | 10 | More than 80 % (10) | 50 to 80 % (5) | Less than 50 % (3) | |
| Ground water status | 5 | Over exploited (5) | Critical (3) | Sub critical (2) | Safe (0) |
| 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 | |
| Area under rain-fed agriculture | 15 | More than 90 % (15) | 80 to 90 % (10) | 70 to 80% (5) | Above 70 % (Reject) |
| Drinking water | 10 | No source (10) | Problematic village (7.5) | Partially covered (5) | Fully covered (0) |
| Degraded land | 15 | High – above 20 % (15) | Medium – 10 to 20 % (10) | Low- less than 10 % of TGA (5) | |
| Productivity potential of the land | 15 | Lands with low production & where productivity can be significantly enhanced with reasonable efforts (15) | Lands with moderate production & where productivity can be enhanced with reasonable efforts (10) | Lands with high production & where productivity can be marginally enhanced with reasonable efforts (5) | |
| 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) | |

| | | | | | |
|---|---|---|---|---|---|
| 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) | |
| 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 Payyanur Block Panchayat selected for treatment under IWMP is tabled below:

### 5.2. Weightage obtained for the watersheds

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| 35P16a | 5 | 3 | 10 | 3 | 15 | 7.5 | 5 | 0 | 10 | 59 |
| 35P16b | 5 | 3 | 10 | 3 | 15 | 7.5 | 0 | 10 | 10 | 64 |
| 35P16c | 5 | 3 | 10 | 3 | 15 | 7.5 | 5 | 10 | 10 | 69 |
| 35P17a | 5 | 3 | 10 | 3 | 15 | 7.5 | 0 | 10 | 10 | 64 |
| 35P18a | 5 | 5 | 10 | 0 | 15 | 7.5 | 5 | 0 | 10 | 58 |
| 35P19a | 5 | 5 | 10 | 2 | 15 | 7.5 | 10 | 0 | 10 | 65 |
| 35P19b | 5 | 3 | 10 | 3 | 15 | 7.5 | 5 | 10 | 15 | 74 |
| 35P19c | 5 | 3 | 10 | 3 | 15 | 7.5 | 5 | 0 | 15 | 64 |
| 35P19h | 5 | 3 | 10 | 3 | 15 | 7.5 | 0 | 10 | 15 | 69 |
| 35P19i | 5 | 5 | 10 | 2 | 15 | 7.5 | 5 | 0 | 15 | 65 |
| 35P19j | 5 | 3 | 10 | 3 | 15 | 7.5 | 5 | 0 | 15 | 64 |
| 35P20a | 5 | 3 | 10 | 5 | 15 | 7.5 | 10 | 0 | 15 | 71 |
| 35P21a | 5 | 3 | 10 | 3 | 15 | 7.5 | 0 | 0 | 15 | 59 |
| 35P22a | 5 | 3 | 10 | 3 | 15 | 7.5 | 5 | 0 | 15 | 64 |
| 35P23b | 5 | 3 | 10 | 3 | 15 | 7.5 | 0 | 10 | 15 | 69 |
| Grand Total | 75 | 51 | 150 | 42 | 225 | 112.5 | 60 | 60 | 195 | 978 |

### 5.3. Physiography, relief & drainage

The general feature of the watershed area with regard to physiography is undulating with moderate to steep slopes. One can observe hillocks and sloping valleys and sometimes, in some areas, plains. However, the most common nature is undulating.

In the general condition of the watershed mainly two types of soil is seen: ***Gravelly Clay and brown hydromorphic soils***. The predominant soil in the major part of almost all the watersheds is gravelly clay which is the weathered product derived under humid tropical condition. It occurs mainly in the midland and hilly areas characterized by rugged topography.They range from sandy loam to red loam.

Brown hydromorphic soil is confined to the valleys between undulating topographyin the midlandsand in the low lying areas. This is brown in colour and the surface texture varies from sandy loam to clay. This had been formed as a result of transportation and deposition of materials from adjoining hill slopes and also through deposition by rivers.

Very rarely river alluvium is also observed in the watershed, especially along the river bed and banks of the rivers and big streams cutting across the extensive lateritic soil. The soil is very deep with surface texture ranging from sandy loam to clay. It is fertile having water holding capacity and plant nutrients which are regularly replenished during floods.

The main drainange system of the watershed area is formed by two small but important rivers – Eriam River and Panapuzha River. These two together join to form Vannathipuzha which in turn joins with Peruvamba (Perumba) river. Thus the vannathipauzha is one among the tributaries of the Peruvamba River which also forms the drainage of Payyanur Block Panchayat.

## 5.4. CLIMATE

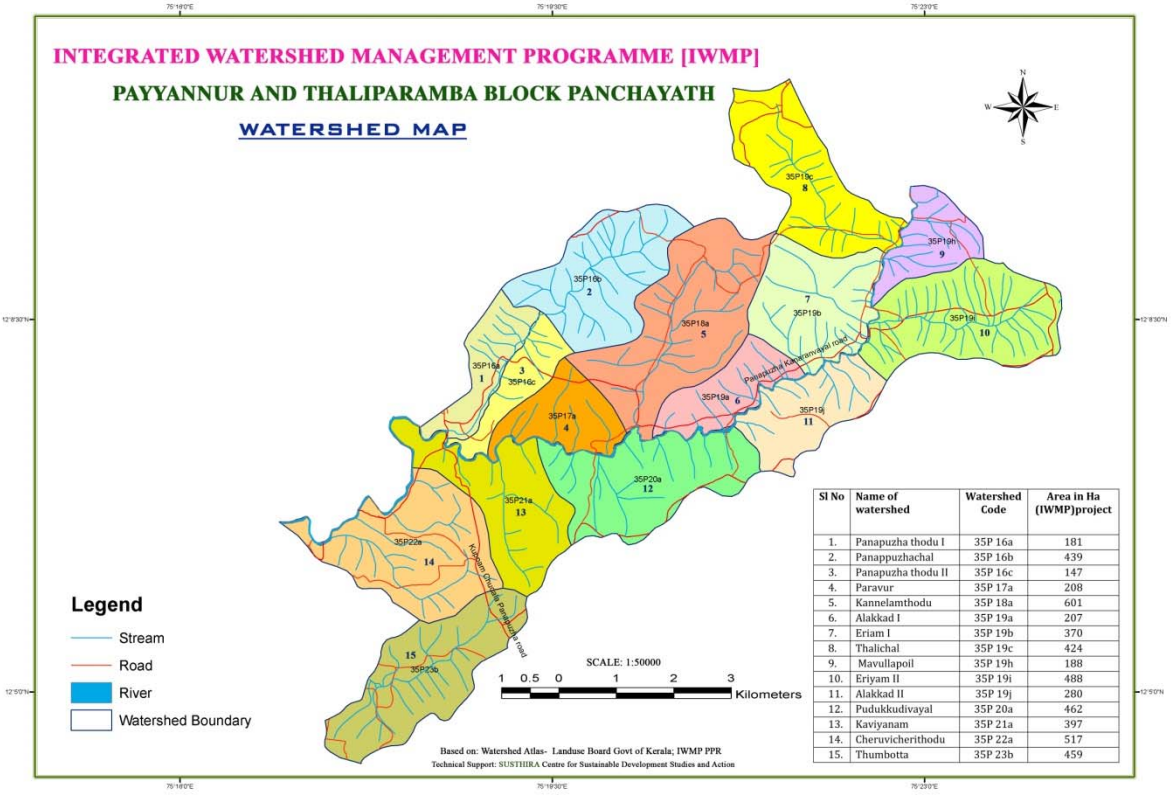
Three important features are described under the head climate. These three features are Rain fall, temperature and relative humidity and rainfall. Given below is a brief description of the both. The temperature is high during the months of March to May and is low during December and January. The average mean monthly maximum temperature ranges from 28.4 to 36.90C and minimum temperature ranges from 19.7 to 23.90C. Relative humidity is more during south west monsoon season (ie June to September). It is more during morning hours and is less during evening hours. Humidity ranges from 77 to 88 % in the district.

### 5.4.1. Rainfall

The watershed area experiences heavy rainfall during the South West monsoon season followed by North East monsoon. The South West monsoon (Edavappathi in vernacular) during June to September contributes 70 % of the total rainfall of the year. The northeast monsoon (Thulavarsham in Vernacular) contributes only about 30%. The annual average rainfall in the watershed area is around 3543mm. The year to year variability of annual rainfall is around 28.2%. Rainfall data for the last ten years is given under the details of Block Panchayat.

**The list of watershed proposed for treatment under IWMP is furnished below:**
**IWMP -Payyannur Block**
**Details of Watersheds in the Cluster**

| Sl. No. | Code No. | Name of Watershed | Total Area | Land Under Agriculture | Rain fed Area | Waste Land | | Geographic Coordinates | | Elevation (ft) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Cultivable | Non-Cultivable | Longitude | Latitude | |
| 1 | 35P16a | Panapuzhathodu - I | 181 | 181 | 181 | 0 | 0 | $12^0$7’30” N - $12^0$9’30” N | $75^0$18’ 0”E - $75^0$19’30”E | 156 |
| 2 | 35P16b | Panapuzhachal | 439 | 322 | 439 | 71 | 45 | $12^0$ 8’ 0” N - $12^0$9’30” N | $75^0$ 19’0”E - $75^0$ 21’0”E | 183 |
| 3 | 35P16c | Panapuzhathodu - II | 147 | 147 | 147 | 0 | 0 | $12^0$ 7’ 0” N - $12^0$8’30” N | $75^0$18’30”E -$75^0$19’30”E | 229 |
| 4 | 35P17a | Paravoor | 208 | 183 | 208 | 25 | 0 | $12^0$ 7’0”N - $12^0$ 8’0”N | $75^0$19’0” E -$75^0$20’0” E | 136 |
| 5 | 35P18a | Kannelam Thodu | 602 | 402 | 602 | 199 | 0 | $12^0$ 7’30”N - $12^0$9’30”N | $75^0$19’30”E-$75^0$21’30”E | 386 |
| 6 | 35P19a | Alakkadu –I | 207 | 207 | 207 | 0 | 0 | $12^0$7’0”N - $12^0$8’30”N | $75^0$20’30”E-$75^0$22’0”E | 245 |
| 7 | 35P19b | Eriam – I | 370 | 232 | 370 | 138 | 0 | $12^0$8’0” N - $12^0$9’30” N | $75^0$21’30”E-$75^0$22’30”E | 428 |
| 8 | 35P19c | Thalichal | 424 | 413 | 424 | 12 | 0 | $12^0$9’0”N - $12^0$10’30”N | $75^0$21’0”E- $75^0$23’0”E | 410 |
| 9 | 35P19h | Mavullapoil | 188 | 188 | 188 | 0 | 0 | $12^0$ 8’30”N - $12^0$ 10’0”N | $75^0$22’30”E-$75^0$23’30”E | 219 |
| 10 | 35P19i | Eriyam – II | 488 | 488 | 488 | 0 | 0 | $12^0$8’0” N - $12^0$9’0”N | $75^0$22’30”E -$75^0$24’0”E | 153 |
| 11 | 35P19j | Alakkadu – II | 280 | 280 | 280 | 73 | 0 | $12^0$7’0” N - $12^0$8’30” N | $75^0$21’0”E -$75^0$22’30”E | 367 |
| 12 | 35P20a | Puthukkudivayal | 462 | 462 | 462 | 125 | 0 | $12^0$ 6’30” N - $12^0$7’30” N | $75^0$19’30”E -$75^0$21’30”E | 255 |
| 13 | 35P21a | Kaviyanam | 397 | 397 | 397 | 191 | 0 | $12^0$ 6’0”N - $12^0$ 7’30”N | $75^0$ 18’0”E -$75^0$ 19’30”E | 240 |
| 14 | 35P22a | Cheruvicherythodu | 517 | 517 | 517 | 226 | 0 | $12^0$ 5’30” N - $12^0$ 7’0” N | $75^0$17’0”E-$75^0$19’0”E | 90 |
| 15 | 35P23b | Thumbotta | 459 | 459 | 459 | 29 | 201 | $12^0$ 4’30” N - $12^0$ 6’0” N | $75^0$17’30” E -$75^0$19’0” E | 112 |
| **Total** | | | **5369** | **4878** | **5369** | **1089** | **246** | | | |




## 5.7 Ground Water Scenario

Groundwater occurs under phreatic conditions in weathered mantle of the crystalline rocks, laterites and unconsolidated coastal sediments. It occurs under semi confined to confined conditions in the deep-seated fractured aquifers of the crystalline rocks and Tertiary sediments.

The project area is safe in ground water availability and utilization as noticed by the Ground Water Department of the Government of Kerala. The details regarding the ground water situation in the project area is shown below:

**Situation of Ground Water Resources as on March 2004 (Courtsey: GWD, GoK)**

| Net Annual Ground Water Availability | Existing Gross Ground Water Draft for irrigation | Existing Gross Ground Water Draft for domestic and industrial water supply | Existing Gross Ground Water Draft for all uses | Allocation for domestic and industrial requirement supply up to next 25 years | Net Ground water Availability for future irrigation development | Stage of Ground water development (%) |
|---|---|---|---|---|---|---|
| 130.62 | 37.82 | 10.72 | 48.54 | 13.85 | 78.95 | 37.16 |

**Comparison of stage of development, TotalGross Draft and Categorization**
**(Courtsey: GWD, GoK)**

| Net Ground water availability (MCM) | Total gross draft (MCM) | | Stage of development | | Categorization |
|---|---|---|---|---|---|
| | 1999 | 2004 | 1999 | 2004 | |
| 130.62 | 36.94 | 48.54 | 17.94 | 37.16 | Safe |

There are two major problems/issues related to ground water availability in the watershed area. They are declinein water leveland water scarcity. Water scarcity is a common and severe problem faced by the watershed communities living in hilly trerrains due to the drying up of wells in summer season. Dug wells in the midland regions also dry up due to the delay of monsoon rains or to the absence of summer showers.

### 5.8. Watersupply and Irrigation.

None of the proposed IWMP project area has covered under assured irrigation as it is mentioned in the selection criteria. This means that there is no big or medium or small irrigation project in any of the streams or the rivers flowing through the watershed. However, people makes their own arrangements either in the traditional way of caarying water in the pots for irrigation from the ponds and wells or using electric/diesel motor pumpsets for bailing water for irrigation from the traditional sources.

There are no big water supply schemes like Community Water Supply Schemes under Jalanidhi (WB aided KRWSA Project) or under Kerala Water Authority (KWA). The concerned Panchayats had some small scale drinking water supply scheme run and operated by the Panchayat authorities. Of late the pipe line of the Japan Drinking Water Supply Scheme (JICA Propject) is passing through some of the watersheds in the cluster, which brought expectations among the watershed community that they get water supply from the scheme. But it is not finalized.

### 5.9. Socio-Economic Details

The general socio-economic condition of the watershed community is observed to be that of the middle class, because there are no physical parameters to understand the different communites in general. The watersheds have a mixed community with farmers, agricultural labourers, government employees, people employed in private sectors, construction workers, wage labourers and casual labourers. Therefore the economic situation is alsomixed. The factors that decide the social status is also confusing because nonetheless can be identified as belonging to different strata. Details regarding the factors that decide the socio-economic status of the watersheds are explained below:

#### a. Demography

The total households in the watershed area are 3770 out of which 1593 are belonging to BPL category and trh erest in the APL. In all these households there is a total population of 16442 out of which the male population is 7900 and the female population is 8542. This is coincides with the general population of the state of Kerala where the female population is more than the male population. The population density is 306/$Km^2$ and the sexratio is 1081. The average literacy is 92.2. The male literacy is 94.8 and the female literacy is 89.6.

The total SC population in the watershed area is 252 amongst which 159 are male and 57 are female. Comparatively the SC population in the area is less than
other areas of Payyanur Block Panchayat. There are no ST households reported in the watershed area.

**b. Educational Status**

Educationally the watershed community is betteroff asmajority of them have completed their X class (High Schooland Higher secondary education). The older generation has acquired education at upper primary level, where as the new generation have gone through even collegeate education. Perhaps this may be a reason for the higher No. of teachers and government employees in the watershed area. The present generation has all the facilities for continuing education upto PG level and even for research studies.

The accessibility to the educational institution for all the households in the watersheds is higher than any other area of the Grama Panchayats. Kadannappally – Panapuzha area has several schools (LP &UP) and a well furnished Higher Secondary School with all modern facilities like computer lab, laboratory arrangements for other science subjects and well trained teachers. Similary the watersheds in the Eramam – Kuttur Grama Panchayat area has similar facilities. Those who wanted to continue their education Payyanur College is very near to the watersheds and the College in the cooperative sector is also is accessible to them. All these facilities and the interest of the people to send their children for education together contribute to the educational status of the watershed community.

| | |
|---|---|
| Anganwadi | 15 |
| L.P.School | 5 |
| U.P.School | 2 |
| Higher Secondary School | 2 |

**c. Health situation**

The health situation is comparatively good as per data obtained from the Primary Health Centres (PHC) which cater to the watershed community. Being interior villages, the watershed area is comparatively non-polluted and with less reported deadly diseases. The primary health centres and some village clinics run by medical practishoners are the main source for medical treatment for the watershed community.

| | |
|---|---|
| Primary health centres | 2 |
| Homeo Dispensary | 2 |

**d. Transport and communication**

There is a very good road network that passes across almost all watersheds and these connect all the watersheds each other. There are road transport facilities including bus service in almost all the watersheds. The bus service is available through the main roads and to the interior village area auto rikshaws and Jeep services are available. The watershed is connected to the Grama Panchayat Head Quarters and to the Block Panchayat Headquarters by roads and the transport facilities is comparatively satisfactory.

All the modern communication facilities like Television, satellite communication like DTH, mobile phone and land phone are available in the watersheds. Perhaps, there is nobody without a mobile phone in the watershed. All the news papers published in the state and some local news papers and magazines are also available. People are subscribers of almost all types of news papers and Cable TV communications.

**e. Credit Facilities**

The watershed community enjoys the presence of Service Cooperative banks in almost all the watersheds. In Kadannappally – Panapuzha Panchayat area the presence of the branches of Panapuzha Service Cooperative bank is predominant and in Ermam – Kuttur area the presence of the branches of Eramam-Kuttur Service Cooperative Bank is predominant. Besides these the

branches of North Malabar Gramin Bank and HDFC bank is also functioning in the watershed area. These financial institutions provide necessary credit facilities to the members of the watershed community whenthey need a loan for their agricultural, housing and other needs.

Another arrangement is the Kudumbasree units, which specifically arranges credit facilities for the womenfor enterprises development, self employment programmes and sometimes their domestic needs. In fact, the availability of credit is not atall a problem with regard to the watershed community.

### f. Recreation Facilities

The watershed community had many forums for recreation. There are Arts & Sports clubs and reading rooms (Public Libraries) and cultural centres in every look and corner of almost all the watersheds. These clubs and reading rooms are either run by political parties or youth clubs. However, these clubs and reading rooms not only mould the cultural growth and development but also provide opportunities for recreation. Clubs and reading rooms are also provided with Televisions.

One of the limitations of these forums is that these are specifrically for men. There are no such exclusive arrangements for women. Women find their forums for recreation during festivals and celebrations like onam and vishu. Given below is a list of available facilities in the watershed area:

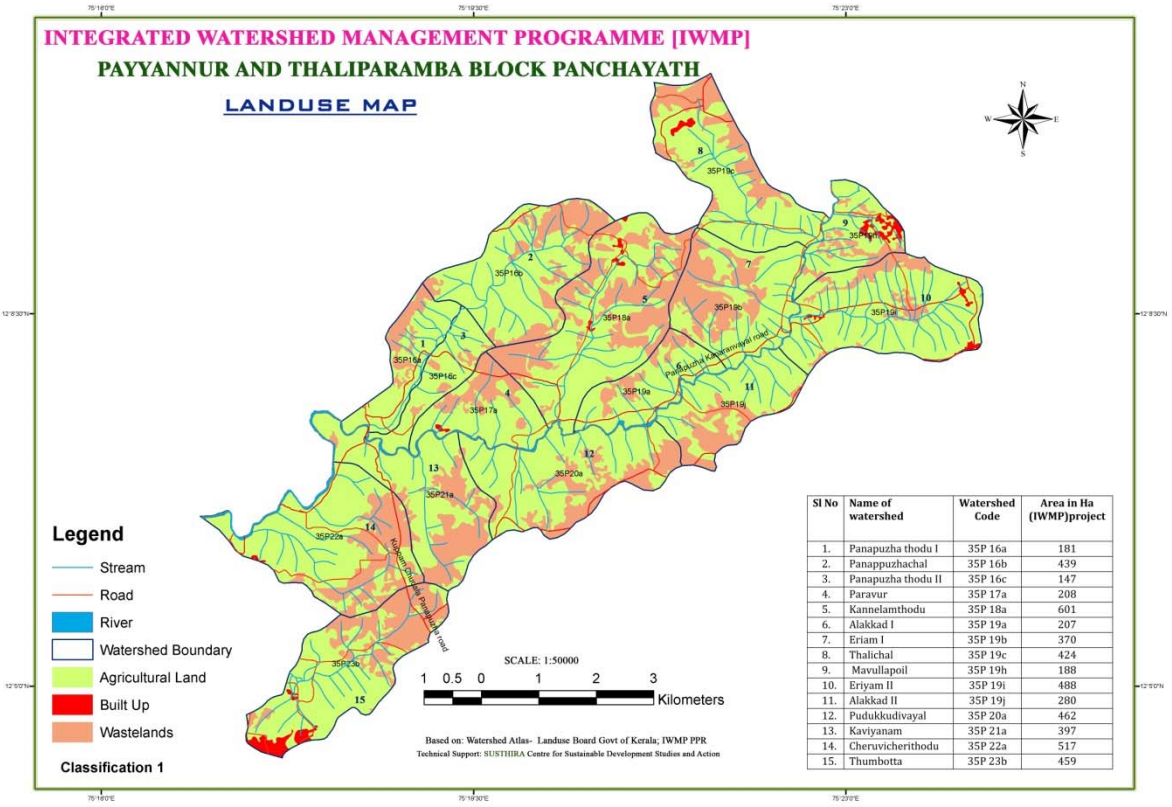
1. Public Library – 7
2. Reading Rooms – 13
3. Arts Centres – 15
4. Community Halls – 1
5. Community Radio Centres – 4
6. Community T.V. Centres – 6
7. Sports Clubs – 40
8. Study Centrefor Eleders - 1

### g. Land Use Pattern

Some years back almost all the waterhed had paddy fileds and thefarmers were cultivating two crops. Unfortunately, due to various reasons, specifically for want of the availability of the labourers, hike in fertilizers, low price for the yield and climatic change had forced the farmers to shift to other cultivation which require lesser labour and those which are long term crops. Consequently major part of the paddy fields had been leveled for plantain and arecanut coupled with coconut cultivation. Now the major crop in almost all watersheds is rubber. Around 2770.73 ha out of the available 5369 ha (51.6%) is rubber. The general land use pattern (in ha) of the watershed coming under the IWMP project is shown in a tabular format followed by a graphic illustration.

**Table Showing Land Use& Cropping Pattern**

| Coconut | Arecanut | Cashew Nut | Plantain | Vegetables | Rubber | Tubers | Paddy | Built Up | Cultivable Waste | Un Cult. Waste | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 621.22 | 504.82 | 335.2 | 201.12 | 210.2 | 2032.36 | 108.27 | 73.4 | 528.32 | 713.4 | 40.7 | 5369 |
| 11.57% | 9.40% | 6.24% | 3.92 | 3.92% | 37.85% | 2.02% | 1.37% | 9.84% | 13.29 | 0.76% | 100% |




| Sl No | Name of watershed | Watershed Code | Area in Ha (IWMP)project |
|---|---|---|---|
| 1. | Panapuzha thodu I | 35P 16a | 181 |
| 2. | Panappuzhachal | 35P 16b | 439 |
| 3. | Panapuzha thodu II | 35P 16c | 147 |
| 4. | Paravur | 35P 17a | 208 |
| 5. | Kannelamthodu | 35P 18a | 601 |
| 6. | Alakkad I | 35P 19a | 207 |
| 7. | Eriam I | 35P 19b | 370 |
| 8. | Thalichal | 35P 19c | 424 |
| 9. | Mavullapoil | 35P 19h | 188 |
| 10. | Eriyam II | 35P 19i | 488 |
| 11. | Alakkad II | 35P 19j | 280 |
| 12. | Pudukkudivayal | 35P 20a | 462 |
| 13. | Kaviyanam | 35P 21a | 397 |
| 14. | Cheruvicherithodu | 35P 22a | 517 |
| 15. | Thumbotta | 35P 23b | 459 |

**Problems of Special Mention:**

The watershed is slowly deteriorating in its natural resources. The watersheds were blessed with a number of streams that provides water to land, animals and even human beings belonging to the watersheds. The shift in cultivation, i.e. from the seasonal crops to perennial crops and even to long-term crops have much changed the natural resources of the watershed – soil, water and biomass. There are specific issues in different sectors that badly affect the watershed. These issues are summarized below:

**Soil related Problems**

- 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
- 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 became seasonal

- 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

# CHAPTER – 6
# METHODOLOGY ADOPTED

IWMP planning has been done in a decentralized manner and in the process different approaches had been adopted.

## 6.1. THE PROCESS OF PLANNING (Methodology adopted for Planning)

### 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 is collected by the 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.

### 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.

### Formation of Watershed Committees

Watershed Committees are necessary to ensure timely implementation and early fund release to the individual beneficiaries. This will also ensure the transparency and subsidiarity of the programme and the expected results will be obtained in time as it is envisaged in the project plan.

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 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. 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.

**PARTICIPATORY RURAL APPRAISAL – PRA**

The **Technical Support Organization (TSO), Susthira** has conducted PRA in all the fifteen watersheds identified under the IWMP project. In each watershed Participatory Appraisals ended with a one day participatory planning workshop during which participants were given feedback on the information gathered during the exercise. Other activities carried out during these workshops included: identification, analysis and prioritization of problems; identification of possible solutions; and drafting a tentative community action plan. Ideas for action developed during the participatory planning workshop were subsequently reviewed by project management and field staff and interest groups through a participatory feasibility analysis, aimed at assessing the extent to which these ideas were technically, economically and socially viable and sound. This assessment included: priority-setting exercises, technical studies, on-site investigations and conflict management initiatives. Following the feasibility study, detailed terms of reference for joint implementation were negotiated among local actors, leading to the definition of collaborative implementation agreements.

**Tools Applied in the Participatory Rural Appraisal in The Watersheds:**

Though there are several tools that can be applied in assessing the situation and to carry aout the situational analysis and knowledge generation, for want of time and space, four most important tools have applied in the PRA exercise conducted in the watershed. They are Mapping, Focus Group Discussion (FGD), SWOT Analysis, Seasonality calendar Problem Tree Analysis, Scoring & Ranking (Pair-wise & Matrix Ranking and Transect Walk. Given below is a brief description of the tools.

**Mapping:**

The basic objective of Resource Mapping was to document and understand the natural resources and the institutions (schools, farms etc) of the watershed. It is the visual representation of the basic facilities and the geographical terrain of the watersheds. It also shows how far each hamlet is situated from the other and how many households are there in each hamlet. This basic grassroots level information is crucial in planning any interventions at the micro-level.

**Focus Group Discussion**

The focus group discussion (FGD) is a rapid assessment, semi-structured data gathering method in which a purposively selected set of participants gather to discuss issues and concerns based on a list of key themes drawn up by the researcher/facilitator. Focus group discussion has become extremely popular because it provides a fast way to learn from the target audience. Marketing and media studies have shown that the focus group discussion is a cost-effective technique for eliciting views and opinions of prospective clients, customers and end-users. In agriculture, focus groups have been used to obtain insights into target audience perceptions, needs, problems, beliefs, and reasons for certain practices.

The purpose of focus group discussions is to gain knowledge about a particular topic or need by interviewing a group of people directly affected by the issue. Focus group data can be used to collect information for many purposes, such as conducting a needs assessment or evaluating a program. Below are brief pointers regarding the “why” and “how” of focus groups. **Focus Groups are appropriate when one want to Explore** the depth and nuances of opinions regarding an issue, Understand differences in perspectives, Understand what factors influence opinions or behavior, Test materials or products, Test reactions to actual or proposed services, Design a large study or understand its results, Capture opinions and perspectives of a program’s target audience and Learn about participants by observing their interactions

**SWOT Analysis**

**SWOT** analysis is a tool that identifies the **S**trengths, **W**eaknesses, **O**pportunities and **T**hreats of an organization. Specifically, SWOT is basically used in the watershed analysis as a straightforward model that assesses what a watershed community can and cannot do as well as its potential opportunities and threats. The method of SWOT analysis is to take the information from an environmental analysis and separate it into internal (strengths and weaknesses) and external issues (opportunities and threats). Once this is completed, SWOT analysis determines what may assist the watershed community in accomplishing its objectives, and what obstacles must be overcome or minimized to achieve desired results.

SWOT is commonly used as part of strategic planning and looks at Internal strengths, Internal weaknesses, Opportunities in the external environment and Threats in the external environment. SWOT is a process which generates information that is helpful in matching a development goal programs, and capacities of a community, to the social environment in which it operates. Note that SWOT in itself is only a data capture – the analysis follows.

**Strengths** are the positive tangible and intangible attributes, internal to an organization and they are within the organization's control. **Weaknesses** are factors that are within a community's / organization's control that detract from its ability to attain the desired goal and this explains which areas the community /organization might improve.

**Opportunities are e**xternal attractive factors that represent the reason for an organization to exist and develop. It also explains what opportunities exist in the environment, which will propel the organization. Identify them by their "time frames". **Threats are e**xternal factors, beyond an organization's control, which could place the organization mission or operation at risk. The organization may benefit by having contingency plans to address them if they should occur. Classify them by their "seriousness" and "probability of occurrence".

***In summary:***

- **Strengths** need to be maintained, built upon or leveraged.
- **Weaknesses** need to be remedied, changed or stopped.
- **Opportunitie**s need to be prioritized, captured, built on and optimized.
- **Threats** need to be countered or minimized and managed.

A **SWOT analysi**s can be very subjective, and two people rarely come-up with the same final version of **SWOT**. It is an excellent tool however, for looking at the negative factors first in order to turn them into positive factors. Use **SWOT** as guide and not a prescription.

**Seasonality Calendar**

A seasonal calendar is a participatory tool to explore seasonal changes (e.g. gender-specific workload, diseases, income, expenditure etc.) and the Objective is to learn about changes in livelihoods over the year and to show the seasonality of agricultural and non agricultural workload, food availability, human diseases, gender-specific income and expenditure, water, forage, credit and holidays.

Seasonal calendars are tools for collection of information relevant to seasonal happenings of natural conditions and associated socio-economic-cultural activities of a community during a one year cycle. Calendars help develop understanding of water availability, agricultural produce, Pests and pest control measures, behavior choice, activity patterns, local market economics and can support annual work plans and the allocate resources in a timely manner.

**Problem Tree Analysis**

Problem Tree is an effective tool for participatory planning, to get an understanding about pressing problems in the community and probe their causes and possible effects. The procedure is as follows:

The group was requested to discuss pressing issues in the community. For example, they could be low income, degraded environment, natural disasters, etc., and these problems were listed and the group was ask to pick the issue that they are the most concerned about.

The commonly occurring reasons (e.g. the environment is polluted) were elegantly listed on a chart paper and fixed to a wall to make it possible to have a onetime observation of the group members

The group members were asked to brainstorm on the first level of causes, directly leading to such a problem, then eventually go to second level, third level until repetition occurs and no further causes emerge. For each cause, it was written on another chart paper and fixed again on the wall. Similarly, the groups looked for the possible effects of the problem and different levels of these.

The group members were given considerable time to think and discuss. When facilitating the discussion, the group was reminded that none is completely true or completely false, but the majority's opinions shall be respected. Further, the problems were written in full sentence rather than in short hand. Additionally, causes/effects of the second level were linked to multiple causes/effects of the first level, so there are more causes/effects than two levels. This tool is very relevant to Problem Ranking; the difference is that ranking compares different problems, meanwhile the tree analyses one problem.

**Scoring & Ranking**

Ranking and scoring is used in PRA to understand people's preferences and choices, drawing on their own categories and classifications rather than imposing those of outsiders.
The problems, solutions technical inputs etc are arranged on the interests of the users.

**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.

**NRM - steps followed for planning:**

The boundary line of the watershed is delineated in the very first step with the help of village cadastral map and Topo-sheet. 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 and are marked in the cadastral map. Lands are surveyed on the basis of land type, soil type, erosion class and slope and accordingly the whole watershed land is divided into various patches which are treated as individual mapping units.

During the transect various resources like different water bodies, wells and farm ponds are identified and are marked in the cadastral map. The present land use is also studied during transect and accordingly present land use map is prepared using different notions and symbols. In the individual patch identified, the various treatments required are also finalized in consensus with the villagers.

Finally a proposed land use map and treatment map is also prepared which is treated as the strategic action plan on Natural Resources Management perspective for the whole watershed during the entire project period 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
- Measures needed to disseminate technology
- 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

## Chapter – 7
## Convergence with MGNREGS & Other schemes

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

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.

***Covergence of IWMP with MGNREGS ssuggests very important objectives such as:***

- Strenghtening democratic Decentralized decision making process which is taking place in the planning process of IWMP
- Enabling sustainable development which is envisaged in the IWMP process
- Further enhancing the benefits of MNREGS by providing the people, especially unskilled women labourers in the enhanced watershed development activitiesformulated for IWMP
- Enhancing economic opportunities by finding out additional sources for finance for the works assigned to the unskilled labourers from IWMP funds

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

1. MNREGS guidelines to be followed
2. If cost per ha Rs.12000/ or Rs.15,000/- not adequate additional cost to be met from MNREGA
3. Labour:material cost i.e 60:40 ratio to be maintained
4. Works be done by manual labour-machines to be avoided
5. Contractor service not allowed
6. Convergence activities to be identified by PIA
7. 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.
8. As far as practicable, a task funded under the scheme shall be performed by using manual labour and not machines
9. No contractors shall be engaged in the execution of the works.
10. 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.
11. 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.

**CHAPTER – 8**
**PROJECT COMPONENTS AND ACTIVITIES**

## 8.1. CAPACITY BUILDING AND IEC PROGRAMMES

Capacity building means establishing resources needed to fulfill a mission or achieve a goal. The Department of Rural Development (DRD) and DoLR recognize that watershed groups and local governments need a range of tools to effectively manage their local land and water resources. Local and state governments and watershed groups around the Project Implementing Agency (PIA) are employing innovative approaches to capacity building.

IWMP specifically emphasize on developing the capacities and skills of the stakeholders, so that they take up the responsibility of the effective implementation of the project activities, management of funds, monitoring & evaluation of the end results and keeping records and registers of what happened in the watersheds and in the project implementation.

### *a. Pre Project Implementation Period*

- **Orientation Training At Different Levels**

The orientation training programmes are organized for the members of UGs, and SHGs as inception training to enable them to conduct their day to day activities. During this training, the members are given the orientation about the purpose of such group promotion & the activities those groups are expected to undertake. After the watershed association is promoted, the orientation training will be given to watershed committee members & office bearers about the watershed concept, the activities to be done through watershed project for the entry programme as well as the next 5 year period etc.

- **Skill enhancement training**

This training is basically for SHG and UG members at grass-roots levels and it provides different skills required for the activities to be done through these groups. For SHG members, skill is required for economic activities for their livelihood. During this training, the existing skills for the members will be mapped out and necessary enhancement for future growth will be focused. Under the skill enhancement training, the accounts and book keeping training will be arranged for treasurers of SHGs and UGs.

- **Technological training & Field demonstrations**

Crop production, water management and other technical skills will be imparted to users' group members based on their need & interest. Under this, seed treatment and improved field practices will be demonstrated to the selected key farmers.

- **Leadership training**

The growth and sustainability of any institution will depend on the leadership qualities of office bearers of the institutions promoted. For that, the selected leaders will be given development and management training over a period of time. Before starting the actual implementation, the UGs, SHGs and watershed association leaders will be given the required training to manage the associations in different situations.

### *b. Trainings during Implementation*

- **Training For Managerial Skills**

For implementing the various watershed development activities, the managerial skills of the office bearers at SHG, UG & WC level will be upgraded by giving structured training with the content of how to supervise the activities, how to prioritize the activities, and taking decisions at critical situations. These trainings will be given when found necessary to ensure consistency in improvement.

- **Exposure Visits**

During implementation, the association members who are yet to start the work will be taken for exposure visit to the locations where similar works have been executed. By these exposure visits the attitude of the farmers towards the implementation of works and contribution mobilization become quite pos

### *c. Post Project Trainings*

Towards the end of the project period, necessary steps will be taken to ensure sustainability even after the withdrawal of the project facilitators. To ensure that similar kind of self sustaining institutions will be identified within (or) out of the particular locations and the exposure will be arranged for the selected leaders of SHGs, UGs and watershed associations to observe and learn from them. *DPR for Institution and capacity building (Training plan) and IEC Programmes are submitted as separate voulume along with this DPR. (Main text) – Book – I

## 8.2. ENTRYPOINT ACTIVITIES

Entry Point Activities (EPAs) are those subproject interventions that are first identified by villagers during the initial awareness raising carried out by the external implementing agency. Entry-Point Activities are necessary part to orient the community members towards Integrated Watershed Management Project (IWMP). There was a need assessment carried out initially to identify the community needs. Need assessment is followed by community mobilization meetings where consultations from the community were also included again.

Introducing watershed development program to the community has always been recognized as an important activity. This is done through what are called '**Entry Point Activities**' (EPA) in the parlance of watershed literature. It involves building the rapport with the community, strengthening and sustaining it throughout the program and beyond. Knowledge-based EPAs are found more effective to build rapport with the community by ensuring tangible economic benefits for the community.

The community has collectively identified the entry point activities in each watershed. Special attention has been taken up to ensure that the Entry Point Activities include creation of community assets to be maintained by them. Keeping in view the crucial motivational role of entry point activities in the IWMP project, it is proposed to allow up to 4% of the total allocation of each watershed for the purposes in the projects.

**Scheme Proposed for Entry Point Activities (EPA)**

| Sl. No | Name of Grama Panchayat | Name of Watershed | Problem/s to be solved | Name of EPA | Location | Objectives |
|---|---|---|---|---|---|---|
| 1. | Kadannappally – Panapuzha | Panapuzhathodu - I | Drinking Water Scarcity | V.C.B. Repairing | Kalarikkal, Pilathra Vayal and Kadapramchal | To ensure adequate water for irrigation and household purposes and to protect the stream from stream bank erosion |
| 2. | Kadannappally – Panapuzha | Panapuzhachal | Severe water scarcity in Mundapram, Vellariyanam and Irul regions | Shutter type check dam construction | Vellariyanam | Drinking water ensured for 100 households |
| 3. | Kadannappally – Panapuzha | Panapuzhathodu - II | Major portion of the Paddy fields left barren due to the lack of irrigation facilities. | Drainage Canal construction | Panapuzha Padashekharam | Agricultural production improved by availing adequate water for irrigation thereby improving the living condition of the people. |
| 4. | Kadannappally – Panapuzha | Paravoor | Heavy siltation,<br>Bank Erosion<br>waste disposal in the river<br>Removed vegetative cover along the river bank<br>Flood during the monsoon<br>Presence of thick and thorny plants | River Bank Protection | Throughout the course of the river covering the proposed watersheds | To improve the yield from the paddy fields by improving irrigation |
| 5. | Eramam – Kuttur | Kannelam Thodu | Shortage of water in the pond the farmers were forced to stop cultivation | Pond Renovation | Koyipra Vayal | To protect the pond from contamination and to ensure adequate water for agricultural and other purposes. |

| Sl. No | Name of Grama Panchayat | Name of Watershed | Problem/s to be solved | Name of EPA | Location | Objective |
|---|---|---|---|---|---|---|
| 6. | Kadannappally – Panapuzha | Alakkadu –I | As in the case of Paravoor | River Bank Protection' | Throughout the course of the river covering the proposed watersheds | Drinking water for 60 households in the colony ensured. |
| 7. | Kadannappally – Panapuzha | Eriam – I | As above | River Bank Protection | Throughout the course of the river covering the proposed watersheds | Paddy cultivation retained in the Kakkassery padashekharam and the farmers increase their income |
| 8. | Eramam – Kuttur | Thalichal | Uncontrolled human interventions caused damages to the natural spring and the water availability reduced. | Kundanchittady spring protection and drinking water scheme | Kundamchittady | Adequate water for surrounding houses ensured by protecting the natural spring |
| 9. | Eramam – Kuttur | Mavullapoil | The over utilization and human encroachment resulted in deterioration of the natural spring. | Drinking water Scheme | Kanam Region | Drinking water ensured for 15 households living around the Kanam spring. |
| 10. | Kadannappally – Panapuzha | Eriyam – II | The decreasing water availability in the Kanaramvayal stream adversely effects the agricultural production. | Shutter type check dam | Kanaramvayal | Adequate water for agricultural purposes ensured and the Kanaramvayal stream safeguarded |

| Sl. No | Name of Grama Panchayat | Name of Watershed | Problem/s to be solved | Name of EPA | Location | Objective |
|---|---|---|---|---|---|---|
| 11. | Kadannappally – Panapuzha | Alakkadu – II | Heavy siltation<br>Bank Erosion<br>Waste disposal in the river<br>Removed vegetative cover along the river bank<br>Flood during the monsoon<br>Presence of thick and thorny plants | River Bank Protection | Throughout the course of the river covering the proposed watersheds | |
| 12. | Kadannappally – Panapuzha | Puthukkudivayal | Water scarcity increases the drudgery of woman and children and subsequent health problems. | Checkdam construction | Karakkundu | To safeguard the stream from stream bank erosion, to protect the stream from contamination and pollution and to ensure adequate water for agricultural purposes. |
| 13. | Kadannappally – Panapuzha | Kaviyanam | Inadequate water in the stream and stream bank erosion | Construction of check dam with side protection | Vellikkanam | To safeguard the stream from stream bank erosion, to protect the stream from contamination and pollution and to ensure adequate water for agricultural purposes. |
| 14. | Kadannappally – Panapuzha | Cheruvicherythodu | Drinking water scarcity is the main problem in the watershed. Around 50 families suffer from this problem. | Community Water Supply Scheme | Columba | Adequate drinking water for 50 families in Columba region of Cheruvicherithodu watershed ensured. |
| 15. | Kadannappally – Panapuzha | Thumbotta | Drinking water scarcity | Drinking water supply scheme | Peruvalanga | To ensure adequate drinking water for 50 families in Peruvalanga settlement |

## EPA - FUNDING PATTERN

| SL.NO. | WATERSHED NAME | PANCHAYATH | AREA IN HECTARE | EPA fund Available | Additional amount taken from IWMP Project Cost | TOTAL ESTIMATED COST | ACTIVITY PROPOSED |
|---|---|---|---|---|---|---|---|
| 1. | Panapuzhathode- 1 | Kadannappalli-Panapuzha | 181 | 108600 | 860 | 109460 | CASTING&SHUTTERING OF KALARIKKAL VCB ,,PILATHARA VAYAL V CB,EDATHUMTHAZHE VCB |
| 2. | Panapuzhachal | Kadannappalli-Panapuzha & Eramam Kuttur | 439 | 263400 | 270 | 263670 | SHUTTER TYPE CHEK DAM AT VELLARIYANAM 2NOS |
| 3. | Panapuzhathode- 2 | Kadannappalli-Panapuzha | 147 | 88200 | 88300 | 176500 | DIVERSION CHANNEL CONSTRUCTION |
| 4. | Paravoor | Kadannappalli-Panapuzha | 208 | 124800 | - | 124800 | RIVER BANK PROTECTION |
| 5. | Kannilamthode | Kadannappalli-Panapuzha & Eramam Kuttur | 602 | 361200 | 619800 | 981000 | POND RENOVATION AT KOYIPRA |
| 6. | Alakkad- 1 | Kadannappalli-Panapuzha | 207 | 124200 | - | 124200 | RIVER BANK PROTECTION |
| 7. | Eriam- 1 | Kadannappalli-Panapuzha & Eramam Kuttur | 370 | 222000 | - | 222000 | RIVER BANK PROTECTION |
| 8. | Thalichal | Kadannappalli-Panapuzha & Eramam Kuttur | 424 | 254400 | 46 | 254446 | KUNDANCHITTADICHAL SPRING PROTECTION ,COMPAIGN WORK |
| 9. | Mavullapoyil | Kadannappalli-Panapuzha & Eramam Kuttur | 188 | 112800 | 130 | 112930 | DRINKING WATER PROJECT AT MAVULLAPOYIL |
| 10. | Eriam- 2 | Kadannappalli-Panapuzha | 488 | 292800 | 210 | 293010 | SHUTTER TYPE CHECK DAM AT KANARAMVAYAL |
| 11. | Alkkad -2 | Kadannappalli-Panapuzha | 280 | 168000 | - | 168000 | RIVER BANK PROTECTION |
| 12. | Puthukkudivayal | Kadannappalli-Panapuzha | 462 | 277200 | - | 277200 | CHECKDAM CONSTRUCTION |
| 13. | Kaviyanam | Kadannappalli-Panapuzha | 397 | 238200 | - | 238200 | DRINKING WATER PROJECT AT VALLIKKANAM THODU |
| 14. | Cheruvicherithode | Kadannappalli-Panapuzha | 517 | 310200 | 14760 | 324960 | KOLAMBA DRINKING WATER PROJECT |
| 15. | Thumbotta | Kadannappalli-Panapuzha | 459 | 275400 | 546400 | 821800 | PERUVALANGA DRINKING WATER PROJECT |
| **Total** | | | | 3221400 | 1270776 | 4492176 | |

*DPR for Entry point activity is submitted as separate voulume along with this DPR. (Main text) – Book - II

## 8.3. NATURAL RESOURCE MANAGEMENT (NRM) ACTIVITIES/WATERSHED DEVELOPMENT ACTIVITIES

Works component includes activities required to restore the health of the catchment area by reducing the volume and velocity of surface run-off, including regeneration of vegetative cover in common land, afforestation, staggered trenching, contour and graded bunding, bench terracing etc. Drainage line treatment with a combination of vegetative and engineering structures, such as earthen checks, brushwood checks, gully plugs, loose boulder checks, gabion structures, underground dykes etc., Development of water harvesting structures such as low-cost farm ponds, nalla bunds, check-dams, percolation tanks and ground water recharge through wells and other measures, Nursery raising for fodder, fuel, timber and horticultural species, as far as possible local species may be given priority. Land Development including in-situ soil and moisture conservation and drainage management measures like field bunds, contour and graded bunds fortified with plantation, bench terracing in hilly terrain etc. Crop demonstrations for popularizing new crops/varieties, water saving technologies such as drip irrigation or innovative management practices. As far as possible varieties based on the local germplasm may be promoted and Pasture development are the major works to be taken up.

1. **Soil And Water Conservation Works:**

Conservation works for soil and water cannot be separated from one another, because these tow supplement eachother and there is no existence for these components of the nature individually. When a soil conservation activity is taken up and implemented, it may also end in a water conservation work. Therefore a comprehensive approach is necessary in the case of soil and water in the watersheds.

A very thoughtful and targeted approach to achieve effective, efficient and site-specific soil and water conservation will be adopted. Ridge-to-valley treatment needs to be strictly followed. Contour trenches, staggered pits, gully control measures, drainage line treatment along with fodder development and plantations of suitable species are taken up on recharge zone. Contour bunds, earthen embankments, nalla bunds, sub-surface dykes, percolation tanks and other water conservation and harvesting structures are taken up in transition and discharge zone.
Agronomic measures like intercropping, intensive cropping etc. along with pasture development are taken up on transition and discharge zone. Intensive SWC treatment work has to be completed in the entire Grama Panchayats on a watershed basis.

Watershed Development activities, especially those related to soil and water conservation varies from watershed to watershed. These activities need further planning based on the felt need of the people, fitness to the watershed areas, feasibility, and sustainability. It should also be considered that how far such activities will contribute to make the area a self sustaining, self sufficient Green Village. A list of conventional soil and water conservation activities aimed at trhe watershed development is tabled below:

| Water Conservation Activities | Soil Conservation Activities |
|---|---|
| • Water percolation pit<br>• Yard water collection pit<br>• Source recharging<br>• 'H' Type check dams<br>• Other check dams (2m, 3m, 4m etc.)<br>• VCB<br>• Construction of pond<br>• Construction of open wells<br>• Spring Development<br>• Drinking Water Scheme<br>• CPT<br>• Deepeing of open well<br>• Renovation of pond<br>• Roof Top rainwater harvesting<br>• Irrigation programmes | • Stone bunding<br>• Bench Terracing<br>• Stream Stabilization<br>• Retaining wall construction for stream bank<br>• Gully controlling check dams<br>• Geotextile<br>• Bio fencing<br>• River bank protection |

Here two important activities need further explanation, because of its importance and practicability in implementation. These are Rain Water Harvesting Tanks and articifial recharge of ground water. Given below is a brief description of the same:

**1. Rain Water Harvesting Tanks**

The abundance of water received during the monsoon season can be harvested using different types of harvesting tanks with vivid technologies. Tanks or storage facilities of different shape, size and capacity can be constructed throughout the watershed, so that the water available will not be lost and kept in the watershed itself. Artificial storage systems can be constructed in public as well as private lands. The natural systems, such as dried up wells, ponds and even streams can be the storage facility to harvest rain water. A community based approach and and community based management system need to be built up for promoting Rain Water Harvesting.

**2. Artificial Recharge of Groundwater:**

Besides conventional water conservation and harvesting measures, percolation tanks and subsurface dykes can be constructed for artificial recharging of the groundwater. These structures shall be constructed on sites identified through remote sensing maps and village transects. Artificial well re-charging systems are also part of this component. Recharge pits shall be constructed near the wells and water is collected from the roof top through pipes, filtered and sent to the wells. This will help the water table increase and sustain the water level even in severe summer. A major emphasis should be given in this regard throughout the Grama Panchayats for Water Table in the watershed villages had shown increased by 1 to 1.5 meters.

**3. Plantation Activities:**

Another important activity which is given top priority among the watershed development activities is bio-fencing or plantation on private and community lands. To supplement these activities, soil working and seed sowing in vast expanses will be taken up. Jatropha (Ratanjot), Anona squamosa (Sitaphal), Moringa oleifera (Moringa), etc. in vast number will be produced and distributed. A large number of fruit bearing species like Mangifera indica (mango), Emblica

officianalis (Amla), Psidium gujava (Guava) etc. shall be given top priority on private lands in the downstream area. Multipurpose trees like Teak, Mahagony, Anjili, Jack, vendek Bamboo, etc. shall be the priority for Government Land as well as private lands in the upstream area. Saplings can be raised in Kitchen gardens of SHG members, Nurseries run by SHGs and Nursery directly run by PIA. The raising of saplings by the SHGs would certainly bring them an additional income.

## 8.4. LIVELIHOOD ACTIVITIES FOR LANDLESS/ASSETLESS PERSONS

Livelihood planning is an essential part of the Integrated Watershed Management Programme's (IWMP) planning process. This process analyzes the socio-economic circumstances of the village and shows how to correlate and identify the priority issues. For Livelihood planning of the micro-watersheds under the IWMP coverage, the base line data have been collected and analyzed for micro planning. During the situation analysis PRA exercises and FGDs have been conducted to mobilize watershed dwellers in the planning process and to facilitate the collection of information to supplement the planning process. Different PRA tools like Well-being Ranking, Pair-wise and Matrix Ranking and Problem Ranking have been used during the process of Livelihood Planning.

The **Well-being Ranking (WBR)** helped to collect villagers' common perception about poverty and to identify households in to various economic classes. The process helped to build a common consensus at village level about the financial status of all households in the village and helps in negotiating equity issue within the community while planning for distribution of project benefits.

**Problem Ranking** helped in identifying specific issues, related problems and prioritizing the problems. This has provided detail information of the priority area for the community and accordingly justification for investment.

The **Ranking & Scoring** helped the participant community to choose the livelihood activities according to their priority of choice from a list of given activities and justify why they choosen it. Such selection will be the most suitable enterprises/livelihood for the community. This also provides them a chance to express their taste and aptitude towards one particular choice.

The watershed community may choose one of their economic activities from among different choices like, bee keeping, back yard poultry, small ruminant, other livestocks, other micro-enterprises, and other livestock improvement measures, Fisheries development in village ponds/tanks, farm ponds etc. Under this component, the selected persons and groups will be assisted with grants and revolving funds as per guidelines given by the DoLR.
Given below is a list of activities choosen to be implemented under the Livelihood Support System (LSS) under IWMP as per interests shown and selection made by the watershed communities.

| Sl. No | Schemes | Sl. No | Schemes |
|---|---|---|---|
| 1 | Cow rearing | 2 | Goat Rearing |
| 3 | Layer Distribution | 4 | Poultry Units |
| 5 | Banana Cultivation | 6 | Rabbit Rearing |
| 7 | Quail Rearing | 8 | Mushroom Cultivation |

*DPR for Livelihood activities for landless/assetless persons/livelihood plan is submitted as separate voulume along with this DPR. (Main text) – Book – III

## 8.5. PRODUCTION SYSTEM & MICRO-ENTERPRISES BASED LIVELIHOOD ACTIVITIES

One of the major problems that came across during the PRA and FGD at the time of planning of watershed activities is reducing soil fertility and the consequent poor yield that cause serious financial difficulties to thosewho entirely depending upon the agriculture for their livelihood. In a sense, this calls for a serious land use analysis and planning by which the villagers can carry out biophysical assessments of their farm lands. These assessments often raise issues concerning the use of manure, seeds, seedlings, irrigation facilities etc. The fragmentation of village land is another issue that needs considering when one thinks about the degradation of the farm land. Villagers often use land close to their settlements and further away, in line with traditional arrangements or owing to the limited availability of agricultural land.

Micro Enterprise Development is a proven way to strengthen viable, small business resulting in increased household income and savings, and this alleviating the crunch of poverty. Micro Enterprises plays a critical role in the local development of any area.

**The proposed PS&M activites are tabled below:**

| Sl. No | Schemes | Sl. No | Schemes |
|---|---|---|---|
| 1 | Food Processing Unit | 2 | Tailoring Unit |
| 3 | Mini Dairy Unit | 4 | Floor Cleaner Making Unit |
| 5 | Bag making Unit | 6 | Welding Unit |
| 7 | Banana Chips Making Un it | 8 | Concrete Mixing Machine |
| 9 | Candle Making Unit | 10 | Detergent Making Unit |
| 11 | Consumer Store | 12 | Toilet Cleaner Making Unit |
| 13 | Organic Vegetable Cultivation | 14 | Banana Cultivation |

Development of sustainable livelihoods for the BPL families in the watershed area is a major objective of the project. It is observed and identified that there is a scope for the activities like pasture development in community lands, Horticulture Nursery Raising, Dairy Farming, and Expansion of Horticulture in the watershed area. The small farmers can be assigned with the development of Agri-Horti Collection Centre in community land.

## 8.6. MANAGEMENT & ADMINISTRATION OF THE PROJECT

For the effective management of the Integrated Watershed Management Programme (IWMP) several arrangements had been made at different levels. First is the institutional arrangement. This part of the administration needs further comments. At state level State Level Nodal Agency (SLNA) is formed and instituionlized. At the district level there are two bodies, one is District Level Co-ordination Committee (DLCC) and the other is Watershed Cell cum Data Centre. The Block Panchayat is the Project Implementing Agency (PIA) and in addition there is a block level coordination committee. When the Grama Panchayat takes an important role in the management of the programme there is also a watershed coordination committee. A separate Watershed Development Team (WDT) is also constituted at PIA level, which is the responsible body for technical side of the project implementation. In each watershed there is a watershed committee (WC) under the chairmanship of the concerned Grama Panchayat.

The planning and DPR preparation is entrusted with a Technical Support Organization (TSO). In the case of IWMPof Payyanur Block, Susthira is the TSO and they carry out all the initial activities like Benchmark study, Participatory Rural Appraisal and Situational Analysis. DPR

preparation is the first step and then the implementation. Monitoring and evaluation has been made integral part of the project, for which GIS platform had been established at SLNA level. To give feedback to the SLNA, there are monitoring and evaluation committees in each watershed. AT GP and Block level the responsibility is vested with WDT.

Fund flow is also arranged for a smooth implementation of the project. The Central Government fund is transferred to the state (SLNA) from where it is transferred to the account of the PIA> The PIA directly transfers this fund to the account of the Watershed Committee to avoid unnecessary proceedings which may delay the fund release to the farmers. The components of the Management and administration are Benchmark Study, Documentation, Awareness Generation Programmes and Capacity Building Trainings, Skill trainings, finance management and evaluation Studies

## 8.7. MONITORING, EVALUATION & DOCUMENTATION

Monitoring and Evaluation are the two words often used together and are essential ingradients 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 veriable 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 adeqauate 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 asnd evaluation study and documention.

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 worlk 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.

## CHAPTER – 9
## EXPECTED OUTCOMES OF THE PROJECT

**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.

**T**he 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

**O**ne 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 lobour 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-ff 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 theses 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

**T**he 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 posses 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 structure 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 Floride 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 small area of land is under paddy cultivation only, which includes up, midland 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 are a large number of cattle populations 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**

**A**griculture 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**

**T**he 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**

**T**he 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. Some of the outcomes are as follows:

| Sectors | Expected Outcomes | Indicators |
|---|---|---|
| **Agriculture** | Improved irrigation | Increment in gross irrigated area |
| | Enhancement in agriculture production | Increment in quantity of agriculture produces |
| | Good Organic farming | Number of functional vermi compost units |
| **Horticulture /Production System Management** | Enhancement in crop production | Rise in quantity produced |
| **Natural resources** | Pasture land development | Increment in pasture land area |
| | Improvement in water resources | Physical existence of the water bodies |
| **Animal husbandry** | Dairy development | Number of dairy farming units |
| | Improved Goat Rearing Practices | Number of farmers with Goat rearing units |
| **Micro enterprises** | Improvement in women's status | Increment in income of women and their institutions (SHGs) |
| | Farm Nursery Rising | Physical existence of Farm Nurseries |
| | Better market facility | Number of well-functioning vegetable and fruit collection centers, milk and meat preservation units |
| **Development of BPL and landless families / Micro Enterprises** | Improvement in economic status of BPL HHs | Increment in the income of BPL families, |
| | Improvement in social status | BPL families have ownership of the resources |

## CHAPTER – 10
## CONSOLIDATION AND WITHDRAWAL PHASE

The main purpose of this phase is to create innovative nature-based, sustainable livelihoods and raise productivity levels of the augmented resources and local economic development plans developed during the Watershed Works Phase. The subsequent activities are planned to be carried out during this stage.

1. **Documentation**: It is proposed to document the activities carried out during the watershed implementation period. It will help to maintain the records and identify and propagate the successful activities carried out under the project.

2. **Up-scaling of Successful Experiments**: It is proposed to identify the best practices carried out during the project period and up-scaling the same as per feasibility and propagate the same among others members of the watershed area.

3. **Evaluation:** Evaluation is a very important activity to assess the success of implementation of the project. It is proposed to carry out evaluation at the following levels.

   **a. Social Audit:** It is proposed to conduct the social audit of the programme at the watershed level where the Gram Sabha will evaluate the programme where the beneficiaries should explain their benefits and current status of the activity. The Watershed Committee should place the books of accounts of watershed programme for approval.

   **b. Evaluation by External Agency:** An external agency with experience in implementation and monitoring and evaluation of watershed projects should be assigned for the evaluation of the watershed programme.

**Withdrawal Mechanism:**

At the end of the project, The Watershed Committee is to take the responsibility for post project management, for which the Memorandum of Agreement is to be formulated between the PIA and Watershed Committee basing on the following terms and conditions:

1. The list of assets created under EPA, NRM, PSM and Livelihood Support System (LSS) is to be prepared with joint signature of the Chairman, Secretary of the Watershed committee and PIA. The Watershed Committee will retain one copy of the list for future reference.

2. **The amount lying unspent as on closing date will be transferred to the Watershed Development Fund (WDF).** Balalnce amount to be disbursed to the direct beneficiaries should be treated as unspent. At the same time on completion of the works they committed this subsidy part should be disbured. To meet this purpose the amount has to be deposited in the WDF and should be treated as WDF

3. **Watershed Committee will be authorised to use only one Bank Account i.e WDF account.** At the time of phasing out the project implementation, 6the project fund which had been operated jointly by the Watershed Committeechairperson and the treasurer, should be closed. Then the the remaining shall be the WDF. This is the Account to be jointly operated by the conscerned at the closure of the programme.

4. **Yearly auditing of the accounts by the Chartered Accountant will be mandatory and to be adhered strictly.** Whether it is project account or WDF, the accounts should be subjected to audit (Both Social Audit and mandatory Chartered accountant audit) to keep and ensure transparency of project implementation as well as post implementation interventions and expenses.

5. **The office bearers of the Watershed Committee shall involve all the community irrespective of caste, creed and religion.** It should be ensured that there are representations of the cross section of the community even in the post prohject phase of IWMP, so that equality and justice is kept to ensure inclusion of under privileged communities.

6. **The Watershed Committee shall have the right to decide the user charges to be collected from the beneficiaries which shall be deposited under the Watershed Development Fund.** If Common Property Resources (CPR) are developed under IWMP, for the common use, a user fee shall be levied from the concerned for the operation & maintenance of such CPRs, and this should be deposited and accounted in the WDF before further use.

7. **The cost of repair and maintenance of the assets created out of NRM component shall be borne out of Watershed Development Fund (WDF) by using maximum 50% of the amount collected in a year.** If more amount than the 50% of WDF is required to meet the expense of some of the assets created under IWMP, this amount shall additionally be collected from the beneficiaries and deposited and accounted in WDF before utilizing it.

8. **The WDF account will primarily run as revolving fund.** Waterever amount is being spent from the WDF, this should be considered as revolving fund to the UGs, and the UGs are liable to return this amount as per conditions pertaining o the release of fundsfrom the WDF

9. **No individual beneficiary should be granted any sort of grant or financial assistance in any form.** Grand/Revolving fund should not be given to individual. The UGs only have the right to receive any type of fund from the WDF. The WC and UG will have to sign an MoU regarding the repayment schedule.

10. **The SHGs and UGs shall have the eligibility to take loan from the WDF with marginal interest as decided by Watershed Committee.** Financial support shall be extended to eligible SHGs and UGs from WDF in the form of loan. The interest rate shall be decided by the WDF. At the same time the interest rate should bnot be exorbitant

11. **The Watershed Committee is also at their liberty to start new profit making ventures by utilising WDF as security deposit and the profit earned should go to the WDF.** The WCshould see that the WDF should be made use of making profit with ethical investment in other ventures. Precautions are to be taken to ensure that the WDF is not used to make money with non-ethical means and the committee should borne in mind that they have responsibility to make the people know what is being done with the WDF on such occasions.

12. **The remuneration for the Watershed Secretary will be finalised in the Watershed Committee meeting.** It is assumed that the daily routine of the WC committee is a responsible one and he should take atmost attention and care to ensure the works are being done in a most professional manner. In such situations, he should be properly paid and the payment shall be decided by the WC. The watershed committee shall verify the person is doin work worth the payment he received.

13. **The Watershed Committee may collect financial assistance from any other sources to augment the WDF.** In contrary to item No. 11, have all the right to receive from who are willingly ready to contribute or raise funds from any other agencies vide a project proposal. On such incidents, the WC should let the watershed community know abou such attempts.

14. **All donations, interests, fines and fees shall be deposited in the WDF.** Neither the Secretary nor the WC are allowed to misuseor take for own use the contributions, co-financing, bank interests and similar donations. These amountsareto be deposited in the WDFand should be presented in the GB meeting of the WC.

15. **The WDF shall be jointly operated by the Chairman and Secretary of the watershed committee.** In order to reduce misuse and misappropriations of the WDF, it is mandatory for the WC; the WDF should be operated by the Treasurer and Chairperson of the WC.

## CHAPTER – 11
## DETAILS ABOUT INDIVIDUAL WATERSHEDS

This chapter deals with the description of individual watersheds, the process taken up for the planning and formulation of project activities, the processes of NHG/UG formation and the processes of PRA and initial awareness generation taken up and implemented as a part of DPR preparation.

## PANAPUZHATHODU I WATERSHED

| | | |
|---|---|---|
| Grama Panchaya | : | Kadannappalli - Panapuzha, |
| Village | : | Panapuzha |
| Wards covered | : | III ward |
| Block Panchayat | : | Thaliparamba |
| Thaluk | : | Kannur |
| District | : | Kannur |
| Total families covere | : | 172 |
| Total Population covered | : | 756 |
| Total treatable Area | : | 181 Ha |
| River Basin | : | Peruvamba (Perumba) River |
| Average Length | : | 2.85. Kms. |
| Average Width | : | 2.2. Kms. |
| Total Project Cost | : | Rs. 27, 15, 000/- |

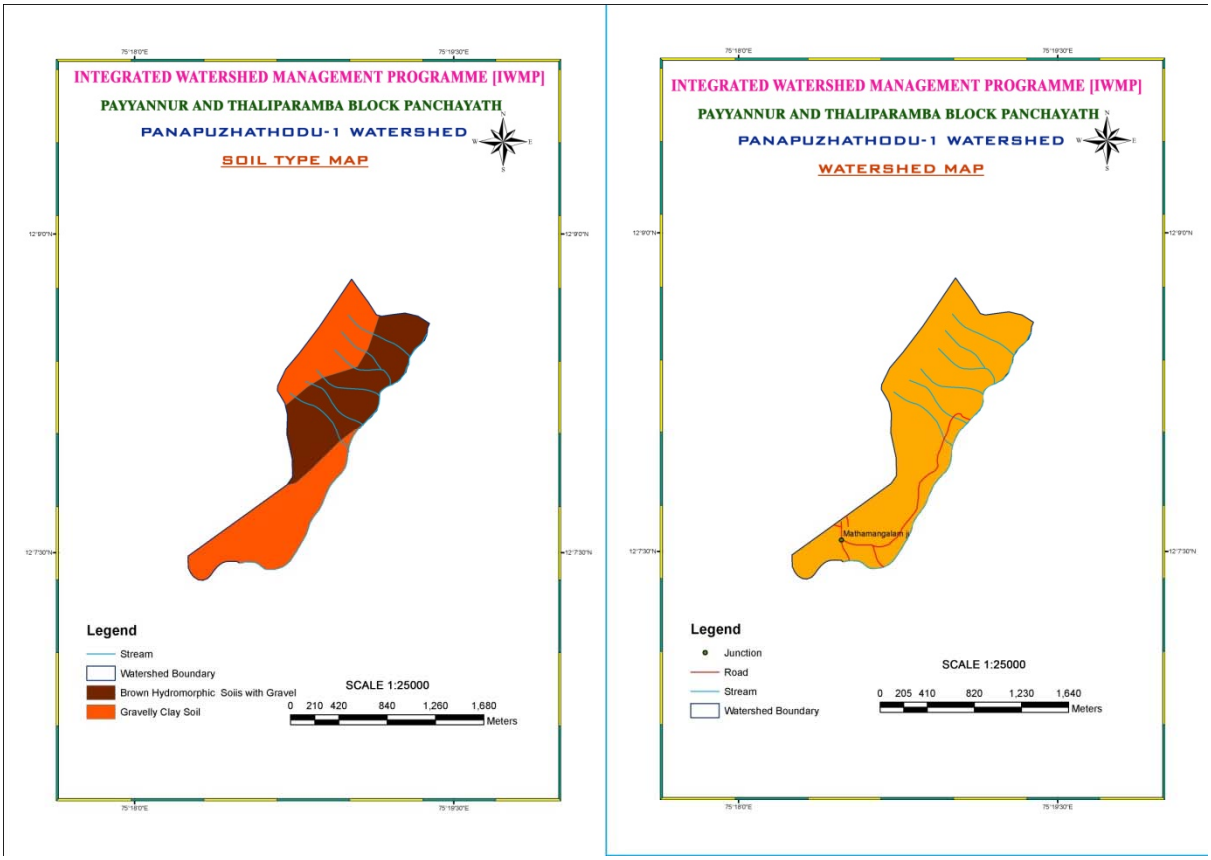
Boundaries:

North : Panapuzhachal watershed

South: Panapuzha River

West : Ermam – Kuttur Panchayat

East : panapuzhathodu – II Watershed




## Introduction

Panapuzhathodu – I Watershed covers the 3rd ward of Kadannappally – Panapuzha Grama Panchayat and coming under Panapuzha revenue village in Thaliparamba Block Panchayat limitation. The watershed has a total area of 181 Ha which is exclusively considered as rainfed without any cultivable or uncultivable waste land.

**Main places in the watershed:** Panapuzha, Kurumunda are the main places coming under the watershed.

## Geographic Description of the Watershed:

### Location:

Panapuzhathodu – I watershed is located in Panapuzha village in Kannur Thaluk is accessible by road. The watershed is around 52 Km away from District Head Quarters Mathamangalam is the nearest town to the watershed and is situated around 2 Km away. The nearest railway station to the watershed is Payyannur and Payangadi which are situated almost at the same distance from the watershed.

### The geographic coordinates:

Geographycally the watershed area lies between the east longitude $75^0$18’0” and $75^0$19’30”and North latitude $12^0$7’30” and $12^0$9’30” with an average elevation of 156 ft.

### Average length and width of the watershed

Panapuzhathodu Watershed is comparatively small among the 15 watersheds. The watershed has an average length of 2.85Km and a width of 2.20Km.

**Relief & Drainage**
The main stream is Panapuzhathodu which originate from Koyipra and joins Panapuzha River near Kacherikkadavu Bridge. It flows across the watershed at about 3.5Kms. with an average width of 5 meters. The main stream is enriched with the following sub-streams:

1. Valiyaveettil Chal
2. Padmanabhan Chal
3. V.K. Rameshan chal
4. Kakkodi Cahl
5. Eandichal
6. Krishnan Embranthiri Chal
7. George Kutty Chal
8. Kurumundachal

**The drainage density:** 43.09 M /Ha

**Other water sources**
The number of open well is the watershed is 158 mainly owned by individual households amongst which 43 are seasonal and the rest are perennial. There are 13 perennial ponds also in the watershed.

**Rainfall and Climate**
The watershed has a humid climate with a hot season from March to the end of May. This is followed by South-West Monsoon (June-September) and North -East Monsoon (December-February). During the month of April and May the mean maximum temperature is $35^0$C and a minimum temperature of $26^{0.}$ The annual average rainfall is 3697mm and 57% of it occurs during the period of June-July.

**Present situation of the streams and other water bodies**
Considering the water sources in the watershed, it seems that the watershed is prosperous, but the reality is different. The water available in the streams and ponds are not making use of increasing the agricultural produce. Instead the abundant flowing water is wasted due to ignorance and lack of proper conservation measures. No big irrigation facilities are being provided to the watershed and hence the agriculture is fully rainfed.

The streams and ponds sometimes dry up in the summer, but no water scarcity is observed even in the summer season. There is heavy flow during the monsoon and during some post monsoon period, but the general characteristic of these water bodies, especially the streams are high velocity runoff taking all the drained water into the river.

**Soil Type & Depth**

In the plains (paddy fields) the soil is alluvial in nature and in the upper reaches of the watershed red soil mixed with gravels is seen. In the slopes, the general feature of the soil is red without gravels. The common depth of the soil in the watershed ranges from one meter to 1½ meters.
The general condition of the soil is of two types. One is brown hydromorphic soil with gravel and clay soil with gravels. The watershed has a total area of 71.89 ha with brown hydromorphic soil and the rest, 134.11 ha with clay soil with gravels.

**Agriculture & Land Use**

Major crops in the watershed are rubber. Coconut, areca nut, cashew nut, pepper, plantain, paddy and the tubers are ginger and turmeric. Plots with mixed crop are the main feature of the watershed. The land use pattern is given in a tabular form followed by a graphic illustration:

| Crops | Land Used (Ha) | % of Land used | Production Tonnes /Ha |
|---|---|---|---|
| Coconut | 38.01 | 21% | 2581nuts |
| Areca nut | 28.96 | 16% | 31 |
| Cashew nut | 14.48 | 8% | 14.23 |
| Plantain | 6.88 | 3.8% | 44.41 |
| Vegetables | 3.62 | 2% | 0.5 |
| Rubber | 65.16 | 36% | 101.97 |
| Tubers | 3.62 | 2% | 0.5 |
| Built Up Area | 20.27 | 11.2 % | 0 |
| Total | 181 | 100.00% | 192.61 |

**Animal Husbandry**

The watershed is poor in Animal Husbandry. This could be because of the changed mentality of the farmers and the new living condition with modern houses and limited area of the house plots. The most important reason is the non-availability of fodder, both green and dry. When paddy has extinct, the availability of straw is a big question for the farmers. However, there are some exceptions in this case. Given below is a table of livestock in the watershed:

a. Hybrid Variety cows (Male) : 3
b. Hybrid Variety Cows (Female): 27
c. Indigenous Cows (Males): 8
d. Indigenous Cows(Females): 26
e. Goat(Males): 9
f. Goat (Female): 37
g. Indigenous fouls: 22
h. Hybrid Variety: 78

**Socio-Economic Details:**
***The watershed population is given below:***

Total Population: 756
Male: 352
Female: 404
SC Population (total): 26
Male (SC): 13
Female (SC): 13
APL Families: 108
BPL Families: 64

The general living condition of the populace expresses that they have middle class economic nature. Most of the people gained good education and had pucca houses to live in. Every household have sanitation facilities. One peculiarity of the places is that it is known for its higher caste (Namboodiris and Nairs) population.

Available infrastructure facilities in the watershed like road network, adequate conveyance, the cultural institutions and people's organizations all played an important role in the social development rather than the economic development of the people.

The economic development is based on the production and productivity of the agriculture and the availability of farm labour in the watershed. This is because the economy of the watershed is built upon agriculture. More than 50 % of the total population is either farmers or farm labourers. For them this is the main source of income. The other occupations of the people are toddy workers, construction workers, drivers and traditional artisans like carpenters. There are only a few who have government employment and earning a fixed monthly income like teachers in the private schools and workers in other private sectors.

People enjoy all kinds of communication facilities and Medias like TV, Internet, and mobile phones. One can find a person without a mobile phone in the watershed very rarely. However, this cannot be considered as icon of economic development in the watershed.

The housing system has much changed from the traditional housing as the new houses, newly constructed and renovated have faces of modernity with tiled roofs replaced RCC roofs. The bed rooms have attached bathrooms instead of a single bathroom for the whole members of the household. This is also considered to be a jump in the social and economic change brought into the watershed over the years.

**Road Network:**

The transportation facilities and road network are satisfactory in this watershed. There are many mud roads in the watershed which makes a network of roads helping the mobility of the people. There are three important roads: Kacherikkadavu- Mathamangalam Road, Mathamangalam – Eriam Road and Government L.P. School Road.

**Institutions and Community based organizations:**

The presence of institutions and CBOs in a watershed become relevant when these influence the lives of the watershed community. They take the important role of educating, passing information, building capacity and form the attitude of the people towards a better situation. Following are the institutions that influenced the formation of the watershed community in Panapuzhathodu-I watershed

- AKG Reading Room
- Kadannappally Panapuzha Service Co-op. Bank
- Kalarikkal Someswari Temple
- Anganwadi, Panapuzha
- G.LP.School, Panapuzha
- Sree Uravankara Bhagavathi Temple

**Market Facilities:**

There are no marketing centres within the watershed, nor do the authorities have plans to make one. The watershed community depends Mathamangalam bazar for the marketing facilities which is situated about 2 Km away from the watershed

**Hospital facilities:**

The watershed community can access the hospital facilities at Payyanur about 16 Km away from the watershed. They have also accessibility to the Pariyaram Medical College which is about 10 Kms away for further specialized treatment.

**Major Problems of the watershed**

The problems are categorized under four headings: Soil related, Water related, Agro-Bio Diversity Related and Animal Husbandry related. Such a categorization is in line with the activities that can be undertaken IWMP to solve the issues. The issues are listed below:

**Soil related Problems**

- Heavy soil erosion in the upstream region of the watershed like Kurumunda, Panapuzha and Panapuzhachal
- Formation of gullies in Perachal area
- Reducing productivity of the soil almost all parts of the watershed
- Heavy water drain from the soil upper parts and sloppy areas like Kurumunda and Panapuzhachal
- Soil Pollution due to indiscriminate use of Chemicals especially in the rubber estates

**Water related Problems**

- Drying up of water sources in the beginning of summer – for example Endi, Kakkodi
- High velocity runoff in the monsoon season along Chepathodu, Kakkottumchal and Endichal
- Lowering water yield in the catchment affecting the groundwater recharge due to non-storage of water at Perachal
- Sedimentation of Ponds like Amabalkulam near Valiyaveettil chal and of the main Stream at Kalarikkal Someswari Temple
- Contamination of stream side aquifer due to pollution
- Contamination due to direct disposal of waste

**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 – Catharanthus, Ixora, Oscimum canam, Blood flower (Arali), Albesia chinansis (Nenmeni Vaaka) Adathoda vasika (Adalodakam), Cherula, Karinochi, Aanakurumthotty.etc.
- Destruction/deterioration of holy grooves (Kavus) Oravankara Kavu
- Shift from multi crops to mono crops

**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

**Activities proposed to address the issues**

Generally the activities are of three folds: Natural Resource Management Activities which covers the soil, water and bio-diversity issues, Production System Management and Micro Enterprises (PS&M) which covers the agriculture and soil problems along with economic backwardness, , which manages the livelihoods and economic backwardness of the landless, women and the indigenous communities. Given below is a brief about the activities proposed for the watershed:

| Natural Resource Management (NRM) | Production System & Micro-Enterprises (PS&M) | Livelihood Support Systems (LSS) |
|---|---|---|
| **Soil Conservation**<br>1. Gully Plugging<br>2. Stream bank stabilization<br>3. Live fencing<br>4. Stone bunding<br>5. Centripetal Terracing | 1. Goat Rearing<br>2. Wormy Composting<br>3. Rabbit Rearing | 1. Cow Rearing Unit<br>2. Poultry Unit |
| **Water Conservation**<br>1. Yard water collection pits<br>2. Husk Trenches<br>3. Moisture Collection Pits<br>4. Source Recharging<br>5. Check Dams<br>6. Rain Water Harvesting<br>7. Retaining wall | | |

**Panappuzhathodu - I Watershed**
**Development Project (Area – 181 Ha) - Master plan for Four Years - Funding pattern**

| Instal lment | Administ ration | Monito-ring | Evalua-tion | Entry Point Activity | Institution & Capacity Building | DPR prepar-ation | Watershed Develop-ment Activities | Liveli-hood Activi-ties | Production system & Micro Enterprises | Consolid ation Phase | Total IWMP project fund |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1St | 54300 | 5430 | 5430 | 108600 | 81450 | 27150 | 260640 | 0 | 0 | 0 | 543000 |
| % | 2 | 0.2 | 0.2 | 4 | 3 | 1 | 9.6 | 0 | 0 | 0 | 20 |
| 2nd | 67875 | 5430 | 5430 | 0 | 27150 | 0 | 450690 | 122175 | 135750 | 0 | 814500 |
| % | 2.5 | 0.2 | 0.2 | 0 | 1 | 0 | 16.6 | 4.5 | 5 | 0 | 30 |
| 3rd | 81450 | 8145 | 8145 | 0 | 27150 | 0 | 431685 | 122175 | 135750 | 0 | 814500 |
| % | 3 | 0.3 | 0.3 | 0 | 1 | 0 | 15.9 | 4.5 | 5 | 0 | 30 |
| 4rd | 67875 | 8145 | 8145 | 0 | 0 | 0 | 377385 | 0 | 0 | 81450 | 543000 |
| % | 2.5 | 0.3 | 0.3 | 0 | 0 | 0 | 13.9 | 0 | 0 | 3 | 20 |
| **Total** | **271500** | **27150** | **27150** | **108600** | **135750** | **27150** | **1520400** | **244350** | **271500** | **81450** | **2715000** |
| % | 10 | 1 | 1 | 4 | 5 | 1 | 56 | 9 | 10 | 3 | 100 |

**Panapuzhathodu I Watershed - Sector – I – Watershed Development Activities - I year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Moisture collection pits | $M^3$ | 149 | 1000 | 0 | 0 | 149000 | 149000 | 10 % General & 5 % SC / ST |
| 2. | Live fencing | RM | 24 | 1000 | 0 | 0 | 24000 | 24000 | |
| 3. | Stone bunding | $M^2$ | 144 | 285.1 | 0 | 41055 | 0 | 41055 | |
| 4. | Centry petal terracing | NOS | 65.67 | 285.1 | 0 | 0 | 65670 | 65670 | |
| 5. | Gully controlled check dam | RM | 2996 | 5.09 | 0 | 15264 | 0 | 15264 | |
| 6. | Retaining wall (1.5m height ) along the sides of panapuzhathodu | RM | 2395 | 47.04 | 0 | 112680 | 0 | 112680 | |
| 7. | Gully controlled H-type checkdam(4.5 m base width) at panapuzha thodu | NOS | 22000 | 1 | 0 | 22000 | 0 | 22000 | |
| 8. | Husk trunch | NOS | 165 | 1000 | 0 | 0 | 169000 | 169000 | |
| 9. | Retaining wall (1m height ) | RM | 2395 | 29.07 | 0 | 69641 | 0 | 69641 | |
| **Total** | | | | | | **260640** | **407670** | **668310** | |

**Panapuzhathodu I Watershed - Sector – I – Watershed Development Activities - II year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Well Recharging | Nos | 12970 | 10 | 0 | 129700 | 0 | 129700 | 10 % General & 5 % SC / ST |
| 2. | Moisture collection pits | $M^3$ | 149 | 1000 | 0 | 0 | 149000 | 149000 | |
| 3. | Live fencing | RM | 24 | 500 | 0 | 0 | 12000 | 12000 | |
| 4. | Stone bunding | $M^2$ | 144 | 279.1 | 0 | 40195 | 0 | 40195 | |
| 5. | Centry petal terracing | Nos | 65.67 | 1000 | 0 | 0 | 65670 | 65670 | |
| 6. | Gully controlled check dam | RM | 2996 | 2.12 | 0 | 6360 | 0 | 6360 | |
| 7. | Gully controlled H-type checkdam(4.5 m base width) at panapuzha thodu | RM | 2996 | 22.02 | 0 | 66000 | 0 | 66000 | |
| 8. | Husk trunch | Nos | 169 | 500 | 0 | 0 | 84500 | 84500 | |
| 9. | Retaining wall (1m height ) | RM | 22395 | 87.02 | 0 | 208435 | 0 | 208435 | |
| **Total** | | | | | | **450690** | **311170** | **761860** | |

**Panapuzhathodu I Watershed - Sector – I – Watershed Development Activities - III year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Live fencing | RM | 65.67 | 1000 | 0 | 0 | 65670 | 65670 | 10 % General & 5 % SC / ST |
| 2. | Retaining wall (1.5m height ) | RM | 2395 | 105.45 | 0 | 252560 | 0 | 252560 | |
| 3. | Well Recharging | NOS | 12970 | 5 | 0 | 64850 | 0 | 64850 | |
| 4. | Centry petal terracing | NOS | 65.67 | 500 | 0 | 0 | 32835 | 32835 | |
| 5. | Stone bunding | $M^2$ | 144 | 279.1 | 0 | 40195 | 0 | 40195 | |
| 6. | Gully controlled check dam | RM | 2996 | 6.36 | 0 | 19080 | 0 | 19080 | |
| 7. | RWH tank 10000 ltrs in panapuzhachal anganavadi. | NOS | 55000 | 1 | 0 | 55000 | 0 | 55000 | |
| 8. | Moisture collection pits | $M^3$ | 149 | 500 | 0 | 0 | 74500 | 74500 | |
| 9. | Husk trunch | NOS | 169 | 800 | 0 | 0 | 135200 | 135200 | |
| 10. | Yard water collection pit | NOS | 400 | 20 | 0 | 0 | 8000 | 8000 | |
| **Total** | | | | | | **431685** | **316205** | **747890** | |

**Panapuzhathodu I Watershed - Sector – I – Watershed Development Activities - IV year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/ Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Centry petal terracing | Nos | 65.67 | 500 | 0 | 0 | 32835 | 32835 | 10 % General & 5 % SC / ST |
| 2. | Well Recharging | Nos | 12970 | 6 | 0 | 77820 | 0 | 77820 | |
| 3. | Stone bunding | $M^2$ | 144 | 224.5 | 0 | 32335 | 0 | 32335 | |
| 4. | Live fencing | RM | 24 | 800 | 0 | 0 | 19200 | 19200 | |
| 5. | Gully controlled check dam | RM | 2996 | 4.24 | 0 | 12720 | 0 | 12720 | |
| 6. | Constructing shutter type checkdam (5.50m width) in panapuzhathodu (S.N.43/88) | Nos | 170000 | 1 | 0 | 170000 | 0 | 170000 | |
| 7. | Husk trunch | Nos | 169 | 500 | 0 | 0 | 84500 | 84500 | |
| 8. | Yard water collection pit | Nos | 400 | 20 | 0 | 0 | 8000 | 8000 | |
| 9. | Moisture collection pits | Nos | 149 | 500 | 0 | 0 | 74500 | 74500 | |
| 10. | Retaining wall (1.5m height ) | RM | 2395 | 35.28 | 0 | 84510 | 0 | 84510 | |
| **Total** | | | | | | **377385** | **219035** | **596420** | |

**Panapuzha thodu - I Watershed - Sector – II – Livelihood Activities for Land less/Asset less - II year Action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | MNREGS / other source/Bank Loan | Total |
|---|---|---|---|---|---|---|---|
| 1 | seed money for enterprising individuals | Nos | 0 | 0 | 24435 | 0 | 24435 |
| 1 | Seed money for SHGs | Nos | 0 | 0 | 97740 | 0 | 97740 |
| **Total** | | | | | **122175** | **0** | **122175** |

**Panapuzha thodu - I Watershed - Sector – II – Livelihood Activities for Land less/Asset less - III year Action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | MNREGS / other source/Bank Loan | Total |
|---|---|---|---|---|---|---|---|
| 1 | Seed money for SHGs | Nos | 0 | 0 | 48870 | 0 | 48870 |
| **III** | **Funding for Major livelihood activities** | | | | | | |
| | Poultry unit | Nos | 147000 | 1 | 73305 | 73695 | 147000 |
| **Total** | | | | | **122175** | **73695** | **195870** |

| **Funding pattern** | |
|---|---|
| Seed money for enterprising individuals (10% of the allocation -Revolving fund) | 24435 |
| Seed money for SHGs (60 % of the allocation - Revolving fund) | 146610 |
| Funding for major livelihood activities (30% of the allocation - Grant in aid) | 73305 |
| **Total allocation** | **244350** |

**Action Plan - Sector – III – Production System & Micro Enterprises based livelihood activities - II year Action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | Total | WDF |
|---|---|---|---|---|---|---|---|
| 1 | Cow rearing unit | Nos | 24000 | 5 | 109750 | 109750 | 20 % for General & 10 % for SC / ST |
| 2 | Rabbit rearing | Nos | 26000 | 1 | 26000 | 26000 | |
| **Total** | | | | | **135750** | **135750** | |

**Action Plan - Sector – III – Production System & Micro Enterprises based livelihood activities - III year action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | Total | WDF |
|---|---|---|---|---|---|---|---|
| 1 | Cow rearing unit | Nos | 24000 | 5 | 109750 | 120000 | 20 % for General & 10 % for SC / ST |
| 2 | Rabbit rearing | Nos | 26000 | 1 | 26000 | 26000 | |
| **Total** | | | | | **135750** | **135750** | |

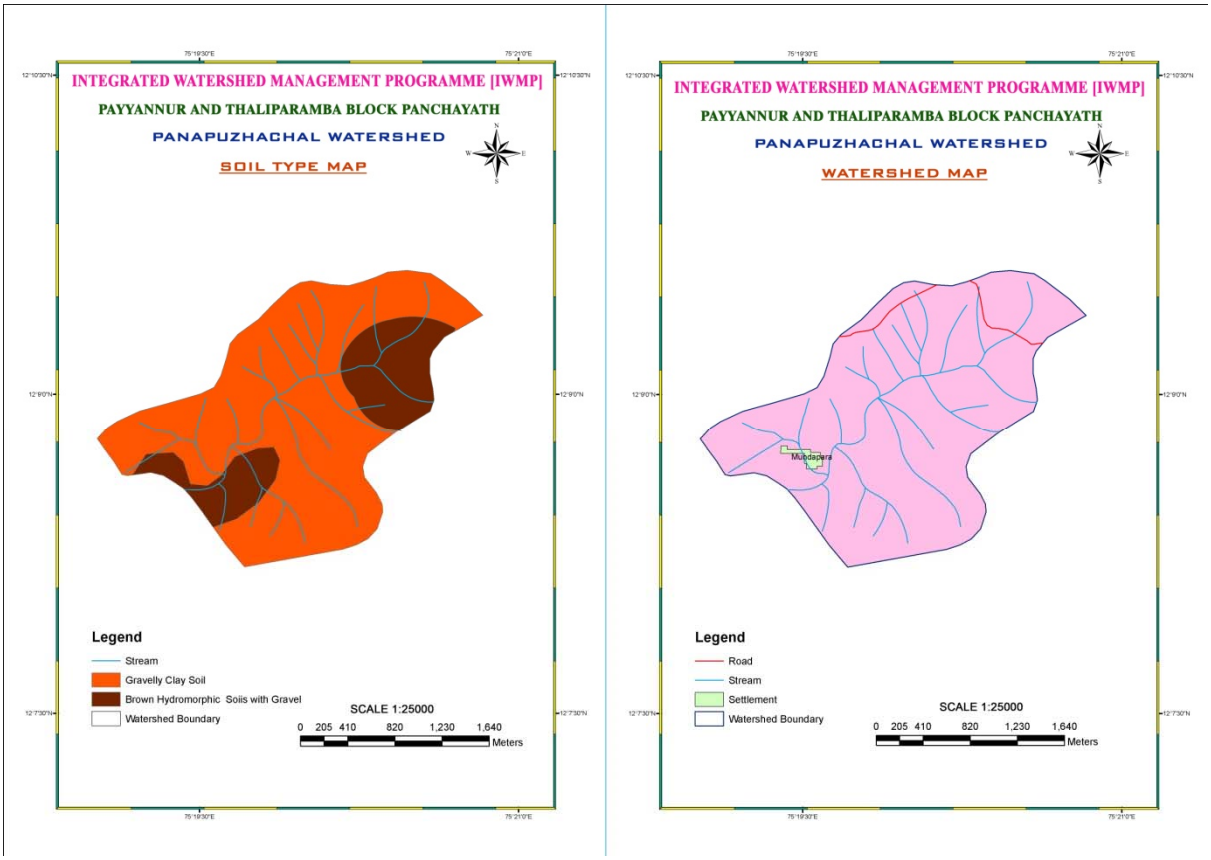
**Total Allotment - 271500**

**ENTRY POINT ACTIVITY - ACTION PLAN**

| Sl No | Activity | Unit | Unit cost | Target | IWMP EPA fund | IWMP Project fund | Total |
|---|---|---|---|---|---|---|---|
| 1. | Casting shuttering Kalarikakl thodu V.C.B | No | 20670 | 1 | 20670 | - | 20670 |
| 2. | Casting shuttering Edathum thazhe VCB | No | 16730 | 1 | 16730 | - | 16730 |
| 3. | Casting shuttering Pilatharavayal VCB Supplying | No | 20670 | 1 | 21660 | - | 21660 |
| 4. | Stream bank protection | Rm | 1800 | 28 | 49540 | 860 | 50400 |
| | **Total** | | | | **108600** | **860** | **109460** |

# PANAPUZHACHAL WATERSHED

| | | |
|---|---|---|
| Grama Panchayat | : | Kadannappalli - Panapuzha, & Eramam- Kuttur |
| Village | : | Panapuzha & Vellora |
| Wards covered | : | III of Kadannappally Panapuzha & XIII of Eramam-Kuttur |
| Block Panchayat | : | Payyanur & Thaliparamba |
| Thaluk | : | Kannur |
| District | : | Kannur |
| Total families covered | : | 111 |
| Total Population covered | : | 488 |
| Total treatable Area | : | 439 Ha |
| River Basin | : | Peruvamba (Perumba) River |
| Average Length | : | 2.75. Kms. |
| Average Width | : | 3.75. Kms. |
| Total Project Cost | : | Rs. 65, 85,000/- |
| Boundaries | : | North: Ermama-Kuttur Panchayat |
| | : | South: Panapuzhathodu I & II Watershed |
| | : | West: Ermam – Kuttur Panchayat |
| | : | East: Kannelamthodu Watershed |




## Introduction

Panapuzhachal watershed can be considered as a continuation of the Panapuzhathodu I watershed because the main drain Koyipra Valiyathodu is also forms the drainage of Panapuzhathodu - I. The difference is that the watershed is nottouching the river. Only some sub-streams are different in the case of drainage system.

Panapuzhachal Watershed again covers part of the 3rd ward of Kadannappally – Panapuzha Grama Panchayat which comes under Panapuzha revenue village in Thaliparamba Block Panchayat limitation. Another part of the watershed is in the 13th ward of Eramam – Kuttur Grama Panchayat which comes under the Vellora revenue village which is in Payyanur Block Panchayat. The watershed has a total area of 439 Ha which has a cultivable waste 71 ha and an uncultivable waste of 25 ha. The other parts of the watershed are exclusively considered as rainfed.

## Main places in the watershed:

Koyipra, Vellariyanam, Mundapram and Panapuzhchal are the main places in the watershed.

## Geographic Description of the Watershed:

### Location:

Panapuzhachal watershed is located in two revenue villages – viz, Panapuzha village and Vellora village in Kannur Thaluk. It is accessible by road. The watershed is around 56 Km away from District Head Quarters. Mathamangalam is the nearest town to the watershed and is situated around 3.5.Km away. The nearest railway station to the watershed is Payyannur and Payangadi which are situated almost at the same distance from the watershed.

**The geographic coordinates**: The watershed area lies between the east longitude $75^0$ 19'0" and $75^0$ 21'0" and North latitude $12^0$ 8' 0" and $12^0$ 9'30" with an average elevation of 156 ft.

**Average length and width of the watershed**

Panapuzhachal Watershed is small among the approved 15 watersheds under IWMP. The watershed has an average length of 2.75Km and a width of 3.75Km.

**Relief & Drainage**

The main stream is Koyipra Valiyathodu which originate from Koyipra and formds the boundary of Panapuzhathodu I & II. It flows across the watershed at about 3.75Kms along the watershed with an average width of 5 meters. At some locations the stream has 6 meters width. The main stream is enriched with the following sub-streams:

1) Cheetathodu
2) Maideen thodu
3) Palakkunnu chal
4) Antony Cahl
5) Chappel Chal
6) Green Valley Chal
7) Benny Chal
8) Raman Kutty chal
9) Rajesewari Cheriya Chal
10) Rajeswari Thodu
11) Mundapram Kavu Thodu
12) Chempullani Thodu
13) Vellachal
14) Michbhoomichal

**The drainage density:** 41 M /Ha
**Other water sources**

The number of household wells corresponds to the number of households in the watershed, as every family has a drinking water well either open well or bore-well. The number of household open wells in the watershed is 84 and the rest (27) are bore-wells. Among the open wells 22 are seasonal. There is only one bore-well owned by the Grama Panchayat. There are 8 perennial ponds in the watershed amongst which one is public.

***List of the ponds is given below***

1. Mathew Muttathupalam kulam
2. Parathi Balan kulam
3. Ismail kulam
4. C.P. Narayanan Kulam
5. C.P. Madhu Kulam
6. K. J. Antony Kulam
7. Koothankeel Raju Kulam
8. Neerveli Appachan Kulam

**Present situation of the streams and other water bodies**
In the upper part of the watershed – Koyipra water is available in the streams even in the summer. In the middle area the water availability is comparatively less. In the lower portions water is available in all seasons. The water availability is not adequate for irrigation purposes. The flowing water is wasted due to ignorance and lack of proper conservation measures.

All the smaller streams and few ponds dry up in the summer. During the monsoon season, the banks disrupted allowing water flow into the agricultural land causing damage to the crops. The increasing number of bore wells in the Vellariyanam side is a threat to the ground water table because of the heavy drain from those bore-wells both for agriculture and household purposes.

**Rainfall and Climate**

The watershed has a humid climate with a hot season from March to the end of May. This is followed by South-West Monsoon (June-September) and North -East Monsoon (December-

February). During the month of April and May the mean maximum temperature is $35^0$C and a minimum temperature of $26^{0.}$ The annual average rainfall is 3697mm and 57% of it occurs during the period of June-July.

**Soil Type & Depth**

The general condition of the soil is of two types. Brown hydromorphic soil with gravel is seen in the upper parts of the watershed and clay soil with gravels in the lower portions. The watershed has a total area of 101.67 ha with brown hydromorphic soil and the rest, 337.33 ha with clay soil with gravels. Depth of the soil in the watershed is 100 cms to 150 cms.

**Agriculture & Land Use**

Major crops in the watershed are rubber. Coconut, areca nut, cashew nut, pepper, plantain, paddy and the tubers are ginger and turmeric. Plots with mixed crop are the main feature of the watershed. The land use pattern is given in a tabular form followed by a graphic illustration:

| **Crops** | **Land Used (Ha)** | **% of Land used** | **Productivity Tones/ha** |
|---|---|---|---|
| Coconut | 60.06 | 13.68 | 4970 |
| Areca nut | 45.30 | 10.32 | 82.38 |
| Cashew nut | 36.91 | 8.41 | 34.63 |
| Plantain | 16.68 | 3.8 | 132.79 |
| Vegetables | 9.04 | 2.06 | 13.84 |
| Rubber | 151.54 | 34.52 | 204.65 |
| Tubers | 8.08 | 1.84 | 141.89 |
| Built Up | 40.39 | 9.2 | 0 |
| Cultivable Waste | 71 | 16.17 | 0 |
| **Total** | **439** | **100** | |

**Animal Husbandry**

The changed mentality of the farmers and the new living condition with modern houses and limited area of the house plots had resulted in poor animal husbandry practice when compared to the gone days. Another reason is the non-availability of fodder, both green and dry. When paddy cultivation was alienated, the availability of straw became a big question for the farmers. There are some exceptions in this case. Given below is a table of livestock in the watershed:

a) Hybrid Variety cows (Male) : 2
b) Hybrid Variety Cows (Female): 18
c) Indigenous Cows (Males): 3
d) Indigenous Cows(Females): 32
e) Goat(Males): 13
f) Goat (Female): 67
g) Indigenous fouls: 33
h) Hybrid Variety: 98

**Socio-Economic Details:**
***The watershed population is given below:***

Total Population: 488
Male: 228
Female: 260
SC Population (total): 17
Male (SC): 8
Female (SC): 9
APL Families: 67
BPL Families: 44

The economic development is based on the production and productivity of the agriculture and the availability of farm labour in the watershed. This is because the economy of the watershed

is built upon agriculture. More than 63 % of the total population is either farmers or farm labourers. For them this is the main source of income. The other occupations of the people are construction workers, drivers and traditional artisans. Few have government employment and earning a fixed monthly income.
People have accessibility to communication facilities and medias like TV, Internet, news papers and mobile phones. One can find a person without a mobile phone in the watershed very rarely. However, this cannot be considered as icon of economic development in the watershed.

The housing system has much changed from the traditional housing as the newly constructed and renovated houses have faces of modernity with RCC roofs. The bathrooms are attached to the bed rooms. This is also considered to be a jump in the social and economic change brought into the watershed over the years.

**Road Network:**

The transportation facilities are rare and road network is satisfactory in this watershed. The mud roads in the watershed are waiting for tarring and transport vehicles which is expected to make the network of roads helping the mobility of the people. There are five major roads: Panapuzhachal – Koyipra Road, Vellariyanam Road, Irul Road, Mundapram Kavu Roadand Michabhoomi – Mundapram Road. Among these the Mundapram road, michabhoomi – Mundapram and the upper part of the Pnapuzhachal Koyipra road are not yet tarred.

**Institutions and Community based organizations:**

Though comparatively less in number, the institutions and CBOs are highly influential factors that affect the lives of the watershed community. They take the important role of educating, passing information, building capacity and form the attitude of the people towards a better situation. Following are the institutions that influenced the formation of the watershed community in Panapuzhachal watershed: Mundapram Kavu, Irul Church, Irul Reading Room

**Market Facilities:**

There are no marketing centres within the watershed, nor do the authorities have plans to make one. The watershed community depends Mathamangalam bazar for the marketing facilities which is situated about 2 Km away from the watershed

**Hospital facilities:**

The watershed community can access the hospital facilities at Payyanur about 18 Km away from the watershed. They have also accessibility to the Pariyaram Medical College which is about 13 Kms away for further specialized treatment.

**Major Problems of the watershed**

The problems are categorized under four headings: Soil related, Water related, Agro-Bio Diversity Related and Animal Husbandry related. Such a categorization is in line with the activities that can be undertaken IWMP to solve the issues. The issues are listed below:

**Soil related Issues:**

- Once fertile soil has deteriorated and the Productivity has drastically decreased
- The fertile top soil is washed off with high velocity running water, especially during monsoon

- Inadequate soil conservation measures enhances the loss of fertile soil
- Change in land usage like leveling of paddy fields for mixed crops has reduced food crops to a great extent.
- 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

**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
- Steep slopes results in fast runoff.
- Drinking water scarcity

**Agro-biodiversity related issues**

- Over cultivation of mono crops
- Absence of crop rotation
- Disinterest in food cultivation
- Alienation of women from agriculture
- Extinct medicinal plants
- 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**

| **Natural Resource Management (NRM)** | **Production System & Micro- Enterprises (PS&M)** | **Livelihood Support Systems (LSS)** |
|---|---|---|
| **<u>Soil Conservation</u>**<br>6. Gully Plugging<br>7. Stone bunding<br>8. Centripetal Terracing | 1. Goat Rearing<br>2. Cow Rearing<br>3. Japanese Quail Rearing | 1. Mini Dairy Unit<br>2. Tailoring Machine Distribution<br>3. Tailoring Unit |

| | | |
|---|---|---|
| **Water Conservation**<br>8. Well improvement<br>9. Yard water collection pits<br>10. Husk Trenches<br>11. Moisture Collection Pits<br>12. Source Recharging<br>13. Check Dams<br>14. Rain Water Harvesting<br>15. Construction of well<br>16. Retaining wall | 4. Rabbit Rearing<br>5. Banana Cultivation<br>6. Organic Vegetable Cultivation | |

**Watershed Committee**

| Sl. No. | Name | Designation | Position | Phone No. |
|---|---|---|---|---|
| 1. | T. Sulaja | Kadannappalli President | Chairperson | 9961493767 |
| 2. | K.B. Balakrishnan | Eramam-kuttur GP President | Vice Chairperson | 9400451251 |
| 3. | | VEO | Convener | |
| 4. | Pradeep U. | Kulirma NHG | Jt. Convener | 9388065910 |
| 5. | T.P. Divya | AE. WDT | Secretary | 9526220464 |
| 6. | T.J.Thankachan | Valli NHG | Jt. Secretary | 279550 |
| 7. | Vilasini | Kulirma NHG | Treasurer | |
| 8. | Sunil P. | Kulirma NHG | Member | |
| 9. | P.Nisha | | Member | |
| 10. | P.M.Abraham | Valli NHG | Member | 278918 |
| 11. | Valsala | Kulirma NHG | Member | |
| 12. | Shinoj | Valli NHG | Member | |
| 13. | A.J.Kunjumon | Vally NHG | Member | |
| 14. | K.P. Vijayan | Member | Member | 9605047616 |
| 15. | Kamalakshan | Member Eramam Kutoor GP | Member | 9562278871 |
| 16. | P. V. Bhaskaran | President – Co-Op. bank | Member | 04985 - 278004 |
| 17. | V.V.Reetha | Block Member Thaliparamba | Member | 9497141457 |
| 18. | K.V.Damodaran | Block Member-Payyannur | Member | 9400851657 |
| 19. | Prasanna.K.M | ADS Chairperson | Member | |
| 20. | Shylaja.C.P | ADS Chairperson | Member | 9544241338 |
| 21. | Sunny Asariparambil | Director Susthira | Member | 9744888122 |

**Panappuzhachal Watershed Development Project (Area – 439 Ha) - Master plan for Four Years - Funding pattern**

| Instal lment | Adminis tration | Monitori ng | Evaluati on | Entry Point Activity | Institution & Capacity Building | DPR preparati on | Watershe d Developm ent Activities | Liveliho od Activiti es | Production system & Micro Enterprises | Consolidat ion Phase | Total IWMP project fund |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1St | 131700 | 13170 | 13170 | 263400 | 197550 | 65850 | 632160 | 0 | 0 | 0 | 1317000 |
| % | 2 | 0.2 | 0.2 | 4 | 3 | 1 | 9.6 | 0 | 0 | 0 | 20 |
| 2nd | 164625 | 13170 | 13170 | 0 | 65850 | 0 | 1093110 | 296325 | 329250 | 0 | 1975500 |
| % | 2.5 | 0.2 | 0.2 | 0 | 1 | 0 | 16.6 | 4.5 | 5 | 0 | 30 |
| 3rd | 197550 | 19755 | 19755 | 0 | 65850 | 0 | 1047015 | 296325 | 329250 | 0 | 1975500 |
| % | 3 | 0.3 | 0.3 | 0 | 1 | 0 | 15.9 | 4.5 | 5 | 0 | 30 |
| 4rd | 164625 | 19755 | 19755 | 0 | 0 | 0 | 915315 | 0 | 0 | 197550 | 1317000 |
| % | 2.5 | 0.3 | 0.3 | 0 | 0 | 0 | 13.9 | 0 | 0 | 3 | 20 |
| **Total** | **658500** | **65850** | **65850** | **263400** | **329250** | **65850** | **3687600** | **592650** | **658500** | **197550** | **6585000** |
| % | 10 | 1 | 1 | 4 | 5 | 1 | 56 | 9 | 10 | 3 | 100 |

**Panapuzhachal Watershed - Sector – I – Watershed Development Activities - I year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Moisture collection pits | $M^3$ | 149 | 1000 | 0 | 0 | 149000 | 149000 | 10 % General & 5 % SC / ST |
| 2. | Centry petal terracing | Nos | 65.67 | 400 | 0 | 0 | 26268 | 26268 | |
| 3. | Husk trunch | Nos | 169 | 1000 | 0 | 0 | 169000 | 169000 | |
| 4. | Gully controlled check dam | RM | 2996 | 10.61 | 0 | 31800 | 0 | 31800 | |
| 5. | Shutter type checkdam | Nos | 170000 | 1 | 0 | 170000 | 0 | 170000 | |
| 6. | Retaining wall | RM | 2395 | 14.29 | 0 | 34225 | 0 | 34225 | |
| 7. | Yard water collection pit | Nos | 400 | 30 | 0 | 0 | 12000 | 12000 | |
| 8. | Shutter type checkdam | Nos | 201585 | 1 | 0 | 201585 | 0 | 201585 | |
| 9. | well recharging | Nos | 12970 | 15 | 0 | 194550 | 0 | 194550 | |
| **Total** | | | | | | **632160** | **356268** | **988428** | |

**Panapuzhachal Watershed - Sector – I – Watershed Development Activities - II year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Centry petal terracing | Nos | 65.67 | 800 | 0 | 0 | 52536 | 52536 | 10 % General & 5 % SC / ST |
| 2. | Stone bunding | $M^2$ | 144 | 837.3 | 0 | 120585 | 0 | 120585 | |
| 3. | well recharging | Nos | 12970 | 20 | 0 | 259400 | 0 | 259400 | |
| 4. | Husk trunch | Nos | 169 | 1000 | 0 | 0 | 169000 | 169000 | |
| 5. | Gully controlled check dam | RM | 2996 | 6.79 | 0 | 20352 | 0 | 20352 | |
| 6. | Retaining wall (1.00m height ) | RM | 2395 | 64.58 | 0 | 154673 | 0 | 154673 | |
| 7. | Yard water collection pit | Nos | 400 | 148.296 | 0 | 0 | 8000 | 8000 | |
| 8. | Moisture collection pits | $M^3$ | 149 | 1000 | 0 | 0 | 149000 | 149000 | |
| 9. | Retaining wall | RM | 2395 | 156.82 | 0 | 375600 | 0 | 375600 | |
| 10. | Retaining wall | RM | 2395 | 67.84 | 0 | 162500 | 0 | 162500 | |
| **Total** | | | | | | **1093110** | **378536** | **1471646** | |

**Panapuzhachal Watershed - Sector – I – Watershed Development Activities - III year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Retaining wall | RM | 2395 | 188.27 | 0 | 450910 | 0 | 450910 | 10 % General & 5 % SC / ST |
| 2. | construction of well | Nos | 258000 | 1 | 0 | 258000 | 0 | 258000 | |
| 3. | RWH tank 5000 ltr capacity for individual | Nos | 32500 | 3 | 0 | 97500 | 0 | 97500 | |
| 4. | Husk trunch | Nos | 169 | 600 | 0 | 0 | 101400 | 101400 | |
| 5. | well recharging | Nos | 12970 | 13 | 0 | 168610 | 0 | 168610 | |
| 6. | Stone bunding | $M^2$ | 144 | 279.1 | 0 | 40195 | 0 | 40195 | |
| 7. | Moisture collection pits | $M^3$ | 149 | 1000 | 0 | 0 | 149000 | 149000 | |
| 8. | Gully controlled check dam | RM | 2996 | 10.61 | 0 | 31800 | 0 | 31800 | |
| 9. | Yard water collection pit | Nos | 400 | 20 | 0 | 0 | 8000 | 8000 | |
| 10. | Centry petal terracing | Nos | 65.67 | 600 | 0 | 0 | 39402 | 39402 | |
| **Total** | | | | | | **1093110** | **378536** | **1471646** | |

**Panapuzhachal Watershed - Sector – I – Watershed Development Activities - IV year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Centry petal terracing | Nos | 65.67 | 500 | 0 | 0 | 32835 | 32835 | 10 % General & 5 % SC / ST |
| 2. | Yard water collection pit | Nos | 400 | 20 | 0 | 0 | 8000 | 8000 | |
| 3. | well recharging | Nos | 12970 | 15 | 0 | 194550 | 0 | 194550 | |
| 4. | Husk trench | Nos | 169 | 500 | 0 | 0 | 84500 | 84500 | |
| 5. | Retaining wall | RM | 2395 | 43.54 | 0 | 104300 | 0 | 104300 | |
| 6. | Moisture collection pits | $M^3$ | 149 | 500 | 0 | 0 | 74500 | 74500 | |
| 7. | RWH tank 5000 ltr capacity for individual | Nos | 32500 | 4 | 0 | 130000 | 0 | 130000 | |
| 8. | Gully controlled check dam | RM | 2996 | 30.02 | 0 | 89940 | 0 | 89940 | |
| 9. | Stone bunding | $M^2$ | 144 | 279.1 | 0 | 40195 | 0 | 40195 | |
| 10. | Retaining wall | RM | 2395 | 148.78 | 9225 | 356330 | 0 | 365555 | |
| **Total** | | | | | 9225 | **1047015** | **297802** | **1344817** | |

**Panapuzhachal Watershed - Sector – II – Livelihood Activities for Land less/Asset less - II year Action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | MNREGS / other source/Bank Loan | Total |
|---|---|---|---|---|---|---|---|
| 1 | seed money for enterprising individuals | Nos | 0 | 0 | 59265 | 0 | 59265 |
| 1 | Seed money for SHGs | Nos | 0 | 0 | 237060 | 0 | 237060 |
| **Total** | | | | | **296325** | **0** | **296325** |

**Panapuzhachal Watershed - Sector – II – Livelihood Activities for Land less/Asset less - III year Action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | MNREGS / other source/Bank Loan | Total |
|---|---|---|---|---|---|---|---|
| 1 | Seed money for SHGs | Nos | 0 | 0 | 118530 | 0 | 118530 |
| **III** | **Funding for Major livelihood activities** | | | | | | |
| 1 | Mini diary unit | Nos | 300000 | 1 | 150000 | 150000 | 300000 |
| 2 | Plantain cultivation for leaves | Ha | 28000 | 2 | 27795 | 28205 | 56000 |
| **Total** | | | | | **296325** | **178205** | **474530** |

| **Funding pattern** | |
|---|---|
| Seed money for enterprising individuals (10% of the allocation -Revolving fund) | 59265 |
| Seed money for SHGs (60 % of the allocation - Revolving fund) | 355590 |
| Funding for major livelihood activities (30% of the allocation - Grant in aid) | 177795 |
| **Total allocation** | **592650** |

**Panapuzhachal Watershed - Sector – III – Production System & Micro Enterprises based livelihood activities - II year Action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | Total | WDF |
|---|---|---|---|---|---|---|---|
| 1 | Cow rearing unit | Nos | 24000 | 7 | 157250 | 157250 | 20 % for General & 10 % for SC / ST |
| 2 | Banana cultivation | Nos | 24000 | 6 | 144000 | 144000 | |
| 3 | Rabbit rearing | Nos | 28000 | 1 | 28000 | 28000 | |
| **Total** | | | | | **329250** | **329250** | |

**Panapuzhachal Watershed - Sector – III – Production System & Micro Enterprises based livelihood activities - III year action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | Total | WDF |
|---|---|---|---|---|---|---|---|
| 1 | Organic vegitable cultivation | Nos | 24000 | 7 | 157250 | 157250 | 20 % for General & 10 % for SC / ST |
| 2 | Banana cultivation | Nos | 24000 | 6 | 144000 | 144000 | |
| 3 | Rabbit rearing | Nos | 28000 | 1 | 28000 | 28000 | |
| **Total** | | | | | **329250** | **329250** | |

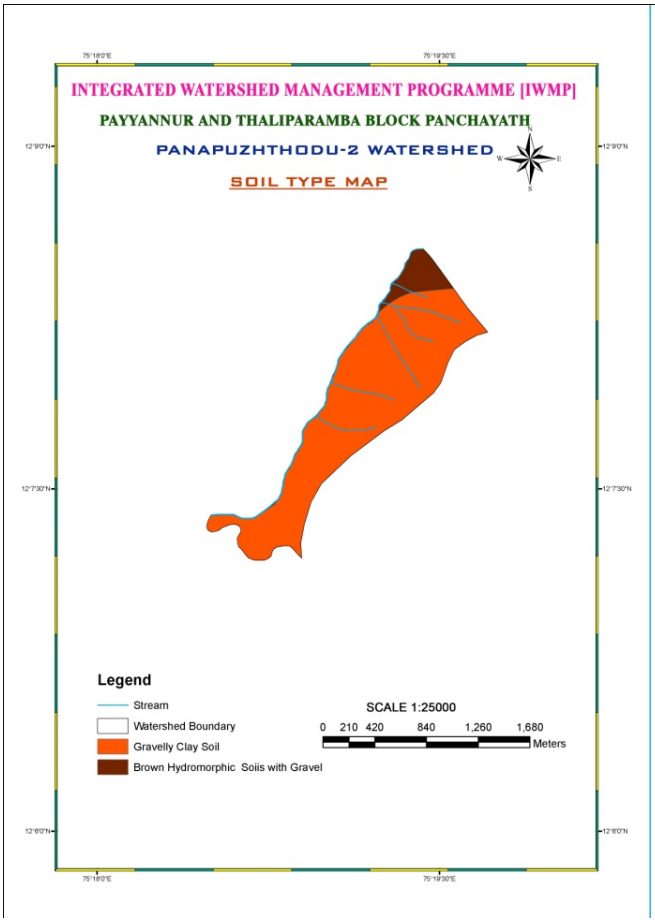
## Total Allotment -658500

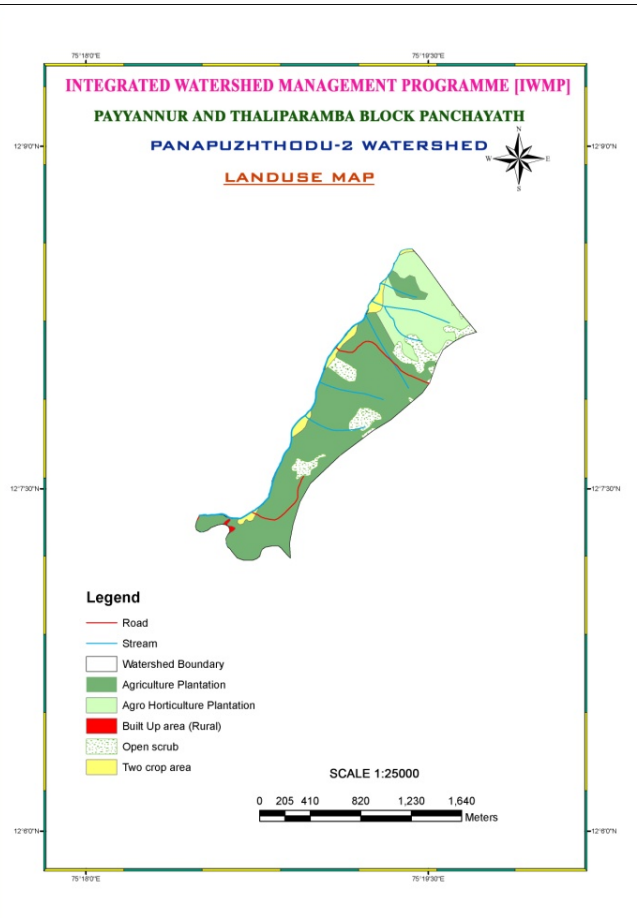
**ENTRY POINT ACTIVITY - PANAPUZHACHAL WATERSHED DEVELOPMENT PROJECT - ACTION PLAN**

| Sl:no | Activity | Unit | Unit cost | Target | IWMP EPA fund | IWMP Project fund | Total |
|---|---|---|---|---|---|---|---|
| 1. | Construction of shutter type check dam 3m width – kadannapally G.P | No | 98500 | 1 | 98500 | - | 98500 |
| 2. | Construction of shutter type check dam 4.50m width – Eramam kuttur G.P | No | 132000 | 1 | 132000 | - | 132000 |
| 3. | Stream bank protection | Rm | 1070 | 31.00 | 32900 | 270 | 33170 |
| | Total | | | | **263400** | **270** | **263670** |

# PANAPUZHATHODU II WATERSHED

| | | |
|---|---|---|
| Grama Panchayat | : | Kadannappalli - Panapuzha, |
| Village | : | Panapuzha |
| Wards covered | : | III of Kadannappally Panapuzha |
| Block Panchayat | : | Thaliparamba |
| Thaluk | : | Kannur |
| District | : | Kannur |
| Total families covered | : | 129 |
| Total Population covered | : | 567 |
| Total treatable Area | : | 147 Ha |
| River Basin | : | Peruvamba (Perumba) River |
| Average Length | : | 2.9. Kms. |
| Average Width | : | 2.5. Kms. |
| Total Project Cost | : | Rs. 22, 05,000/- |
| Boundaries | : | North: Panapuzhachal Watershed |
| | : | South: Vannathipuzha (River) |
| | : | West: Panapuzhathodu I Watershed |
| | : | East: Paravoor Watershed |




**Introduction**

The physical and geographic nature of the watershed is similar to that of the other two watersheds – Panapuzhachal & Panapuzhathodu –I. The main drainage of the watersheds is Koyipra Valiyathodu. The watershed is comparatively small with a total geographic area of 147 Ha. It has a slanting nature from north to south-west.

**Main places in the watershed:**

The important places in the watershed are Poongottu, Manjangottu, Kallachal, Panapuzha, and Kundanthodu.

**Geographic Description of the Watershed:**
**Location:**

Panapuzhathodu watershed is located in Panapuzha village in Kannur Thaluk. It is accessible by road. The watershed is around 53 Km away from District Head Quarters. Mathamangalam is the nearest town to the watershed and is situated around 2.75.Km away. The nearest railway station to the watershed is Payyannur and Payangadi which are situated almost at the same distance from the watershed.

**The geographic coordinates:** Geographically the watershed area lies between the east longitude $75^0$18’30”and $75^0$19’30” and north latitude $12^0$ 7’0” and $12^0$8’30” with an average elevation of 229 ft.

**Average length and width of the watershed**

Panapuzhachal Watershed is small among the approved 15 watersheds under IWMP. The watershed has an average length of 2.9Km and a width of 2.5Km.

**Relief & Drainage**

The main stream Koyipora Valiyathodu receives another name when entered into the watershed Panapuzhathodu. It flows across the watershed at about 3.5 Kms along the watershed with an average width of 5 meters. At some locations the stream has 8 meters width. The main stream is enriched with the following sub-streams:

1. The stream originating from Muthalakkunnu and flowing through the plot of Ulahannan
2. The common stream formed by two sub-streams one originating from the rocky upland and the stream named Kallachal which originating from the plot of Parathi Family and entering into the main stream.
3. Poomkottu Chal which originates from the land of Mr. P.J. Babu and entering into the mainstream in the Panapuzhathode I watershed. There is a VCB here.
4. The stream originating from the land of Bakery Ambu
5. Manjangottu Thode

**The drainage density** : 49.32 M /Ha

**Other water sources**

**T**he number of household wells corresponds to the number of households in the watershed, as every family has a drinking water well either open well or bore-well. The number of household open wells in the watershed is 113 and the rest (16) are bore-wells. Among the open wells 103 are perennial. There is only one public bore-well owned by the Grama Panchayat situated at a place known as Aalullapara. There are 8 perennial ponds in the watershed which are all owned by private parties.

1. Parathi Prabha Kulam
2. V.V. Dineshan kulam
3. Prashanthan kulam
4. Prabhakaran Kulam
5. Shivashankaran Kulam
6. Parameswaran Kulam
7. C. Balan Kulam
8. K.P. Bhaskaran Kulam

**Present situation of the streams and other water bodies**

In the upper part of the watershed – Poongottu and Manjangottu water is available in the streams even in the summer. Whereas, in place like Muthalakkunnu, water scarcity is experienced in the same season. In the middle area of the watershed there is no water scarcity. In the lower portions water is available in all seasons. The water availability is not enough for irrigation purposes.

All the smaller streams except Manjangottu Thodu dry up in the summer season. In the case of ponds few dry up in the summer. During the monsoon season, the banks washed off diverting water flow into the agricultural land causing damage to the crops. The easy flow of water in the streams is blocked by the scrupine plants in the main stream.

**Rainfall and Climate**

The watershed has a humid climate with a hot season from March to the end of May. This is followed by South-West Monsoon (June-September) and North -East Monsoon (December-February). During the month of April and May the mean maximum temperature is $35^0$C and a minimum temperature of $26^{0.}$ The annual average rainfall is 3697mm and 57% of it occurs during the period of June-July.

**Soil Type & Depth**

The general condition of the soil is of two types. Brown hydromorphic soil with gravel is seen in the upper parts of the watershed and clay soil with gravels in the lower portions. The watershed

has a total area of 12.53 ha with brown hydromorphic soil and the rest, 134.47 ha consists of clay soil with gravels. Depth of the soil in the watershed is 100 cms to 150 cms.

**Agriculture & Land Use**

Major crop in the watershed is rubber. Coconut, areca nut, cashew nut, pepper, plantain, paddy and the tubers are ginger and turmeric. Plots with mixed crop are the main feature of the watershed. The land use pattern is given in a tabular form followed by a graphic illustration:

| Crops | Land Used (Ha) | % of Land used | Productivity |
|---|---|---|---|
| Coconut | 21.59 | 14.68 | 1786 |
| Areca nut | 18.83 | 12.86 | 34.24 |
| Cashew nut | 12.20 | 8.30 | 11.45 |
| Plantain | 8.39 | 5.7 | 66.79 |
| Vegetables | 8.29 | 5.63 | 12.69 |
| Rubber | 57.80 | 39.31 | 78.06 |
| Tubers | 9.76 | 6.62 | 171.4 |
| Built Up Area | 10.14 | 6.9 | 0 |
| Total | 147 | 100 | |

**Animal Husbandry**

As a general condition that is observed in Kerala is that the farmers interest in growing domestic animals is drastically reducing. This is also reflected in the water shed under discussion. Given below is a table of livestock in the watershed:

i. Hybrid Variety cows (Male) : 6
j. Hybrid Variety Cows (Female): 27
k. Indigenous Cows (Males): 2
l. Indigenous Cows(Females): 23
m. Goat(Males): 18
n. Goat (Female): 72
o. Indigenous fouls: 33
p. Hybrid Variety: 105

**Socio-Economic Details:**

***The watershed population is given below:***

Total Population: 567
Male: 265
Female: 302
SC Population (total): 21
Male (SC): 9
Female (SC): 12
APL Families: 74
BPL Families: 55

The general living condition of the populace expresses that they have middle class economic nature. Most of the people gained good education and had pucca houses to live in. Every household have sanitation facilities.

Available infrastructure facilities in the watershed like road network, adequate conveyance, the cultural institutions and people's organizations all played an important role in the social development rather than the economic development of the people.

The economic development is based on the production and productivity of the agriculture and the availability of farm labour in the watershed. This is because the economy of the watershed is built upon agriculture. More than 63 % of the total population is either farmers or farm labourers. For them this is the main source of income. The other occupations of the people are

construction workers, drivers and traditional artisans. Few have government employment and earning a fixed monthly income.

People have accessibility to communication facilities and medias like TV, Internet, news papers and mobile phones. One can find a person without a mobile phone in the watershed very rarely. However, this cannot be considered as icon of economic development in the watershed.

The housing system has much changed from the traditional housing as the newly constructed and renovated houses have faces of modernity with RCC roofs. The bathrooms are attached to the bed rooms. This is also considered to be a jump in the social and economic change brought into the watershed over the years.

**Road Network:**
The transportation facilities are rare and road network is beneficial for the watershed community. The mud roads in the watershed are waiting for tarring and transport vehicles which is expected to make the network of roads supporting the mobility of the people. There are four major roads: Mathamangalam - Eriam road is the main road and passing through the watershed. Panapuzha – Kizhakkekara road, Aalullapara Road, and Poongottu Road are other roads in the watershed.

**Institutions and Community based organizations:**
Institutions take the important role of educating, passing information, building capacity and form the attitude of the people towards a better situation. Following are the institutions that influenced the formation of the watershed community in Panapuzhachal watershed. The institutions are Panapuzha Temple and the Mosque

**Market Facilities:**
There are no marketing centres within the watershed, nor do the authorities have plans to make one. The watershed community depends Mathamangalam bazaar for the marketing facilities which is situated about 2 Km away from the watershed

**Hospital facilities:**
The watershed community can access the hospital facilities at Payyanur about 18 Km away from the watershed. They have also accessibility to the Pariyaram Medical College which is about 13 Kms away for further specialized treatment.

**Major Problems of the watershed**
The problems are categorized under four headings: Soil related, Water related, Agro-Bio Diversity Related and Animal Husbandry related. Such a categorization is in line with the activities that can be undertaken IWMP to solve the issues. The issues are listed below:

**Soil related Issues:**
- Once fertile soil has deteriorated and the Productivity has drastically decreased throughout the watershed
- The fertile top soil is washed off with high velocity running water, especially during monsoon, at Vellariyanam, Irul and Koyipra regions
- Inadequate soil conservation measures enhances the loss of fertile soil
- Change in land use like paddy fields for mixed crops has reduced food crops to a great extent in places like Vellariyanam where there were paddy fields and rice cultivation.

**Water related issues:**
- Fast drying water sources, especially in midland region of the watershed (e.g. Mundapram Region)

- Poor water conservation measures
- Poor water literacy among the watershed community
- Ground water deterioration/lowering of water table at Vellariyanam Side
- Sedimentation of sources like streams and ponds
- Fast water runoff due to Steep slopes in areas like Irul and Vellariyanam.
- Drinking water scarcity in Vellariyanam and Koyipra side.

**Agro-biodiversity related issues**

- Over cultivation of mono crops irrespective of areas
- Absence of crop rotation
- Alienation of women from agriculture
- Extinct medicinal plants like Karingotta (Samadora indica), Vaathamkolly (Jestisia genderusa) Aavanakku (Sebastinia chamelia)
- Eco-destruction resulted in reduction in plant & animal diversity
- Un expected plant diseases and pest attacks ( Quick wilt of Pepper, Bunchy top of Plantain, Mahali of Areca nut, Mandari of Coconut)

**Animal Husbandry related issues**

- Poor interest in indigenous varieties
- Lack of common grazing land and pastures
- Compartmentalization of land
- Mono crops do no supplement livestock
- Lack of interest in animal husbandry

**Activities proposed to address the issues**

Generally the activities are of three folds: Natural Resource Management Activities which covers the soil, water and bio-diversity issues, Production System Management and Micro Enterprises (PS&M) which covers the agriculture and soil problems along with economic backwardness, , which manages the livelihoods and economic backwardness of the landless, women and the indigenous communities. Given below is a brief about the activities proposed for the watershed:

| Natural Resource Management (NRM) | Production System & Micro- Enterprises (PS&M) | Livelihood Support Systems (LSS) |
|---|---|---|
| **<u>Soil Conservation</u>**<br>1. Geo textiles<br>2. Live fencing<br>3. Stone bunding<br>4. Centripetal Terracing | 1. Layer Distribution<br>2. Rabbit Rearing<br>3. Cow Rearing<br>4. Banana Cultivation | 1. Distribution of Tailoring Machine<br>2. Toilet Cleaner Making Unit<br>3. Poultry Unit |
| **<u>Water Conservation</u>**<br>1. Pond renovation<br>2. Yard water collection pits<br>3. Husk Trenches<br>4. Moisture Collection Pits<br>5. Source Recharging<br>6. Check Dams<br>7. Well improvement<br>8. Retaining wall<br>9. Diversion canal | | |

**Panappuzhathodu - II Watershed Development Project (Area – 147 Ha) - Master plan for Four Years - Funding pattern**

| Instalment | Administration | Monitoring | Evaluation | Entry Point Activity | Institution & Capacity Building | DPR preparation | Watershed Development Activities | Livelihood Activities | Production system & Micro Enterprises | Consolidation Phase | Total IWMP project fund |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1St | 44100 | 4410 | 4410 | 88200 | 66150 | 22050 | 211680 | 0 | 0 | 0 | 441000 |
| % | 2 | 0.2 | 0.2 | 4 | 3 | 1 | 9.6 | 0 | 0 | 0 | 20 |
| 2nd | 55125 | 4410 | 4410 | 0 | 22050 | 0 | 366030 | 99225 | 110250 | 0 | 661500 |
| % | 2.5 | 0.2 | 0.2 | 0 | 1 | 0 | 16.6 | 4.5 | 5 | 0 | 30 |
| 3rd | 66150 | 6615 | 6615 | 0 | 22050 | 0 | 350595 | 99225 | 110250 | 0 | 661500 |
| % | 3 | 0.3 | 0.3 | 0 | 1 | 0 | 15.9 | 4.5 | 5 | 0 | 30 |
| 4rd | 55125 | 6615 | 6615 | 0 | 0 | 0 | 306495 | 0 | 0 | 66150 | 441000 |
| % | 2.5 | 0.3 | 0.3 | 0 | 0 | 0 | 13.9 | 0 | 0 | 3 | 20 |
| **Total** | **220500** | **22050** | **22050** | **88200** | **110250** | **22050** | **1234800** | **198450** | **220500** | **66150** | **2205000** |
| % | 10 | 1 | 1 | 4 | 5 | 1 | 56 | 9 | 10 | 3 | 100 |

**Panapuzhathodu II Watershed - <u>Sector – I – Watershed Development Activities - I year action plan</u>**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Divertion canal (EPA) | $M^3$ | 133932 | 1 | 6722 | 127210 | 0 | 133932 | 10 % General & 5 % SC / ST |
| 2. | Live fencing | RM | 24 | 300 | 0 | 0 | 7200 | 7200 | |
| 3. | Husk trunch | Nos | 169 | 300 | 0 | 0 | 50700 | 50700 | |
| 4. | Yard water collection pit | Nos | 400 | 20 | 0 | 0 | 8000 | 8000 | |
| 5. | Centry petal terracing | Nos | 65.67 | 400 | 0 | 0 | 26268 | 26268 | |
| 6. | Stone bunding | $M^2$ | 144 | 224.4 | 0 | 32320 | 0 | 32320 | |
| 7. | Moisture collection pits | $M^2$ | 149 | 500 | 0 | 0 | 74500 | 74500 | |
| 8. | Retaining wall | RM | 2395 | 21.77 | 0 | 52120 | 0 | 52120 | |
| **Total** | | | | | **6722** | **211650** | **166668** | **385040** | |

**Panapuzhathodu II Watershed - Sector – I – Watershed Development Activities - II year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Centry petal terracing | Nos | 133932 | 800 | 0 | 0 | 52536 | 52536 | 10 % General & 5 % SC / ST |
| 2. | Yard water collection pit | Nos | 400 | 25 | 0 | 0 | 10000 | 10000 | |
| 3. | Retaining wall | RM | 2395 | 20.65 | 0 | 49480 | 0 | 49480 | |
| 4. | Husk trunch | Nos | 169 | 500 | 0 | 0 | 84500 | 84500 | |
| 5. | koodapram vayal pond renavation,at the property of shivashankaran | Nos | 307000 | 1 | 0 | 307000 | 0 | 307000 | |
| 6. | Live fencing | RM | 24 | 500 | 0 | 0 | 12000 | 12000 | |
| 7. | Moisture collection pits | $M^3$ | 149 | 500 | 0 | 0 | 74500 | 74500 | |
| 8. | Stone bunding | $M^2$ | 144 | 66.3 | 0 | 9550 | 0 | 9550 | |
| **Total** | | | | | | **366030** | **233536** | **599566** | |

**Panapuzhathodu II Watershed - Sector – I – Watershed Development Activities - III year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/ Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | shutter type check dam across panapuzhathodu | NOS | 206000 | 1 | 0 | 206000 | 0 | 206000 | 10 % General & 5 % SC / ST |
| 2. | Retaining wall 2m hight at panapuzha thodu | RM | 2395 | 55.06 | 0 | 131875 | 0 | 131875 | |
| 3. | Moisture collection pits | $M^3$ | 149 | 400 | 0 | 0 | 59600 | 59600 | |
| 4. | Gully controlled check dam | RM | 2996 | 4.24 | 0 | 12720 | 0 | 12720 | |
| 5. | Husk trunch | NOS | 169 | 300 | 0 | 0 | 50700 | 50700 | |
| 6. | Yard water collection pit | NOS | 400 | 15 | 0 | 0 | 6000 | 6000 | |
| 7. | Centry petal terracing | NOS | 65.67 | 600 | 0 | 0 | 39402 | 39402 | |
| 8. | Live fencing | RM | 24 | 500 | 0 | 0 | 12000 | 12000 | |
| **Total** | | | | | | **350595** | **167702** | **518297** | |

**Panapuzhathodu II Watershed - Sector – I – Watershed Development Activities - IV year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Centry petal terracing | Nos | 65.67 | 600 | 0 | 0 | 39402 | 39402 | 10 % General & 5 % SC / ST |
| 2. | Yard water collection pit | Nos | 400 | 20 | 0 | 0 | 8000 | 8000 | |
| 3. | well recharging | Nos | 12970 | 8 | 0 | 103760 | 0 | 103760 | |
| 4. | Geo Textile | $M^2$ | 191 | 300 | 0 | 57300 | 0 | 57300 | |
| 5. | Stone bunding | $M^2$ | 144 | 55.8 | 0 | 8039 | 0 | 8039 | |
| 6. | Moisture collection pits | $M^3$ | 149 | 500 | 0 | 0 | 74500 | 74500 | |
| 7. | Well Renovation | Nos | 10600 | 1 | 0 | 10600 | 0 | 10600 | |
| 8. | Husk trunch | Nos | 169 | 500 | 0 | 0 | 84500 | 84500 | |
| 9. | Gully controlled check dam | RM | 2996 | 21.054 | 0 | 63080 | 0 | 63080 | |
| 10. | Retaining Wall | RM | 2395 | 26.60 | 0 | 63716 | 0 | 63716 | |
| **Total** | | | | | | **306495** | **206402** | **512897** | |

**Panapuzhathodu - II Watershed - Sector – II – Livelihood Activities for Land less/Asset less - II year Action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | MNREGS / other source/Bank Loan | Total |
|---|---|---|---|---|---|---|---|
| 1 | seed money for enterprising individuals | Nos | 0 | 0 | 19845 | 0 | 19845 |
| 1 | Seed money for SHGs | Nos | 0 | 0 | 79380 | 0 | 79380 |
| **TOTAL** | | | | | **99225** | **28035** | **127260** |

**Panapuzhathodu - II Watershed - Sector – II – Livelihood Activities for Land less/Asset less - III year Action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | MNREGS / other source/Bank Loan | Total |
|---|---|---|---|---|---|---|---|
| 2 | Seed money for SHGs | Nos | 0 | 0 | 39690 | 0 | 39690 |
| **III** | **Funding for Major livelihood activities** | | | | | | |
| 1 | Poultry unit | Nos | 120000 | 1 | 59535 | 60465 | 120000 |
| **Total** | | | | | **99225** | **60465** | **159690** |

| **Funding pattern** | |
|---|---|
| Seed money for enterprising individuals (10% of the allocation -Revolving fund) | 19845 |
| Seed money for SHGs (60 % of the allocation - Revolving fund) | 119070 |
| Funding for major livelihood activities (30% of the allocation - Grant in aid) | 59535 |
| **Total allocation** | **198450** |

**Panapuzhathodu - II Watershed - Sector – III – Production System & Micro Enterprises based livelihood activities - II year Action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | Total | WDF |
|---|---|---|---|---|---|---|---|
| 1 | Cow rearing | Nos | 24000 | 5 | 110250 | 110250 | 20 % for General & 10 % for SC / ST |
| **TOTAL** | | | | | **110250** | **110250** | |

**Panapuzhathodu - II Watershed - Sector – III – Production System & Micro Enterprises based livelihood activities - III year action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | Total | WDF |
|---|---|---|---|---|---|---|---|
| 1 | Banana cultivation | Nos | 24000 | 5 | 110250 | 110250 | 20 % for General & 10 % for SC / ST |
| **TOTAL** | | | | | **110250** | **110250** | |

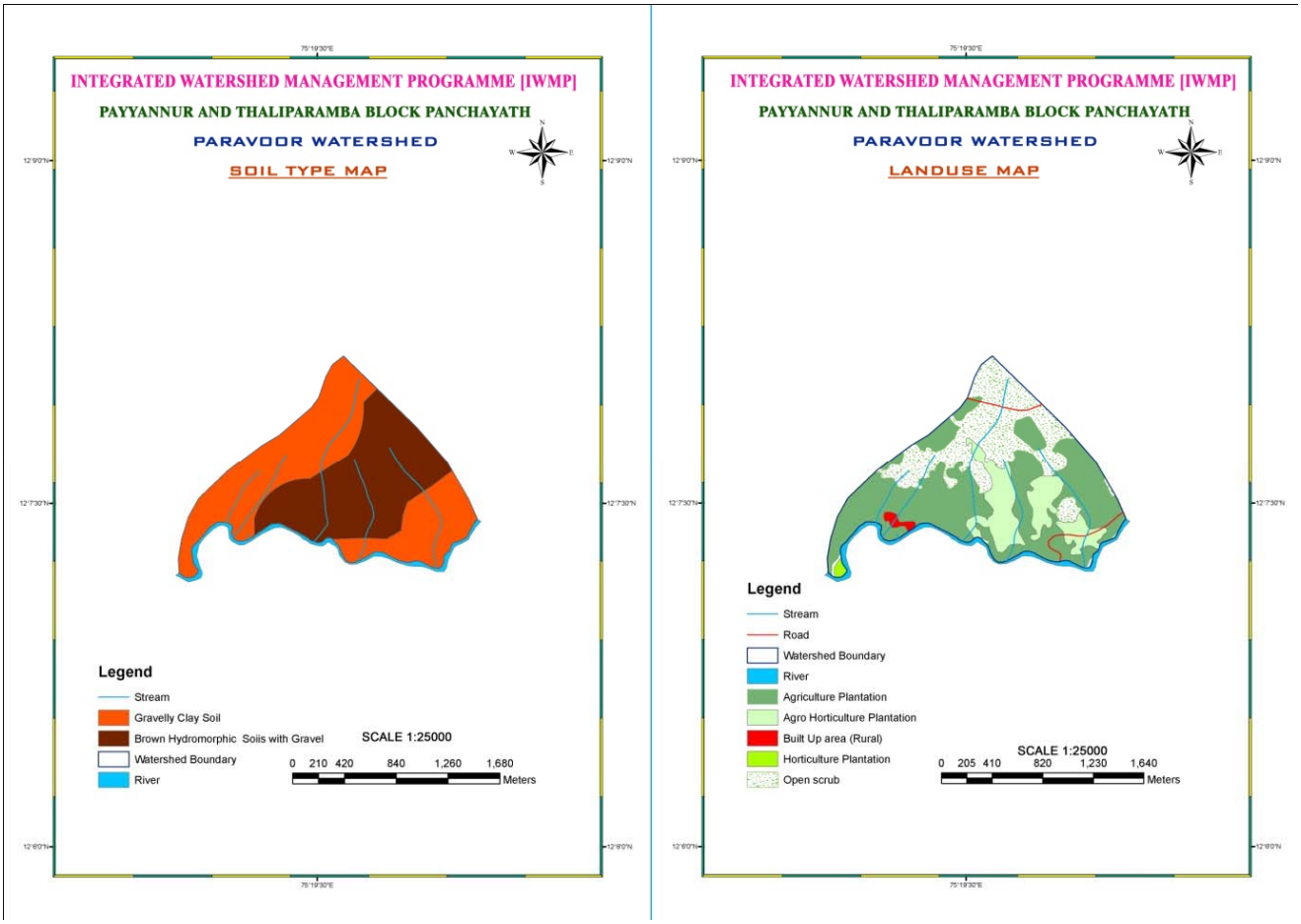
## Total Allotment -220500

**ENTRY POINT ACTIVITY - ACTION PLAN**

| Sl:no | Activity | Unit | Unit cost | Target | IWMP EPA fund | IWMP Project fund | Total |
|---|---|---|---|---|---|---|---|
| 1. | Diversion channel construction | Rm | 176500 | 1 | 88200 | 88300 | 176500 |
| | Total | | | | **88200** | **88300** | **176500** |

# PARAVOOR WATERSHED

| | | |
|---|---|---|
| Grama Panchayat | : | Kadannappalli - Panapuzha, |
| Village | : | Panapuzha |
| Wards covered | : | V & VI |
| Block Panchayat | : | Thaliparamba |
| Thaluk | : | Kannur |
| District | : | Kannur |
| Total families covered | : | 232 |
| Total Population covered | : | 1021 |
| Total treatable Area | : | 208 Ha |
| River Basin | : | Peruvamba (Perumba) River |
| Average Length | : | 2 Kms. |
| Average Width | : | 2.75. Kms. |
| Total Project Cost | : | Rs. 31, 20,000/- |
| Boundaries | : | North: Karipalpoil Rocks |
| | : | South: Paravoor River |
| | : | West: Mudenga Watershed |
| | : | East: Kannelamthodu Watershed |




## Introduction

The watershed covers 5th and 6th wards of Kadannappally – Panapuzha Panchayat. Only part of 5th ward is covered and almost all parts of the 6th ward included in the watershed. The total area of the watershed is 208 ha. The watershed is slanting towards south and has an undulating nature because of the presence of small hills and moderate slopes. Because of its slanting nature, soil erosion is at its peak in the watershed. It has about 25 ha of cultivable waste.

**Main places in the watershed:** The important places in the watershed are Anatty, Madeda, Choyyakundu and Paravoor.

## Geographic Description of the Watershed:

## Location:

Paravoor watershed is located in Panapuzha village in Kannur Thaluk. It is accessible by road. The watershed is around 48 Km away from District Head Quarters. Mathamangalam is the nearest town to the watershed and is situated around 4.Km away. The nearest railway station to the watershed is Payyannur and Payangadi which are situated almost at the same distance from the watershed.

**The geographic coordinates:** The watershed area lies between the east longitude $75^0$19'0" and $75^0$20'0" and North latitude $12^0$ 7'0" and $12^0$ 8'0" with an average elevation of 136 ft.

**Average length and width of the watershed**

Paravoor Watershed has an average length of 2 Kms and width of 2.75Kms. Therefore it can be considered as a small watershed approved under IWMP.

**Relief & Drainage**

The watershed is slanting towards south and has an undulating nature because of the presence of small hills and moderate slopes. Because of its slanting nature, soil erosion is at its peak in the watershed.

The main stream of the watershed is Kandamkol Thodu which has a length of 1½ Kms, width of 2 meters and depth of 5 meters. The sub streams are Cheetah Thodu, Kulukki Thodu, Kulangarakunnu thodu, Manichery thodu, Mayilottu thodu, Aanari Thodu, Piliyamkodu Thodu, Parakkadavu thodu and Varanam Thodu. Flow of all these streams are directly entering into the Panapuzha River.

**The drainage density** **:** 20.43 M /Ha

**Other water sources**

Besides the above mentioned natural sources of water there are 218 household wells and five natural springs which supply water to the watershed community. The springs are Chethathodu Spring, Kulukkithodu Spring, Piliyamkodu Spring, Kandamkol Spring and Mayiloduy Spring. However, water scarcity is experienced in each summer season by around fifty families residing in the watershed between Panapuzha Old Post Office and New Post Office and they have to walk long distances to fetch the water.

**Present situation of the streams and other water bodies**

The three springs, Cheetha, Kulukki and Piliyamkodu are perennial and people collect water from these springs through hose pipes for their household needs. The mayilodu spring dries up in the beginning of the month of May.

Though the streams are originating from the springs, most of them will dry upe due to lack of flow during the post monsoon months. The high velocity runoff during the monsoon affects the streams banks and washing away the stream bank soil along with the runoff water.

## Rainfall and Climate

The watershed has a humid climate with a hot season from March to the end of May. This is followed by South-West Monsoon (June-September) and North -East Monsoon (December-February). During the month of April and May the mean maximum temperature is $35^0$C and a minimum temperature of $26^{0.}$ The annual average rainfall is 3697mm and 57% of it occurs during the period of June-July.

## Soil Type & Depth

The general condition of the soil is of two types. Brown hydromorphic soil with gravel is seen in the upper parts of the watershed and clay soil with gravels in the lower portions. The Soil type in about 92.31 ha of the watershed is brown hydromorphic soil and 115.69 ha is of clay soil with gravels. Depth of the soil in the watershed is 100 cms to 150 cms.

## Agriculture & Land Use

Major crops in the watershed are coconut, arecanut, cashew, rubber and plantain. There is about 3 acres of paddy fields out of which a single crop is being done in about 1¼ ha only. The rest is left barren. The produce from this cultivation is nominal and did not include in the land use pattern given below:

As in the case of other watersheds in the Grama Panchayat, Paravoor watershed is also promoting rubber cultivation. The rubber is taking advantage at the expense of traditional crops like coconut and mixed plantations. The land use pattern is shown in a table below followed a graphic illustration.

| Crops | Land Used | % of Land used | Produ-ctivity |
|---|---|---|---|
| Coconut | 38.81 | 18.66 | 3212 |
| Areca nut | 35.82 | 17.22 | 65.14 |
| Cashew | 23.34 | 11.22 | 21.90 |
| Plantain | 5.37 | 2.58 | 42.75 |
| Vegetables | 2.89 | 1.39 | 4.42 |
| Rubber | 82.24 | 39.54 | 111.06 |
| Tubers | 2.75 | 1.32 | 48.30 |
| Built Up Area | 16.78 | 8.07 | 0 |
| **Total** | **208** | **100** | |

## Animal Husbandry

Animal husbandry is reducing in the watershed area compared to the olden days. Thgis is because of the reducing grazing land and lack of fodder both dry and green. Given below is a table of livestock in the watershed:

a. Hybrid Variety cows (Male) : 5
b. Hybrid Variety Cows (Female): 32
c. Indigenous Cows (Males): 2
d. Indigenous Cows(Females): 38
e. Goat(Males): 26
f. Goat (Female): 83
g. Indigenous fouls: 62
h. Hybrid Variety: 212

**Socio-Economic Details:**

Though Paravoor watershed is comparatively small the household hold density is more than some other bigger watershed. This could be because of the favourable living condition due to fertile land, contiguity or vicinity of the river and the harmony people maintain. The demographic details of the watershed are given below:

Total Population: 1021
Male: 490
Female: 531
SC Population (total): 67
Male (SC): 33
Female (SC): 34
APL Families: 160
BPL Families: 72

Majority of the population in the watershed is either farmers or farm labourers. Therefore, it can be assumed that the economy of the watershed is built upon agriculture. Any issues that affect the agricultural sector will reflect in the livelihood of the people. Also there are construction workers, stone cutters, toddy workers, rubber tapers etc. Only very few are employed in government services.

All the families in the watershed live in own houses, houses with modern amenities like very good sanitation facilities, multimedia like TV and Mobile Phone and uses good communication instruments. However, they have no mechanism for safe disposal of solid and liquid wastes.

Water scarcity is threatening the community at a particular region mentioned above during the summer because the wells dry up. In-taking of water from unsafe sources brings in the chance of outbreak of contagious diseases. However, the community is well aware of the situation and they had taken all necessary precautions. This shows that their awareness level is very good.

Almost all the houses in the watershed are electrified except a few (12 Houses) at Aanayadi area. Efforts had been taken by the inhabitants to get electric connection. The delay in getting the electrification denies them the modern communication media like TV and modern home appliances which require power connection.

Educationally, almost 93% of the watershed communities have preliminary education and the female education index is very high with 9.4 compared to male education. Post graduates are very rare in the watershed. The government employees must have gone through their graduation and this will come only 2%.

**Road Network:**

The only one tarred road in the watershed is Mathamangalam – Eriam Road, which also has Bus service. The mud roads in the watershed are waiting for tarring and transport vehicles. Other major roads are: Paravoor Central – Cemetery road, Poil – Pariyaram Road and Aanari – Quarry road.

**Institutions and Community based organizations:**

There are 15 institutions that directly influence the watershed community. These institutions play an important role in the moulding of the watershed community in their cuyoltural and socio-economic well being. The institutions are as follows:

| Natural Resource Management (NRM) | Production System & Micro- Enterprises (PS&M) | Livelihood Support Systems (LSS) |
|---|---|---|
| **Soil Conservation**<br>1. Gully Plugging<br>2. Stream bank stabilization<br>3. Live fencing<br>4. Contour bunding<br>5. Centripetal Terracing<br>**Water Conservation**<br>1. Widening and deepening of stream<br>2. Yard water collection pits<br>3. Husk Trenches<br>4. Moisture Collection Pits<br>5. Source Recharging<br>6. Check Dams | 1. Goat Rearing<br>2. Cow Rearing<br>3. Banana Cultivation<br>4. Organic Vegetable Cultivation<br>5. Vermi Composting | 1. Consumer Store<br>2. Candle Making Unit<br>3. Detergent Making Unit |

## Pravoor Watershed Development Project (Area – 208 Ha) - Master plan for Four Years - Funding pattern

| Installment | Administration | Monitoring | Evaluation | Entry Point Activity | Institution & Capacity Building | DPR preparation | Watershed Development Activities | Livelihood Activities | Production system & Micro Enterprises | Consolidation Phase | Total IWMP project fund |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1St | 62400 | 6240 | 6240 | 124800 | 93600 | 31200 | 299520 | 0 | 0 | 0 | 624000 |
| % | 2 | 0.2 | 0.2 | 4 | 3 | 1 | 9.6 | 0 | 0 | 0 | 20 |
| 2nd | 78000 | 6240 | 6240 | 0 | 31200 | 0 | 517920 | 140400 | 156000 | 0 | 936000 |
| % | 2.5 | 0.2 | 0.2 | 0 | 1 | 0 | 16.6 | 4.5 | 5 | 0 | 30 |
| 3rd | 93600 | 9360 | 9360 | 0 | 31200 | 0 | 496080 | 140400 | 156000 | 0 | 936000 |
| % | 3 | 0.3 | 0.3 | 0 | 1 | 0 | 15.9 | 4.5 | 5 | 0 | 30 |
| 4rd | 78000 | 9360 | 9360 | 0 | 0 | 0 | 433680 | 0 | 0 | 93600 | 624000 |
| % | 2.5 | 0.3 | 0.3 | 0 | 0 | 0 | 13.9 | 0 | 0 | 3 | 20 |
| **Total** | **312000** | **31200** | **31200** | **124800** | **156000** | **31200** | **1747200** | **280800** | **312000** | **93600** | **3120000** |
| % | 10 | 1 | 1 | 4 | 5 | 1 | 56 | 9 | 10 | 3 | 100 |

## Paravoor Watershed Action Plan - Sector – I – Watershed Development Activities - I year

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Stone bunding | $M^2$ | 144 | 588.8 | 0 | 84790 | 0 | 84790 | 10 % General & 5 % SC / ST |
| 2. | Moisture collection pits | $M^3$ | 149 | 1000 | 0 | 0 | 149000 | 149000 | |
| 3. | Live fencing | RM | 24 | 1500 | 0 | 0 | 36000 | 36000 | |
| 4. | Gully controlled checkdam in Peeliyancode thodu | RM | 2996 | 8.49 | 0 | 25440 | 0 | 25440 | |
| 5. | Shutter type check dam in Peeliyncode thodu near the plot of P.T.Lakshmi | Nos | 98500 | 1 | 0 | 98500 | 0 | 98500 | |
| 6. | Well recharge | RM | 12970 | 1 | 0 | 90790 | 0 | 90790 | |
| **Total** | | | | | | **299520** | **185000** | **484520** | |

**Paravoor Watershed - Watershed - Action Plan - Sector – I – Watershed Development Activities II year**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Moisture collection pits | $M^3$ | 149 | 1000 | 0 | 0 | 149000 | 149000 | 10 % General & 5 % SC / ST |
| 2. | Live fencing | RM | 24 | 1600 | 0 | 0 | 38400 | 38400 | |
| 3. | Stone bunding | $M^2$ | 144 | 770.2 | 0 | 110918 | 0 | 110918 | |
| 4. | Centry petal terracing | Nos | 65.67 | 300 | | 0 | 19701 | 19701 | |
| 5. | Yard water collection pit | Nos | 400 | 50 | 0 | 0 | 20000 | 20000 | |
| 6. | Husk trench | | 165 | 400 | | 0 | 66000 | 66000 | |
| 7. | Retaining Wall | RM | 2395 | 98.45 | 0 | 235800 | 0 | 235800 | |
| 8. | Retaining Wall | RM | 2395 | 71.48 | 0 | 171202 | 0 | 171202 | |
| **Total** | | | | | | **517920** | **293101** | **811021** | |

## Paravoor Watershed Action Plan - Sector – I – Watershed Development Activities - III year

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Husk trench | Nos | 165 | 300 | 0 | 0 | 49500 | 49500 | 10 % General & 5 % SC / ST |
| 2. | Live fencing | RM | 24 | 1500 | 0 | 0 | 36000 | 36000 | |
| 3. | Yard water collection pit | Nos | 400 | 100 | 0 | 0 | 40000 | 40000 | |
| 4. | Stream bank stabilization with retaining wall in peeliyancode thodu | RM | 2395 | 78.41 | 0 | 187800 | 0 | 187800 | |
| 5. | Gully controlled check dam in Pulkithodu | RM | 2996 | 8.49 | 0 | 25440 | 0 | 25440 | |
| 6. | Stream bank stabilization with retaining wall in Pulkithodu | RM | 2395 | 118.09 | 0 | 282840 | 0 | 282840 | |
| **Total** | | | | | | **496080** | **125500** | **621580** | |

**Paravoor Watershed - Action Plan - Sector – I – Watershed Development Activities - IV year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Stone bunding | $M^2$ | 144 | 220.3 | 0 | 31731 | 0 | 31731 | 10 % General & 5 % SC / ST |
| 2. | Stream bank stabilization with retaining wall in Ponkuram chal | RM | 2395 | 35.30 | 0 | 84550 | 0 | 84550 | |
| 3. | Stream bank stabilization with retaining wall | RM | 2996 | 98.73 | 0 | 236459 | 0 | 236459 | |
| 4. | Gully controlling structures in Ponkuramchal | RM | 2395 | 8.49 | 0 | 25440 | 0 | 25440 | |
| 5. | Retaining Wall Ponkuramchal | RM | 165 | 23.17 | 0 | 55500 | 0 | 55500 | |
| 6. | Husk trench | Nos | 24 | 50 | 0 | 0 | 8250 | 8250 | |
| 7. | Live fencing | RM | 400 | 2000 | 0 | 0 | 48000 | 48000 | |
| 8. | Yard water collection pit | Nos | 400 | 160 | 0 | 0 | 64000 | 64000 | |
| **TOTAL** | | | | | | **433680** | **120250** | **553930** | |

**Paravoor Watershed - Action Plan - Sector – II – Livelihood Activities for Land less/Asset less - II year**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | MNREGS / other source/Bank Loan | Total |
|---|---|---|---|---|---|---|---|
| 1 | seed money for enterprising individuals | Nos | 0 | 0 | 28080 | 0 | 28080 |
| 1 | Seed money for SHGs | | 0 | 0 | 112320 | 0 | 112320 |
| **TOTAL** | | | | | **140400** | **0** | **140400** |

**Paravoor Watershed - Action Plan - Sector – II – Livelihood Activities for Land less/Asset less - III year**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | MNREGS / other source/Bank Loan | Total |
|---|---|---|---|---|---|---|---|
| 1 | Seed money for SHGs | Nos | 0 | 0 | 56160 | 0 | 56160 |
| **III** | **Funding for Major livelihood activities** | | | | | | |
| 1 | vanitha vadhya sangam | Nos | 100000 | 1 | 84240 | 15760 | 100000 |
| | | | | **TOTAL** | **140400** | **15760** | **156160** |

| **Funding pattern** | |
|---|---|
| Seed money for enterprising individuals (10% of the allocation -Revolving fund) | 28080 |
| Seed money for SHGs (60 % of the allocation - Revolving fund) | 168480 |
| Funding for major livelihood activities (30% of the allocation - Grant in aid) | 84240 |
| **Total allocation** | **280800** |

**Action Plan - Sector – III – Production System & Micro Enterprises based livelihood activities - II year Action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | Total | WDF |
|---|---|---|---|---|---|---|---|
| 1 | Candle making unit | Nos | 21300 | 1 | 21300 | 21300 | 20 % for General & 10 % for SC / ST |
| 2 | Detergent making unit | Nos | 19500 | 1 | 19500 | 19500 | |
| 3 | Plantain cultivation for leaves | Ha | 24000 | 4 | 91200 | 91200 | |
| 4 | Goat rearing | Nos | 12000 | 2 | 24000 | 24000 | |
| | | | | **TOTAL** | **156000** | **156000** | |

**Action Plan - Sector – III – Production System & Micro Enterprises based livelihood activities - III year**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | Total | WDF |
|---|---|---|---|---|---|---|---|
| 1 | Organic vegetable cultivation - @Rs.2000 / 10 cent | Nos | 24000 | 5 | 120000 | 120000 | 20 % for General & 10 % for SC / ST |
| 2 | Vermi composting | Nos | 9000 | 4 | 36000 | 36000 | |
| | | | | **TOTAL** | **156000** | **156000** | |

**Total allotment - 312000**

**ENTRY POINT ACTIVITY - ACTION PLAN**

| Sl.no | Activity | Unit | Unit cost | Target | Amount |
|---|---|---|---|---|---|
| 1 | Cleaning and silt removing from the stream | $M^3$ | 205.20 | 159.60 | 32750 |
| 2 | Agronomical measures on the River sides | Rm | 139 | 400 | 55600 |
| 3 | Clearing thick throny jungle and small trees | $M^2$ | 21 | 250 | 5250 |
| 4 | Planting trees along the River sides | Nos | 27 | 600 | 16200 |
| 5 | Campaign work * | | | | 15000 |
| **GRAND TOTAL** | | | | | **124800** |

# KANNELAMTHODU WATERSHED

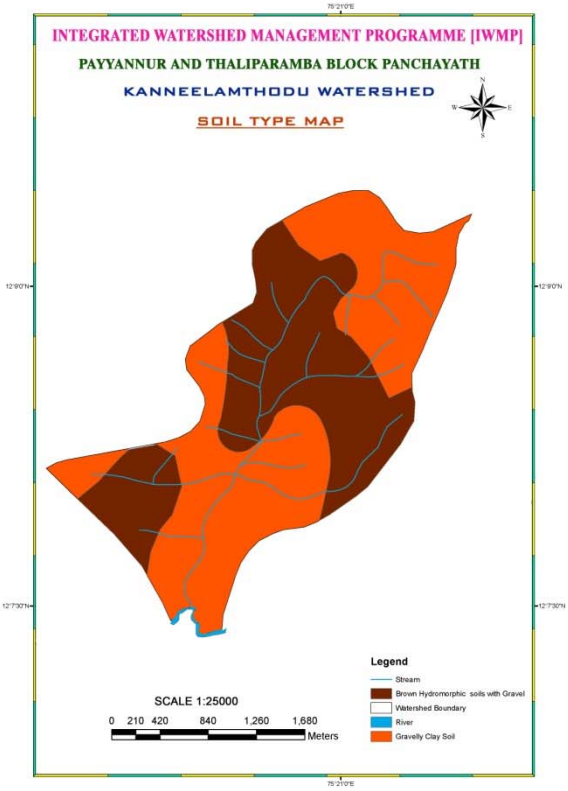
| | | |
|---|---|---|
| Grama Panchayat | : | Eramam – Kuttur &<br>Kadannappalli - Panapuzha, |
| Village | : | Vellora & Panapuzha |
| Wards covered | : | V of Kadannappally Panapuzha<br>XII & XIII wards of EramamKuttur |
| Block Panchayat | : | Payyanur & Thaliparamba |
| Thaluk | : | Kannur |
| District | : | Kannur |
| Total families covered | : | 378 |
| Total Population covered | : | 1663 |
| Total treatable Area | : | 602 Ha |
| River Basin | : | Peruvamba (Perumba) River |
| Average Length | : | 4.5. Kms. |
| Average Width | : | 4. Kms. |
| Total Project Cost | : | Rs. 90, 30,000/- |

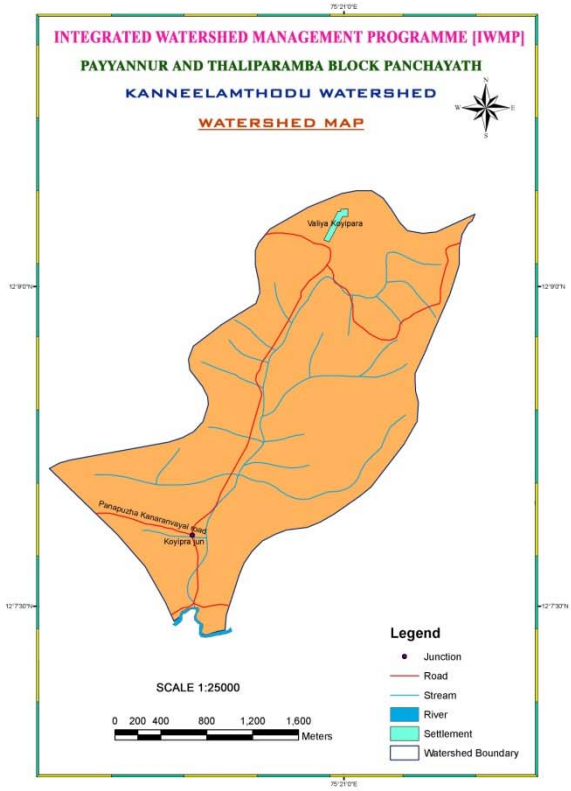
Boundaries : North: Eramam – Kuttur Gramam Panchayat

South: Panapuzha River

East: Alakkau I & Eriam I Watersheds

West: Panapuzhachal Watershed


INTEGRATED WATERSHED MANAGEMENT PROGRAMME [IWMP]
PAYYANNUR AND THALIPARAMBA BLOCK PANCHAYATH
KANNEELAMTHODU WATERSHED
SOIL TYPE MAP
75°21'0"E
12°9'0"N
12°7'30"N
Legend
Stream
Brown Hydromorphic soils with Gravel
Watershed Boundary
River
Gravelly Clay Soil
SCALE 1:25000
0 210 420 840 1,260 1,680
Meters


INTEGRATED WATERSHED MANAGEMENT PROGRAMME [IWMP]
PAYYANNUR AND THALIPARAMBA BLOCK PANCHAYATH
KANNEELAMTHODU WATERSHED
WATERSHED MAP
75°21'0"E
12°9'0"N
12°7'30"N
Valiya Koyipara
Panapuzha Kanaramvayal Road
Koyipra jun
Legend
Junction
Road
Stream
River
Settlement
Watershed Boundary
SCALE 1:25000
0 200 400 800 1,200 1,600
Meters

## Introduction

Kannelamthodu watershed is in the 5th ward of the Kadannappally – Panapuzha Panchayat and in the 12th and 13th wards of Eramam – Kuttur Grama Panchayat. Kannelamthodu watershed has a total area 602 ha out of which 402 ha are under cultivation. The agriculture is totally rainfed. The watershed has a cultivable wasteland of 199 Ha.

## Main places in the watershed:

The main places in the watershed are Paravoor, Anatty, Kundayadu, Thalapolinhi, Koyipra and Kannilamthodu are the main places in the watershed.

## Geographic Description of the Watershed:

## Location:

Kannelamthodu watershed is located in Panapuzha village of Thaliparamba Block Panchayath and Vellora village of Payyanur Block Panchayat. It is around 61km away from the District head quarters and is accessible by road. Pilathara, the nearest bus station of the watershed is situated around 26 km away in the west. Payyannur and Pazhayangadi Railway stations are almost at the same distance from the watershed. The watershed is situated around 7 km away from Eramam – Kuttoor Panchayath office. Paravoor is a small growing township in the watershed.

## The geographic coordinates

Geographically Kannelamthodu watershed lies between the east longitude $75^0$19'30" and $75^0$21'30" and north latitude $12^0$ 7'30" and $12^0$9'30" with a total elevation of 386 feet.

## Average length and width of the watershed

Kannelamthodu watershed is comparatively one of the biggest watersheds. The watershed has an average length of 4.5 km and 4 km width.

## Relief & Drainage

There are small hills and moderate valleys with plains in the upper reaches as well as lower reaches of the watershed. The watershed is specifically characterized by the presence of hill plains. In all three sides of the watershed are hills and on the top of the hills laterite rocks are present. The northern part of this watershed is Koyipra rocks which is part of Eramam Kuttur Grama Panchayat, in the eastern part is Madayida rocks and in the western part Painkiliyodu rocks. The slope ranges from $10^o$ to $40^o$.

The main drain of the watershed is Kannelamthodu. This stream is originating from the Koyipra Valiya vayal. Another important stream in the watershed, which could be considered as the main stream is Monthikkunnu Stream, originating from Monthikkunnu and entering into Kannilamthodu. The Kannelam stream flows about 5 Kms along the watershed with an average width of 8 Meters and an average depth of 3 meters. The sub-streams that enrich the main stream are: Paikiliyodu Thodu, Aanakuzhithodu, Paluvallithodu, Kundayadu Thodu, Thalapolinhi Thodu, Mummadakku Thodu and Muthukkallu thodu.

**The Drainage density:** Kannelamthodu has a drainage density of 27.45m/Ha.

**Other water sources**

There are five ponds in the watershed which are: Nareekamvally Kunhiraman's, Kalai Sreedharan's, Bhajanamadham Pradeepan's, Kanhirapuzha Narayanan's and Painkiliyodu Sathi Teacher's Ponds.

Besides the above water sources, the watershed have a total 372 wells amongst which 337 are perennial and the rest seasonal. However, water table in the summer is very poor in all these wells.

Regarding the wells, as usual each household has a well to meet their drinking water purposes and other domestic uses. Wells in the upper part of the watershed are drying up in summer causing water scarcity for the watershed communities, wells in the lower portion is perennial in nature and provide water throughout out the year. The **natural springs** are Muthukka, Thalapolinhi (2 Nos.), Kundayadu (2 Nos.)

**Present situation of the streams and other water bodies**

All the streams in the watershed including the main stream Kannelamthodu are seasonal. The five springs in the watershed are perennial and provides water to the community living around them.

Some of the ponds dry up in the middle of the summer. This results in low production during that period as the farmers did not get water for irrigation. Likewise, wells, especially in the upstream area also dry up in the summer.

Kannelamthodu and Monthikkunnu streams were perennial before years. Change in the land use, especially removal of vegetative cover of theland in huge quantities for mono crop cultivation made these streams seasonal with water flowing only during monsoon and some of the post monsoon months.

**Rainfall and Climate**

Kannelamthodu watershed is included in the midland zone and hence the climate is similar to that of other watersheds. The rainfall is comparatively high in the watershed. Maximum Rainfall is obtaining during the South-west Monsoon. Rain is also obtained during the North-east Monsoon. 55% of the rainfall is during the former and the rest is during the latter. The average rainfall in the watershed is 3697.6mm.

The temperature is similar to that of the other watersheds with humid hot season between March to the end of May. During the month of April and May the mean maximum temperature is $35^0$C and a minimum temperature of $26^{0.}$

**Soil Type & Depth**

The general condition of the soil is of two types. Brown hydromorphic soil with gravel is seen in the upper parts of the watershed and clay soil with gravels in the lower portions. The

watershed has a total area of 262.52 ha with brown hydromorphic soil and the rest, 339.48 ha consists of clay soil with gravels. Depth of the soil in the watershed is 100 cms to 150 cms.

**Agriculture & Land Use**

80% of the total area of the watershed is used for cultivation. Though in the early period the main cultivation was coconut and arecanut and now rubber is replacing all these traditional agriculture. Though there are paddy fields, it seems that people abandoned paddy cultivation and most of the paddy fields are converted for other land use purposes. Some are left un-cultivated for the last few years. This has to be considered as the cultivable waste. Such land is about 15 ha. Another 5 ha at Kundayadu area is found to be sludge. The land use pattern along with cultivated area is shown below:

| Crops | Land Used | % of Land used | Productivity |
|---|---|---|---|
| Coconut | 50.48 | 8.4 | 4178 |
| Areca nut | 30.53 | 5.08 | 5.55 |
| Cashew | 42.07 | 7 | 39.47 |
| Plantain | 12.02 | 2 | 95.69 |
| Vegetables | 7.21 | 1.2 | 11.03 |
| Tubers | 6.01 | 1 | 105.55 |
| Rubber | 194.58 | 32.21 | 262.77 |
| Cultivable Waste | 199 | 33.11 | 0 |
| Built Up Area | 60.1 | 10 | 0 |
| **Total** | **602** | **100** | |

**Animal Husbandry**

The farmer's interest in growing domestic animals is drastically reducing. This is also reflected in the Kannelamthodu watershed. Given below is a table of livestock in the watershed:

q. Hybrid Variety cows (Male) : 9
r. Hybrid Variety Cows (Female): 43
s. Indigenous Cows (Males): 7
t. Indigenous Cows(Females): 54
u. Goat(Males): 32
v. Goat (Female): 127
w. Indigenous fouls: 52
x. Hybrid Variety: 244

**Socio-Economic Details: The watershed population is given below:**

Total Population: 1663
Male: 798
Female: 865

APL Families: 180
BPL Families: 198

Majority of the families are categorized as BPL and only a small percentage can be considered as APL. However, a general observation brings a feel that the community belongs to Middle Class. The community draws their livelihood means mainly from wage labour in the construction sector and only a few are involved in agriculture. This is due to the specific nature of the land which is mostly unfertile due to laterite rocks. The farmers are only 5% and the government employees only 1%. There a negligible percentage of people doing their traditional work (Black smithy)

The nature of the houses shows that there is a general tendency to adopt RCC roofing against the traditional tiled roofing. But this could not be taken into consideration to assess the socio-economic situation of the community. Majority of the families own houses and only some migrants live in rented houses. Pucca sanitation facilities are available with individual households, and the general health condition is satisfactory.

90% of the households enjoy modern communication facilities and they have the habit of reading news papers and using telecommunication equipments. There for the knowledge level of the people is high and they are aware of the modern trends in commerce as well other related issues that directly affects the life.

**Road Network:**

The transport facilities in the watershed are satisfactory. The road network extends to every part of the watershed and their condition is also good. The important tar roads in the watershed are follows:

1. Eriam-Mathamangalam Road
2. Paravoor – Koyipra Road
3. Palullavally Road
4. Kuttur- Kakkara Road

The important mud road in the watershed is Kundayadu Anganwadi – Karipapoil Road which is awaiting for tarring

**Institutions and Community based organizations:**

The Main Institution and Community Based Organizations are listed below:

- Karayadu Anganwadi
- Karayadu L. P. School
- ICDP Subcentre, Karayadu
- Spark Arts & Sports Club
- Milk Co-op. Socirety
- Azhikodan Memorial Library
- Red StarArts & Sports Club
- Kundayadu Anganwadi
- Rubber Marketing Society
- Co-operative Bank
- Anatty Cultural Forum
- Young Voice Club, Koyipra
- Moque, Koyipra
- Kakkara Bhagavathi Temple
- Paluvally Sree Krishna Temple

**Market Facilities:**

The watershed community depends up on Mathamangalam bazaar and Paravoor Township for their marketing requirements. Mathamangalam Bazaar is situated about 8 Km away from the watershed

**Hospital facilities:** The watershed community can access the hospital facilities at Payyanur about 24 Km away from the watershed. They have also accessibility to the Pariyaram Medical College which is about 19 Kms away for further specialized treatment.

**Major Problems of the watershed**

The problems are categorized under four headings: Soil related, Water related, Agro-Bio Diversity Related and Animal Husbandry related. Such a categorization is in line with the activities that can be undertaken IWMP to solve the issues. The issues are listed below:

**Soil related Problems**

- Pertinent soil erosion in higher areas and slopes
- Reduced productivity
- Change in the chemical structure of the soil
- Reducing water storage capacity of the soil
- Heavy water drain from the soil
- Soil Pollution due to indiscriminate use of Chemicals

**Water related Problems**

- Severe drought in upper reaches like Koyipra, Anatty and Monthikkunnu
- Drying up of water sources at the end of post monsoon months
- High velocity runoff in the monsoon season resulting in stream bank erosion - Paluvallithodu, Kundayadu Thodu and Monthikkunnu Thodu
- Increasing number of bore-wells
- Lowering water yield in the catchment.
- Poor groundwater recharge
- Sedimentation in Ponds, Streams and paddy fields – Koyipra area
- Contamination due to direct disposal of waste

**Problems related to Agriculture/Bio-diversity**

- Unavailability of seeds with ensured germination
- Reluctance to cultivate food crops (replacing cash crops)
- Unavailability of quality organic fertilizers and bio-repellants
- Poor awareness on the importance and relevance of Organic Farming
- Alienated/extinct medicinal plants – Thazhuthama *(Borhavia difusa),* Ekanayakam *(Salesia reticulata),* Vathamkolly *(jestacia genderusa)*
- Shift from multi crops to mono crops (fast growing rubber plantations)
- Deterioration of natural grazing land/pastures
- Reducing Paddy fields
- Poor vegetable cultivation
- Reducing freshwater fishes

**Problems related to Livestock/Animal Husbandry**

- Reluctance in cow rearing
- Reducing livestock population
- Unavailability of green fodder/dry fodder
- High rearing cost and poor returns
- Lack of Interest in Animal Husbandry
- Reluctance of New generation in animal husbandry.

**Activities proposed to address the issues**

Generally the activities are of three folds: Natural Resource Management Activities which covers the soil, water and bio-diversity issues, Production System Management and Micro Enterprises (PS&M) which covers the agriculture and soil problems along with economic backwardness, , which manages the livelihoods and economic backwardness of the landless, women and the indigenous communities. Given below is a brief about the activities proposed for the watershed:

| **Natural Resource Management (NRM)** | **Production System & Micro- Enterprises (PS&M)** | **Livelihood Support Systems (LSS)** |
|---|---|---|
| **<u>Soil Conservation</u>**<br>1. Gully Plugging<br>2. Geo textiles<br>3. Live fencing<br>4. Stone bunding<br>5. Centripetal Terracing<br><br>**<u>Water Conservation</u>**<br>1. Well renovation<br>2. Yard water collection pits<br>3. Husk Trenches<br>4. Moisture Collection Pits<br>5. Source Recharging<br>6. Check Dams<br>7. Rain Water Harvesting<br>8. Pond renovation<br>9. VCB construction<br>10. Diversion canal<br>11. Well deepening | 1. Layer Distribution<br>2. Goat Rearing<br>3. Cow Rearing<br>4. Wormy Composting<br>5. Organic Vegetable cultivation<br>6. Banana Cultivation<br>7. Organic Fertilizer Distribution<br>8. Rabbit Rearing<br>9. Japanese Quail Rearing | 1. Mini Dairy Unit<br>2. Soap Making Unit<br>3. Candle Making Unit<br>4. Floor Cleaner Making Unit<br>5. Dish-wash liquid making unit<br>6. Distribution of tailoring Machines |

## Kannelamthodu Watershed Development Project (Area – 602 Ha) - Master plan for Four Years' Funding pattern

| Installment | Administration | Monitoring | Evaluation | Entry Point Activity | Institution & Capacity Building | DPR preparation | Watershed Development Activities | Livelihood Activities | Production system & Micro Enterprises | Consolidation Phase | Total IWMP project fund |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1St | 180600 | 18060 | 18060 | 361200 | 270900 | 90300 | 866880 | 0 | 0 | 0 | 1806000 |
| % | 2 | 0.2 | 0.2 | 4 | 3 | 1 | 9.6 | 0 | 0 | 0 | 20 |
| 2nd | 225750 | 18060 | 18060 | 0 | 90300 | 0 | 1498980 | 406350 | 451500 | 0 | 2709000 |
| % | 2.5 | 0.2 | 0.2 | 0 | 1 | 0 | 16.6 | 4.5 | 5 | 0 | 30 |
| 3rd | 270900 | 27090 | 27090 | 0 | 90300 | 0 | 1435770 | 406350 | 451500 | 0 | 2709000 |
| % | 3 | 0.3 | 0.3 | 0 | 1 | 0 | 15.9 | 4.5 | 5 | 0 | 30 |
| 4rd | 225750 | 27090 | 27090 | 0 | 0 | 0 | 1255170 | 0 | 0 | 270900 | 1806000 |
| % | 2.5 | 0.3 | 0.3 | 0 | 0 | 0 | 13.9 | 0 | 0 | 3 | 20 |
| **Total** | **903000** | **90300** | **90300** | **361200** | **451500** | **90300** | **5056800** | **812700** | **903000** | **270900** | **9030000** |
| % | 10 | 1 | 1 | 4 | 5 | 1 | 56 | 9 | 10 | 3 | 100 |

**Kannelamthodu Watershed - Sector – I – Watershed Development Activities - I year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/ Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Live fencing | RM | 24 | 2400 | 0 | 0 | 57600 | 57600 | 10 % General & 5 % SC / ST |
| 2. | Centry petal terracing | Nos | 65.67 | 300 | 0 | 0 | 19701 | 19701 | |
| 3. | Husk trench | Nos | 165 | 320 | 0 | 0 | 52800 | 52800 | |
| 4. | Moisture conservation pit | $M^3$ | 149 | 700 | 0 | 0 | 104300 | 104300 | |
| 5. | Stone bunding | $M^2$ | 144 | 282.9 | 0 | 40739 | 0 | 40739 | |
| 6. | Renovation of Open dug out pond at Koyipra | Nos | 460000 | 1 | 0 | 460000 | 0 | 460000 | |
| 7. | Check Dam near the plot of Moidheen | Nos | 354241 | 1 | 0 | 354241 | 0 | 354241 | |
| 8. | Plant Distribution | Nos | 50 | 238 | 0 | 11900 | 0 | 11900 | |
| **Total** | | | | | | **866880** | **234401** | **1101281** | |

**Kannelamthodu Watershed - Sector – I –Watershed Development Activities II year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/ Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Stone bunding | $M^2$ | 144 | 564.09 | 0 | 81230 | 70000 | 151200 | 10 % General & 5 % SC / ST |
| 2. | Moisture conservation pit | $M^3$ | 149 | 1200 | 0 | 0 | 178800 | 178800 | |
| 3. | Live fencing | RM | 24 | 4000 | 0 | 0 | 96000 | 96000 | |
| 4. | Yard water collection pit | Nos | 400 | 40 | 0 | 0 | 16000 | 16000 | |
| 5. | Well recharging | Nos | 12970 | 10 | 0 | 129700 | 0 | 129700 | |
| 6. | H Type gully controlling structures having 2m width across Kundayadu thodu at Muthukkallu | Nos | 20000 | 4 | 0 | 80000 | 0 | 80000 | |
| 7. | Constructing H Type check dams across sub drains in Koyipra area | Nos | 15000 | 3 | 0 | 45000 | 0 | 45000 | |
| 8. | H Type gully controlling structures having 3m width across Kannilam thodu at Koyipra | Nos | 20000 | 2 | 0 | 40000 | 0 | 40000 | |
| 9. | H Type gully controlling structures 4 m width across Kannilam thodu at Koyipra | Nos | 20000 | 1 | 0 | 20000 | 0 | 20000 | |
| 10. | H Type Check in Koyipra thodu | Nos | 15000 | 2 | 0 | 30000 | 0 | 30000 | |
| 11. | H Type Gully controlling structures having 5 m bed width across Kannilam thodu at Koyipra | Nos | 20000 | 7 | 0 | 140000 | 0 | 140000 | |
| 12. | H Type Gully controlling structures having 4 m bed width across Kannilam thodu at Koyipra | Nos | 22000 | 3 | 0 | 66000 | 0 | 66000 | |
| 13. | H Type Gully controlling structures having 5 m bed width across Kannilam thodu at Koyipra | Nos | 25000 | 5 | 0 | 125000 | 0 | 125000 | |
| 14. | VCB & Drainage Construction near the plot of Pileri Damodharan in Kannilamthodu | Nos | 722100 | 1 | | 722100 | 0 | 722100 | |
| 15. | Plant Distribution | Nos | 50 | 399 | | 19950 | 0 | 19980 | |
| **Total** | | | | | | **1498980** | **360800** | **1859780** | |

**Kannelamthodu Watershed - Sector – I – Watershed Development Activities - III year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/ Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Deepening the existing public well at Koyipra | Nos | 24000 | 1 | 0 | 24056 | 0 | 24056 | 10 % General & 5 % SC / ST |
| 2. | Improvements to the existing pond at Palunny Quarry | Nos | 100000 | 1 | 0 | 100000 | 0 | 100000 | |
| 3. | Construction of retaining wall along the east side of Kannilam thodu just Above the bridge near Paravoor town | RM | 2395 | 106.47 | 0 | 255000 | 0 | 255000 | |
| 4. | Pond Renovation in Koyipra Vayal | Nos | 180110 | 1 | 0 | 180110 | 0 | 180110 | |
| 5. | Stream bank stabilization along Kannilamthodu | RM | 2395 | 47.04 | 0 | 112680 | 0 | 112680 | |
| 6. | Stone bunding | $M^2$ | 144 | 1366 | 0 | 196704 | 0 | 196704 | |
| 7. | Well recharging | Nos | 12970 | 15 | 0 | 194550 | 0 | 194550 | |
| 8. | Stream bank stabilization in Koyiprathodu | RM | 2395 | 43.54 | 0 | 104300 | 0 | 104300 | |
| 9. | Stream bank stabilization | RM | 2395 | 109.77 | 0 | 262920 | 0 | 262920 | |
| 10. | Centry petal terracing | Nos | 65.67 | 300 | 0 | 0 | 19701 | 19701 | |
| 11. | Live fencing | Nos | 24 | 3500 | 0 | 0 | 84000 | 84000 | |
| 12. | Husk trench | Nos | 165 | 500 | 0 | 0 | 82500 | 82500 | |
| 13. | Plant Distribution | Nos | 50 | 109 | 0 | 5450 | 0 | 5450 | |
| **Total** | | | | | | **1435770** | **186201** | **1621971** | |

**Kannelamthodu Watershed - Sector – I – Watershed Development Activities - IV year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Stone bunding | $M^2$ | 144 | 1383 | 0 | 199152 | 0 | 199170 | 10 % General & 5 % SC / ST |
| 2. | Live fencing | RM | 24 | 3500 | 0 | 0 | 84000 | 84000 | |
| 3. | Husk trench | Nos | 165 | 300 | 0 | 0 | 49500 | 49500 | |
| 4. | Centry petal terracing | Nos | 65.67 | 400 | 0 | 0 | 26268 | 26268 | |
| 5. | Well recharge | Nos | 191 | 36 | 0 | 466920 | 0 | 466920 | |
| 6. | Stream bank stabilization in kannilamthodu 1.50m height | RM | 2395 | 235.24 | 0 | 563400 | 0 | 563400 | |
| 7. | Yard water collection pit | Nos | 400 | 25 | 0 | 10000 | 0 | 10000 | |
| 8. | Plant Distribution | Nos | 15698 | 1 | 0 | 15698 | 0 | 15680 | |
| **TOTAL** | | | | | | **1255170** | **159768** | **1414938** | |

**Kannelamthodu Watershed - Sector – II – Livelihood Activities for Land less/Asset less - II year Action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | MNREGS / other source/Bank Loan | Total |
|---|---|---|---|---|---|---|---|
| 1 | seed money for enterprising individuals | Nos | 0 | 0 | 81270 | 0 | 81270 |
| 1 | Seed money for SHGs | Nos | 0 | 0 | 325080 | 0 | 325080 |
| **TOTAL** | | | | | **406350** | **0** | **406350** |

**Kannelamthodu Watershed - Sector – II – Livelihood Activities for Land less/Asset less - III year Action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | MNREGS / other source/Bank Loan | Total |
|---|---|---|---|---|---|---|---|
| 1 | Seed money for SHGs | Nos | 0 | 0 | 162540 | 0 | 162540 |
| **II** | **Funding for Major livelihood activities** | | | | | | |
| 1 | Mini diary unit | Nos | 300000 | 2 | 243810 | 356190 | 600000 |
| **Total** | | | | | **406350** | **356190** | **762540** |

| **Funding pattern** | - |
|---|---|
| Seed money for enterprising individuals (10% of the allocation) | 81270 |
| Seed money for SHGs (60 % of the allocation) | 487620 |
| Funding for major livelihood activities (30% of the allocation) | 243810 |
| **Total allocation** | **812700** |

**Kannelamthodu Watershed - Sector – III – Production System & Micro Enterprises based livelihood activities - II year Action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | Total | WDF |
|---|---|---|---|---|---|---|---|
| 1 | Paultry farm | Nos | 122250 | 2 | 244500 | 244500 | 20 % for General & 10 % for SC / ST |
| 2 | soap making unit | Nos | 25000 | 1 | 25000 | 25000 | |
| 3 | Palantain cultivation for leaves | Ha | 22750 | 8 | 182000 | 182000 | |
| **TOTAL** | | | | | **451500** | **451800** | |

**Kannelamthodu Watershed - Sector – III – Production System & Micro Enterprises based livelihood activities – III year action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | Total | WDF |
|---|---|---|---|---|---|---|---|
| 1 | Banana cultivation | Nos | 24000 | 9 | 206700 | 216000 | 20 % for General & 10 % for SC / ST |
| 2 | Organic vegetable cultivation | Nos | 24000 | 9 | 216000 | 216000 | |
| 3 | Dish wash liquid making | Nos | 20800 | 1 | 20800 | 20800 | |
| 4 | Goat rearing | Nos | 8000 | 1 | 8000 | 8000 | |
| **TOTAL** | | | | | **451500** | **460800** | |

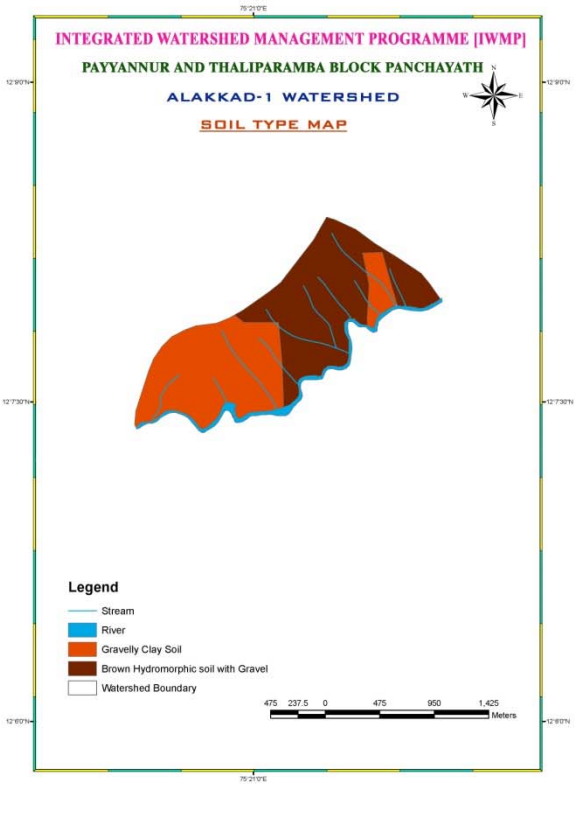
## Total Allotment -903000

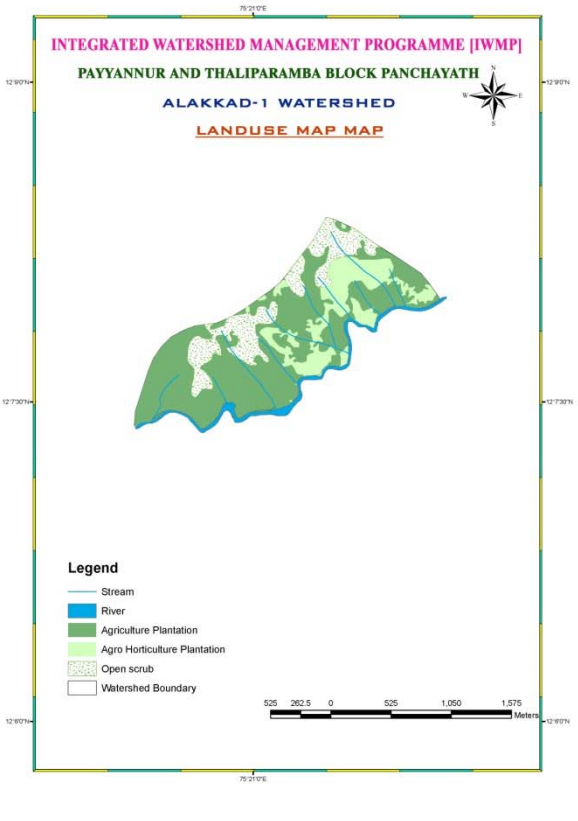
**KANNELAMTHODU WATERSHED ENTRY POINT ACTIVITY**

| Sl:no | Activity | Unit | Unit cost | Target | IWMP EPA fund | IWMP Project fund | Total |
|---|---|---|---|---|---|---|---|
| 2. | Renovation of open dug out pond at Koyipra | No | 981000 | 1 | 361200 | 619800 | 981000 |
| | Total | | | | **361200** | **619800** | **981000** |

# ALAKKADU I – WATERSHED

| | | |
|---|---|---|
| Grama Panchayat | : | Kadannappalli - Panapuzha, |
| Village | : | Panapuzha |
| Wards covered | : | V & VI wards |
| Block Panchayat | : | Thaliparamba |
| Thaluk | : | Kannur |
| District | : | Kannur |
| Total families covered | : | 182 |
| Total Population covered | : | 1085 |
| Total treatable Area | : | 207 Ha |
| River Basin | : | Peruvamba (Perumba) River |
| Average Length | : | 1.9. Kms. |
| Average Width | : | 3.2. Kms. |
| Total Project Cost | : | Rs. 31, 05, 000/- |
| Boundaries | : | North: Kannelamthodu Watershed |
| | : | South: Panapuzha River |
| | : | West: Kannelamthodu Watershed |
| | : | East: Eriam I Watershed |




**Introduction**

Alakkadu watershed covers the 5th and 6th wards of Kadannappally Panapuzha Grama Panchayat and coming under Thaliparamba Block. The revenue village in which the watershed is situated is Panapuzha of Kannur Thaluk. The watershed has a total area of 207 ha. Agriculture in the watershed n almost all areas is rainfed without any waste land.

**Main Places in the watershed**:

Alakkad, Ooradi, Parottipoyil, Odera, etc are the main places coming under the watershed.

**Geographical Description of the watershed**

**Location** : Alakkad I watershed is situated in Panapuzha Village of Thaliparamba block Panchayat. It is located at around 8 Km away from the Grama Panchayat Head quarters and around 50Km away from the District head quarters. The Nearest bus station, Pilathara is about 13km away from the watershed.

**The geographic coordinates**:

Geographically the watershed lies between the east longitude $75^0$20’30” and $75^0$22’0” and north latitude $12^0$7’0” and $12^0$8’30” with an average elevation of 245 ft.

**Average Length and Width**

:

The watershed has an average length of 1.9 km and a width of 3.2Km.

**Drainage & Relief**

The topography is seemed to be undulating with comparatively small hills and medium slopes. There are no plains in the watershed. However, the watershed is specifically characterized with it barren laterite rocks. In the southern part of the watershed is prominent with rocks and slopes.

The watershed is formed around the main stream Ooradi Valiyapallithodu. There are four more streams which the people considered to be important in the formation of the watershed. They are: Oderathodu, Enadamvalapp thodu, Alakkadu Mundangamthodu and Aarappathodu. The latter four streams contribute the hydrology and water table of the watershed to a great extent and people depend all these streams for the water requirement. Besides these important streams, the other streams (which mostly are seasonal) like Mundangam thodu, Parottipoil thodu, Bhasakran Peedika thodu and Mustafa Peedika thodu are also contributing to the water requirement of the watershed community.

**Drainage Density of the watershed is 30.92M/Ha**

**Other water Sources**

There are two ponds in the watershed: Madayappara Pond, and Alakkadu Ooradippara Pond. These two ponds are belonging to the Grama Panchayat and situated in common property land.

**Wells:**

| Sl. No. | Source | Total | Private | Public | Seasonal | Perennial |
|---|---|---|---|---|---|---|
| 1. | Well | **300** | 300 | 0 | 108 | 192 |
| 2. | Bore wells | **2** | 0 | 2 | 0 | 2 |
| 3. | Ponds | **2** | 2 | 0 | 0 | 2 |
| 4. | Springs | **4** | 4 | 0 | 2 | 2 |

People depend upon these water sources for all their purposes – irrigation, domestic use, animal husbandry etc. No big irrigation facilities are being provided to the watershed and hence the agriculture is fully rainfed.

**Present situation of the water bodies**

Streams are being leveled for construction works. For example the stream which had been flowing through the land of Mustafa Hajee is leveled and the stream does not exist now. Similarly there was a spring from which the stream Valappan Chindan Chal originated also had been leveled and this resulted in drying up of the stream. It is assumed that this stream will also be leveled for other purposes.

Water flow in the streams is only during the monsoon and one or two months of post monsoon. The river banks at the lower potions where these streams flow in to them usually undergoing stream bank erosion and land slip from the banks. When tree fallen down in the river, the river flow is diverting causing serious damage to the agriculture.

Water scarcity is experienced by the settlers at Parottipoyil and regions like Ooradi, Aarappa, Valiyapalli, etc. from February onwards. This means that the water sources in these areas are drying up right from the beginning of summer season.

**Rain fall and water availability in the watershed**

The watershed has a humid climate with heavy summer season from March to May. This is followed by South-West Monsoon (June-September) and North -East Monsoon (December-February).During the month of April and May the mean maximum temperature is $35^0$C. The annual average rainfall is 3697mm and 57% of it occurs during the period of June-July.

**Soil Type and depth**

In the plains (paddy fields) the soil is alluvial in nature and in the upper reaches of the watershed red soil mixed with gravels is seen. In the slopes, the general feature of the soil is red without gravels. The common depth of the soil in the watershed ranges from one meter to 1½ meters.

The general condition of the soil is of two types. One is brown hydromorphic soil with gravel and clay soil with gravels. The watershed has a total area of 101.60 ha with brown hydromorphic soil and the rest, 105.4 ha with clay soil with gravels.

**Agriculture & Land Use**

Major crops in the watershed are rubber. Even on the two sides of the river is planted with river. This is unseals in many watersheds as this area is utilized for mixed cultivation. Coconut, areca nut, cashew nut, pepper, plantain, paddy and the tubers like ginger and turmeric are other crops. Plots with mixed crop are the main feature of the watershed. The land use pattern is given in a tabular form followed by a graphic illustration:

| **Land Use** | **Area Used (Ha)** | **Percentage of Area used** | **ProductivityTonnes/Ha** |
|---|---|---|---|
| Coconut Cultivation | 24.84 | 12% | 20559 |
| Areca nut | 18.63 | 9% | 33.88 |
| Cashew Nut | 20.70 | 10% | 19.42 |
| Rubber Cultivation | 72.45 | 35% | 97.84 |
| Vegetable | 2.07 | 1% | 3.17 |
| Tuber Cultivation | 2.07 | 1% | 36.35 |
| Miscellaneous | 20.7 | 10% | 0 |
| Water Bodies | 14.49 | 7% | 0 |
| Built up area | 31.05 | 15% | 0 |
| **Total** | **207** | **100** | |

**Animal Husbandry**

The watershed is poor in Animal Husbandry. This could be because of the changed mentality of the farmers and the new living condition with modern houses and limited area of the house plots. The most important reason is the non-availability of fodder, both green and dry. When paddy has extinct, the availability of straw is a big question for the farmers. However, there are some exceptions in this case. Given below is a table of livestock in the watershed:

a. Hybrid Variety cows (Male) : 4
b. Hybrid Variety Cows (Female): 31
c. Indigenous Cows (Males): 8
d. Indigenous Cows(Females): 22
e. Goat(Males): 8
f. Goat (Female): 41
g. Indigenous fouls: 31
h. Hybrid Variety: 83

**General Socio-Economic Condition**

***The watershed population is given below:***

| Description | Nos. | Description | Nos. |
|---|---|---|---|
| Total Population | 1085 | SC Population Total | 37 |
| Male | 513 | Male (SC) | 19 |
| Female | 572 | Female (SC) | 18 |
| BPL Families | 120 | APL Families | 62 |

Majority of the population is either farmers or farm labourers. Therefore it is assumed that the main source of income and the main livelihood is agriculture. Besides this, there are some workers in the construction sector and some are in toddy industry. A few are working in the laterite stone quarries as stone cutters. Government employees are nominal. A very small number is working in Gulf Countries.

Almost all the families are living in own houses and almost 98% of the houses are electrified. A few houses at Ooradi region are waiting for electricity connection. Though almost all the houses have sanitation facilities, none of them have safe waste disposal mechanisms.

Almost all the household use Communication Medias like TV. News Papers, Radio, Telephone, mobile phone, etc. But none of the houses have internet facilities.

**Road Network:**

The watershed has a very good road network which allows people to move from one place to another. Public transport facilities are available in almost all roads. This helps people to reach the nearby townships for various purposes. The important roads in the watershed are listed below:

| SL No. | Name of the Road | Length(Km) |
|---|---|---|
| 1. | Arappa-Mundompoyil Road | 1 |
| 2. | Alakkad-Mundayompoyil-Koyipra Road | 3 |
| 3. | Alakkad-Mundayompoyil Road | 0.8 |
| 4. | Alakkad-Ooradi Road | 0.2 |
| 5. | Choweri Road | 0.1 |
| 6. | Ezhumvayal Colony Road | 0.5 |
| 7. | Odera-Ezhumvayal Road | 0.05 |

**Communication Facilities:**

Communication Facilities of the watershed are good. People depend on Newspapers, radio, television, telephone, internet, etc for communication.

**Electricity:**

Most of the houses in the watershed are electrified except a few houses (about15) in the Ooradi region. There are two transformers in the watershed at Alakkad Valiya Palli and Alakkad Cheriya Palli. So the watershed community has no voltage problems.

**Marketing Facilities:**

The watershed community depends Mathamangalam township for marketing which is about 5 Km away from the watershed. They also depend country market which within the watershed and at ariam side. For bigger marketing they depend on Thaliparamba or Pauyyanur markets.

**Hospital Facilities:**

There is a Primary Health Centre in the watershed which has a greater influence in the health condition of the people. The nearest super specialty hospital to the watershed is Pariyaram Medical College which is about 16Km away from the watershed.

**Main Institutions and Community based organizations:**

- Primary Health Centre Alakkad
- Alakkad Anganwadi
- Parottipoyil Anganwadi
- Alakkad Valiyapalli Anganwadi
- Vallathol Vayanasala Alakkad
- Red Star Arts and Sports Club
- EMS Mandir
- Alakkad Shri Kannankattu Temple
- Paluvalli Bajan Mandapam
- Alakkad Mosque
- Karuvanthodu Bhagavathi Temple

**Colony:**

Parottipoyil settlement which is like a colony is in the watershed. There are about 45 households and all belongs to the general category. Most of them depend on agriculture and allied activities like animal husbandry to meet their livelihood. The housing, electricity and sanitation facilities in the colony are good. The main problem experienced by the colony is drinking water scarcity.

**Major Problems:**

The community study and interaction with the community revealed the various problems in the watershed. The problems are grouped into four major categories-Soil related, Water related, Agro-Biodiversity related and animal Husbandry related.

**Soil Related Problems**

- Heavy soil erosion is experienced in almost all parts of the watershed due to over tillage on the slopes between Ooradi and Valiyapalli
- Poor or no conservation measures taken up to check the soil erosion
- Soil contamination due to unsafe disposal of solid and liquid wastes
- Removal of hills and hillocks to level the farm lands and make roads at Ooradi Region.
- Indiscriminate throwing of plastic waste affects the soil fertility and water absorption capacity near the township formed around Aalakkadu Valiyapalli
- Land Slip along the banks of river and streams (Odera thodu, Kunnummachal Thodu, Madayappara Thodu, .etc.)

**Water Related Issues**

- Drinking water scarcity in the upper reaches of the watershed like Ooradi, Paluvalli, Mundompoil and Aarappa
- High velocity runoff affects the stability of the stream banks resulting in Stream Bank erosion. (Odera thodu, Kunnummachal Thodu, Madayappara Thodu, .etc.)
- The vegetative cover along the banks of the river and streams are destroyed

- Residual reactions as a result of indiscriminate application of chemicals polluted the water sources
- Poor or no conservation measures taken up to conserve water
- Water contamination due to leaching, especially in settlements like Parottipoil
- Removal of hills and hillocks affects the water availability in Ooradi Region
- Leveling of streams and springs result in water scarcity and poor production.

**Agro-Biodiversity related Issues**

- Indiscriminate application of Chemical Fertilizers and Pesticides negatively affects Bio-diversity
- Shift to Mono Crops
- Extinct herbs and shrubs (Musa superba, Alangium Salvifolium, Glycosmis pentafella, Icbolium Verida, etc….)
- Traditional fruit bearing trees are not further promoted ( For example: jack (Artocarpusheterophillus), mango (Mangifera indica), guava, Pappaya, Amla…etc.)
- Cutting down of plants and tress without replanting.

**Animal Husbandry Related Issues**

- Alienation of indigenous varieties for want of hybrid varieties.
- Reduction & Deterioration of common grazing lands
- Inadequacy of land and water for fodder cultivation
- Unavailability of straw
- Unaffordable price for dry fodder (Company made)

**Activities proposed to address the issues**

Generally the activities are of three folds: Natural Resource Management Activities which covers the soil, water and bio-diversity issues, Production System Management and Micro Enterprises (PS&M) which covers the agriculture and soil problems along with economic backwardness, , which manages the livelihoods and economic backwardness of the landless, women and the indigenous communities. Given below is a brief about the activities proposed for the watershed:

| **Natural Resource Management (NRM)** | **Production System & Micro-Enterprises (PS&M)** | **Livelihood Support Systems (LSS)** |
|---|---|---|
| **<u>Soil Conservation</u>**<br>1. Gully Plugging<br>2. Live fencing<br>3. Stone bunding<br>4. Centripetal Terracing<br><br>**<u>Water Conservation</u>**<br>1. Yard water collection pits<br>2. Husk Trenches<br>3. Moisture Collection Pits<br>4. Source Recharging<br>5. Check Dams<br>6. Rain Water Harvesting<br>7. Retaining wall | 1. Goat Rearing<br>2. Cow Rearing<br>3. Banana Cultivation<br>4. Organic Vegetable cultivation<br>5. Vermin Composting | 1. Consumer Store<br>2. Candle Making Unit<br>3. Detergent Making Unit |

**Implementation Arrangements – Watershed Committee**

The project activities will be implemented by the watershed community under the close supervision of the PIA and the WC. The nano groups will be responsible for the undertaking of the activities proposed for their area. This will be closely supervised by the watershed committee. Timely information will be passed to the concerned Grama Panchayats and the WDT by the watershed committees. The structure of the watershed committee is given below with its present members as follows:

| Sl. No. | Name | Designation | Position | Phone No. |
|---|---|---|---|---|
| 1. | T. Sulaja | GP President | Chairperson | 9961493767 |
| 2. | Nalinakshi C. | Ward Member | Vice Chairperson | 9605414199 |
| 3. | Ruby Jannette Johny | Agriculture Officer | Convenor | 9961130832 |
| 4. | Hamsa.C | Nanma NHG | Jt. Convener | 9846914486 |
| 5. | Sheena. K. M | VEO, Kadannappally | Secretary | 9497612495 |
| 6. | Kuthur Krishnan | Koottayma NHG | Jt. Secretary | 9847266364 |
| 7. | N.Karthyayani | Prakrithi NHG | Treasurer | 9961493782 |
| 8. | Madhusudanan.K. | Koottayma NHG | Member | 9847670235 |
| 9. | Khadar.K. | Valiyapalli NHG | Member | |
| 10. | Thomas.T.J. | Sahrudhaya NHG | Member | |
| 11. | Rabiya T.K. | Valiyapalli NHG | Member | 9656256464 |
| 12. | Shantha K.V. | Nanma NHG | Member | |
| 13. | Mukundan K. | Prakrithi NHG | Member | 9447044414 |
| 14. | Ramani M. | Ward Member | Member | 9846916231 |
| 15. | P. V. Bhaskaran | President – Co-Op. Bank | Member | 04985 - 278004 |

**Alakkad - I Watershed Development Project (Area – 207 Ha)**
**Master plan for Four Years - Funding pattern**

| Installment | Administration | Monitoring | Evaluation | Entry Point Activity | Institution & Capacity Building | DPR preparation | Watershed Development Activities | Livelihood Activities | Production system & Micro Enterprises | Consolidation Phase | Total IWMP project fund |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1St | 62100 | 6210 | 6210 | 124200 | 93150 | 31050 | 298080 | 0 | 0 | 0 | 621000 |
| % | 2 | 0.2 | 0.2 | 4 | 3 | 1 | 9.6 | 0 | 0 | 0 | 20 |
| 2nd | 77625 | 6210 | 6210 | 0 | 31050 | 0 | 515430 | 139725 | 155250 | 0 | 931500 |
| % | 2.5 | 0.2 | 0.2 | 0 | 1 | 0 | 16.6 | 4.5 | 5 | 0 | 30 |
| 3rd | 93150 | 9315 | 9315 | 0 | 31050 | 0 | 493695 | 139725 | 155250 | 0 | 931500 |
| % | 3 | 0.3 | 0.3 | 0 | 1 | 0 | 15.9 | 4.5 | 5 | 0 | 30 |
| 4rd | 77625 | 9315 | 9315 | 0 | 0 | 0 | 431595 | 0 | 0 | 93150 | 621000 |
| % | 2.5 | 0.3 | 0.3 | 0 | 0 | 0 | 13.9 | 0 | 0 | 3 | 20 |
| **Total** | **310500** | **31050** | **31050** | **124200** | **155250** | **31050** | **1738800** | **279450** | **310500** | **93150** | **3105000** |
| % | 10 | 1 | 1 | 4 | 5 | 1 | 56 | 9 | 10 | 3 | 100 |

**Alakkad I - Sector –I - Watershed - Watershed Development Activities - I year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Moisture collection pits | $M^3$ | 149 | 500 | 0 | 0 | 74500 | 74500 | 10 % General & 5 % SC / ST |
| 2. | Centri Petal Teressing | Nos | 65.67 | 500 | 0 | 0 | 32835 | 32835 | |
| 3. | Husk trunch | Nos | 169 | 500 | 0 | 0 | 84500 | 84500 | |
| 4. | Stone bunding | $M^2$ | 144 | 279.131 | | 40195 | 0 | 40195 | |
| 5. | Gully controlled check dam | RM | 2996 | 6.36 | 0 | 19080 | 0 | 19080 | |
| 6. | Retaining wall (1.00m height ) | RM | 2395 | 72.63 | 0 | 173955 | 0 | 173955 | |
| 7. | Yard water collection pit | Nos | 400 | 30 | 0 | 0 | 12000 | 12000 | |
| 8. | well recharging | Nos | 12970 | 5 | 0 | 64850 | 0 | 64850 | |
| **Total** | | | | | | **298080** | **203835** | **501915** | |

**Alakkad I Watershed - <u>Sector – I – Watershed Development Activities - II year action plan</u>**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Centri Petal Teressing | Nos | 65.67 | 800 | 0 | 0 | 52536 | 52536 | 10 % General & 5 % SC / ST |
| 2. | Stone bunding | $M^2$ | 144 | 730.5 | 0 | 105195 | 0 | 105195 | |
| 3. | well recharging | Nos | 12970 | 10 | 0 | 129700 | 0 | 129700 | |
| 4. | Husk trunch | Nos | 169 | 800 | 0 | 0 | 135200 | 135200 | |
| 5. | Gully controlled check dam | RM | 2996 | 9.06 | 14424 | 12720 | 0 | 27144 | |
| 6. | Retaining wall (1.00m height ) | RM | 2395 | 33.4 | 0 | 80015 | 0 | 80015 | |
| 7. | Yard water collection pit | Nos | 400 | 600 | 0 | 0 | 240000 | 240000 | |
| 8. | Moisture collection pits | $M^3$ | 149 | 500 | 0 | 0 | 74500 | 74500 | |
| 9. | Retaining wall (1.50m height ) | RM | 2395 | 78.4 | 0 | 187800 | 0 | 187800 | |
| **Total** | | | | | 14424 | 515430 | 502236 | 1032090 | |

**Alakkad I Watershed - <u>Sector – I – Watershed Development Activities - III year action plan</u>**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | RWH tank 5000 ltr capacity for individual | Nos | 32500 | 3 | 0 | 97500 | 0 | 97500 | 10 % General & 5 % SC / ST |
| 2. | Retaining wall (1.50m height ) | RM | 2395 | 100.1245 | 0 | 188034 | 0 | 188034 | |
| 3. | Well Recharging | Nos | 169 | 800 | 0 | 0 | 135200 | 135200 | |
| 4. | Husk trunch | Nos | 12970 | 9 | 0 | 116730 | 0 | 116730 | |
| 5. | Stone bunding | $M^2$ | 144 | 502.4 | 0 | 72351 | 0 | 72351 | |
| 6. | Moisture collection pits | $M^3$ | 149 | 800 | 0 | 0 | 119200 | 119200 | |
| 7. | Gully controlled check dam | RM | 2996 | 6.36 | 0 | 19080 | 0 | 19080 | |
| 8. | Yard water collection pit | Nos | 400 | 20 | 0 | 0 | 8000 | 8000 | |
| 9. | Centri Petal Teressing | Nos | 65.67 | 1000 | 0 | 0 | 65670 | 65670 | |
| **Total** | | | | | | **493695** | **328070** | **821765** | |

**Alakkad I Watershed - <u>Sector – I – Watershed Development Activities - IV year action plan</u>**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | well recharging | Nos | 12970 | 5 | 0 | 64850 | 0 | 64850 | 10 % General & 5 % SC / ST |
| 2. | Stone bunding | $M^2$ | 144 | 279.1 | 0 | 40195 | 0 | 40195 | |
| 3. | Gully controlled check dam | RM | 2996 | 4.2 | 0 | 12720 | 0 | 12720 | |
| 4. | Retaining wall (1.50m height ) | RM | 2395 | 69.05 | 0 | 165390 | 0 | 165390 | |
| 5. | Husk trunch | Nos | 169 | 600 | 0 | 0 | 101400 | 101400 | |
| 6. | Centry petal terracing | RM | 65.67 | 600 | 0 | 0 | 39402 | 39402 | |
| 7. | RWH tank 5000 ltr capacity for individual | Nos | 32500 | 2 | 0 | 65000 | 0 | 65000 | |
| 8. | Yard water collection pit | Nos | 400 | 20 | 0 | 0 | 8000 | 8000 | |
| 9. | Moisture collection pit | $M^3$ | 149 | 500 | 0 | 0 | 74500 | 74500 | |
| 10. | Retaining wall (1.00m height ) | RM | 2395 | 34.83 | 0 | 83440 | 0 | 83440 | |
| **Total** | | | | | | **431595** | **223302** | **654897** | |

**Alakkad - I Watershed - Sector – II – Livelihood Activities for Land less/Asset less - II year Action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | MNREGS / other source/Bank Loan | Total |
|---|---|---|---|---|---|---|---|
| 1 | seed money for enterprising individuals | Nos | 0 | 0 | 27945 | 0 | 27945 |
| 1 | Seed money for SHGs | | 0 | 0 | 111780 | 0 | 111780 |
| **TOTAL** | | | | | **139725** | **0** | **139725** |

**Alakkad - I Watershed - Sector – II – Livelihood Activities for Land less/Asset less - III year Action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | MNREGS / other source/Bank Loan | Total |
|---|---|---|---|---|---|---|---|
| 1 | Seed money for SHGs | Nos | 0 | 0 | 55890 | 0 | 55890 |
| III | Funding for Major livelihood activities | | | | | | |
| 1 | Consumer store | Nos | 168000 | 1 | 83835 | 84165 | 168000 |
| **TOTAL** | | | | | **139725** | **84165** | **223890** |

| **Funding pattern** | | |
|---|---|---|
| Seed money for enterprising individuals (10% of the allocation -Revolving fund) | | 27945 |
| Seed money for SHGs (60 % of the allocation - Revolving fund) | | 167670 |
| Funding for major livelihood activities (30% of the allocation - Grant in aid) | | 83835 |
| **Total allocation** | | **279450** |

**Alakkad - I Watershed - Sector – III – Production System & Micro Enterprises based livelihood activities - II year Action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | Total | WDF |
|---|---|---|---|---|---|---|---|
| 1 | Candle making unit | Nos | 21300 | 1 | 21300 | 21300 | 20 % for General & 10 % for SC / ST |
| 2 | Detergent making unit | Nos | 19500 | 1 | 19500 | 19500 | |
| 3 | Banana cultivation | Nos | 24000 | 5 | 102450 | 120000 | |
| 4 | Goat rearing | Nos | 12000 | 1 | 12000 | 12000 | |
| **TOTAL** | | | | | **155250** | **172800** | |

**Alakkad - I Watershed - Sector – III – Production System & Micro Enterprises based livelihood activities - IV year action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | Total | WDF |
|---|---|---|---|---|---|---|---|
| 1 | Organic vegetable cultivation - @Rs.2000 / 10 cent | Nos | 24000 | 5 | 120000 | 120000 | 20 % for General & 10 % for SC / ST |
| 2 | Vermi composting | Nos | 9000 | 4 | 35250 | 36000 | |
| **TOTAL** | | | | | **155250** | **156000** | |

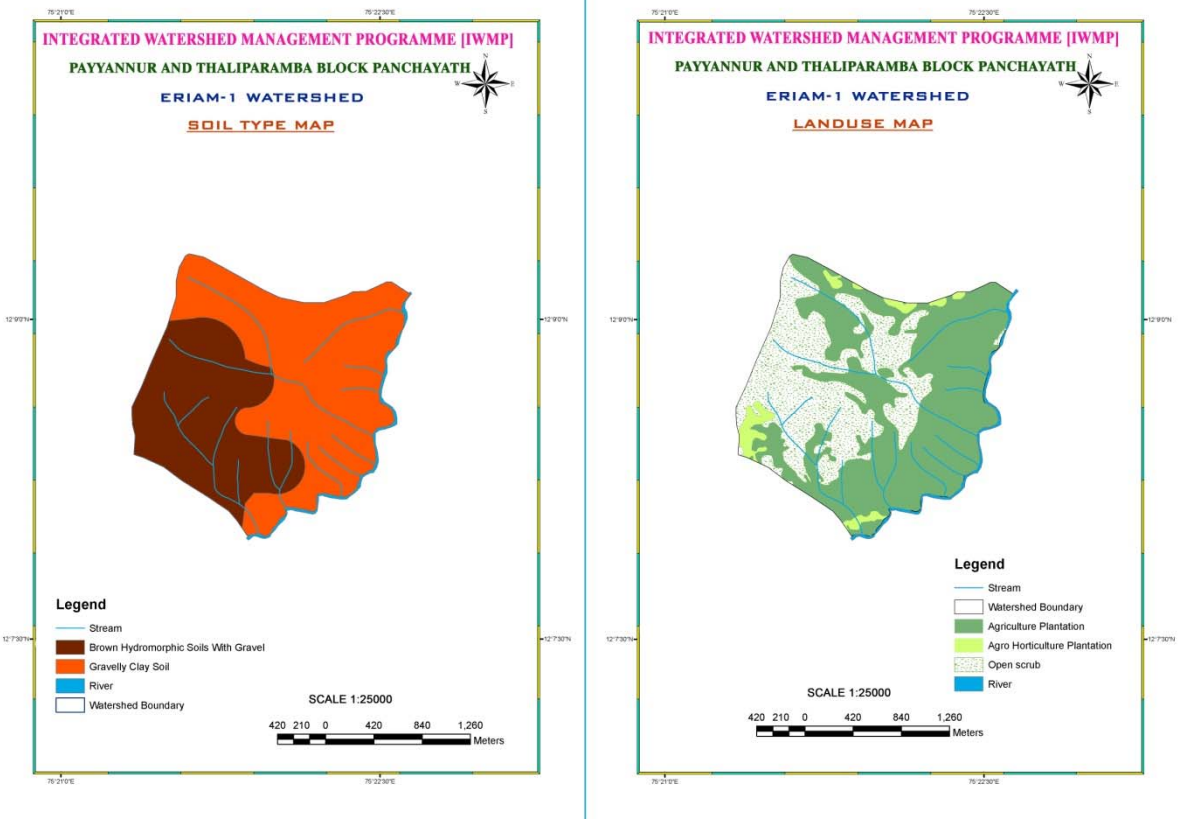
| | | |
|---|---|---|
| **Total allotment** | | **310500** |

**ENTRY POINT ACTIVITY - ACTION PLAN - KADANNAPPALI –PANAPUZHA& ERAMAM KUTTUR GRAMAPANCHAYATH - ALAKKAD I W/S**

| Sl.no | Activity | Unit | Unit cost | Target | Amount |
|---|---|---|---|---|---|
| 1 | Cleaning and silt removing from the stream | $M^3$ | 205.20 | 180.07 | 36950 |
| 2 | Agronomical measures on the River sides | Rm | 139 | 400 | 55600 |
| 3 | Clearing thick throny jungle and small trees | $M^2$ | 21 | 150 | 3150 |
| 4 | Planting trees along the River sides | Nos | 27 | 500 | 13500 |
| 5 | Campaign work * | | | | 15000 |
| **GRAND TOTAL** | | | | | **124200** |

# ERIAM – I WATERSHED

| | | |
|---|---|---|
| Grama Panchayat | : | Eramam – Kuttur & Kadannappalli - Panapuzha, |
| Village | : | Vellora & Panapuzha |
| Wards covered | : | VII of Kadannappally Panapuzha<br>XII wards of EramamKuttur |
| Block Panchayat | : | Payyanur & Thaliparamba |
| Thaluk | : | Kannur |
| District | : | Kannur |
| Total families covered | : | 161 |
| Total Population covered | : | 709 |
| Total treatable Area | : | 370 Ha |
| River Basin | : | Peruvamba (Perumba) River |
| Average Length | : | 2.75. Kms. |
| Average Width | : | 2.75. Kms. |
| Total Project Cost | : | Rs. 55, 50,000/- |
| Boundaries | : | North: Thalichal Watershed |
| | : | South: Panapuzha River |
| | : | East: PanapuzhaRiver |
| | : | West: Eriam - I Watershed |




**Introduction**

Eriam – I watershed covers the 7th ward of Kadannappally – Panapuzha Grama Panchayat and 12th ward of Eramam Kutuur Grama Panchayat. It has a total geographic area of 370 ha out of which 138 ha is cultivable waste. In Kadannappally – Panapuzha Grama Panchayat the watershed shares a total area of 206.67 ha and the rest is in Ermama Kuttur Grama Panchayat. The whole area is considered as rainfed as a very small portion of the total available area has irrigation facilities that too in small scale.

**Main places in the watershed:**

The important places in the watershed are, Thennam, Eriam, Nechangadu, Cheeta, Karuvankunnu, Bekkalm and Theradimala.

**Geographic Description of the Watershed:**

***a. Location:***

Eriam I watershed is located in two villages, Panapuzha of Thaliparamba Block Panchayath and Vellora of Payyanur Block Panchayat. It is around 56 km away from the District Head Quarters and is accessible by road. Pilathara, the nearest bus station of the watershed is situated around 16 km away in the west. Payyannur and Pazhayangadi Railway stations are almost at the same distance from the watershed, i.e., 24 Kms. The watershed is situated around 8 km away from Eramam – Kuttoor Panchayath office. Eriam is a small growing township in the watershed.

b. **The geographic coordinates:** Geographically Eriam - I watershed lies between the east longitude $75^0$21'30" and $75^0$22'30" and north latitude $12^0$8'0" and $12^0$9'30" with a total elevation of 386 feet.

**c. Average length and width of the watershed**

Eriam - I watershed is with a mediocre size. The watershed is almost square in shape with an average length of 2.75km and 2.75 km width.

**Relief & Drainage**

The terrain of the watershed can be divided into two distinct categories – Hills and plains. However, the plains are lesser than the hills. 60% of the total area is hilly and the rest is comparatively plain. The topography of the watershed is slightly undulating with small hillocks and moderate slopes. The higher ranges of the watershed is with soft laterite rocks and comparatively unfit for cultivation. Lower portions of the watershed are cultivated and are comparatively less undulating. The Theradimala forms a safeguarding wall of the watershed in the north-western part of the watershed.

The main drainage of the watershed is Eriam River to which a number of streams are entering in. The important streams that drain the watershed are, Eriam School stream, Eriam Cheetha stream, Eriam Pathayakkundu stream, stream originating from the land of Rajankutty, stream originating from the land of Bhaskaran Nair, stream originating from the land of Hamza Haji and several other smaller streams.
There are 7 springs in the watershed. One is in the place known as Eriam Cheetha from which the Cheethathodu is originating, Pathayakkundu Spring from which Pathayakkundu Stream originates and the other five are in private lands.

**The Drainage density:** Eriam - I has a drainage density of 32.03m/Ha.

**Other water sources**

Though there is no public ponds there are three ponds owned by farmers – A.M. Krishnan Nair, Palakkodan Muhammed and Kaniyakkunnel Baby. Along with this there is one community well (Near the shop of Shivaraman at Thennam) and 161 private wells. Out of the wells 58 are seasonal and the rest 103 are perennial. It was observed that people living in the upstream experience severe drought during the summer season.

**Present situation of the streams and other water bodies**

All the streams in the watershed except the main drainage Panapuzha River and Chethathodu are perennial. Others dry up in the summer season. Out of the seven springs five springs in the watershed are seasonal and provides water to the community living around them during the early post monsoon months. Water is available in the ponds throughout the year.

**Rainfall and Climate**

Eriam - I watershed is included in the midland zone and hence the climate is similar to that of other watersheds. The rainfall is comparatively high in the watershed. Maximum Rainfall is

obtaining during the South-west Monsoon. Rain is also obtained during the North-east Monsoon. 58% of the rainfall is during the former and the rest is during the latter. The average rainfall in the watershed is 3697.6 mm.

The temperature is similar to that of the other watersheds with humid hot season between March to the end of May. During the month of April and May the mean maximum temperature is $35^0$C and a minimum temperature of $26^{0.}$

**Soil Type & Depth**

The general condition of the soil is of two types. Brown hydromorphic soil is seen in the upper parts of the watershed and gravel clay soil in the lower portions. The watershed has a total area of 152.25 ha with brown hydromorphic soil and the rest, 217.75 ha consists of clay gravelly soil with gravels. Depth of the soil in the watershed is 100 cms to 150 cms.

**Agriculture & Land Use**

Though the watershed is only of a few ha (370 ha), according to the land use data 138 ha are left uncultivated and considered as cultivable waste. However, in its physical appearance, the watershed is blessed with greenery, major part of which is the contribution of rubber plantations. There are mixed crop cultivation is also in some parts of the watershed. However, the trend is that the rubber plantation is replacing almost all types of cultivation in the watershed. Traditional agriculture is in question in the watershed. This has created a situation where the land is becoming lesser and lesser fertile for traditional cultivation and getting contaminated with application of chemical fertilizers and pesticides. The land use pattern is shown below:

| Crops | Land Used | % of Land used | Produ-ctivity |
|---|---|---|---|
| Coconut | 28.93 | 7.82 | 2394 |
| Areca nut | 15.64 | 4.22 | 28.44 |
| Cashew | 18.94 | 5.12 | 17.77 |
| Pepper | 7.77 | 2.1 | 2.28 |
| Plantain | 4.58 | 1.2 | 36.46 |
| Vegetables | 10.18 | 2.75 | 15.58 |
| Tubers | 4.54 | 1.2 | 79.73 |
| Rubber | 83.78 | 22.64 | 113.14 |
| Cultivable Waste | 138 | 37.29 | 0 |
| Built Up Area | 58.29 | 15.75 | 0 |
| Total | 370 | 100 | |

**Animal Husbandry**

The farmer's interest in growing domestic animals is drastically reducing. This is also reflected in the Eriam - I watershed. Given below is a table of livestock in the watershed:

a. Hybrid Variety cows (Male) : 8
b. Hybrid Variety Cows (Female): 44
c. Indigenous Cows (Males): 9
d. Indigenous Cows(Females): 62
e. Goat(Males): 41
f. Goat (Female): 118
g. Indigenous fouls: 62
h. Hybrid Variety: 178

**Socio-Economic Details:**
***The watershed population is given below:***

Total Population: 709
Male: 340
Female: 369

APL Families: 42
BPL Families: 119

Eighty Five percentage of the people living in the watershed depend upon agriculture and allied activities like animal husbandry for their livelihood. The migration of the agrarian communities from southern regions of the state, especially from Travancore area played a pivotal role in changing the culture and living conditions of the natives. As rubber become the main cultivation, the economic situation of the area has been changed significantly. Approximately 5% of the people in the watershed are told to be working in the construction sector and another 7% are working abroad. The rest are either government employees or self-employed.

Educational level of the people is satisfactory and major portion of the population have completed their High School/Higher Secondary School Education. A very good number of people in the watershed have acquired collegiate education and this could be a reason for the government employment. In promoting education among the watershed community, certain educational institutions like Vidyamithram U.P. School within the watershed and the accessibility of other higher educational institution to the watershed community.

Every family has very good houses and majority of the houses are with tiles roof. There is a general tendency, as in the case of other watersheds in the Grama Panchayat, to bring a shift to RCC roof as the wooden construction materials are not easily available. The houses also have adequate sanitation facilities but poor waste disposal arrangements.

The general economic condition of the people in the watershed is that of middle class. The average annual income of majority of the families is between Rs. 60,000 and Rs. 120,000/- Most of the children in the school going age gets very education and the educational facilities are available within the reach of the watershed community.

**Road Network:**

The transport facilities in the watershed are satisfactory. The road network extends to every part of the watershed and their condition is also good. The important tar roads in the watershed are follows:

1. Eriam-Thennam Road (Tarred) 1.3 Kms Length and 6 meters width
2. Eriam - Kanaramvayal Road (Tarred) ½ Km length and 6 meter width
3. Eriam – Bekkalam Road (Mud) 1.65 Kms Length and 4 meter width
4. Thennam - Bekkalam Road (Mud) ½ Kms Length 4 meters width
5. Eriam- Thennam Parallel Road (Mud) 1.2. kms length 4 meters width
6. Eriam-Mavullapoil Road (Tarred) 1 Km length and 4 meters width

**Institutions and Community based organizations:**
***The Main Institution and Community Based Organizations are listed below:***

- Vidyamithram UP School
- Post Office

- Thennam Mosque
- Service Co-op. Bank
- Anganwadi, Thennam
- Gnanodayam Reading Room
- Kairali Arts & Sports Club
- Lucky Star Arts & Sports Club
- Puliyoor Kali Temple
- Homeo Dispensary
- Paluvally Sree Krishna Temple
- Eriam Mahavishnu Temple

**Market Facilities:**

The watershed community depends up on Eriam Township within the watershed and Perumbadavu Township near the watershed area for their immediate needs. Mathamangalam Bazaar is situated about 10 Km away from the watershed

**Hospital facilities:**

The only government facility is the Homeo hospital situated in the watershed. The watershed community can access the hospital facilities at Payyanur about 26 Km away from the watershed. They have also accessibility to the Pariyaram Medical College which is about 20 Kms away for further specialized treatment.

**Major Problems of the watershed**

The problems are categorized under four headings: Soil related, Water related, Agro-Bio Diversity Related and Animal Husbandry related. Such a categorization is in line with the activities that can be undertaken in IWMP to solve the issues. The issues are listed below:

| Soil related Problems | Water related Problems | Problems related to Agriculture/Bio-diversity | Problems related to Livestock/Animal Husbandry |
|---|---|---|---|
| • Severe and heavy soil erosion<br>• Reducing productivity of the soil<br>• Deterioration of the soil humus<br>• Change in the chemical structure of the soil and reducing storage capacity | • Severe drought<br>• High velocity runoff in the monsoon season<br>• Increasing number of bore-wells<br>• Lowering water table<br>• Sedimentation in the water bodies<br>• introduction of plantation crops | • Reluctance to cultivate food crops<br>• Unavailability of quality organic fertilizers and bio-repellants<br>• Poor awareness on the importance and relevance of Organic Farming | • Reduction in cow rearing<br>• Reduction in poultry<br>• Poor performance of the veterinary hospitals<br>• Unavailability of green fodder/dry fodder |

| | | | |
|---|---|---|---|
| of the soil<br>➧ Heavy water drain from the soil<br>➧ Soil Pollution due to indiscriminate use of Chemicals | ➧ Contamination of stream side aquifer<br>➧ Contamination due to direct disposal of waste<br>➧ Waterborne diseases especially during monsoon. | ➧ Shift from multi crops to mono crops<br>➧ Reducing Paddy fields<br>➧ Poor vegetable cultivation<br>➧ Reducing freshwater fishes | ➧ Inadequate returns<br>➧ Lack of Interest in Animal Husbandry<br>➧ New generation reluctant to enter into the field of animal husbandry. |

**Activities proposed to address the issues**

| Natural Resource Management (NRM) | Production System & Micro-Enterprises (PS&M) | Livelihood Support Systems (LSS) |
|---|---|---|
| **<u>Soil Conservation</u>**<br>1. Gully Plugging<br>2. Stream Bank Stabilization<br>3. Live fencing<br>4. Contour bunding<br>5. Centripetal Terracing | 1. Goat Rearing<br>2. Cow Rearing<br>3. Rabbit Rearing<br>4. Organic Vegetable Cultivation<br>5. Banana Cultivation | 1. Mini Dairy farm<br>2. Distribution of Tailoring Machine |
| **<u>Water Conservation</u>**<br>1. Well renovation<br>2. Yard water collection pits<br>3. Husk Trenches<br>4. Moisture Collection Pits<br>5. Source Recharging<br>6. Check Dams<br>7. Rain Water Harvesting | | |

## Eriam - I Watershed Development Project (Area – 370 Ha) - Master plan for Four Years - Funding pattern

| Installment | Administration | Monitoring | Evaluation | Entry Point Activity | Institution & Capacity Building | DPR preparation | Watershed Development Activities | Livelihood Activities | Production system & Micro Enterprises | Consolidation Phase | Total IWMP project fund |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1St | 111000 | 11100 | 11100 | 222000 | 166500 | 55500 | 532800 | 0 | 0 | 0 | 1110000 |
| % | 2 | 0.2 | 0.2 | 4 | 3 | 1 | 9.6 | 0 | 0 | 0 | 20 |
| 2nd | 138750 | 11100 | 11100 | 0 | 55500 | 0 | 921300 | 249750 | 277500 | 0 | 1665000 |
| % | 2.5 | 0.2 | 0.2 | 0 | 1 | 0 | 16.6 | 4.5 | 5 | 0 | 30 |
| 3rd | 166500 | 16650 | 16650 | 0 | 55500 | 0 | 882450 | 249750 | 277500 | 0 | 1665000 |
| % | 3 | 0.3 | 0.3 | 0 | 1 | 0 | 15.9 | 4.5 | 5 | 0 | 30 |
| 4rd | 138750 | 16650 | 16650 | 0 | 0 | 0 | 771450 | 0 | 0 | 166500 | 1110000 |
| % | 2.5 | 0.3 | 0.3 | 0 | 0 | 0 | 13.9 | 0 | 0 | 3 | 20 |
| **Total** | **555000** | **55500** | **55500** | **222000** | **277500** | **55500** | **3108000** | **499500** | **555000** | **166500** | **5550000** |
| % | 10 | 1 | 1 | 4 | 5 | 1 | 56 | 9 | 10 | 3 | 100 |

**ERIAM - I Watershed - <u>Sector – I – Watershed Development Activities - I year action plan</u>**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/ Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Moisture collection pits | $M^3$ | 149 | 1000 | 0 | 0 | 149000 | 149000 | 10 % General & 5 % SC / ST |
| 2. | Live fencing | RM | 24 | 2500 | 0 | 0 | 60000 | 60000 | |
| 3. | Stone bunding | $M^2$ | 144 | 1493 | 0 | 215000 | 0 | 215000 | |
| 4. | Centry petal terracing | Nos | 65.67 | 500 | 0 | 0 | 32835 | 32835 | |
| 5. | Husk trench | Nos | 165 | 500 | 0 | 0 | 82500 | 82500 | |
| 6. | 2m Htype check dams across Cheethathodu | Nos | 14600 | 4 | 0 | 58400 | 0 | 58400 | |
| 7. | Well recharging | Nos | 12970 | 20 | 0 | 259400 | 0 | 259400 | |
| **Total** | | | | | | **532800** | **324335** | **857135** | |

**Eriam –I Watershed - Sector – I – Watershed Development Activities II year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Stone bunding | $M^2$ | 144 | 2606 | 0 | 375270 | 0 | 375270 | 10 % General & 5 % SC / ST |
| 2. | Centry petal terracing | Nos | 65.67 | 400 | 0 | 0 | 26268 | 26268 | |
| 3. | Husk trench | Nos | 165 | 300 | 0 | 0 | 49500 | 49500 | |
| 4. | Live fencing | RM | 24 | 2200 | 0 | 0 | 52800 | 52800 | |
| 5. | Well recharging | Nos | 12970 | 26 | 0 | 337220 | 0 | 337220 | |
| 6. | 3m H type check dam across thennam cheetha thodu | Nos | 15200 | 2 | 0 | 30400 | 0 | 30400 | |
| 7. | Construction of retaining wall along school cheetha thodu (From culvert near school to top portion two sides) | Nos | 2395 | 74.49 | 0 | 178410 | 0 | 178410 | |
| 8. | Moisture conservation pit | $M^3$ | 149 | 1200 | 0 | 0 | 178800 | 178800 | |
| **Total** | | | | | | **921300** | **307368** | **1228668** | |

**Eriam - I - Sector – I – Watershed Development Activities III year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/ Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Husk trench | Nos | 165 | 250 | 0 | 0 | 41250 | 41250 | 10 % General & 5 % SC / ST |
| 2. | Live fencing | RM | 24 | 2600 | 0 | 0 | 62400 | 62400 | |
| 3. | Stone bunding | $M^2$ | 144 | 1429.4 | 0 | 205840 | 0 | 205840 | |
| 4. | Centry petal terracing | Nos | 65.67 | 280 | 0 | 0 | 18388 | 18388 | |
| 5. | Yard water collection pit | Nos | 400 | 45 | 0 | 0 | 18000 | 18000 | |
| 6. | Improvements to the existing pond at Pathayakundu | Nos | 61520 | 1 | 0 | 61520 | 0 | 61520 | |
| 7. | H type check dam 4 m width across Cheetha - Pathayakundu thodu | Nos | 16500 | 5 | 0 | 82500 | 0 | 82500 | |
| 8. | Retaining Wall | RM | 2395 | 222.37 | 0 | 532590 | 0 | 532590 | |
| **Total** | | | | | | **882450** | **140038** | **1022488** | |

**Eriam - I Watershed - Sector – I – Watershed Development Activities IV year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/ Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Centry petal terracing | Nos | 65.67 | 200 | 0 | 0 | 13134 | 13134 | 10 % General & 5 % SC / ST |
| 2. | Yard water collection pit | RM | 400 | 30 | 0 | 0 | 12000 | 12000 | |
| 3. | Husk trench | $M^2$ | 165 | 300 | 0 | 0 | 49500 | 49500 | |
| 4. | Live fencing | Nos | 24 | 3000 | 0 | 0 | 72000 | 72000 | |
| 5. | Stone bunding | $M^2$ | 144 | 2174.3 | 0 | 313100 | | 313100 | |
| 6. | Well recharging | Nos | 12970 | 10 | 0 | 129700 | | 129700 | |
| 7. | Stream bank stabilization in Pathayakundu thodu | Nos | 2395 | 58.81 | 0 | 140850 | | 140850 | |
| 8. | Stream bank stabilization in Hamsa Haji thodu | Nos | 2395 | 78.41 | 0 | 187800 | | 187800 | |
| **Total** | | | | | | **771450** | **771450** | **918084** | |

**Eriam - I Watershed - Sector – II – Livelihood Activities for Land less/Asset less - II year Action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | MNREGS / other source/Bank Loan | Total |
|---|---|---|---|---|---|---|---|
| 1 | seed money for enterprising individuals | Nos | 0 | 0 | 49950 | 0 | 49950 |
| 2 | Seed money for SHGs | Nos | 0 | 0 | 199800 | 0 | 199800 |
| **Total** | | | | | **249750** | **0** | **249750** |

**Eriam - I Watershed - Sector – II – Livelihood Activities for Land less/Asset less - III year Action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | MNREGS / other source/Bank Loan | Total |
|---|---|---|---|---|---|---|---|
| 1 | Seed money for SHGs | Nos | 0 | 0 | 99900 | 0 | 99900 |
| **III** | **Funding for Major livelihood activivtes** | | | | | | |
| 1 | Mini diary unit | Nos | 300000 | 1 | 149850 | 150150 | 300000 |
| **Total** | | | | | **249750** | **150150** | **399900** |

| **Funding pattern** | | | |
|---|---|---|---|
| Seed money for enterprising individuals (10% of the allocation) | | | 49950 |
| Seed money for SHGs (60 % of the allocation) | | | 299700 |
| Funding for major livelihood activities (30% of the allocation) | | | 149850 |
| **Total allocation** | | | **499500** |

**Eriam - I Watershed Sector – III – Production System & Micro Enterprises based livelihood activities - II year Action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | Beneficiary contribution / other source | Total | WDF |
|---|---|---|---|---|---|---|---|---|
| 1 | Cow rearing unit | Nos | 24000 | 5 | 115500 | 4500 | 120000 | 20 % for General & 10 % for SC / ST |
| 2 | Banana cultivation | Nos | 24000 | 5 | 120000 | 0 | 120000 | |
| 3 | Rabbit rearing | Nos | 28000 | 1 | 28000 | 0 | 28000 | |
| 4 | Plantain cultivation for leaves | Ha | 14000 | 1 | 14000 | 0 | 14000 | |
| **Total** | | | | | **277500** | **4500** | **282000** | |

**Eriam - I Watershed Sector – III – Production System & Micro Enterprises based livelihood activities - III year action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | Beneficiary contribution /other source | Total | WDF |
|---|---|---|---|---|---|---|---|---|
| 1 | Organic vegitable cultivation | Nos | 24000 | 5 | 113500 | 6500 | 120000 | 20 % for General & 10 % for SC / ST |
| 2 | Banana cultivation | Nos | 24000 | 5 | 120000 | 0 | 120000 | |
| 3 | Rabbit rearing | Nos | 28000 | 1 | 28000 | 0 | 28000 | |
| 4 | Goat rearing | Nos | 8000 | 2 | 16000 | 0 | 16000 | |
| **Total** | | | | | **277500** | **6500** | **284000** | |

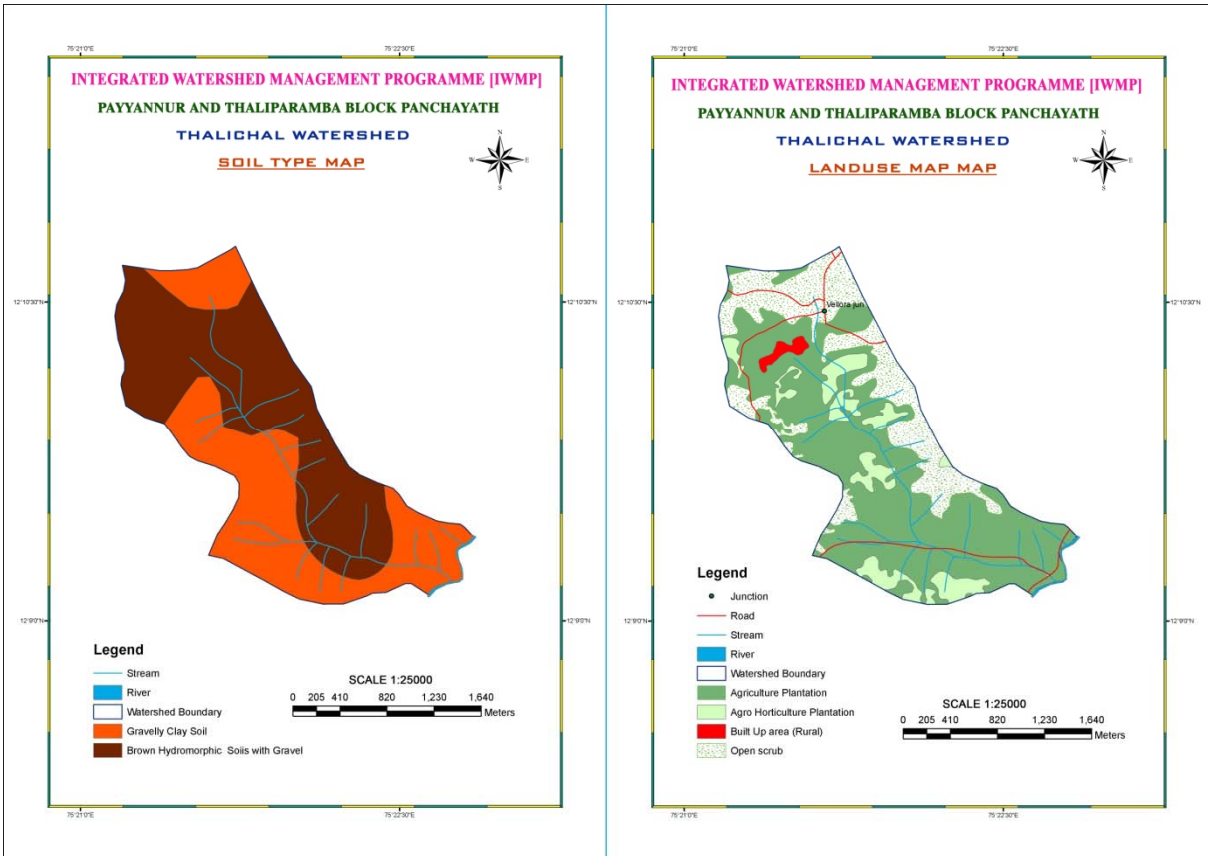
**Total Allotment - 555000**

## ENTRY POINT ACTIVITY - ACTION PLAN

| Sl.no | Activity | Unit | Unit cost | Target | Amount |
|---|---|---|---|---|---|
| 1 | Cleaning and silt removing from the stream | $M^3$ | 205.20 | 169.10 | 34700 |
| 2 | Agronomical measures on the River sides | Rm | 139 | 1000 | 139000 |
| 3 | Clearing thick throny jungle and small trees | $M^2$ | 21 | 300 | 6300 |
| 4 | Planting trees along the River sides | Nos | 27 | 1000 | 27000 |
| 5 | Campaign work * | | | | 15000 |
| **GRAND TOTAL** | | | | | **222000** |

## THALICHAL WATERSHED

| | | |
|---|---|---|
| Grama Panchayat | : | Eramam – Kuttur &<br>Kadannappalli - Panapuzha, |
| Village | : | Vellora & Panapuzha |
| Wards covered | : | VII of Kadannappally Panapuzha<br>XI, X, XI, XII wards of EramamKuttur |
| Block Panchayat | : | Payyanur & Thaliparamba |
| Thaluk | : | Kannur |
| District | : | Kannur |
| Total families covered | : | 352 |
| Total Population covered | : | 1514 |
| Total treatable Area | : | 424 Ha |
| River Basin | : | Peruvamba (Perumba) River |
| Average Length | : | 3.4. Kms. |
| Average Width | : | 3.3. Kms. |
| Total Project Cost | : | Rs. 63, 60, 000/- |
| Boundaries | : | North: Thumbathadam Watershed |
| | : | South: Eriam – I watershed |
| | : | East: Edoly Watershed |
| | : | West: Mylanchery Watershed |




## Introduction

A small part of the seventh ward of Kadannappally-Panapuzha Grama Panchayat (only 9 Ha) and 9th, 10th, 11th and 12th wards of Eramam – Kuttur Grama Panchayat form the Thalichal watershed with a total geographic area of 424 Ha. Around 12 Ha of land in the watershed is marked as cultivable waste and the remaining part is under cultivation. The whole area is considered as rainfed.

The watershed is of slanting nature towards east from Pulluvanchal to Edoli. The Karingoli area is slanting towards south east. Area in Kadannappali – Pavapuzha Grama Panchayat is slanting northwards. In general the topography of Thalichal Watershed is undulating with small hillocks and moderate slopping Valleys.

## Main places in the watershed:

Vellora, Karingoli, Pulluvanchal, Thalichal, Chenkol, Pachani and Eriam are the main places in the watershed.

## Geographic Description of the Watershed:
## Location:

Thalichal watershed is located in Vellora village of Payyannur Block Panchayath. It is around 54 km away from the District head quarters and is accessible by road. Pilathara, the nearest bus station of the watershed is situated around 20 km away in the west.

Payyannur and Pazhayangadi Railway station are almost at the same distance from the watershed. The watershed is situated around 10 km away from Eramam – Kuttoor Panchayath office. Vellora is a small township in the watershed. People depends Mathamangalam bazaar for marketing which is around 8 km away from the watershed.

**The geographic coordinates**

Geographically Thalichal watershed lies between the east longitude $75^0$21'0" and $75^0$23'0" and north latitude $12^0$9'0" and $12^0$10'30" with a total elevation of 410 feet.

**Average length and width of the watershed:** Thalichal watershed is comparatively one of the biggest watersheds. The watershed has an average length of 3.4 km and 3.3 km width.

**Relief & Drainage**

The watershed is of slanting nature towards east from Pulluvanchal to Edoli. The Karingoli area is slanting towards south east. Area in Kadannappalli-Panapuzha Grama Panchayat is slanting northwards. In general the topography of Thalichal watershed is undulating with small hillocks and moderate sloppy valleys.

The watershed is drained into Appithodu. Appithodu is flowing about 6 kms vertically along the watershed and is perennial. The stream is originating from the rocks of Vellora Hillocks and flowing through Chenkol area and entering into Panapuzha river near Thennam Mosque. The stream covers almost the full area and flowing through the middle of the watershed.

There are many small and large sub-streams which can be considered as tributaries to the main stream Appithodu. A list is furnished below.

1. Hassan Thodu
2. Kolappala Hamsa Thodu
3. C. Kunjiraman Thodu
4. Kundanchittadi Thodu
5. Chellakkambu Mala Thodu
6. Kakkatta Haji Parambu Thodu
7. Khadar Haji Thodu
8. Moolathali Thodu
9. Chandran Kunhappan Thodu
10. EramKunnu Thodu -1
11. Thudaruvilakki Thodu
12. Mudikkanam Thodu -1
13. Chenkol Vayal Thodu
14. Pazhayakulam Thodu
15. Mudikkanam Thodu – 2
16. EramKunnu Thodu - 2
17. Kizhakkevayal Thodu

**The Drainage density:** Thalichal watershed is enriched with large number of water bodies. Around 15.8 Kms of streams drain in the total 424 Ha. So the drainage density of Thalichal watershed is 37m/Ha.

**Other water sources**

The watershed is rich in the number of ponds and it is astonishing that many ponds are built in such a small area with only 424 Ha of land. However this is only true. There are

30 ponds out of which only two are public and all the rest are private. A list is given below:

| Sl. No. | Name of the Pond | Ownership |
|---|---|---|
| 1. | Pazhayakulam | Public |
| 2. | Mudikkanam Kulam | Public |
| 3. | M. Rajan Kulam - 1 | Private |
| 4. | Khader Haji Kulam | Private |
| 5. | Thomas Kulam | Private |
| 6. | Divakaran Kulam | Private |
| 7. | Sadashivan Master Kulam | Private |
| 8. | Rohiniyamma Kulam | Private |
| 9. | Ebrahim Kulam | Private |
| 10. | Abdullahaji Kula | Private |
| 11. | Prasannakumar Kulam | Private |
| 12. | Vettukallamkuzhi Kulam -1 | Private |
| 13. | Vettukallamkuzhi Kulam -2 | Private |
| 14. | Sasi Kulam | Private |
| 15. | Biju Kulam | Private |
| 16. | Boatukaran Kulam | Private |
| 17. | Hamza Haji Kulam | Private |
| 18. | K. Gangadharan Kulam | Private |
| 19. | Narayanan Kulam | Private |
| 20. | Kannan Velichappadan Kulam | Private |
| 21. | Surendran Kulam | Private |
| 22. | Ismail Kulam | Private |
| 23. | Chandrasekharan Pillai Kulam | Private |
| 24. | Baburajan Kulam | Private |
| 25. | Gangadharan Kulam | Private |
| 26. | Muth8ukudakkulam | Public |
| 27. | M. Rajan Kulam - 2 | Private |
| 28. | Narikkottu Haji Kulam | Private |
| 29. | Yesoda Kulam | Private |
| 30. | MN Kulam | Private |

Regarding the wells, as usual each household has a well to meet their drinking water purposes and other domestic uses. Wells in the upper part of the watershed are drying up in summer causing water scarcity for the watershed communities, wells in the lower portion is perennial in nature and provide water throughout out the year.

***The list of natural springs present in the watershed is give below:***

1. Kundan Chittadi spring – 3Nos.
2. Chenkol spring
3. Spring present in the origin of Kakkatti Haji thodu.

Regarding the wells, as usual each household has a well to meet their drinking water purposes and other domestic uses. Well in the upper part of the watershed are drying up in summer causing water scarcity for the watershed community, wells in the lower portion is perennial in nature and provide water throughout the year.

**Present situation of the streams and other water bodies**

All the streams in the watershed including those originating from the springs dry up in the summer season. The main stream Appithodu retains water in the downstream. The five springs in the watershed also are perennial which provides water to the community living around them.
It is reported that some of the private ponds dry up in the middle of the summer. Then it will be difficult for the farmers to irrigate their crops. Similarly, wells, especially in the upstream area also dry up in the summer.

The main stream and other large tributaries were perennial before years. But now except the main stream all other became seasonal. The main stream also faces the threat of seasonality. During the midsummer season water is available in the Appithodu about 1 to 2 kms away from the outlet point. The point of origin and all other upper and midland portions get dried up.

**Rainfall and Climate**

Thalichal watershed is included in the midland agro-ecological zone. The rainfall is comparatively high in the watershed. Rainfall is maximum during the month of June to September. 55% of the rainfall is during this period. During the past 10 years maximum rainfall obtained in 2009. However, there is no change in the average rainfall of the watershed – 3697.6mm. The climate of the watershed is similar to that of the other watersheds with humid hot season between March to the end of May. This is followed by South-West Monsoon (June-September) and North -East Monsoon (December-February). During the month of April and May the mean maximum temperature is $35^0$C and a minimum temperature of $26^{0.}$

**Soil Type & Depth**

The general condition of the soil is of two types. Brown hydromorphic soil with gravel is seen in the upper parts of the watershed and clay soil with gravels in the lower portions. The watershed has a total area of 232.11 ha with brown hydromorphic soil and the rest, 191.89 ha consists of clay soil with gravels. Depth of the soil in the watershed is 100 cms to 150 cms.

**Agriculture & Land Use**

Around 85% of the total area is under crops. In the northern middle part of the watershed the paddy land is converted for mixed crops and now there is no paddy cultivation at all. Similarly on both sides of the main stream(Appithodu)the land is full of mixed crops(coconut, areca nut, plantain, vegetables, tubers and spices).All the three

boundaries – east, north and half of west are laterite rocks which once were used for shifting cultivation. Now the area is slowly converting to rubber plantation.

The land is full of mixed crops (coconut, areca nut, plantain, vegetables, tubers and spices). All the three boundaries – east, north and half of the west are laterite rocks which once were used for shifting cultivation. Now the area is slowly converting to rubber plantation. The land use pattern of the watershed is tabled below followed by a graphic illustration:

| **Crops** | **Land Used** | **% of Land used** | **Productivity** |
|---|---|---|---|
| Coconut | 84.72 | 19.98 | 7011 |
| Areca nut | 47.57 | 11.22 | 86.51 |
| Cashew | 29.34 | 6.92 | 27.53 |
| Pepper | 15.94 | 3.76 | 4.67 |
| Plantain | 8.90 | 2.1 | 70.85 |
| Vegetables | 20.18 | 4.76 | 30.89 |
| Tubers | 20.35 | 4.8 | 357.38 |
| Rubber | 174.69 | 41.2 | 235.91 |
| Cultivable Waste | 12.01 | 2.83 | 0 |
| Built Up Area | 10.30 | 2.43 | 0 |
| Total | 424 | 100 | |

**Animal Husbandry**

As a general condition that is observed in Kerala is that the farmer's interest in growing domestic animals is drastically reducing. This is also reflected in the water shed under discussion. Given below is a table of livestock in the watershed:

a. Hybrid Variety cows (Male) : 7
b. Hybrid Variety Cows (Female): 37
c. Indigenous Cows (Males): 4
d. Indigenous Cows(Females): 32
e. Goat(Males): 23
f. Goat (Female): 87
g. Indigenous fouls: 48
h. Hybrid Variety: 233

**Socio-Economic Details:**

***The watershed population details are given below:***

Total Population: 1514
Male: 712
Female: 802
SC Population (total): 31
Male (SC): 15
Female (SC): 16
APL Families: 216
BPL Families: 136

There are 6 SC households. Out of the total households nearly 15% are reported to be migrant farmers from southern part of Kerala as well as from among farmers of Eastern boundary of Kannur district.

Around 38.6% of the total households in the watershed are living below poverty line and majority of the households have few cents of lands in which they cultivate mostly coconut. There are estate owners also who are naturally migrants and have the capacity to invest huge amounts in rubber plantations. It must be assumed that there is distinct economic situation between the populace living in the watershed.

When agriculture becomes the major source of income for a few, wage labour plays an important role to bring daily bread to a majority of the people. Many are working in the construction sector also. There are a few in the gulf countries and the money they send also playing a role in building up the economy of the watershed. However, the backbone of the economy of the watershed is agriculture.

The watershed community is comparatively poor in education, but most of the watershed community members have completed High School Education. In addition the migrant community influenced the local culture and social situation as they came from a better background. Tagore Memorial Higher Secondary School, which has a long history of more than 30 years, is an influencing factor in the educational status of the watershed community.

All the members of the watershed community have own houses with attached sanitation facilities and drinking water well. The cultural and artistic clubs in and around the watershed ensures the cultural and social transformation of the existing communities.

Health status of all the members of households in the watershed is satisfactory. But occasions have been occurred that there were outbursts of contagious diseases, especially in the monsoon season.

**Road Network:**
The transport facilities in the watershed are satisfactory. The road network extends to every part of the watershed and their condition is also good. ***The important tar roads in the watershed are follows:***

| SL No. | Name of the road | Length(Km) | Width(m) |
|---|---|---|---|
| 1. | Eriam-Perumbadavu road | 2.50 | 10 |
| 2. | Kuttor-Kakkara road | 1.00 | 8 |
| 3. | Vellora-Pachani road | 2.30 | 8 |
| 4. | Vellora-Perumbadavu road | 2.50 | 8 |

***The important mud roads in the watershed are listed below:***

| SL No. | Name of the road | Length(m) | Width(m) |
|---|---|---|---|
| 1. | Chenkol-Thali road | 700 | 5 |
| 2. | Chekkikundu-Chenkol-Thali road | 3000 | 5 |
| 3. | Perumbadavu-Vengola road | 2000 | 4 |
| 4. | Chekkithodu-Thali road | 2500 | 8 |

**Institutions and Community based organizations**

The institutions and Community Based Organizations have a greater influence in the cultural arena of the watershed. The Main Institution and Community Based Organizations are listed below:

- Vellora homeo hospital
- Vellora village office
- Co-Operative bank
- Vellora Anganawadi
- Tagore Memorial Higher Secondary School Vellora
- Kairali Vayanasala
- Eriam mosque
- Vellora Vayanasala
- Vellora Shri Chuzhali Bhagavathi Temple
- Yuvadhara Club Vellora
- Vellora Shri.Muthappan Temple
- Vellora Shri Kannankattu temple
- Shri Muchilottu Bhagavathi Temple Vellora

**Market Facilities:**

Vellora is the only township in the watershed to which people depend mostly for their marketing requirements. The watershed community depends Mathamangalam bazaar for their higher marketing requirements. Mathamangalam Bazaar is situated about 6 Km away from the watershed

**Hospital facilities:**

The watershed community can access the hospital facilities at Payyanur about 28 Km away from the watershed. They have also accessibility to the Pariyaram Medical College which is about 22 Kms away for further specialized treatment.

**Major Problems of the watershed**

The problems are categorized under four headings: Soil related, Water related, Agro-Bio Diversity Related and Animal Husbandry related. Such a categorization is in line with the activities that can be undertaken IWMP to solve the issues. The issues are listed below:

**Soil Related Problems:**

- Reducing soil fertility throughout the watershed
- Heavy soil erosion from the fertile land available at places like Vengola, Karingoli, Chenkol and Thali.

- Inadequate soil conservation measures
- Change in land use. For example Chenkol Paddy Field is converted for mixed crops like coconut, areca nut, plantain, tapioca etc.
- Indiscriminate application of chemical fertilizers and pesticides especially in rubber Plantations
- Acidic nature of the soil due to application of chemicals

**Water related issues:**

- Fast drying water sources and drinking water scarcity - Vellora Higher secondary School, Homeo hospital, Chenkol, etc.
- The top portion of Vellora is considered as draught prone.
- Poor water conservation measures
- Poor water literacy among the watershed community
- Ground water deterioration
- Sedimentation of sources like streams and ponds

**Agro-biodiversity related issues**

- Shift to mono crops in areas like Chenkol, Vellora, Thali, etc.
- Absence of crop rotation – Mono crops like rubber is fast extending
- Alienation of women from agriculture
- Extinct medicinal plants like Brahmi *(Monniera cuneifolia)*, Kurupanal *(Glucosmis pentaphella),* Karimkurinhi *(Strobilanthus coeliata),* Mukkitty *(Biophyttam reinvade)*
- Reduction in plant & animal diversity: Plants like Hibiscus, Sandal, Anjili *(Artocarpus hirsutus)* and animals like Fungoid frog (Rana Malabarica), Birds like Kingfisher etc...
- 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 to address the issues**

Generally the activities are of three folds: Natural Resource Management Activities which covers the soil, water and bio-diversity issues, Production System Management and Micro Enterprises (PS&M) which covers the agriculture and soil problems along with economic backwardness, , which manages the livelihoods and economic backwardness of the landless, women and the indigenous communities. Given below is a brief about the activities proposed for the watershed:

| Natural Resource Management (NRM) | Production System & Micro- Enterprises (PS&M) | Livelihood Support Systems (LSS) |
|---|---|---|
| **<u>Soil Conservation</u>**<br>1. Gully Plugging<br>2. Stream bank stabilization<br>3. Live fencing<br>4. Stone bunding<br>5. Centripetal Terracing<br>6. Bench terracing | 1. Goat Rearing<br>2. Cow Rearing<br>3. Banana Cultivation<br>4. Organic Vegetable cultivation | 1. Mini Dairy farm<br>2. Floor Cleaner Making Unit<br>3. Tailoring Unit<br>4. Distribution of Tailoring Machine |
| **<u>Water Conservation</u>**<br>1. Pond construction<br>2. Yard water collection pits<br>3. Husk Trenches<br>4. Moisture Collection Pits<br>5. Source Recharging<br>6. Check Dams<br>7. VCB construction<br>8. Water collection tank | | |

## Thalichal Watershed Development Project (Area – 424 Ha) - Master plan for Four Years - Funding pattern

| Installment | Administration | Monitoring | Evaluation | Entry Point Activity | Institution & Capacity Building | DPR preparation | Watershed Development Activities | Livelihood Activities | Production system & Micro Enterprises | Consolidation Phase | Total IWMP project fund |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1St | 127200 | 12720 | 12720 | 254400 | 190800 | 63600 | 610560 | 0 | 0 | 0 | 1272000 |
| % | 2 | 0.2 | 0.2 | 4 | 3 | 1 | 9.6 | 0 | 0 | 0 | 20 |
| 2nd | 159000 | 12720 | 12720 | 0 | 63600 | 0 | 1055760 | 286200 | 318000 | 0 | 1908000 |
| % | 2.5 | 0.2 | 0.2 | 0 | 1 | 0 | 16.6 | 4.5 | 5 | 0 | 30 |
| 3rd | 190800 | 19080 | 19080 | 0 | 63600 | 0 | 1011240 | 286200 | 318000 | 0 | 1908000 |
| % | 3 | 0.3 | 0.3 | 0 | 1 | 0 | 15.9 | 4.5 | 5 | 0 | 30 |
| 4rd | 159000 | 19080 | 19080 | 0 | 0 | 0 | 884040 | 0 | 0 | 190800 | 1272000 |
| % | 2.5 | 0.3 | 0.3 | 0 | 0 | 0 | 13.9 | 0 | 0 | 3 | 20 |
| **Total** | **636000** | **63600** | **63600** | **254400** | **318000** | **63600** | **3561600** | **572400** | **636000** | **190800** | **6360000** |
| % | 10 | 1 | 1 | 4 | 5 | 1 | 56 | 9 | 10 | 3 | 100 |

## Thalichal Watershed - Sector – I – Watershed Development Activities - I year action plan

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/ Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Stone bunding | $M^2$ | 144 | 1139.4 | 0 | 164084 | 0 | 164084 | 10 % General & 5 % SC / ST |
| 2. | Centripetal terracing | Nos | 65.67 | 250 | 0 | 0 | 16418 | 16418 | |
| 3. | Yard water collection pit | Nos | 400 | 25 | 0 | 0 | 10000 | 10000 | |
| 4. | Live fencing | Nos | 24 | 1700 | 0 | 0 | 40800 | 40800 | |
| 5. | Stream bank protection along kundamchittadichal (EPA) | RM | 2395 | 146.13 | 0 | 350000 | 0 | 350000 | |
| 6. | Gully controlling structures in Appithodu | RM | 2996 | 10.61 | 0 | 31800 | 0 | 31800 | |
| 7. | Gully controlling structures in Kundamchdichal | RM | 2996 | 8.49 | 0 | 25440 | 0 | 25440 | |
| 8. | Gully controlling structures in Mudikanamthodu | RM | 2996 | 6.38 | 0 | 19126 | 0 | 19126 | |
| 9. | Plant Distribution | Nos | 50 | 402 | 0 | 20110 | 0 | 20110 | |
| **Total** | | | | | | **610560** | **67218** | **677778** | |

**Thalichal Watershed - Sector – I – Watershed Development Activities II year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/ Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Moisture collection pits | $M^3$ | 149 | 1500 | 0 | 0 | 223500 | 223500 | 10 % General & 5 % SC / ST |
| 2. | Stone bunding | $M^2$ | 144 | 1572 | 0 | 151368 | 75000 | 226368 | |
| 3. | Live fencing | RM | 24 | 2500 | 0 | 0 | 60000 | 60000 | |
| 4. | Well recharging | Nos | 12970 | 10 | 0 | 129700 | 0 | 129700 | |
| 5. | Construction of a Vented cross bar near the plot of P.Sreedharan - Sadhasivan,S.N.150/3 | Nos | 764500 | 1 | 0 | 764500 | 0 | 764500 | |
| 6. | Husk trench | Nos | 165 | 150 | 0 | 0 | 24750 | 24750 | |
| 7. | Plant Distribution | Nos | 50 | 203 | 0 | 10192 | 0 | 10192 | |
| **Total** | | | | | | 1055760 | 383250 | 1439010 | |

**Thalichal Watershed - Sector – I – Watershed Development Activities - III year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/ Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Moisture collection pits | $M^3$ | 149 | 1200 | 0 | 0 | 178800 | 178800 | 10 % General & 5 % SC / ST |
| 2. | Live Fencing | RM | 24 | 2300 | 0 | 0 | 55200 | 55200 | |
| 3. | Stone bunding | $M^2$ | 144 | 1160.6 | 0 | 167130 | 0 | 167130 | |
| 4. | Centripetal terracing | Nos | 65.67 | 300 | 0 | 0 | 19701 | 19701 | |
| 5. | Husk trench | Nos | 165 | 320 | 0 | 0 | 52800 | 52800 | |
| 6. | Gully controlling structures in Hassan thodu | Nos | 2996 | 10.61 | 0 | 31800 | 0 | 31800 | |
| 7. | Well recharging | Nos | 12970 | 11 | 0 | 142670 | 0 | 142670 | |
| 8. | Pond renovation, in the plot of K.V.Dhamodharan | Nos | 350000 | 1 | 0 | 350000 | 0 | 350000 | |
| 9. | Construction of a Shutter type check dam near the plot of Kunnumel Kunjiraman S.N.38/140 | Nos | 119640 | 1 | 0 | 119640 | 0 | 119640 | |
| 10. | Retaining Wall, thalichal thodu | RM | 2395 | 83.50 | 0 | 200000 | 0 | 200000 | |
| **Total** | | | | | | **1011240** | **306501** | **1317741** | |

**Thalichal Watershed - Sector – I – Watershed Development Activities - IV year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Centripetal terracing | Nos | 65.67 | 250 | 0 | 0 | 16418 | 16418 | 10 % General & 5 % SC / ST |
| 2. | Yard water collection pit | Nos | 400 | 180 | 0 | 0 | 72000 | 72000 | |
| 3. | Live fencing | RM | 24 | 2800 | 0 | 0 | 67200 | 67200 | |
| 4. | Moisture collection pit | $M^3$ | 149 | 1600 | 0 | 0 | 238400 | 238400 | |
| 5. | Husk trench | Nos | 165 | 600 | 0 | 0 | 99000 | 99000 | |
| 6. | Stone bunding | $M^2$ | 144 | 1763.6 | 0 | 253960 | 0 | 253960 | |
| 7. | Well recharging | Nos | 12970 | 15 | 0 | 194550 | 5450 | 200000 | |
| 8. | Construction of a shutter type check dam near the plot of M.K.Musthafa | Nos | 135500 | 1 | 0 | 135500 | 0 | 135500 | |
| 9. | stream bank stabilization in Eramkunnu thodu | RM | 2395 | 69.67 | 0 | 166880 | 0 | 166880 | |
| 10. | Construction of a shutter type check dam near the plot of P.Meenakshi - M.Saraswathi | Nos | 73100 | 1 | 0 | 119640 | 0 | 119640 | |
| 11. | Plant distribution | Nos | 50 | 270 | 0 | 13510 | 0 | 13510 | |
| **TOTAL** | | | | | | **884040** | **498468** | **1382508** | |

**Thalichal Watershed - Sector – II – Livelihood Activities for Land less/Asset less - II year Action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | MNREGS / other source/Bank Loan | Total |
|---|---|---|---|---|---|---|---|
| 1 | seed money for enterprising individuals | Nos | 0 | 0 | 57240 | 0 | 57240 |
| 1 | Seed money for SHGs | Nos | 0 | 0 | 228960 | 0 | 228960 |
| Total | | | | | **286200** | **0** | **286200** |

**Thalichal Watershed - Sector – II – Livelihood Activities for Land less/Asset less - III year Action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | MNREGS / other source/Bank Loan | Total |
|---|---|---|---|---|---|---|---|
| 1 | Seed money for SHGs | Nos | 0 | 0 | 114480 | 0 | 114480 |
| **III** | **Funding for Major livelihood activities** | | | | | | |
| 1 | Mini diary unit | Nos | 300000 | 1 | 150000 | 150000 | 300000 |
| 2 | Tailoring unit | Nos | 56000 | 1 | 21720 | 22280 | 44000 |
| **Total** | | | | | **286200** | **172280** | **458480** |

| **Funding pattern** | - |
|---|---|
| Seed money for enterprising individuals (10% of the allocation -Revolving fund) | 57240 |
| Seed money for SHGs (60 % of the allocation - Revolving fund) | 343440 |
| Funding for major livelihood activities (30% of the allocation - Grant in aid) | 171720 |
| **Total allocation** | **572400** |

**Sector – III – Production System & Micro Enterprises based livelihood activities - II year Action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | Beneficiary contribution/ other source | Total | WDF |
|---|---|---|---|---|---|---|---|---|
| 1 | Goat rearing unit | Nos | 9080 | 25 | 222000 | 5000 | 227000 | 20 % for General & 10 % for SC / ST |
| 2 | Banana cultivation | Nos | 24000 | 4 | 96000 | 0 | 96000 | |
| **Total** | | | | | **318000** | **5000** | **323000** | |

**Sector – III – Production System & Micro Enterprises based livelihood activities - III year action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | Beneficiary contribution/ other source | Total | WDF |
|---|---|---|---|---|---|---|---|---|
| 1 | Organic vegetable cultivation | Nos | 24000 | 7 | 162000 | 6000 | 168000 | 20 % for General & 10 % for SC / ST |
| 2 | Banana cultivation | Nos | 19500 | 8 | 156000 | 0 | 156000 | |
| **Total** | | | | | **318000** | **6000** | **324000** | |

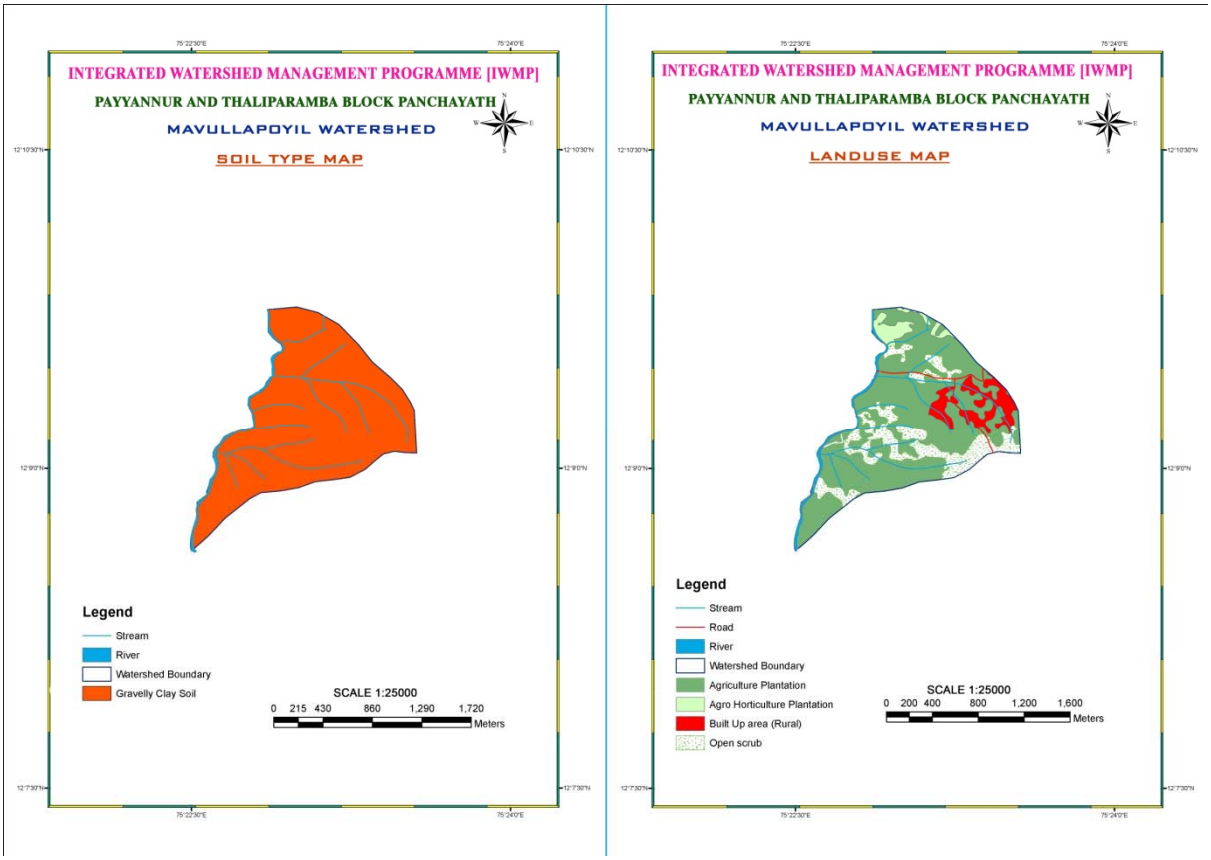
**Total Allotment - 636000**

**ENTRY POINT ACTIVITY - ACTION PLAN**

| Sl. no | Activity | Unit | Unit cost | Target | IWMP EPA fund | IWMP Project fund | Total |
|---|---|---|---|---|---|---|---|
| 1. | Storage tank | No | 80,025 | 1 | 80,025 | - | 80025 |
| 2. | Gully controlled check dam in Kundamchittadichal | NO | 2550 | 1 | 2550 | - | 2550 |
| 3. | Stream bank protection of kundamchittadichal | Rm | 1001 | 171.65 | 171825 | 46 | 171871 |
| | **Total** | | | | **254400** | **46** | **254446** |

## MAVULLAPOIL WATERSHED

| | | |
|---|---|---|
| Grama Panchayat | : | Eramam – Kuttur & Kadannappalli - Panapuzha, |
| Village | : | Vellora & Panapuzha |
| Wards covered | : | VII of Kadannappally Panapuzha<br>XI wards of EramamKuttur |
| Block Panchayat | : | Payyanur & Thaliparamba |
| Thaluk | : | Kannur |
| District | : | Kannur |
| Total families covered | : | 175 |
| Total Population covered | : | 777 |
| Total treatable Area | : | 188 Ha |
| River Basin | : | Peruvamba (Perumba) River |
| Average Length | : | 2.25. Kms. |
| Average Width | : | 2.25. Kms. |
| Total Project Cost | : | Rs. 28,20,000/- |
| Boundaries | : | North: Nayakkunnu Watershed |
| | : | South: Eriam - II |
| | : | East: Nayakkunnu Watershed |
| | : | West: Eriam River |




## Introduction

Mavullapoil watershed is included in Kadannappally – Panapuzha and Eramam – Kuttur Grama Panchayats. Out of the total area (188 ha) major part of the watershed (116.03 ha) is in Eramam – Kuttur Grama Panchayat and the remaining part (71.97ha) is in Kadannappally – Panapuzha Grama Panchayat.

## Main places in the watershed:

The important places in the watershed are: Karuvankunnu, Chellakkambu, Valliohm, ,Karippal, Mavullapoyil, Chamakkala and Parakkadavu. The watershed is formed around the main stream Mavullapoyil thodu.

## Geographic Description of the Watershed:

### *d. Location:*

Mavullapoil watershed is located in two villages, Panapuzha of Thaliparamba Block Panchayath and Vellora of Payyanur Block Panchayat. It is around 57 km away from the District Head Quarters and is accessible by road. Pilathara, one of the the nearest bus station of the watershed is situated around 17 km away in the west and Perumbadavu, the other bus staion is situated about 2 Kms North. Payyannur and Pazhayangadi

Railway stations are almost at the same distance from the watershed, i.e., 26 Kms. The watershed is situated around 10 km away from Eramam – Kuttoor Panchayath office.

e. **The geographic coordinates**

The total area of the watershed taken for treatment under IWMP is 188ha and it lies between the east longitude $75^0$22'30" and $75^0$23'30" and north latitude $12^0$ 8'30" and$12^0$ 10'0" with a total elevation of 410 feet.

**f. Average length and width of the watershed**

Mavullapoil watershed is almost square in shape with a mediocre size. The average length and width of the watershed is 2.25 km respectively.

**Relief & Drainage**

Karuvankunnu, Chellakkombu, Karippal and Valliohm areas are comparatively higher than other areas. However certain areas in the watershed has $40^o$ slope. There is no plain in the watershed.

The main drainage of the watershed is Mavullapoyil stream (Kanam stream). It is originating from Chamakkala flowing through Karippal before it enters into the Eriam River. The other streams which enrich the main stream are Parakkadavu stream and sub stream (which has no name). Other important streams are Valliohmthodu, the stream originating from K.K. Ravi's, the stream originating from T.V. Dhamodharan's and Ibrahimchal. There is only one pond in the watershed which belongs to the temple. Besides these, each household owns a drinking water well.

There are 9 springs in the watershed. One is around the middle portion of Kanam Thodu on the course of its flow. There are two springs near the house of Kuzhimullil Thankchan. One is near the house of Sarojini at Valliyam. Spring at the house of Damodaran (Police) is another one. The remaining are: Near the house orf M.V. Devaki, N. Sukumaran, K. F. Chacko (Parakkadavu) and K. C. Balakrishnan (Chamakkal). All these springs except one in the Kanam Stream are seasonal.

**The Drainage density:** Mavullapoil has a drainage density of 40m/Ha.

**Present situation of the streams and other water bodies**

The main stream Kanam Thodu retains water all time at the area where the springs is situated. Other parts of the stream dry up in the summer along with all the other streams in the watershed. Similarly other springs will also dry up in the summer. In short, water is available in almost all the streams only during monsoon season. Wells situated in the Karipal region is also seasonal. This is perhaps the one area where people experience water scarcity.

**Rainfall and Climate**

Mavullapoil watershed is included in the midland zone and hence the climate is similar to the other watersheds. The temperature is similar to that of the other watersheds with humid hot season between March to the end of May. During the month of April and May the mean maximum temperature is $35^0$C and a minimum temperature of $26^{0.}$

The rainfall is comparatively high in the watershed. Maximum Rainfall is obtaining during the South-west Monsoon. Rain is also obtained during the North-east Monsoon. 58% of the rainfall is during the former and the rest is during the latter. The average rainfall in the watershed is 3697.6 mm.

**Soil Type & Depth**

Two types of soil is observed in almost all the other watersheds. But Mavullapoil watershed consists of only one type of soil, i.e., clay soil with gravels (Alluvial type with poor fertility). Depth of the soil in the watershed is 100 cms to 150 cms.

**Agriculture & Land Use**

The total geographical area is covered with vegetation specifically with mixed crops and rubber. Rubber dominates all the other crops in the watershed. The land use pattern of the watershed is shown below in a tabular form followed by a graphic illustration.

| **Crops** | **Area(Ha)** | **%** | **Productivity** |
|---|---|---|---|
| Rubber | 120.3 | 64 | 162.46 |
| Coconut | 9.4 | 5 | 77 |
| Areca nut | 9.4 | 5 | 17.09 |
| Plantain | 18.8 | 5 | 149.67 |
| Cashew | 5.64 | 3 | 5.29 |
| Vegetables | 9.40 | 5 | 14.39 |
| Tubers | 2.24 | 1 | 39.34 |
| Built up area | 12.82 | 5 | 0 |
| **Total** | **188** | **100** | |

**Animal Husbandry**

The farmer's interest in growing domestic animals is drastically reducing. This is also reflected in the Mavullapoil watershed. Given below is a table of livestock in the watershed:

a. Hybrid Variety cows (Male) : 4
b. Hybrid Variety Cows (Female): 24
c. Indigenous Cows (Males): 6
d. Indigenous Cows(Females): 47
e. Goat(Males): 64
f. Goat (Female): 202
g. Indigenous fouls: 78
h. Hybrid Variety: 213

**Socio-Economic Details:**

The demographic details of Mavullapoil watershed is given below in a tabular format:

| Sl. No. | Particulars | Nos. |
|---|---|---|
| 1. | Total Population | 777 |
| 2. | Male | 372 |
| 3. | Female | 405 |
| 4. | APL Families | 111 |
| 5. | BPL Families | 64 |
| 6. | SC households | 6 |
| 7. | SC Population | 32 |
| 8. | Male (SC) | 15 |
| 9. | Female (SC) | 17 |

Nearly 72% of the total working class population of the watershed is farmers or farm, labourers. 7.5% are working in construction sector. Salaried people are 9.68% which include employees both in Government and Non- Government Sector. Another 3.42% are doing business. Casual labourers are 6.4%, the rest one percent are doing different types of wage labour.

Categorization of watershed community based on their main occupation shown above reveals that majority of the people depend on agriculture or farm labour for their main source of income. Therefore any fluctuation in the market or climatic change affects the economy of the watershed. About 47% of the total household living Below Poverty Line (BPL)

The arts clubs and cultural institutions in every look and corner of the watershed directly influence the cultural arena of the watershed community. Similarly the road network enhances the mobility of the community which in turn helps exchange of culture and social status by establishing a rapport with people within and without of the watershed.

Though not highly educated, most of the people in the watershed has obtained High School level education and they form a mixed community of farmers, agricultural labourers and those who are working in the construction sector. Someswari Vilasam U. P. School has been an influencing component of the watershed community in the education sector.

Almost all the households are living in pucca houses which have adequate latrine facilities. However, safe disposal mechanism for solid and liquid wastes could not be noticed in any of the houses. This would affect environmental hygiene. The general physical health condition of the people is satisfactory.

**Road Network:**

The transport facilities in the watershed are not satisfactory as people could not get regular bus services. If they wanted to travel outside the watershed, they have walk long distance to catch the bus. People mainly depends either on own vehicle or on smaller service vehicles like Jeep and Auto. The road network extends to every part of the watershed and their condition is also good. The important tar roads in the watershed are: Eriam – Mavullapoil Road and Karipal – Chathamangalam Road. The mud roads are: Karipal Mavullapoil Road, Karippal Anganwadi Road, Karipal – Karipal Temple Road, Mavullapoil – Valliohm road, and Mavullapoil – River road,

**Institutions and Community based organizations:**

Institutions and CBOs directly influence the living situation and cultural formation of a community. Hence it is important to study about such arrangements. Given below are such institutions:

- Sree Someswari Temple, Karipal
- Karipal Naagam Kavu
- Ayyappa Bhajana Madam
- GrameenaKala Samithy, Mavullapoil
- Anganwadi, Karipal
- Someswari Vilasam UP School
- Valliohm Reading Room
- Jwala Kala Samskarika Vedi, Karipal

**Market Facilities:**

The watershed community depends up on Perumbadavu Township near the watershed area for their immediate needs. Perumpadavu is about 2 Kms away from the watershed. Mathamangalam Bazaar is situated about 12 Km away from the watershed

**Hospital facilities:**

There are no hospitals or dispensaries in the watershed. The watershed community depend such institutions in Thaliparamaba, which is 23 KMs away from the watershed. They can access the hospital facilities at Payyanur also about 28 Km away from the watershed. They have also accessibility to the Pariyaram Medical College which is about 21 Kms away for further specialized treatment.

**Major Problems of the watershed**

The problems are categorized under four headings: Soil related, Water related, Agro-Bio Diversity Related and Animal Husbandry related. Such a categorization is in line with the activities that can be undertaken IWMP to solve the issues. The issues are listed below:

| Water | Soil | Agro-Biodiversity | Animal Husbandry |
|---|---|---|---|
| Depleting ground water table at Karipal Area | Reducing soil fertility a general condition of the watershed | Extinction of traditional plants and seeds | Extinction of traditional animals like Vechur Cows and Malabri Goats |
| Contamination of Water Sources, especially Kanamthodu | Changing Chemical Structure of the Soil in rubber plantations | Shift from multi crops to mono crops | Privatization of Common Property Resources for Development interventions |
| Drying up of streams and ponds in the watershed during summer in the upper regions | Reducing water storage capacity of the soil due to change of structure | Destruction of natural eco-system alienating plants and animals for rubber plantations | Unavailability of dry fodder (straw) |
| Reducing number of rain days | Soil Pollution due to indiscriminate use of agro-chemicals | Poor yield of agricultural crops | Inadequate fodder cultivation & high price of dry fodder |
| Lack of water conservation measures | Low PH of the soil and reducing productivity | Modern development and allied mechanism helped reduction in the number of birds, insects and amphibians | Lack of interest in Animal husbandry and changed mentality of the farmers |

**Activities proposed to address the issues**

| Natural Resource Management (NRM) | Production System & Micro- Enterprises (PS&M) | Livelihood Support Systems (LSS) |
|---|---|---|
| **<u>Soil Conservation</u>**<br>1. Stream bank stabilization<br>2. Live fencing<br>3. Stone bunding<br>4. Centripetal Terracing<br>5. Earth filling | 1. Goat Rearing<br>2. Cow Rearing<br>3. Rabbit Rearing | 1. Candle Making Unit<br>2. Detergent Making Unit<br>3. Floor Cleaner Making Unit<br>4. Consumer Store |
| **<u>Water Conservation</u>**<br>1. Open Well renovation<br>2. Yard water collection pits<br>3. Husk Trenches<br>4. Moisture Collection Pits<br>5. Source Recharging<br>6. Construction of open dug well | | |

**Market Facilities:**
The watershed community depends up on Perumbadavu Township near the watershed area for their immediate needs. Perumpadavu is about 2 Kms away from the watershed. Mathamangalam Bazaar is situated about 12 Km away from the watershed

**Hospital facilities:**

There are no hospitals or dispensaries in the watershed. The watershed community depend such institutions in Thaliparamaba, which is 23 KMs away from the watershed. They can access the hospital facilities at Payyanur also about 28 Km away from the watershed. They have also accessibility to the Pariyaram Medical College which is about 21 Kms away for further specialized treatment.

**Major Problems of the watershed**
The problems are categorized under four headings: Soil related, Water related, Agro-Bio Diversity Related and Animal Husbandry related. Such a categorization is in line with the activities that can be undertaken IWMP to solve the issues. The issues are listed below:

| Water | Soil | Agro-Biodiversity | Animal Husbandry |
|---|---|---|---|
| Depleting ground water table at Karipal Area | Reducing soil fertility a general condition of the watershed | Extinction of traditional plants and seeds | Extinction of traditional animals like Vechur Cows and Malabri Goats |
| Contamination of Water Sources, especially Kanamthodu | Changing Chemical Structure of the Soil in rubber plantations | Shift from multi crops to mono crops | Privatization of Common Property Resources for Development interventions |
| Drying up of streams and ponds in the watershed during summer in the upper regions | Reducing water storage capacity of the soil due to change of structure | Destruction of natural eco-system alienating plants and animals for rubber plantations | Unavailability of dry fodder (straw) |
| Reducing number of rain days | Soil Pollution due to indiscriminate use of agro-chemicals | Poor yield of agricultural crops | Inadequate fodder cultivation & high price of dry fodder |
| Lack of water conservation measures | Low PH of the soil and reducing productivity | Modern development and allied mechanism helped reduction in the number of birds, insects and amphibians | Lack of interest in Animal husbandry and changed mentality of the farmers |

**Activities proposed to address the issues**

| Natural Resource Management (NRM) | Production System & Micro-Enterprises (PS&M) | Livelihood Support Systems (LSS) |
|---|---|---|
| **<u>Soil Conservation</u>**<br>1. Stream bank stabilization<br>2. Live fencing<br>3. Stone bunding<br>4. Centripetal Terracing<br>5. Earth filling | 1. Goat Rearing<br>2. Cow Rearing<br>3. Rabbit Rearing | 1. Candle Making Unit<br>2. Detergent Making Unit<br>3. Floor Cleaner Making Unit<br>4. Consumer Store |
| **<u>Water Conservation</u>**<br>1. Open Well renovation<br>2. Yard water collection pits<br>3. Husk Trenches<br>4. Moisture Collection Pits<br>5. Source Recharging<br>6. Construction of open dug well | | |

## Mavullapoyil Watershed Development Project (Area – 188 Ha) - Master plan for Four Years - Funding pattern

| Installment | Administration | Monitoring | Evaluation | Entry Point Activity | Institution & Capacity Building | DPR preparation | Watershed Development Activities | Livelihood Activities | Production system & Micro Enterprises | Consolidation Phase | Total IWMP project fund |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1St | 56400 | 5640 | 5640 | 112800 | 84600 | 28200 | 270720 | 0 | 0 | 0 | 564000 |
| % | 2 | 0.2 | 0.2 | 4 | 3 | 1 | 9.6 | 0 | 0 | 0 | 20 |
| 2nd | 70500 | 5640 | 5640 | 0 | 28200 | 0 | 468120 | 126900 | 141000 | 0 | 846000 |
| % | 2.5 | 0.2 | 0.2 | 0 | 1 | 0 | 16.6 | 4.5 | 5 | 0 | 30 |
| 3rd | 84600 | 8460 | 8460 | 0 | 28200 | 0 | 448380 | 126900 | 141000 | 0 | 846000 |
| % | 3 | 0.3 | 0.3 | 0 | 1 | 0 | 15.9 | 4.5 | 5 | 0 | 30 |
| 4rd | 70500 | 8460 | 8460 | 0 | 0 | 0 | 391980 | 0 | 0 | 84600 | 564000 |
| % | 2.5 | 0.3 | 0.3 | 0 | 0 | 0 | 13.9 | 0 | 0 | 3 | 20 |
| **Total** | **282000** | **28200** | **28200** | **112800** | **141000** | **28200** | **1579200** | **253800** | **282000** | **84600** | **2820000** |
| % | 10 | 1 | 1 | 4 | 5 | 1 | 56 | 9 | 10 | 3 | 100 |

**Mavullapoyil Watershed - Sector – I – Watershed Development Activities - I year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Moisture collection pits | $M^3$ | 149 | 500 | 0 | 0 | 74500 | 74500 | 10 % General & 5 % SC / ST |
| 2. | Live fencing | RM | 24 | 1500 | 0 | 0 | 36000 | 36000 | |
| 3. | Stone bunding | $M^2$ | 144 | 279.1 | 0 | 40195 | 0 | 40195 | |
| 4. | Centripetal terracing | Nos | 65.67 | 200 | 0 | 0 | 13134 | 13134 | |
| 5. | Husk trench | Nos | 165 | 175 | 0 | 0 | 28875 | 28875 | |
| 6. | Yard water collection pit | Nos | 400 | 50 | 0 | 0 | 20000 | 20000 | |
| 7. | Rennovation of existing open dug out well near Karippal school | Nos | 22300 | 1 | 0 | 22300 | 0 | 22300 | |
| 8. | Stream bank stabilization along the sides of Chamakkal thodu | RM | 2395 | 86.94 | 0 | 208225 | 0 | 208225 | |
| **Total** | | | | | | **270720** | **172509** | **443229** | |

## Mavullapoyil Watershed - Sector – I – Watershed Development Activities II year action plan

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Centripetal terracing | Nos | 65.67 | 80 | 0 | 0 | 5254 | 5254 | 10 % General & 5 % SC / ST |
| 2. | Live fencing | RM | 24 | 1000 | 0 | 0 | 24000 | 24000 | |
| 3. | Husk trench | Nos | 165 | 200 | 0 | 0 | 33000 | 33000 | |
| 4. | Source recharging | Nos | 12970 | 6 | 0 | 77820 | 0 | 77820 | |
| 5. | Stone bunding | $M^2$ | 144 | 682.2 | 0 | 48234 | 50000 | 98234 | |
| 6. | Stream bank stabilization along the sides of Chamakkal thodu near the plot of Pullayikodi Dhamodharan Nambiar | RM | 2395 | 63.57 | 0 | 152266 | 0 | 152266 | |
| 7. | Stream bank stabilization along the sides of Valliyam thodu near the plot of Pattiyamma. | Nos | 189800 | 1 | 0 | 189800 | 0 | 189800 | |
| **Total** | | | | | | **468120** | **112254** | **580374** | |

**Mavullapoyil Watershed - Sector – I – Watershed Development Activities - III year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Stone bunding | $M^2$ | 144 | 279 | 0 | 40176 | 0 | 40176 | 10 % General & 5 % SC / ST |
| 2. | Live fencing | RM | 24 | 1000 | 0 | 0 | 24000 | 24000 | |
| 3. | Husk trench | Nos | 165 | 150 | 0 | 0 | 24750 | 24750 | |
| 4. | Gulli controlling check dam | RM | 2996 | 12.73 | 0 | 38160 | 0 | 38160 | |
| 5. | Stream bank protection with retaining wall along the sides of Eryam river | RM | 2395 | 150.31 | 0 | 360000 | 0 | 360000 | |
| 6. | Stream bank protection with retaining wall along the sides of Mavullapoyil river (Eryam river) | Nos | 965 | 1 | 0 | 965 | 0 | 965 | |
| 7. | Plant distribution | Nos | 50 | 181 | 0 | 9079 | 0 | 9079 | |
| **Total** | | | | | | **448380** | **48750** | **497130** | |

**Mavullapoyil Watershed - Sector – I – Watershed Development Activities - IV year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Moisture collection pits | $M^3$ | 149 | 800 | 0 | 0 | 119200 | 119200 | 10 % General & 5 % SC / ST |
| 2. | Stone bunding | $M^2$ | 144 | 240 | 0 | 34560 | 0 | 34560 | |
| 3. | Live fencing | RM | 24 | 1100 | 0 | 0 | 26400 | 26400 | |
| 4. | Well recharging | Nos | 12970 | 4 | 0 | 51880 | 8120 | 60000 | |
| 5. | Gully controlling structures in Parakadvu | RM | 2996 | 6.36 | 0 | 19080 | 0 | 19080 | |
| 6. | Stream bank protection with retaining wall along the sides of Mavullapoyil river (Eryam river) | RM | 2395 | 116.91 | 0 | 280000 | 0 | 280000 | |
| 7. | Plant distribution | Nos | 50 | 129 | 0 | 6460 | 0 | 6460 | |
| **TOTAL** | | | | | | **391980** | **153720** | **545700** | |

**Mavullapoil Watershed - Sector – II – Livelihood Activities for Land less/Asset less - II year Action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | MNREGS / other source/Bank Loan | Total |
|---|---|---|---|---|---|---|---|
| 1 | Seed money for enterprising individuals | Nos | 0 | 0 | 25380 | 0 | 25380 |
| 1 | Seed money for SHGs | Nos | 0 | 0 | 101520 | 0 | 101520 |
| **Total** | | | | | **126900** | **0** | **126900** |

**Mavullapoil Watershed - Sector – II – Livelihood Activities for Land less/Asset less - III year Action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | MNREGS / other source/Bank Loan | Total |
|---|---|---|---|---|---|---|---|
| 1 | Seed money for SHGs | Nos | 0 | 0 | 50760 | 0 | 50760 |
| **III** | **Funding for Major livelihood activities** | | | | | | |
| 1 | Grossary and stationary shope | Nos | 153000 | 1 | 76140 | 76860 | 153000 |
| **Total** | | | | | **126900** | **76860** | **203760** |

| **Funding pattern** | |
|---|---|
| Seed money for enterprising individuals (10% of the allocation - Revolving fund) | 25380 |
| Seed money for SHGs (60 % of the allocation - Revolving fund) | 152280 |
| Funding for major livelihood activities (30% of the allocation - Grant in aid) | 76140 |
| **Total allocation** | **253800** |

**Mavullapoil Watershed - Sector – III – Production System & Micro Enterprises based livelihood activities - II year Action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | Total | WDF |
|---|---|---|---|---|---|---|---|
| 1 | Cow rearing unit | Nos | 24000 | 5 | 120000 | 120000 | 20 % for General & 10 % for SC / ST |
| 2 | Rabbit rearing | Nos | 21000 | 1 | 21000 | 21000 | |
| **Total** | | | | | **141000** | **141000** | |

**Mavullapoil Watershed - Sector – III – Production System & Micro Enterprises based livelihood activities - III year action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | Total | WDF |
|---|---|---|---|---|---|---|---|
| 1 | Cow rearing unit | Nos | 24000 | 5 | 120000 | 120000 | 20 % for General & 10 % for SC / ST |
| 2 | Rabbit rearing | Nos | 21000 | 1 | 21000 | 21000 | |
| **Total** | | | | | **141000** | **141000** | |

**Total Allotment -282000**

**ENTRY POINT ACTIVITY - MAVULLAPOYIL WATERSHED DEVELOPMENT PROJECT - ACTION PLAN**

| Sl:no | Activity | Unit | Unit cost | Target | IWMP EPA fund | IWMP Project fund | Total |
|---|---|---|---|---|---|---|---|
| 3. | Construction of a well at Mavullapoyil near Kanamthodu | No | 62500 | 1 | 62500 | - | 62500 |
| 4. | Construction of a check dam in Kanamthodu | Nos | 4370 | 1 | 4370 | - | 4370 |
| 5. | Stream bank stabilization with retaining wall along the side of Kanamthodu below checkdam | Rm | 940 | 49 | 45930 | 130 | 46060 |
| | **Total** | | | | **112800** | **130** | **112930** |

# ERIAM – II WATERSHED

| | | |
|---|---|---|
| Grama Panchayat | : | Kadannappalli - Panapuzha, |
| Village | : | Panapuzha |
| Wards covered | : | VII & VIII |
| Block Panchayat | : | Thaliparamba |
| Thaluk | : | Kannur |
| District | : | Kannur |
| Total families covered | : | 392 |
| Total Population covered | : | 1724 |
| Total treatable Area | : | 488 Ha |
| River Basin | : | Peruvamba (Perumba) River |
| Average Length | : | 2.5. Kms. |
| Average Width | : | 7.5. Kms. |
| Total Project Cost | : | Rs. 73, 20,000/- |

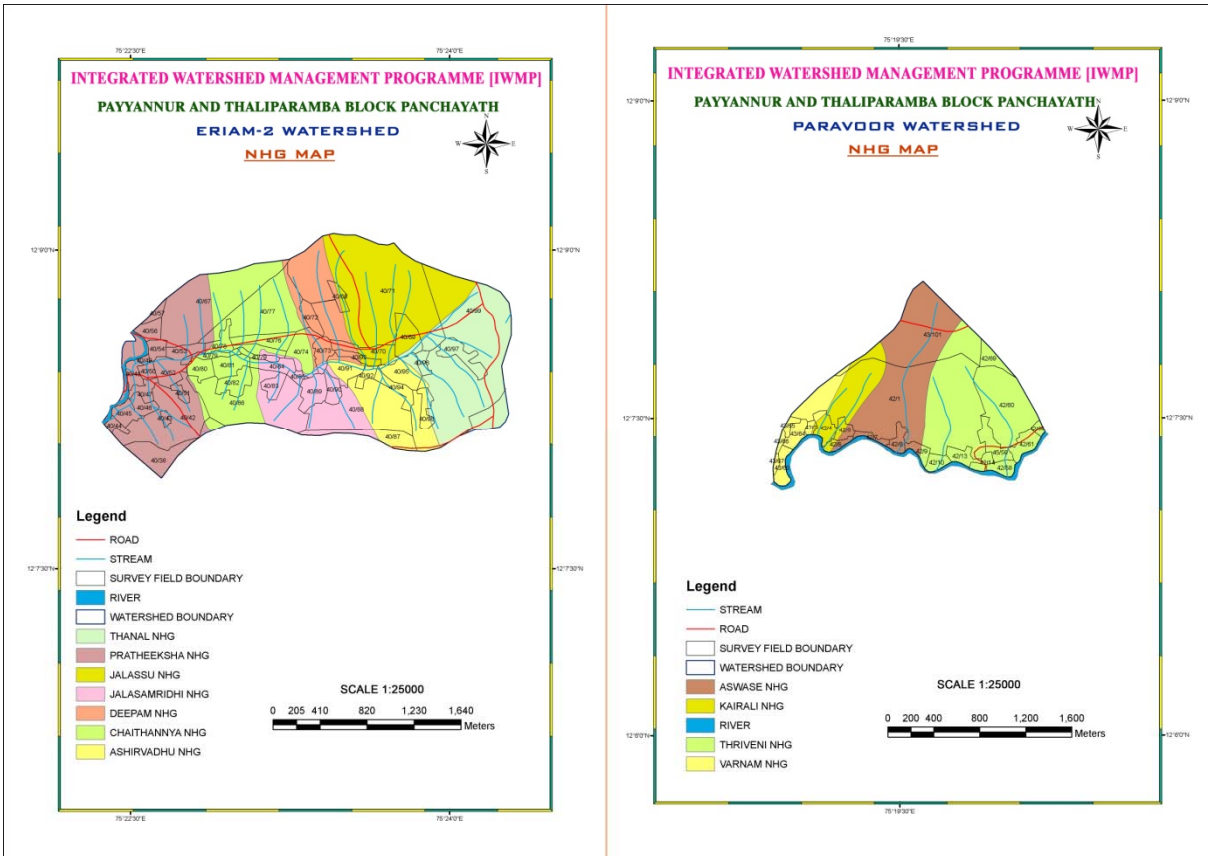
Boundaries

North: Mavullapoil & Nayikkunnu watersheds

South: Aripambra & Therandi watersheds

East: Chapparappadavu Grama Panchayat

West: Eriam River




## Introduction

The watershed is also known as Kanaramvayal as the local people call it. This watershed covers two wards of the Grama Panchayat viz, 7 & 8 wards. **The important places** in the watershed are Kanaramvayal, Eriam, Kannamkai, Edakome, Njandambalam and Paracheri. This watershed is generally an agricultural area. The watershed has a total area of 488 ha.

## Geographic Description of the Watershed:

### *a. Location:*

Eriam II watershed is located in Panapuzha village of Thaliparamba Block Panchayath. It is around 56 km away from the District Head Quarters and is accessible by road. Pilathara, and Thaliparamba, the nearest bus stations are situated around 16 km away. Payyannur and Pazhayangadi Railway stations are almost at the same distance from the watershed, i.e., 24 Kms.

### b. The geographic coordinates :

Geographically the watershed area lies between the east longitude $75^0 22'30"$ and $75^0 24'0"$ and north latitude $12^0 8'0"$ and $12^0 9'0"$ . The watershed has an elevation of 153 ft.

### c. Average length and width of the watershed

Eriam II watershed has an average length of 2.5 Kms and an average width of 7.5 Kms.

**Demographic Details:**

Eriam II watershed covers 392 households with a total population of 1724. The male population is 827 and the female population is 897. There are 3 SC households residing in the watershed with a total population of 14 with equal male and female. The number of BPL families is 175.

**Relief & Drainage**

The topography is moderately undulating. The upper reaches like Vellakkunnu are rocky areas. Lower portions of the watershed were paddy fields in olden days and in these places the soil was of alluvial type.

Water is mainly drained by Kanaramvayal Stream which originates from Kulangarakkunnu Aattukadavil Antony's plot and joins with Eriam River. Before the stream enter into the river, it flows a distance of 3.85 Kms, with an average width of 3 meters and a depth of 1½ meters. The upper reach of this stream is usually dry up. In the downstream water is available in all seasons.

***The other drainage systems in the watershed are shown below:***

1. Stream -1: Originating from K.V.Bhasakaran's and K.V.Karunakaran's
2. Kulangarakkunnu Thodu: Originating from Mankuzhuchal Jose'
3. Stream – 3.: Originating from Ittammal Raman's
4. Madayullachal Stream: Originating from Karakkeel Kumaran's
5. Stream – 5: Originating from Vaniyappura Sunny's
6. Stream-6: Originating from Valluvalappil Mukundhan
7. Kariyil Thodu
8. Stream-8: Originating from Maikeel Gopalan's
9. Stream-9: Originating from Claramma Thomas
10. Stream-10:Originating from Muhammad's
11. Karippal Chunda Stream
12. Poothakkam Chal
13. Stream-13: Originating from Aboobakkar's
14. Stream-14: Originating from Pullathu George
15. Stream-15: Originating from Poovathum Moottil Chako's
16. Stream-16: Originating from Ibhrahim Kutty's
17. Stream-17: Originating from Kunnappada Kannan's
18. Stream-18: Originating from Mottammal Narayanan's plots.

Besides the above streams there are 13 ponds, 11 bore wells and 2 springs in the watershed along with 263 open wells. All the water sources enrich the watershed, but the availability of water in most of the sources is seasonal. This had resulted the farmer became reluctant to continue the food crops and they stepped into the cash crops which are mainly rainfed.

**The Drainage density:** Mavullapoil has a drainage density of 50.2m/Ha.

**Present situation of the streams and other water bodies**

As mentioned above, the mainstream dries up in the summer, especially in the upper region. All the smaller streams are also drying in the summer. Water scarcity is experienced in Paracherry and Nhandambalm area.

**Rainfall and Climate**

Climate in the Eriam II watershed is similar to the other watersheds in the Grama Panchayat. The maximum temperature of the watershed is $36^{o}$ C and the minimum temperature is $29^{o}$C. The temperature is in its peak between March and May.

The rainfall is comparatively high in the watershed. Maximum Rainfall is obtaining during the South-west Monsoon. 59% of the rainfall is during the South – west Monsoon and the rest is from the North-east monsoon. The average rainfall in the watershed is 3697.6 mm.

**Soil Type & Depth**

The topography is moderately undulating. The upper reaches like Vellakkunnu are rocky areas. Lower portions of the watershed were paddy fields forty years back. and in these places the soil is of alluvial type (clay soil with gravels) . In the upper reaches the soil is laterite with gravel (Brown Hydromorphic). Depth of the soil in the watershed is 100 cms to 150 cms.

**Agriculture & Land Use**

The watershed area, in general, is about $55^{0}$ slopes. The highest area of the watershed is around $77^{0}$ slopes. The major cultivation in the watershed area is rubber which consumed about 55% of the total cultivable area. The cropping and land use pattern is tabled below:

| Crops | Land Used | % of Land used | Productivity |
|---|---|---|---|
| Coconut | 40.50 | 5.82 | 3352 |
| Areca nut | 27.81 | 3.22 | 50.58 |
| Cashew | 29.87 | 6.12 | 28.02 |
| Pepper | 10.25 | 2.1 | 3.00 |
| Plantain | 10.74 | 2.2 | 85.50 |
| Vegetables | 8.54 | 1.75 | 13.07 |
| Tubers | 5.86 | 1.2 | 102.91 |
| Rubber | 277.57 | 56.88 | 374.82 |
| Built Up Area | 76.86 | 15.75 | 0 |
| **Total** | **488** | **100** | **0** |

**Animal Husbandry**

The farmer's interest in growing domestic animals is drastically reducing. This is also reflected in the Eriam - II watershed. Given below is a table of livestock in the watershed:

a. Hybrid Variety cows (Male) : 7
b. Hybrid Variety Cows (Female): 33
c. Indigenous Cows (Males):9
d. Indigenous Cows(Females): 52
e. Goat(Males): 67
f. Goat (Female): 193
g. Indigenous fouls: 83
h. Hybrid Variety: 312

**Socio-Economic Details:**

People in the watershed are mixed community with all religious groups and some ethnic groups. About 75% of the working class population is involved in the economy as Agricultural Labourers. The next position is for people engaged in construction sector. This is clear evidence that the economy of the watershed is mainly built upon agriculture and casual labour. In the agriculture sectors only 5% is considered as farmers. In the case of government employees, perhaps this watershed in the GP comes first with 5% of government employees. 1% is working in Middle East and another 1% is working as Drivers.

Educational level of the people is satisfactory and major portion of the population have completed their High School/Higher Secondary School Education. A very good number of people in the watershed have acquired collegiate education and this could be a reason for the higher percentage of government employees.

Every family has very good houses and majority of the houses are with tiles roof. There is a general tendency, as in the case of other watersheds in the Grama Panchayat, to bring a shift to RCC roof as the wooden construction materials are not easily available. The houses also have adequate sanitation facilities but poor waste disposal arrangements.

There is only one SC family in the watershed, who is involved in their traditional livelihood – mat weaving with some from indigenous plants.

The general economic condition of the people in the watershed is that of middle class. The average annual income of majority of the families is between Rs. 60,000 and Rs. 120,000/- Most of the children in the school going age gets very education and the educational facilities are available within the reach of the watershed community.

**Road Network:**

There is a very vast road network that connects the watershed areas with external world. Transport facilities are available in the main roads. Other roads are occupied by smaller vehicles like three wheelers and two wheelers. Rarely there are some cars. The cars and two wheelers are owned by private parties and making use of theirs or their family's movement from one place to another. The bus service in the main road is mainly to reach the National Highway, super specialty hospitals and to the Block Head Quarters. Given below is a list of roads in the watershed.

| SL No. | Name of the Road | Length(m) | Width(m) |
|---|---|---|---|
| 1. | Eriam-Edakom road | 3000 | 5 |
| 2. | Kannankai-Madamthattu road | 2000 | 4 |
| 3. | Kanaramvayal Dewasam-Kulangarakunnu road | 750 | 3 |
| 4. | Kanaramvayal linj road | 400 | 3 |
| 5. | Kannankai Kurisadi-Vellakunnu road | 1500 | 3 |
| 6. | Kanaram vayal vayanasala(Paracheri)-Edakomthattu road | 1000 | 3 |
| 7. | Kanaram vayal anganwadi-Karippal Chunda road | 1000 | 3 |
| 8. | Kannankai Kurisadi-Kannankai Mosque road | 1000 | 3 |

**Institutions and Community based organizations:**

Institutions and CBOs directly influence the living situation and cultural formation of a community. Hence it is important to study about such arrangements. Given below are such institutions:

- Christ Nagar LP School, Edakome
- Edakome Post Office
- Federal Bank Edakome
- Madai Co-op Rural Bank
- Service – Coop Bank, Kadannappally
- Kanaramvayal Anganwadi
- Women Reading Centre
- Mahila Samajam, Kanaramvayal
- Kudumbasree Working Shed
- Krishna Pillai Memorial Reading Room
- PHC, Kannamkai.
- Vedi. Men SHG
- Red Star Club, Kanaramvayal
- Puthiya Bhagavathi Temple
- Edakome Church

**Market Facilities:**

The watershed community depends up on Edakome Township within the watershed for their immediate needs. Perumpadavu is about 5 Kms away from the watershed. Thaliparamba is situated about 17 Km away from the watershed.

**Hospital facilities:**

There are no major hospitals or dispensaries in the watershed. The watershed community depends on PHC at Kannamkai for minor ailments. Big hospitals are available in Thaliparamaba, which is 17 KMs away from the watershed. They can access the hospital facilities at Payyanur also about 26 Km away from the watershed and the Pariyaram Medical College which is about 19 Kms away for further specialized treatment.

**Major Problems of the watershed**

| Soil related Problems | Water related Problems | Problems related to Agriculture/Bio-diversity | Problems related to Livestock/Animal Husbandry |
|---|---|---|---|
| • Severe and heavy soil erosion<br>• Reducing productivity of the soil<br>• Deterioration of the soil humus<br>• Change in the | • Severe drought<br>• High velocity runoff in the monsoon season<br>• Increasing number of bore-wells<br>• Lowering water | • Reluctance to cultivate food crops<br>• Unavailability of quality organic fertilizers and bio-repellants<br>• Poor awareness | • Reduction in cow rearing<br>• Reduction in poultry<br>• Poor performance of the veterinary hospitals |

| | | | |
|---|---|---|---|
| chemical structure of the soil and reducing storage capacity of the soil<br>• Heavy water drain from the soil | table<br>• Sedimentation in the water bodies<br>• introduction of plantation crops<br>• Contamination of stream side aquifer<br>• Contamination due to direct disposal of waste | on the importance and relevance of Organic Farming<br>• Shift from multi crops to mono crops<br>• Reducing Paddy fields<br>• Poor vegetable cultivation | • Unavailability of green fodder/dry fodder<br>• Inadequate returns<br>• Lack of Interest in Animal Husbandry<br>• New generation reluctant to enter into the field of animal husbandry. |

**Activities proposed to address the issues**

| **Natural Resource Management (NRM)** | **Production System & Micro-Enterprises (PS&M)** | **Livelihood Support Systems (LSS)** |
|---|---|---|
| **<u>Soil Conservation</u>**<br>1. Gully Plugging<br>2. Stream bank stabilization<br>3. Live fencing<br>4. Stone bunding<br>5. Centripetal Terracing | 1. Goat Rearing<br>2. Cow Rearing<br>3. Organic Fertilizer Distribution<br>4. Banana Cultivation<br>5. Organic Vegetable Cultivation<br>6. Vermi Composting | 1. Concrete Mixing Machine<br>2. Tailoring Unit<br>3. Distribution of Tailoring Machine |
| **<u>Water Conservation</u>**<br>1. Well renovation<br>2. Yard water collection pits<br>3. Retaining wall<br>4. Moisture Collection Pits<br>5. Source Recharging<br>6. Check Dams<br>7. Rain Water Harvesting<br>8. Drinking water project<br>9. VCB renovation<br>10. Well digging<br>11. VCB construction | | |

## Eriam - II Watershed Development Project (Area – 488 Ha) - Master plan for Four Years - Funding pattern

| Installment | Administration | Monitoring | Evaluation | Entry Point Activity | Institution & Capacity Building | DPR preparation | Watershed Development Activities | Livelihood Activities | Production system & Micro Enterprises | Consolidation Phase | Total IWMP project fund |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1St | 146400 | 14640 | 14640 | 292800 | 219600 | 73200 | 702720 | 0 | 0 | 0 | 1464000 |
| % | 2 | 0.2 | 0.2 | 4 | 3 | 1 | 9.6 | 0 | 0 | 0 | 20 |
| 2nd | 183000 | 14640 | 14640 | 0 | 73200 | 0 | 1215120 | 329400 | 366000 | 0 | 2196000 |
| % | 2.5 | 0.2 | 0.2 | 0 | 1 | 0 | 16.6 | 4.5 | 5 | 0 | 30 |
| 3rd | 219600 | 21960 | 21960 | 0 | 73200 | 0 | 1163880 | 329400 | 366000 | 0 | 2196000 |
| % | 3 | 0.3 | 0.3 | 0 | 1 | 0 | 15.9 | 4.5 | 5 | 0 | 30 |
| 4rd | 183000 | 21960 | 21960 | 0 | 0 | 0 | 1017480 | 0 | 0 | 219600 | 1464000 |
| % | 2.5 | 0.3 | 0.3 | 0 | 0 | 0 | 13.9 | 0 | 0 | 3 | 20 |
| **Total** | **732000** | **73200** | **73200** | **292800** | **366000** | **73200** | **4099200** | **658800** | **732000** | **219600** | **7320000** |
| % | 10 | 1 | 1 | 4 | 5 | 1 | 56 | 9 | 10 | 3 | 100 |

**Eriam -II Watershed: Sector – I – Watershed Development Activities - I year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/Other Source | Total | WI |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Moisture collection pits | $M^3$ | 149 | 1000 | 0 | 0 | 149000 | 149000 | |
| 2. | Live Fencing | RM | 24 | 1000 | 0 | 0 | 24000 | 24000 | |
| 3. | Stone bunding | $M^2$ | 144 | 757 | 0 | 109022 | 0 | 109022 | |
| 4. | Centry petal terracing | Nos | 65.67 | 200 | 0 | 0 | 13134 | 13134 | |
| 5. | Gully controlled check dam | RM | 2996 | 4.24 | 0 | 12720 | 0 | 12720 | |
| 6. | Retaining wall (2m height ) along the sides of Kanaranvayal thodu | RM | 2395 | 96.06 | 0 | 230068 | 0 | 230068 | |
| 7. | Well recharging | Nos | 12970 | 3 | 0 | 38910 | 0 | 38910 | |
| 8. | Source recharging in Edakkom Christ nagar L P School | Nos | 239000 | 1 | 0 | 239000 | 0 | 239000 | |
| 9. | kulangarakunnu drinking water project | Nos | 73000 | 1 | 0 | 73000 | 0 | 73000 | |
| 10. | Improvements to the exsisting Njandambalam Public well | $M^3$ | 149 | 1000 | 0 | 0 | 149000 | 149000 | |
| 11. | Shutter type check dam atKanaramvayal thodu | RM | 24 | 1000 | 0 | 0 | 24000 | 24000 | |
| 12. | Rain water harvesting tank 5000 ltr capacity for individuals | $M^2$ | 144 | 757 | 0 | 109022 | 0 | 109022 | |
| **Total** | | | | | | **702720** | **78390** | **781110** | |

**Eriam –II Watershed: Sector – I – Watershed Development Activities II year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Constructing shutter type checkdam (3.50m width) in kanaranvayal thodu (below the plot of Palaykkal Baby) | Nos | 124000 | 1 | 0 | 124000 | 0 | 124000 | 10 % General & 5 % SC / ST |
| 2. | Wellrenovation and fixing source recharging system in Kanaramvayal Health centre | Nos | 89000 | 1 | 0 | 89000 | 0 | 89000 | |
| 3. | Rain water harvesting tank 10000 ltr capacity for Kanaramvayal Anganvady | Nos | 55000 | 1 | 0 | 55000 | 0 | 55000 | |
| 4. | kulangarakunnu drinking water project | Nos | 340000 | 1 | 0 | 340000 | 0 | 340000 | |
| 5. | Casting shutter in Kanaramvayal VCB | Nos | 36931 | 1 | 0 | 36931 | 0 | 36931 | |
| 6. | Moisture collection pits | $M^3$ | 149 | 2000 | 0 | 0 | 298000 | 298000 | |
| 7. | Live fencing | RM | 24 | 2500 | 0 | 0 | 60000 | 60000 | |
| 8. | Stone bunding | Nos | 144 | 668.47 | 0 | 96259 | 0 | 96259 | |
| 9. | Centry petal terracing | Nos | 65.67 | 400 | 0 | 0 | 26268 | 26268 | |
| 10. | Improvements to the exsisting Public well in Edakkom town | Nos | 128000 | 1 | 0 | 128000 | 0 | 128000 | |
| 11. | Gully controlled check dam | RM | 2996 | 6.36 | 0 | 19080 | 0 | 19080 | |
| 12. | Retaining wall (2m height ) along the sides of Kanaranvayal t5hodu | RM | 2395 | 109.39 | 0 | 262000 | 0 | 262000 | |
| 13. | Well recharging | Nos | 12970 | 5 | 0 | 64850 | 0 | 64850 | |
| 14. | Yard water collection pit | Nos | 400 | 40 | 0 | 0 | 16000 | 16000 | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 15. | Husk trench | Nos | 165 | 350 | 0 | 0 | 57750 | 57750 | |
| **Total** | | | | | | 1215120 | 458018 | 1673138 | |

**Eriam -II Watershed - Sector – I – Watershed Development Activities - III year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Constructing open dug out well in kannankuzhi | Nos | 311000 | 1 | 0 | 301000 | 0 | 301000 | 10 % General & 5 % SC / ST |
| 2. | Husk trench | Nos | 165 | 300 | 0 | 0 | 49500 | 49500 | |
| 3. | Improvements to the exsisting well in kanaranvayal anganvady | Nos | 65000 | 1 | 0 | 65000 | 0 | 65000 | |
| 4. | steam bank stebilization for Kariyil thodu 1.5m height | RM | 2395 | 49.21 | 0 | 117880 | 0 | 117880 | |
| 5. | Construction of VCB 5m width in Kanaramvayal thodu | Nos | 680000 | 1 | 0 | 680000 | 0 | 680000 | |
| 6. | Moisture collection pits | $M^3$ | 149 | 3000 | 0 | 0 | 447000 | 447000 | |
| 7. | Live fencing | RM | 24 | 2500 | 0 | 0 | 60000 | 60000 | |
| 8. | Centry petal terracing | Nos | 65.67 | 300 | 0 | 0 | 19701 | 19701 | |
| 9. | Yard water collection pit | Nos | 400 | 30 | 0 | 0 | 12000 | 12000 | |
| **Total** | | | | | | 1163880 | 588201 | 1752081 | |

**Eriam -II Watershed - Sector – I – Watershed Development Activities - IV year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Gully controlled check dam in Karippalchunda thodu | RM | 2996 | 6.36 | 0 | 19080 | 0 | 19080 | 10 % General & 5 % SC / ST |
| 2. | Constructing shutter type checkdam (3.50m width) in kanaranvayal thodu | Nos | 124000 | 1 | 0 | 124000 | 0 | 124000 | |
| 3. | Husk trench | Nos | 165 | 200 | 0 | 0 | 33000 | 33000 | |
| 4. | Stone bunding | $M^2$ | 144 | 195.9 | 0 | 28215 | 0 | 28215 | |
| 5. | Moisture collection pits | $M^3$ | 149 | 3000 | 0 | 0 | 447000 | 447000 | |
| 6. | Live fencing | RM | 24 | 2000 | 0 | 0 | 48000 | 48000 | |
| 7. | Centry petal terracing | Nos | 65.67 | 400 | 0 | 0 | 26268 | 26268 | |
| 8. | Yard water collection pit | Nos | 400 | 35 | 0 | 0 | 14000 | 14000 | |
| 9. | Construction of VCB 5m width in Kanaramvayal thodu | Nos | 680000 | 1 | 0 | 680000 | 0 | 680000 | |
| 10. | steam bank stebilization for Poothakulamchal thodu- 1.00m height | RM | 2395 | 19.59 | 0 | 46935 | 0 | 46935 | |
| 11. | Retaining wall (2m height ) along the sides of Kanaranvayal t5hodu | RM | 2395 | 49.79 | 0 | 119250 | 0 | 119250 | |
| **TOTAL** | | | | | | **1017480** | **568268** | **1585748** | |

**Eriam - II Watershed - Sector – II – Livelihood Activities for Land less/Asset less - II year Action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | MNREGS / other source/Bank Loan | Total |
|---|---|---|---|---|---|---|---|
| 1 | seed money for enterprising individuals | Nos | 0 | 0 | 65880 | 0 | 65880 |
| 2 | Seed money for SHGs | Nos | 0 | 0 | 263520 | 0 | 263520 |
| **Total** | | | | | **329400** | **0** | **329400** |

**Eriam - II Watershed - Sector – II – Livelihood Activities for Land less/Asset less - III year Action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | MNREGS / other source/Bank Loan | Total |
|---|---|---|---|---|---|---|---|
| 1 | Seed money for SHGs | Nos | 0 | 0 | 131760 | 0 | 131760 |
| **III** | **Funding for Major livelihood activities** | | | | | | |
| 1 | RCC Work Unit | Nos | 300000 | 1 | 150000 | 150000 | 300000 |
| 2 | Food preservation unit | Nos | 96000 | 1 | 47640 | 48360 | 96000 |
| **Total** | | | | | **329400** | **198360** | **527760** |

| **Funding pattern** | |
|---|---|
| Seed money for enterprising individuals (10% of the allocation) | 65880 |
| Seed money for SHGs (60 % of the allocation) | 395280 |
| Funding for major livelihood activities (30% of the allocation) | 197640 |
| **Total allocation** | **658800** |

**Eriam - II Watershed - Sector – III – Production System & Micro Enterprises based livelihood activities - II year Action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | Total | WDF |
|---|---|---|---|---|---|---|---|
| 1 | Banana cultivation | Nos | 24000 | 10 | 240000 | 240000 | 20 % for General & 10 % for SC / ST |
| 2 | Vermi compost | Nos | 7000 | 5 | 35000 | 35000 | |
| 3 | Organic fertilizer distribution (100kg/Farmer) | Nos | 1800 | 51 | 91000 | 91800 | |
| **TOTAL** | | | | | **366000** | **366800** | |

**Eriam - II Watershed - Sector – III – Production System & Micro Enterprises based livelihood activities - III year action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | Total | WDF |
|---|---|---|---|---|---|---|---|
| 1 | Organic vegetable cultivation | Nos | 24000 | 10 | 240000 | 240000 | 20 % for General & 10 % for SC / ST |
| 2 | Vermi composting | Nos | 9000 | 5 | 45000 | 45000 | |
| 3 | Organic fertilizer distribution (100kg/Farmer) | Nos | 1800 | 45 | 81000 | 81000 | |
| **Total** | | | | | **366000** | **366000** | |

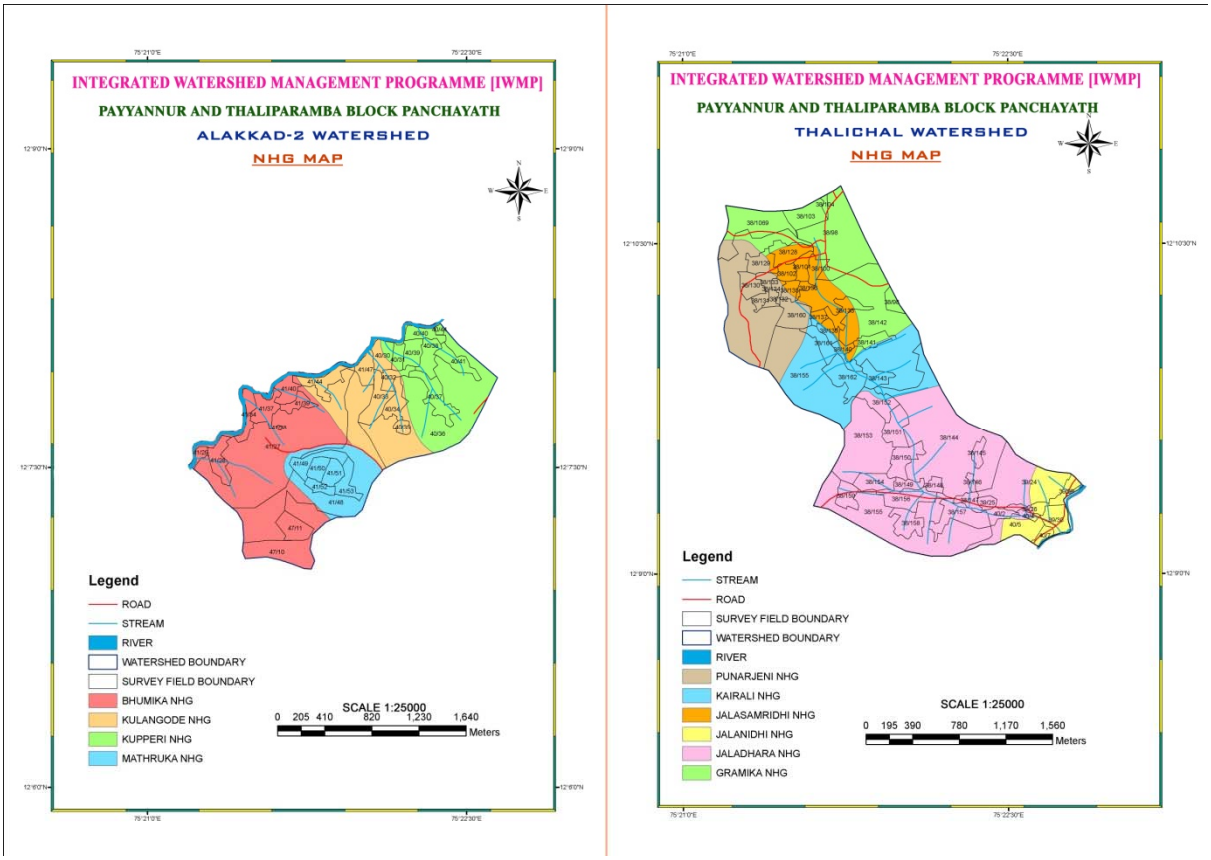
**Total Allotment - 732000**

**ERYAM - II WATERSHED DEVELOPMENT PROJECT - ENTRY POINT ACTIVITY - ACTION PLAN**

| Sl:no | Activity | Unit | Unit cost | Target | IWMP EPA fund | IWMP Project fund | Total |
|---|---|---|---|---|---|---|---|
| 6. | Construction of shutter type check dam 3m width in Kanaramvayalthodu | No | 104010 | 1 | 104010 | - | 104010 |
| 7. | Stream bank protection | Rm | 1800 | 104.88 | 188790 | 210 | 189000 |
| | **Total** | | | | **292800** | **210** | **293010** |

# ALAKKADU – II WATERSHED

| | | |
|---|---|---|
| Grama Panchayat | : | Kadannappalli - Panapuzha, |
| Village | : | Panapuzha |
| Wards covered | : | VI & VII |
| Block Panchayat | : | Thaliparamba |
| Thaluk | : | Kannur |
| District | : | Kannur |
| Total families covered | : | 172 |
| Total Population covered | : | 1100 |
| Total treatable Area | : | 280 Ha |
| River Basin | : | Peruvamba (Perumba) River |
| Average Length | : | 2.9. Kms. |
| Average Width | : | 3.1. Kms. |
| Total Project Cost | : | Rs. 42, 00,000/- |
| Boundaries | : | North: Panapuzha River |
| | : | South: Puthukkudivayal watershed |
| | : | East: Pariyaram Grama Panchayat |
| | : | West: Panapuzha River |




## Introduction

Alakkad II watershed spreaded over 6th and 7th wards of Kadannappalli-Panapuzha gramapanchayath and has a total geographic area of 280 ha. This geographic area includes a spatial coverage of southern part of Pariyaram Grama Panchayath (a small portion), north of Panapuzha River, Manikkamangalam hills in the east and Choweri hills in the west.

**The important places** in the watershed are Choweri, Parottipoyil, Alakkadu, Ezhumvayal, Kupperi, Kulangodu, Manikkamangalam, etc.

## Geographic Description of the Watershed:

### *a. Location:*

Geographically the watershed has a slanting nature towards north direction with hillocks and medium slopes. The upstreaqm areas in the watershed are Kulangodu, Kupperi, Ezhumvayal, Choweri and Manikkamangalam which are about 60% of the total watershed area. The remaining 40% of land can be considered as plains. Alakkad and Eriam which are adjacent to each other and to the river observed as plain lands.

### b. The geographic coordinates:

Geographically the watershed lies between the east longitudes 75$^0$21’0” and 75022’30 and north latitude 12$^0$7’0” and 12$^0$8’30” and has a total elevation of 367 feet.

**c. Average length and width of the watershed**

Alakkadu II watershed is a small watershed which has an average length of 2.9 Kms and an average width of 3.1 Kms.

**Relief & Drainage**

The watershed has a slanting nature towards north direction with hillocks and medium slopes. The high ranges in the watershed are Kulangodu, Kupperi, Ezhumvayal, Choweri and Manikkamangalam which are about 60% of the total watershed area. The remaining 40% of land can be considered as plains. Alakkad and Eriam which are adjacent to each other and to the river observed as plain lands.

Alakkad II watershed is the catchment area of nine streams which are flowing across the watershed and entering into the Panapuzha River which forms the north western boundary of the watershed. The streams are:

1. Athikkallu stream
2. Vanisseri stream
3. Manikkamangalam stream
4. Kulangodu stream
5. Chittadi stream
6. Odera stream
7. Thenamkunnu stream
8. Pathamkunnu stream
9. Karimbilodu stream

There are four tributaries enriching the Kulangodu stream. Which are: Kunnile stream, Kattilekunnu stream, Neeliyara stream I, Neeliyara stream II. The stream which is originating from the plot of shri. Thomas is a sub stream of Karimbilodu stream and contributes its water abundance.

The ponds in the watershed also play a role in keeping the watershed wet. The list of ponds is given below:

| Sl. No. | Name of pond | Ownership |
|---|---|---|
| 1. | Kalathumpara pond | Public |
| 2. | Ezhumvayal pond | Public |
| 3. | Muhammadkunji pond | Private |
| 4. | Moitheen pond | Private |
| 5. | Kadaykkal Ali pond | Private |
| 6. | Narikkodu Muhammad pond | Private |
| 7. | Abdul Rahman Haji pond | Private |
| 8. | Shine pond | Private |
| 9. | Roy pond | Private |
| 10. | Neeliyara Joseph pond | Private |
| 11. | Khadeeja pond | Private |
| 12. | Abdulla Haji pond | Private |
| 13. | Sibi pond | Private |
| 14. | Abraham pond | Private |
| 15. | M.V. Joseph Pond | Private |

**The Drainage density:** Alakkadu II watershed has a drainage density of 24.46m/Ha.

**Present situation of the streams and other water bodies**

It seems that the watershed is abundant in the availability of perennial water when one understand that there are fifteen ponds (two are public) 158 wells and two public bore wells (one in Ezhumvayal Anganwadi and the other in Kulangodu) in the watershed. In addition, two public open wells are also dug, one in Pathamkunnu and the other in Ezhumvayal. But the pity is that most of these water bodies are seasonal providing water for six to eight months. The public ponds- Kalathumpara and Ezhumvayal dry up in early post monsoon months. Similar is the situation of some of the private ponds and house hold wells.

**Rainfall and Climate**

Climate in the Alakkadu II watershed is with common humid tropical climate. The maximum temperature of the watershed is 36.6$^{o}$ C and the minimum temperature is 28.5$^{o}$ C. The temperature is in its peak between February and May.

The rainfall is comparatively high in the watershed. Maximum Rainfall is obtaining during the South-west Monsoon. 61% of the rainfall is during the South – west Monsoon and the rest is from the North-east monsoon. The average rainfall in the watershed is 3697.6 mm.

**Soil Type & Depth**

In the upper portions of the watershed red gravelly clayey soil (Brown hydromorphic soil) is generally seen. This is specifically so in places like Choweri, Manikkamangalam, Kulangodu, Kupperi and Ezhumvayal. Clay (clay soil with gravels) is seen in areas adjacent to the river. Granite rocks are common in Alakkad Vannathan Valappu and the surroundings of Kupperi Church. About 6.31 Ha are with brown hydromorphic soil and 273.69ha is with Clay soil with gravel.

**Agriculture & Land Use**

Around 85% of the total area is under crops. The south east part of the watershed is rocky land where cashew plantation is common. In Eazhumvayal the paddy field is left barren. There is a considerable change from the cultivation of multi crops to mono crops. The area under rubber plantation is considerably increasing. The upper portions of the watershed especially Kulangodu, Kupperi, Ezhumvayal, etc are highly used for rubber cultivation. Mixed crop cultivation is seen in the regions adjacent to the river and streams.

The land use pattern is tabled below

| Crop | Area(Ha) | % | Produ-ctivity |
|---|---|---|---|
| Rubber | 151.2 | 54 | 204.19 |
| Coconut | 25.2 | 9 | 208 |
| Areca nut | 25.2 | 9 | 45.83 |
| Pepper | 5.6 | 2 | 1.64 |
| Cashew | 8.4 | 3 | 7.88 |
| Plantain | 11.2 | 4 | 89.16 |
| Vegetables | 8.4 | 3 | 12.86 |
| Tubers | 5.6 | 2 | 98.35 |
| Others | 11.2 | 4 | 0 |
| Built up area | 28 | 10 | 0 |
| **Total** | **280** | **100** | **0** |

**Animal Husbandry**

Poor interest in livestock maintenance among the farmers had resulted in drastic decrease in the number of domestic animals in the watershed. However, the intervention of the veterinary department and the Grama Panchayat helped to sustain some of the farmers who foster animal husbandry. Given below are the details of livestock in the watershed:

a. Hybrid Variety cows (Male) : 3
b. Hybrid Variety Cows (Female): 26
c. Indigenous Cows (Males):5
d. Indigenous Cows(Females): 34
e. Goat(Males): 58
f. Goat (Female): 112
g. Indigenous fouls: 63
h. Hybrid Variety: 108

**Socio-Economic Details:**

Alakkadu II watershed covers 174 households with a total population of 1100. The male population is 536 and the female population is 564. There are 25 SC households residing in the watershed with a total population of 131 with male population 65 and female population 66. The number of BPL families is 88.

The general economic situation of the watershed community is that of middle class. One cannot distinguish those rich and poor from the physical appearance of the people. But there are poverty stricken families in the watershed, especially those SC communities. Statistics shows that out of the total 174 families 88 are categorized as BPL. This is about 50.57% the total households in the watershed.

Around 83% of the total working class in the watershed is in the agricultural sector and the economy is built upon agriculture. Therefore, the deterioration of farm lands and change in ecology affects the whole economy of the households in the watershed. Only a few percentages are salaried. A very good percentage of working class population (22%) is daily wagers working mainly in construction sector. The rest 15.5% are exclusively living on casual labour either in farm sector or in non-farm sector.

The watershed is net-worked with both tarred and mud roads which enables the people to move one place to another. This road network plays an important role in the civil and political empowerment of the people and their cultural exchange. But the conveyance facilities are still be grown in the watershed.

Educationally and culturally the watershed community is comparatively better because they have easy access to educational institutions in and around the Grama Panchayat. Clubs and cultural associations are the contributors towards this cultural growth and development of the watershed community.

**Road Network:**

There are 6roads that connects different places of the watershed and allowing the people to move one place to another. Bu there is no bus service in the watershed. People depend on private or own vehicles to go outside the watershed for various purposes. The roads are: Choweri – Parottipoil road, Ezhumvayal Colony – Alakkadu PHC road, Ezhumvayal Colony – Jimmy Waiting Shed Road, Kulangodu – Eriam School Road, Kulangodu-Kannamkai Road and Choweri – Manikkamangalam Road.

**Institutions and Community based organizations:**

Institutions that directly related to the watershed community are: Ezhumvayal Anganwadi, Kupperi Mosque, Ezhumvayal Mosque, Kulangodu Church, Ayyappa Bhajana madam, Ezhumvayal and Ezhumvayal Cultuaral Centre.

**Market Facilities:**

The watershed community depends up on Eriam Township (2 Kms away) for their immediate needs. Mathamangalam Bazaar is about 12 Kms away from the watershed.

**Hospital facilities:**

There are no major hospitals or dispensaries in the watershed. The watershed community depends on medical institutions in Mathamangalam and Payyanur for minor ailments. Pariyaram Medical College is about 21 Kms away from the watershed.

**Major Problems of the watershed**

Major problems identified through a brainstorming session in which representatives from the Neighbourhood clusters participated. The problems are categorized under four headings: Soil related, Water related, Agro-Bio Diversity Related and Animal Husbandry related. Such a categorization is in line with the activities that can be undertaken IWMP to solve the issues. The issues are listed below:

**Soil related Problems**

| **Group – I**<br>**Agro Bio- Diversity** | **Group – 2**<br>**Soil Fertility** | **Group – 3**<br>**Water Availability** | **Group – 4**<br>**Animal Husbandry** |
|---|---|---|---|
| Shift from multi crops to mono crops | Low PH of the soil and reducing productivity | Drying up of streams and ponds in the watershed | Absence of Paddy cultivation affected availability of dry fodder (straw) |
| Leveling of Paddy fields which is a natural eco-system (E.g.: Ezhumvayal) | Reducing water storage capacity of the soil | Lack of water conservation measures | Privatization of Common Property Resources for Development interventions |
| Extinction of traditional plants and seeds | Soil erosion in Ezhumvayal | Reducing number of rain days | Lack of interest in Animal husbandry and changed |

| | | | |
|---|---|---|---|
| | | | mentality of the farmers |
| Destruction of natural eco-system alienating plants and animals | Changing Chemical Structure of the Soil due to application of chemicals | Contamination of Water Sources | Inadequate fodder cultivation & high price of dry fodder |
| Atmospheric Radiation from Electronic Equipments speed up the extinction of organisms | Reducing soil fertility | Depleting ground water table and drinking water scarcity (Patthamkunnu, Karimbilodu, Ezhumvayal, Thenamkunnu and Kulangodu Thattu) | Extinction of traditional animals like Vechur Cows and Malabri Goats |

**Activities proposed to address the issues**

Generally the activities are of three folds: Natural Resource Management Activities which covers the soil, water and bio-diversity issues, Production System Management and Micro Enterprises (PS&M) which covers the agriculture and soil problems along with economic backwardness, , which manages the livelihoods and economic backwardness of the landless, women and the indigenous communities. Given below is a brief about the activities proposed for the watershed:

| Natural Resource Management (NRM) | Production System & Micro- Enterprises (PS&M) | Livelihood Support Systems (LSS) |
|---|---|---|
| **<u>Soil Conservation</u>**<br>1. Live fencing<br>2. Stone bunding<br>3. Centripetal terracing<br>4. Stream bank stabilization<br>5. Gully Plugging | 1. Goat Rearing<br>2. Cow rearing<br>3. Banana Cultivation<br>4. Rabbit Rearing<br>5. Organic Vegetable Cultivation | 1. Tailoring Machine Distribution<br>2. Welding Unit<br>3. Banana Chips Making Unit |
| **<u>Water Conservation</u>**<br>1. Retaining wall<br>2. Yard water collection pits<br>3. Husk Trenches<br>4. Moisture Collection Pits<br>5. Source Recharging<br>6. Check Dams<br>7. Rain Water Harvesting | | |

**Alakkad - II Watershed Development Project (Area – 280 Ha)**
**Master plan for Four Years - Funding pattern**

| Installment | Administration | Monitoring | Evaluation | Entry Point Activity | Institution & Capacity Building | DPR preparation | Watershed Development Activities | Livelihood Activities | Production system & Micro Enterprises | Consolidation Phase | Total IWMP project fund |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1St | 84000 | 8400 | 8400 | 168000 | 126000 | 42000 | 403200 | 0 | 0 | 0 | 840000 |
| % | 2 | 0.2 | 0.2 | 4 | 3 | 1 | 9.6 | 0 | 0 | 0 | 20 |
| 2nd | 105000 | 8400 | 8400 | 0 | 42000 | 0 | 697200 | 189000 | 210000 | 0 | 1260000 |
| % | 2.5 | 0.2 | 0.2 | 0 | 1 | 0 | 16.6 | 4.5 | 5 | 0 | 30 |
| 3rd | 126000 | 12600 | 12600 | 0 | 42000 | 0 | 667800 | 189000 | 210000 | 0 | 1260000 |
| % | 3 | 0.3 | 0.3 | 0 | 1 | 0 | 15.9 | 4.5 | 5 | 0 | 30 |
| 4rd | 105000 | 12600 | 12600 | 0 | 0 | 0 | 583800 | 0 | 0 | 126000 | 840000 |
| % | 2.5 | 0.3 | 0.3 | 0 | 0 | 0 | 13.9 | 0 | 0 | 3 | 20 |
| **Total** | **420000** | **42000** | **42000** | **168000** | **210000** | **42000** | **2352000** | **378000** | **420000** | **126000** | **4200000** |
| % | 10 | 1 | 1 | 4 | 5 | 1 | 56 | 9 | 10 | 3 | 100 |

**Alakkadu -II Watershed - <u>Sector – I – Watershed Development Activities - I year action plan</u>**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS /Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Moisture collection pits | $M^3$ | 149 | 500 | 0 | 0 | 74500 | 74500 | 10 % General & 5 % SC / ST |
| 2. | Live fencing | RM | 24 | 1000 | | 0 | 24000 | 24000 | |
| 3. | Stone bunding | $M^2$ | 144 | 489.7 | | 70529 | 0 | 70529 | |
| 4. | Centry petal terracing | NOS | 65.67 | 100 | 0 | 0 | 6567 | 6567 | |
| 5. | Gully controlled check dam across Karimbilode thodu | RM | 2996 | 6.36 | | 19080 | 0 | 19080 | |
| 6. | Construction of check dam in Karimbilod thdou near the plot of Thomas Veranikal and Abraham Choorapuzha | RM | 2996 | 7.17 | | 21491 | 0 | 21491 | |
| 7. | Stream bank protection with retaining wall along the sides of Karimbilod thodu near the plot of C.G.Prabhakaran (2 sides) | RM | 2395 | 43.5 | | 104300 | 0 | 104300 | |
| 8. | Stream bank protection with retainig wall along the sides of Karimbilod thodu near the plot of V.K.Balakrishnan ,Mattummal Hopalan | RM | 2395 | 78.41 | | 187800 | 0 | 187800 | |
| **Total** | | | | | | **403200** | **105067** | **508267** | |

**Alakkadu -II Watershed - Sector – I – Watershed Development Activities II year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Gully controlled Structures across Pathamkunnu thodu at Uriyilkunnu | RM | 2996 | 1 | 0 | 2996 | 0 | 2996 | 10% General & 5 % SC / ST |
| 2. | Gully controlled check dam across pathamkunnu thodu | RM | 2996 | 5.09 | 0 | 15264 | 0 | 15264 | |
| 3. | Stream bank protection with retaining wall along the sides of Karimbilod thodu near the plot of C.G.Prabhakaran (2 sides) | RM | 2395 | 107.98 | 0 | 258614 | 0 | 258614 | |
| 4. | Gully controlled check dam in Thenamkunnu thodu | RM | 2395 | 37.98 | 0 | 90973 | 0 | 90973 | |
| 5. | Retaining wall along the sides of Pathamkunnu thodu near the plot of Chappamthottathil Andruman,Madathil Amina | RM | 2395 | 87.09 | 0 | 208600 | 0 | 208600 | |
| 6. | Retaining wall along the sides of Pathamkunnu thodu near the plot of Madathil Mariyam - Parvathi Peedikavalappil | $M^2$ | 144 | 838.56 | 0 | 120753 | 0 | 120753 | |
| 7. | Stone Bunding | $M^3$ | 149 | 500 | 0 | 0 | 74500 | 74500 | |
| 8. | Moisture conservation pit | RM | 24 | 1500 | 0 | 0 | 36000 | 36000 | |
| 9. | Live fencing | NOS | 400 | 100 | 0 | 0 | 40000 | 40000 | |
| 10. | Yard water collection pit | RM | 2996 | 1 | 0 | 2996 | 0 | 2996 | |
| **Total** | | | | | | **697200** | **150500** | **847700** | |

**Alakkadu -II Watershed - Sector – I – Watershed Development Activities - III year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Stone Bunding | $M^3$ | 144 | 558.2 | 0 | 80390 | 0 | 80390 | 10% General & 5 % SC / ST |
| 2. | Centry petal terracing | Nos | 65.67 | 100 | 0 | 0 | 6567 | 6567 | |
| 3. | Yard water collection pit | Nos | 400 | 15 | 0 | 0 | 6000 | 6000 | |
| 4. | Live fencing | RM | 24 | 1800 | 0 | 0 | 43200 | 43200 | |
| 5. | Rain water harvesting tank 5000 ltr capacity for individuals | Nos | 30200 | 5 | 0 | 151000 | 0 | 151000 | |
| 6. | Well recharging | Nos | 12970 | 9 | 0 | 116730 | 0 | 116730 | |
| 7. | Gully controlling structures in Neeliyar thodu,Kattilakunnu thodu | RM | 2996 | 6.368 | 0 | 19080 | 0 | 19080 | |
| 8. | Retaining wall along the sides of Thahira Pandikashalayil from below the junction between neeliyarkunnu thodu and Kattilakunnu thodu | RM | 2395 | 30.48 | 0 | 73010 | 0 | 73010 | |
| 9. | Retaining wall along the sides Kunnilamthodu from the junction of Kulangod thodu | RM | 2395 | 95.02 | 0 | 227590 | 0 | 227590 | |
| **Total** | | | | | | **667800** | **55767** | **723567** | |

**Alakkadu –II Watershed - Sector – I – Watershed Development Activities - IV year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS /Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Retaining wall along the sides of Manikyamangalamthodu near the plot of Dhamodharan Kalamvalappil | RM | 2395 | 29.79 | 0 | 71355 | 0 | 71355 | 10% General & 5 % SC / ST |
| 2. | Retaining wall along the sides Kunnilamthodu from the junction of Kulangod thodu | RM | 2395 | 78.41 | 0 | 187800 | 0 | 187800 | |
| 3. | Gully plugging in Kulangod thodu from starting point | RM | 2696 | 6.36 | 0 | 19080 | 0 | 19080 | |
| 4. | Gully plugging in Athikkallukunnu thodu | RM | 2696 | 4.24 | 0 | 12720 | 0 | 12720 | |
| 5. | Well recharging | Nos | 12970 | 5 | 0 | 64850 | 0 | 64850 | |
| 6. | Stone bunding | $M^2$ | 144 | 279.1 | 0 | 40195 | 0 | 40195 | |
| 7. | Stream bank protection with retaining wall along the sides of Karimbilod thodu near the plot of Salim kulathunkal - C.G.Prabhakaran | RM | 2395 | 78.41 | 0 | 187800 | 0 | 187800 | |
| 8. | Centry petal terracing | Nos | 65.67 | 500 | 0 | 0 | 32835 | 32835 | |
| 9. | Yard water collection pit | Nos | 400 | 100 | 0 | 0 | 40000 | 40000 | |
| 10. | Live fencing | RM | 24 | 1500 | 0 | 0 | 36000 | 36000 | |
| 11. | Moisture collection pit | $M^3$ | 149 | 1000 | 0 | 0 | 149000 | 149000 | |
| 12. | Husk trench | Nos | 165 | 300 | 0 | 0 | 49500 | 49500 | |
| **TOTAL** | | | | | | **583800** | **307335** | **891135** | |

**Alakkad - II Watershed - Sector – II – Livelihood Activities for Land less/Asset less - II year Action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | MNREGS / other source/Bank Loan | Total |
|---|---|---|---|---|---|---|---|
| 1 | seed money for enterprising individuals | Nos | 0 | 0 | 37800 | 0 | 37800 |
| 1 | Seed money for SHGs | Nos | 0 | 0 | 151200 | 0 | 151200 |
| **Total** | | | | | **189000** | **51000** | **240000** |

**Alakkad - II Watershed - Sector – II – Livelihood Activities for Land less/Asset less - III year Action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | MNREGS / other source/Bank Loan | WDF | Total |
|---|---|---|---|---|---|---|---|
| 1 | Seed money for SHGs | Nos | 0 | 0 | 75600 | 0 | 75600 |
| **III** | **Funding for Major livelihood activities** | | | | | | |
| 1 | Welding unit | Nos | 150000 | 1 | 75000 | 75000 | 150000 |
| 2 | Banana chips making unit | Nos | 77000 | 1 | 38400 | 38600 | 77000 |
| **Total** | | | | | **189000** | **113600** | **302600** |

| **Funding pattern** | | |
|---|---|---|
| Seed money for enterprising individuals (10% of the allocation -Revolving fund) | | 37800 |
| Seed money for SHGs (60 % of the allocation - Revolving fund) | | 226800 |
| Funding for major livelihood activities (30% of the allocation - Grant in aid) | | 113400 |
| **Total allocation** | | **378000** |

**Alakkad - II Watershed - Sector – III – Production System & Micro Enterprises based livelihood activities - II year Action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | Total | WDF |
|---|---|---|---|---|---|---|---|
| 1 | Cow rearing unit | Nos | 24000 | 5 | 113000 | 120000 | 20 % for General & 10 % for SC / ST |
| 2 | Banana cultivation | Nos | 24000 | 3 | 72000 | 72000 | |
| 3 | Rabbit rearing | Nos | 25000 | 1 | 25000 | 25000 | |
| **Total** | | | | | **210000** | **217000** | |

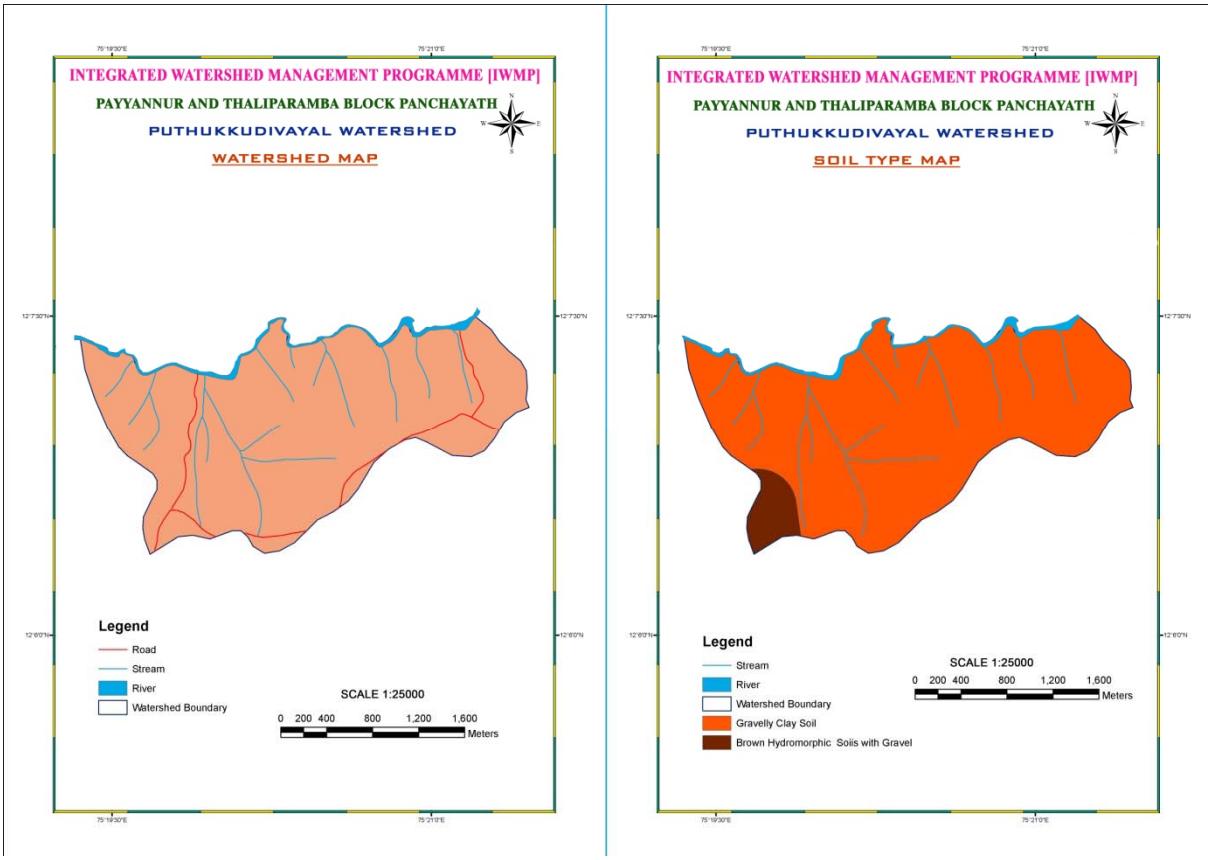
**Alakkad - II Watershed - Sector – III – Production System & Micro Enterprises based livelihood activities - III year action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | Total | WDF |
|---|---|---|---|---|---|---|---|
| 1 | Organic vegitable cultivation | Nos | 24000 | 5 | 113000 | 120000 | 20 % for General & 10 % for SC / ST |
| 2 | Banana cultivation | Nos | 24000 | 3 | 72000 | 72000 | |
| 3 | Rabbit rearing | Nos | 25000 | 1 | 25000 | 25000 | |
| **Total** | | | | | **210000** | **217000** | |

**Total Allotment -420000**

# PUTHUKKUDIVAYAL WATERSHED

| | | |
|---|---|---|
| Grama Panchayat | : | Kadannappalli - Panapuzha |
| Village | : | Panapuzha |
| Wards covered | : | IV, V & VI |
| Block Panchayat | : | Thaliparamba |
| Thaluk | : | Kannur |
| District | : | Kannur |
| Total families covered | : | 211 |
| Total Population covered | : | 950 |
| Total treatable Area | : | 462 Ha |
| River Basin | : | Peruvamba (Perumba) River |
| Average Length | : | 3.0. Kms. |
| Average Width | : | 4.25. Kms. |
| Total Project Cost | : | Rs. 69, 30,000/- |
| Boundaries | : | North: Panapuzha River |
| | : | South: Puthukkudivayal watershed |
| | : | East: Pariyaram Grama Panchayat |
| | : | West: Panapuzha River |




## Introduction

Puthukkudivayal watershed is a micro watershed of 462 ha of land spread over two Grama Panchayats: Kadannappally – Panapuzha and Pariyaram. Only a very small portion is in Pariyaram Grama Panchayat, major portion (406.69 ha) lies in 4$^{th}$, 5$^{th}$ and 6$^{th}$ wards of Kadannappally – Panapuzha Panchayat and the rest ( 55.31ha) lies in Pariyaram Grama Panchayat. The area included in the Pariyaram Panchayat is mostly barren with hard laterite rocks. Including this, the total cultivable waste in this watershed is 125 ha. The main places in the watershed are Puthukudi, Ponnacheri, Cheruvayal, Karakkundu, Pathayakundu, Ezhumvayal, etc. Two revenue villages shares the watershed area, the Panapuzha village and Pariyaram village of Thaliparamba block Panchayath.

**The important places** in the watershed are Choweri, Parottipoyil, Alakkadu, Ezhumvayal, Kupperi, Kulangodu, Manikkamangalam, etc.

## Geographic Description of the Watershed:

### a. *Location:*

The watershed is located about 45 Km away from the District Head Quarters and accessible through road. The watershed is about 6 Km away from the Panchayat Head Quarters. Geographically the watershed has a slanting nature from south to north direction with hillocks and medium slopes. The upstream areas in the watershed like Karakkundu, Ponnachery, cheruvayal, Pallithattu, Muthakkundu, and Madolinhi etc are hills which are of slanting nature.

**b. The geographic coordinates**

The watershed area lies between the east longitude $75^0$19'30 and $75^0$21'30" and north latitude $12^0$ 6'30" and $12^0$7'30" with a total elevation of 367 feet.

**c. Average length and width of the watershed**

Puthukkudivayal watershed has an average length of 3. Kms. and an average width of 4.25 Kms.

**Relief & Drainage**

The watershed has a slanting characteristic. It slants towards north. The nature of the land is generally undulating with small hills and moderate hill slopes. Around 10% of the watershed is with rocky lands and only 1% constitutes the plains. The slanting nature of the watershed helps heavy soil erosion.

Rajagiri Stream forms the main drainage of the watershed. Besides there are nine other streams also. These nine streams together with Rajagiri Stream forms Puthukudivayal watershed. All streams are flowing across the watershed and entering into Panapuzh River. The streams are:

- Koovachal stream
- Cheruvayal stream
- Rajagiri stream
- Chulli stream
- Kunderi stream
- Ponnacheri stream
- Bheemanadi stream
- Thottiyil stream
- Koovacheri stream
- Choweri stream

There are other seven streams which are considered to be tributaries of the main Rajagiri stream. The tributaries that enrich Rajagiri Stream are:

- Parathodu stream
- Kadungamotta stream
- Eachikundu stream
- The stream originating near Karakkundu church
- The stream originating from the plot of shri. Rajan
- The stream originating from the plot of shri. Sukumaran
- Madolinji stream

The Cheetha stream and Ponnacheri Chilly streams are the sub streams of Ponnacheri stream and contributors of its water abundance.

The main water sources for domestic as well as irrigation purposes are wells and ponds. There are about ten ponds, 5 springs and 3 public bore wells in the watershed.

| SL No | Name of Pond | Ownership |
|---|---|---|
| 1. | Janardhanan Pond | Private |
| 2. | Chandran Pond | Private |
| 3. | T.P. Chandran Pond | Private |
| 4. | C.K.Kunjiraman Pond | Private |
| 5. | T.G. Anilkumar Pond | Private |
| 6. | Mottammal Govindhan Pond | Private |
| 7. | Cheeyayi Pond | Private |
| 8. | Temple Pond | Public |
| 9. | Cheetha Pond | Public |
| 10. | Cheruvayal Pond | Public |

The three existing Public bore-wells situated in the following watershed areas are at Pulimbakunnu, Karakkundu and Karakkundu Church. There are five springs observed in the watershed and is seasonal providing water for six to eight months. The following are the natural springs observed in Puthukkudivayal watershed.

- Parathodu Spring
- Karakkundu church Spring
- Ponnacheri Spring
- Choweri Spring
- Narimada Spring

There are 204 private wells in the watershed; out of which 56 are seasonal and the rest 148 are perennial wells.

**The Drainage density:** The drainage density of Puthukkudivayal watershed is 16.77m/Ha.

**Present situation of the streams and other water bodies**

Though about 15% of the household have constructed moisture collection pits to conserve water and stone pitched bunds to protect top soil from erosion, the watershed is in the clutches of water scarcity and soil deterioration. The bunds are also helpful to retain the water in the water shed by checking heavy runoff. However, stream banks are not properly protected and there is no ground water recharging mechanisms. This enhances the water depletion in the watershed.

**Rainfall and Climate**

Climate in the Puthukkudivayal watershed is with common humid tropical climate. The maximum temperature of the watershed is 36.6$^{o}$ C and the minimum temperature is 28.5$^{o}$ C. The temperature is in its peak between February and May.

The rainfall is comparatively high in the watershed. Maximum Rainfall is obtaining during the South-west Monsoon. 61% of the rainfall is during the South – west Monsoon and the rest is from the North-east monsoon. The average rainfall in the watershed is 3697.6 mm.

**Soil Type & Depth**

In the upper portions of the watershed red laterite soil (Brown hydromorphic soil) is generally seen. This is specifically so in places like Karakkundu, Ponnachery, cheruvayal, Muthalakkunnu

and Pallithattu. Clay soil with gravels is seen in areas adjacent to the river and streams. About 22.05 Ha are with brown hydromorphic soil and 439.95 ha is with Clay soil with gravel.

**Agriculture & Land Use**

Around 20% of the total area is with uncultivable rocks and with streams. Major portion of the area is set apart for cultivation. Major crops in the watershed are coconut, areca nut, rubber, vegetables and tubers. Rubber is cultivated in about 32.09% of land, coconut in 13.32%, areca nut in 11.76%and Vegetables and Tubers in 6.54%. The Built up area is around 9.23% and cultivable waste is 27.06%. The table given below will illustrate the land use pattern.

| Crops | Land Used | % of Land used | Productivity |
|---|---|---|---|
| Coconut | 61.54 | 13.32 | 5093 |
| Arecanut | 54.33 | 11.76 | 98.81 |
| Vegetables | 30.21 | 6.54 | 46.24 |
| Rubber | 148.28 | 32.09 | 200.24 |
| Built Up Area | 42.64 | 9.23 | 0 |
| Cultivable waste | 125 | 27.06 | 0 |
| **Total** | **462** | **100** | |

**Animal Husbandry**

Poor interest in livestock maintenance among the farmers had resulted in drastic decrease in the number of domestic animals in the watershed. However, the intervention of the veterinary department and the Grama Panchayat helped to sustain some of the farmers who foster animal husbandry. Given below are the details of livestock in the watershed:

a. Hybrid Variety cows (Male) : 4
b. Hybrid Variety Cows (Female): 32
c. Indigenous Cows (Males):7
d. Indigenous Cows(Females): 23
e. Goat(Males): 32
f. Goat (Female): 78
g. Indigenous fouls: 44
h. Hybrid Variety: 117

**Socio-Economic Details:**

The watershed has 217 households out of which 69.12% belongs to BPL category. The total population in this watershed is only 950 out of which 503 are females and 447 are males. The SC households in the watershed are 34 with a total population of 148. The number of mlae and female are equal (74 each).

Though the major part of the land is used for cultivation only 1% of the total population is considered as farmers. This is because; the land owners are living elsewhere. Majority of the watershed community is involved in construction sector with 36.39% and 28.68% are in farm labour. Government/Semi Government employees are around 11% and 9.88% are drivers. There are 4.65% Business people and the rest are doing other casual labour.

Thus the major source of income for the watershed community is labour. It has been shown earlier that 82% of the households are categorized as BPL. This obviously shows the economic backwardness of the watershed community. The average land occupation is 1.32 acres.

All the households in the watershed have own houses and most of them tile roofed. The new houses are RCC roofed and the owners of such houses are either middle class or those working abroad. The houses are attached with adequate sanitation facilities.

Almost all are educated at secondary level and there only a few who are under educated. This is so especially in the case of men. Continuing education is now conf9ined to girl children as the males are forced to enter in to the labour in early stages of their life span.

About 79% of the working class population involved in agriculture and 22% are wage labourers working mainly in construction sector. Only a very few are employed in government services. The remaining are either drivers or working in engineering divisions.

All are having own houses with adequate sanitation facilities. But safe disposal mechanisms for solid and liquid wastes are absent.

Educationally, all are having secondary education. The knowledge level of the people is satisfactory and the predominant political party membership made them aware of socio-economic backwardness and the reason for such a situation. Most of them are having membership in welfare funds schemes f the government.

**Road Network:**

There are 3 roads that connect different places of the watershed and allowing the people to move one place to another. Karakkundu – Ezhumvayal Road, Puthukkudi Ponnachery Road, Parottypoil – Choweri Kunnu Road and Karakkundu – Paravoor Road. Bus service is available through Karakkundu - Ezhumvayal Road only. Karakkundu - Ezhumvayal Road is the only tarred road.

**Institutions and Community based organizations:**

Karakkundu Anganwadi, Karakkundu Club and Ponnachery Sree Krishna Temple are the three main institutions in the watershed.

**Market Facilities:**

The watershed community depends up on Mathamangalam Bazaar (4 Kms away) for their needs. Local purchase is also possible from Paravoor Market which is a small township.

**Hospital facilities:**

There are no hospitals or dispensaries in the watershed. The watershed community depends on medical institutions in Mathamangalam and Payyanur for minor ailments. Pariyaram Medical College is about 11 Kms away from the watershed.

**Major Problems of the watershed**

Major problems identified through a brainstorming session in which representatives from the Neighbourhood clusters participated. The problems are categorized under four headings: Soil related, Water related, Agro-Bio Diversity Related and Animal Husbandry related. Such a

categorization is in line with the activities that can be undertaken IWMP to solve the issues. The issues are listed below:

**Soil related Issues:**

- Once fertile soil has deteriorated and the Productivity has drastically decreased
- The fertile top soil is washed off with high velocity running water, especially during monsoon
- Inadequate soil conservation measures enhances the loss of fertile soil
- Change in land usage like leveling of paddy fields for mixed crops has reduced food crops to a great extent.
- 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

**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
- Steep slopes results in fast runoff.
- Drinking water scarcity

**Agro-biodiversity related issues**

- Over cultivation of mono crops
- Absence of crop rotation
- Disinterest in food cultivation
- Alienation of women from agriculture
- Extinct medicinal plants
- Eco-destruction resulted in reduction in plant & animal diversity
- Unexpected 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 to address the issues**

Generally the activities are of three folds: Natural Resource Management Activities which covers the soil, water and bio-diversity issues, Production System Management and Micro Enterprises (PS&M) which covers the agriculture and soil problems along with economic backwardness, , which manages the livelihoods and economic backwardness of the landless, women and the indigenous communities. Given below is a brief about the activities proposed for the watershed:

| Natural Resource Management (NRM) | Production System & Micro-Enterprises (PS&M) | Livelihood Support Systems (LSS) |
|---|---|---|
| **Soil Conservation**<br>1. Gully Plugging<br>2. Live fencing<br>3. Stone bunding<br>4. Centripetal Terracing | 1. Cow rearing<br>2. Quail Rearing<br>3. Vermin Composting<br>4. Organic Fertilizer Distribution<br>5. Banana Cultivation<br>6. Organic Vegetable Cultivation<br>7. Rabbit Rearing | 1. Floor Cleaner Making<br>2. Candle Making<br>3. Mini Dairy Unit<br>4. Poultry Unit<br>5. Soap making Unit<br>6. Tailoring Machine Distribution |

**Water Conservation**

1. Yard water collection pits
2. Husk Trenches
3. Moisture Collection Pits
4. Source Recharging
5. Check Dams
6. Retaining wall

**Puthukkudivayal Watershed Development Project (Area – 462 Ha) - Master plan for Four Years - Funding pattern**

| Instal lment | Administr ation | Monitor ing | Evaluat ion | Entry Point Activity | Institut ion & Capacit y Buildin g | DPR prepara tion | Watershe d Develop ment Activities | Livelihoo d Activities | Productio n system & Micro Enterprise s | Consolida tion Phase | Total IWMP project fund |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1St | 138600 | 13860 | 13860 | 277200 | 207900 | 69300 | 665280 | 0 | 0 | 0 | 1386000 |
| % | 2 | 0.2 | 0.2 | 4 | 3 | 1 | 9.6 | 0 | 0 | 0 | 20 |
| 2nd | 173250 | 13860 | 13860 | 0 | 69300 | 0 | 1150380 | 311850 | 346500 | 0 | 2079000 |
| % | 2.5 | 0.2 | 0.2 | 0 | 1 | 0 | 16.6 | 4.5 | 5 | 0 | 30 |
| 3rd | 207900 | 20790 | 20790 | 0 | 69300 | 0 | 1101870 | 311850 | 346500 | 0 | 2079000 |
| % | 3 | 0.3 | 0.3 | 0 | 1 | 0 | 15.9 | 4.5 | 5 | 0 | 30 |
| 4rd | 173250 | 20790 | 20790 | 0 | 0 | 0 | 963270 | 0 | 0 | 207900 | 1386000 |
| % | 2.5 | 0.3 | 0.3 | 0 | 0 | 0 | 13.9 | 0 | 0 | 3 | 20 |
| **Total** | **693000** | **69300** | **69300** | **277200** | **346500** | **69300** | **3880800** | **623700** | **693000** | **207900** | **6930000** |
| % | 10 | 1 | 1 | 4 | 5 | 1 | 56 | 9 | 10 | 3 | 100 |

**Sector – I – Watershed Development Activities - I year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Moisture collection pits | $M^3$ | 149 | 1000 | 0 | 0 | 149000 | 149000 | 10 % General & 5 % SC / ST |
| 2. | Live fencing | RM | 24 | 2500 | 0 | 0 | 60000 | 60000 | |
| 3. | Stone bunding | $M^2$ | 144 | 2000 | 0 | 160780 | 0 | 160780 | |
| 4. | Centripetal terracing | Nos | 65.67 | 500 | 0 | 0 | 14500 | 14500 | |
| 5. | Husk trench | Nos | 165 | 500 | 0 | 0 | 82500 | 82500 | |
| 6. | Shutter type check dam in Parathodu near T.P.Kunjambu (31/1) | Nos | 97780 | 1 | 0 | 97780 | 0 | 97780 | |
| 7. | Gully controlled check dam in Parathodu | RM | 2395 | 169.82 | 0 | 406720 | 0 | 406720 | |
| 8. | Retaining wall construction along the sides of Rajagirithodu | $M^3$ | 149 | 1000 | 0 | 0 | 149000 | 149000 | |
| **Total** | | | | | | **665280** | **306000** | **971280** | |

**Sector – I – Watershed Development Activities II year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Yard water collection pit | Nos | 400 | 50 | 0 | 0 | 20000 | 20000 | 10 % General & 5 % SC / ST |
| 2. | Centripetal terracing | Nos | 65.67 | 1000 | 0 | 0 | 65670 | 65670 | |
| 3. | Live fencing | RM | 24 | 2800 | 0 | 0 | 67200 | 67200 | |
| 4. | Husk trench | Nos | 165 | 400 | 0 | 0 | 66000 | 66000 | |
| 5. | Source recharging | Nos | 12970 | 24 | 0 | 311280 | 0 | 311280 | |
| 6. | Stone bunding | $M^2$ | 144 | 2500 | 0 | 200975 | 0 | 200975 | |
| 7. | Gully controlling structures in Koovachal thodu | RM | 2996 | 6.36 | 0 | 19080 | 0 | 19080 | |
| 8. | Gully controlling structures in Cheruvayal thodu | RM | 2996 | 3.39 | 0 | 10176 | 0 | 10176 | |
| 9. | Stream bank protection of Koovachal thodu from outlet point near plot of Yashodha T.V | RM | 2395 | 8.70 | 0 | 20860 | 0 | 20860 | |
| 10. | Retaining wall along the sides of Koovachal thodu near the plot of Kumaran Kodakkaran,K.Ashokan | RM | 2395 | 30.48 | 0 | 73010 | 0 | 73010 | |
| 11. | Retaining wall along the sides of Cheruvayal thodu P.B.Krishnan | RM | 2395 | 33.21 | 0 | 79539 | 0 | 79539 | |
| 12. | Retaining wall construction along the sides of Rajagirithodu | RM | 2395 | 70.57 | 0 | 169020 | 0 | 169020 | |
| 13. | Retaining wall in Cheruvayalthodu | RM | 2395 | 78.38 | 0 | 187740 | 0 | 187740 | |
| 14. | Construction of shutter type checkdam in cheruvayalthod | Nos | 78700 | 1 | 0 | 78700 | 0 | 78700 | |
| **Total** | | | | | | **1150380** | **218870** | **1369250** | |

**Sector – I – Watershed Development Activities - III year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Stream bank protection of ponnachery thodu near the sides of Mattummal Cheeyeyi(50/1A).Chendachi Cheeyeyi (50/1A) | RM | 2395 | 117.62 | 0 | 281700 | 0 | 281700 | 10 % General & 5 % SC / ST |
| 2. | Well recharging | Nos | 12970 | 15 | 0 | 194550 | 0 | 194550 | |
| 3. | Gully controlling structures in Koovachery thodu from starting | RM | 2996 | 6.79 | 0 | 20352 | 0 | 20352 | |
| 4. | Construction of retaining wall in Choverry thodu from outlet point | Nos | 1878 | 270.92 | 0 | 508800 | 0 | 508800 | |
| 5. | Stone bunding | $M^2$ | 144 | 1200 | 0 | 96468 | 0 | 96468 | |
| 6. | Live fencing | RM | 24 | 2000 | 0 | 0 | 48000 | 48000 | |
| 7. | Husk trench | Nos | 165 | 300 | 0 | 0 | 49500 | 49500 | |
| 8. | Centripetal terracing | Nos | 56.67 | 300 | 0 | 0 | 19701 | 19701 | |
| **Total** | | | | | | **1101870** | **117201** | **1219071** | |

**Sector – I – Watershed Development Activities - IV year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Stream bank stabilization along Koovacherry thodu from outlet point | RM | 2395 | 121.93 | 0 | 292040 | 0 | 292040 | 10 % General & 5 % SC / ST |
| 2. | Stone bunding | $M^2$ | 144 | 1800 | 0 | 144702 | 0 | 144702 | |
| 3. | Construction of retaining wall along the sides of Choverrythodu | Nos | 12970 | 10 | 0 | 129700 | 0 | 129700 | |
| 4. | Well recharge | $M^2$ | 1878 | 190.98 | 0 | 358668 | 0 | 358668 | |
| 5. | Gully controlling structures in Choverrythodu,koovachery thodu | RM | 2996 | 12.73 | 0 | 38160 | 0 | 38160 | |
| 6. | Moisture collection pits | $M^3$ | 149 | 1000 | 0 | 0 | 149000 | 149000 | |
| 7. | Live fencing | RM | 1200 | 24 | 0 | 0 | 28800 | 28800 | |
| 8. | Husk trench | Nos | 165 | 200 | 0 | 0 | 33000 | 33000 | |
| 9. | Centry petal terracing | Nos | 65.67 | 200 | 0 | 0 | 13134 | 13134 | |
| **TOTAL** | | | | | | **963270** | **223934** | **1187204** | |

**Sector – II – Livelihood Activities for Land less/Asset less - II year Action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | MNREGS / other source/Bank Loan | Total |
|---|---|---|---|---|---|---|---|
| 1 | seed money for enterprising individuals | Nos | 0 | 0 | 62370 | 0 | 62370 |
| 2 | Seed money for SHGs | | 0 | 0 | 249480 | 0 | 249480 |
| **TOTAL** | | | | | **311850** | **0** | **311850** |

**Sector – II – Livelihood Activities for Land less/Asset less - III year Action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | MNREGS / other source/Bank Loan | Total |
|---|---|---|---|---|---|---|---|
| 1 | Seed money for SHGs | Nos | 0 | 0 | 124740 | 0 | 124740 |
| **II** | **Funding for Major livelihood activities** | | | | | | |
| 1 | Mini diary unit | Nos | 300000 | 1 | 150000 | 150000 | 300000 |
| 2 | Poultry unit | Nos | 75000 | 1 | 37110 | 37890 | 75000 |
| **Total** | | | | | **311850** | **187890** | **499740** |

| **Funding pattern** | - |
|---|---|
| Seed money for enterprising individuals (10% of the allocation -Revolving fund) | 62370 |
| Seed money for SHGs (60 % of the allocation - Revolving fund) | 374220 |
| Funding for major livelihood activities (30% of the allocation - Grant in aid) | 187110 |
| **Total allocation** | **623700** |

**Sector – III – Production System & Micro Enterprises based livelihood activities - II year Action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | Total | WDF |
|---|---|---|---|---|---|---|---|
| 1 | Organic fertilizer distribution | 1800/100kg | 1800 | 152 | 273600 | 273600 | 20 % for General & 10 % for SC / ST |
| 2 | soap making unit | Nos | 23900 | 1 | 23900 | 23900 | |
| 3 | Vermi composting | Nos | 7000 | 7 | 49000 | 49000 | |
| **TOTAL** | | | | | **346500** | **346500** | |

**Action Plan - Sector – III – Production System & Micro Enterprises based livelihood activities - III year action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | Total | WDF |
|---|---|---|---|---|---|---|---|
| 1 | Banana cultivation | Nos | 24000 | 7 | 168000 | 168000 | 20 % for General & 10 % for SC / ST |
| 2 | Organic vegitable cultivation | Nos | 24000 | 6 | 144000 | 144000 | |
| 3 | Rabbit rearing | Nos | 34500 | 1 | 34500 | 34500 | |
| **TOTAL** | | | | | **346500** | **346500** | |

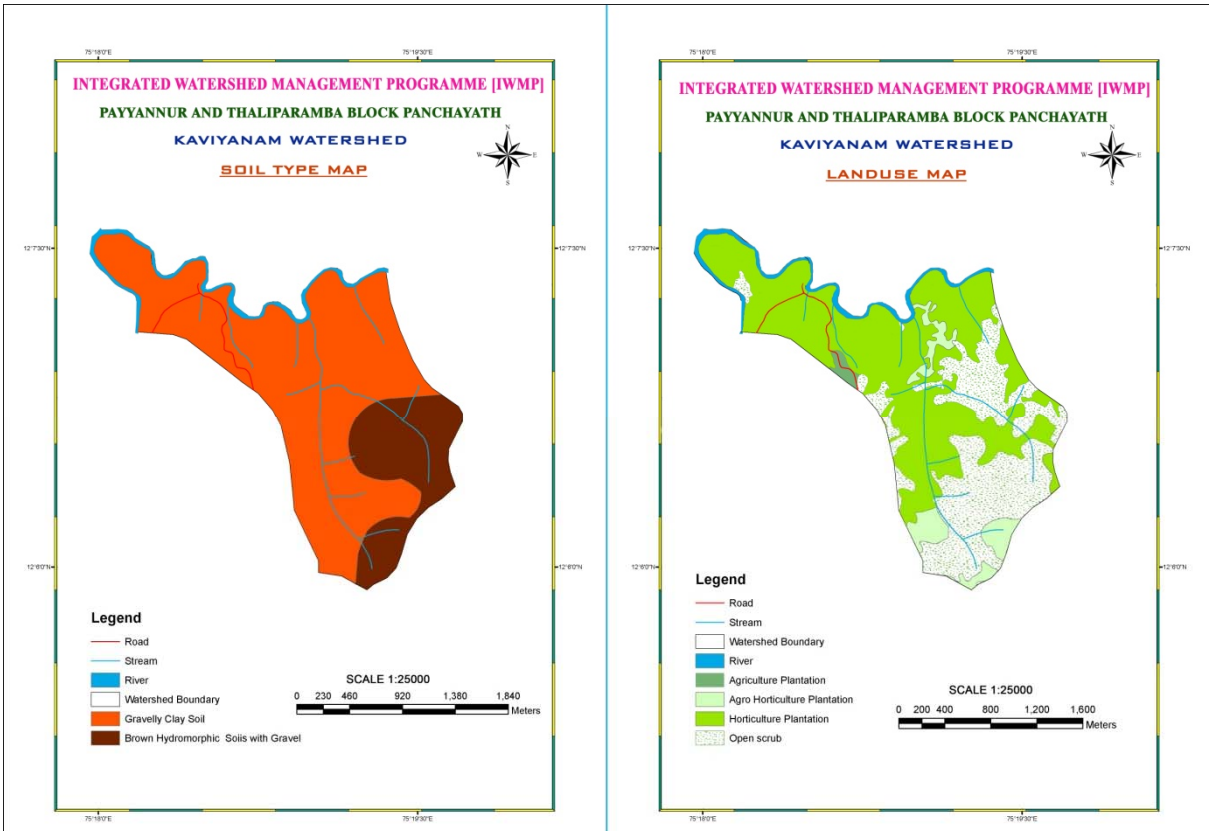
**Total Allotment - 693000**

**ENTRY POINT ACTIVITY - ACTION PLAN**

| Sl:no | Activity | Unit | Unit cost | Target | IWMP EPA fund | IWMP Project fund | Total |
|---|---|---|---|---|---|---|---|
| 8. | Collection tank | No | 77700 | 1 | 77700 | - | 77700 |
| 9. | Checkdam Construction on Karakunduthodu | Rm | 1200 | 166.25 | 199500 | - | 199500 |
| **Total** | | | | | **277200** | **-** | **277200** |

# KAVIYANAM WATERSHED

| | | |
|---|---|---|
| Grama Panchayat | : | Kadannappalli - Panapuzha |
| Village | : | Panapuzha |
| Wards covered | : | III, IV & V |
| Block Panchayat | : | Thaliparamba |
| Thaluk | : | Kannur |
| District | : | Kannur |
| Total families covered | : | 158 |
| Total Population covered | : | 696 |
| Total treatable Area | : | 397 Ha |
| River Basin | : | Peruvamba (Perumba) River |
| Average Length | : | 3.75. Kms. |
| Average Width | : | 3.40. Kms. |
| Total Project Cost | : | Rs. 59, 55,000/- |
| Boundaries | : | North: Panapuzha River |
| | : | South: Pariyaram Panchayat |
| | : | East: Puthukkudivayal Watershed |
| | : | West: Cheruvichery Watershed |




**Introduction**

Kaviyanam is a small watershed with a total geographic area of 397 ha, major part of which (253.56 ha) is included in KadannaPally Panapuzha Panchayat. While the 3rd. 4th and 5th wards of Kadannappally Pananpuzha Panchayat embedded this part the other part (143.44 ha) belongs to Pariyaram Grama Panchayat. The watershed has 134 ha of cultivable waste.

**The important places** in the watershed are Chirakkal, Vallikkanam Koovachal, Karakkundu, Mangadanmotta, Kacherikkadavu and Karrepoil.

**Geographic Description of the Watershed:**

***a. Location:***

The watershed is located about 44 Km away from the District Head Quarters and can be reached by road. The watershed is about 9 Km away from the kadannappally- Panapuzha Panchayat Head Quarters and 8.5 Kms away from Pariyaram Panchayat Head Quarters. Geographically the watershed has hillocks and medium slopes.

**b. The geographic coordinates** :

Geographically the Kaviyanam watershed lies between the east longitude $75^0$ 18'0" and $75^0$ 19'30" and north latitude $12^0$ 6'0" and $12^0$ 7'30" with a total elevation of 240 ft.

**c. Average length and width of the watershed:**

Kaviyanam watershed has an average length of 3.75. Kms and has an average width of 3.40 Kms.

**Relief & Drainage**

The watershed consists of hill slopes and small valleys. The upper reach of the watershed is full of laterite/granite rocks. The southern part of the watershed is comparatively barren as the area is rocky and non-cultivable. The northern side which is adjacent to the Panapuzha River appears to be plain land. Around 20 ha of land are full of rocks.

There are five important streams flowing across the watershed. These streams were once rich in flow but almost of them are dried up.

- Kaviyanam Stream is flowing about 700 meters across the watershed before it enter into the main stream – Panapuzha River
- Chirakkal Stream is flowing across the watershed about 650 meters length with an average width between 3 meter and 1¼ meters depth
- The stream originating from the Land of Shri. Moosa (Moosakkan Thodu) is flowing about 700 meters with a width varied from 2 m to 2½ m and entering into Panapuzha River through the land of Kizhakkepurayil Devi.
- Kacherikkadavu stream is another surface water body which enters into Panapuzha River after flowing 400 meters across the watershed.
- Vallikkanam stream originate from a location situated in Pariyaram Grama Panchayat area, flows downwards through the land of Shri Vallikkanam Suresh in the watershed area before it join with Panapuzha River. It measured that the stream is flowing about 1½ Kms. from the start to the end. There are four tributaries that enrich the Vallikkanam Stream when it flows through the watershed before it enters into Panapuzha River. There are four more small streams originating from different locations.

There are two springs in the land of Shri Vallikkanam Suresh, one of which is perennial and the other is seasonal.

Similarly several ponds also contribute to the hydrology of the watershed. Our observation and transect walk with the leaders of the neighbourhood clusters revealed that there are nine ponds in the watershed area and all of them belong to individual farmers, i.e., none of them can be considered as public. Some of these ponds are in dilapidated condition and need de-siltation and renovation. The list of farmers who owns the ponds is given below:

1. V.K. Kunhirama Poduval
2. V. K. Narayanan
3. Ramachandran Nayanar
4. Gopinathan
5. P. C. Damodaran
6. K.P. Balakrishnan
7. Damodaran
8. Vallikkanam Suresh
9. Moosa

Other sources that add to the hydrology of the watershed are two public wells, one at Chirakkal and the other at Kacherikkadavu. These two are drinking water sources. Almost all the households in the watershed have their own drinking water well in their house premises.

**The Drainage density:** The drainage density of Kaviyanam watershed is 18.89 m/Ha.

**Present situation of the streams and other water bodies**

The watershed seems to be rich in the number of small and big streams but most of these streams areseasonal except Vallikkanam stream where the spring is located. The streams are not made useful and beneficial to the farming community of the watershed. Places like

Chirakkal and Mangadan Motta experiences severe water scarcity and people travel a long distance in search of potable water.

**Rainfall and Climate**

Climate in the Kaviyanam watershed is common humid tropical climate. The maximum temperature of the watershed is 36° C and the minimum temperature is 28° C. The temperature is in its peak between February and May.

The watershed obtains usual rainfall. Maximum Rainfall is obtaining during the South-west Monsoon. 63% of the rainfall is during the South – west Monsoon and 37% is from the North-east monsoon. The average rainfall in the watershed is 3697.6 mm.

**Soil Type & Depth**

Brown hydromorphic soil is seen in 85.72 ha and Clay soil with gravels is seen in 311.28 ha. The soil is generally found to be fertile, but certain areas are unfertile.

**Agriculture & Land Use**

Around 10% of the total geographic area of the watershed is used for constr4uction purposes and the rest except the 20 ha of rocks is left for cultivation. Rubber dominates the other crops in the watershed with more than 35 %. The watershed is having both cash crops like rubber and cashew and food crops like plantain and vegetables. However the area under cultivation with food crops is gradually reducing, because, as farmers put it, heavy loss is occurred in food crop cultivation due to various reasons, especially increase in the production cost and unavailability of labourers. The other crops and land use pattern are as follows:

| Crops | Land Used | % | Productivity |
|---|---|---|---|
| Coconut | 10.16 | 2.56 | 84 |
| Areca nut | 37.00 | 9.32 | 20.45 |
| Cashew | 18.90 | 4.76 | 17.73 |
| Plantain | 22.74 | 3.2 | 181.03 |
| Vegetables | 5.80 | 1.46 | 8.88 |
| Rubber | 109.89 | 27.68 | 148.4 |
| Cultivable Waste | 133.67 | 33.67 | 0 |
| Uncultivable Waste | 20.00 | 5.04 | 0 |
| Built Up Area | 38.84 | 9.78 | 0 |
| **Total** | **397** | **100** | |

**Animal Husbandry**

Poor interest in livestock maintenance among the farmers had resulted in drastic decrease in the number of domestic animals in the watershed. However, the intervention of the veterinary department and the Grama Panchayat helped to sustain some of the farmers who foster animal husbandry. Given below are the details of livestock in the watershed:

a. Hybrid Variety cows (Male) : 5
b. Hybrid Variety Cows (Female): 44
c. Indigenous Cows (Males): 7
d. Indigenous Cows(Females): 31
e. Goat(Males): 41
f. Goat (Female): 112
g. Indigenous fouls: 39
h. Hybrid Variety: 156

**Socio-Economic Details:**

The total population in the watershed according to primary data is 696 with 361 male and 335 female living in 158 households. This pattern of gender distribution is special to this watershed. While in all the other watershed female domination is observed, in Kaviyanam alone male domination is obviously clear. The total No. of households in the watershed is 158 out of which 115 are BPL. There is no trace of ST families, but there are 4 SC households

The watershed community is seemed to be middle class and majority of them have good houses and sanitation facilities. About 46.26% are involved in agriculture sector. 27.38% are construction workers. The government Employees are only 3.32% and 2% are working in traditional trades. The rest (21.04%) is wage labourers.

The watershed has a very good network of roads, but majority of them are mud roads. The transportation facilities also, therefore, are poor. Except a very few all households had electricity connection.

The educational level of the watershed community is average. About 84% of the watershed community members have completed their secondary education. Only a few have gone beyond SSLC and a very few have acquired collegiate education.

All Families have their own houses. Only a negligible number are residing in rented houses, they may either are migrants or temporary workers in the construction sector. The roof type of majority of the house is tiled and there are few houses with RCC roofing.

**Road Network:**

Chudala – Bhoodanam – Panapuzha Road, which is partly tarred passes through watershed touching Kacherikkadavu. Chudala Panapuzha Road is also partly tarred joins the first road at Kacherikkadavu. The mud roads within the watershed are:

1. Bhoodanam – Karakkundu Road
2. Chirakkal – Bhoodanam Road
3. Kacherikkadavu – Kaviyanam Road
4. Karinkalchal – Bhoodanam Road
5. Pynadi Anakkettu road
6. Chirakkal Road
7. Thookkupalam Road

**Institutions and Community based organizations:**

Few institutions are also found in the watershed. Kacherikkadavu Reading Room and Kacherikkadavu Anganwadi are the two major institutions that directly affect the lives of the people.

**Market Facilities:**

The watershed community depends up on Chandapura and Pilathara Townships (2 Kms and 6 kms respectively) for their purchasing needs. For selling the producethey either go to Mathangalam or to Payyanur Bazaars.

**Hospital facilities:**

There are no major hospitals or dispensaries in the watershed. The watershed community depends on medical institutions in Mathamangalam and Payyanur for minor ailments. Pariyaram Medical College is about 8 Kms away from the watershed.

**Major Problems of the watershed**

Major problems identified through a brainstorming session in which representatives from the Neighbourhood clusters participated. The problems are categorized under four headings: Soil related, Water related, Agro-Bio Diversity Related and Animal Husbandry related. Such a categorization is in line with the activities that can be undertaken IWMP to solve the issues. The issues are listed below:

**Soil Related Problems in the watershed**

- Erosion of top soil at areas like Chirakkal
- Soil Degradation for e.g. Mangadanmotta & Chirakkal
- Lower Crop Production – a general feature of the watershed
- Poor Biological Fertility of the soil – Poor humus in the soil due to changed land use
- Very low soil PH

**Water Related Issues**

- Lowering water yield in the catchments
- Poor Ground water Recharging in places like Chirakkal
- Poor vegetative cover on the soil surface on the upper reaches
- Bank erosion and Sedimentation of Water Sources – Vallikkanam Stream, Chirakkal Stream and Kaviyanam Stream and almost all ponds
- Ground water scarcity in places like Mangadan Motta and Chirakkal
- Water Pollution near the spring in Vallikkanam Stream

**Agricultural Related Issues**

- Declining Food crop Cultivation - Mono Crops replace food crops
- Increasing mono crop (rubber) Even in the stream banks rubber cultivation is penetrating
- Shift to non-agricultural work- People migrating to towns for construction works
- High Wages & High cost of living
- Changing food habits- traditional food habits gave way to packet food habits
- Fragile land mass
- Low price

**Animal Husbandry Related issues**

- Degradation of common property resources
- Poor biomass availability
- Poor performance of Veterinary department/hospitals
- Poor service of Agricultural Department/Krishibhavans

- Poor interest of the farmers

**Activities proposed to address the issues**

Generally the activities are of three folds: Natural Resource Management Activities which covers the soil, water and bio-diversity issues, Production System Management and Micro Enterprises (PS&M) which covers the agriculture and soil problems along with economic backwardness, , which manages the livelihoods and economic backwardness of the landless, women and the indigenous communities. Given below is a brief about the activities proposed for the watershed:

| Natural Resource Management (NRM) | Production System & Micro-Enterprises (PS&M) | Livelihood Support Systems (LSS) |
|---|---|---|
| **<u>Soil Conservation</u>**<br>1. Gully Plugging<br>2. Stream bank stabilization<br>3. Live fencing<br>4. Stone bunding<br>5. Centripetal Terracing<br>6. Geo textiles | 1. Cow rearing<br>2. Rabbit Rearing<br>3. Mushroom Cultivation<br>4. Goat Rearing<br>5. Japanese Quail Rearing<br>6. Banana Cultivation<br>7. Organic Fertilizer Distribution<br>8. Organic Vegetable Cultivation | 1. Mini Dairy Unit<br>2. Distribution of Tailoring Machines |
| **<u>Water Conservation</u>**<br>1. Public Well renovation<br>2. Yard water collection pits<br>3. Husk Trenches<br>4. Moisture Collection Pits<br>5. Source Recharging<br>6. Check Dams<br>7. Retaining wall<br>8. Drinking water scheme | | |

## Kaviyanam Watershed Development Project (Area – 397 Ha) - Master plan for Four Years - Funding pattern

| Installment | Administration | Monitoring | Evaluation | Entry Point Activity | Institution & Capacity Building | DPR preparation | Watershed Development Activities | Livelihood Activities | Production system & Micro Enterprises | Consolidation Phase | Total IWMP project fund |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1St | 119100 | 11910 | 11910 | 238200 | 178650 | 59550 | 571680 | 0 | 0 | 0 | 1191000 |
| % | 2 | 0.2 | 0.2 | 4 | 3 | 1 | 9.6 | 0 | 0 | 0 | 20 |
| 2nd | 148875 | 11910 | 11910 | 0 | 59550 | 0 | 988530 | 267975 | 297750 | 0 | 1786500 |
| % | 2.5 | 0.2 | 0.2 | 0 | 1 | 0 | 16.6 | 4.5 | 5 | 0 | 30 |
| 3rd | 178650 | 17865 | 17865 | 0 | 59550 | 0 | 946845 | 267975 | 297750 | 0 | 1786500 |
| % | 3 | 0.3 | 0.3 | 0 | 1 | 0 | 15.9 | 4.5 | 5 | 0 | 30 |
| 4rd | 148875 | 17865 | 17865 | 0 | 0 | 0 | 827745 | 0 | 0 | 178650 | 1191000 |
| % | 2.5 | 0.3 | 0.3 | 0 | 0 | 0 | 13.9 | 0 | 0 | 3 | 20 |
| **Total** | **595500** | **59550** | **59550** | **238200** | **297750** | **59550** | **3334800** | **535950** | **595500** | **178650** | **5955000** |
| % | 10 | 1 | 1 | 4 | 5 | 1 | 56 | 9 | 10 | 3 | 100 |

**Kaviyanam Watershed - Sector – I – Watershed Development Activities - I year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Kacherikadavu vayanashala drinking water project | Nos | 60000 | 1 | 0 | 60000 | 0 | 60000 | 10 % General & 5 % SC / ST |
| 2. | Well recharging | Nos | 12970 | 5 | 0 | 64850 | 0 | 64850 | |
| 3. | Husk trench | Nos | 165 | 200 | 0 | 0 | 33000 | 33000 | |
| 4. | Stone bunding | $M^3$ | 149 | 1000 | 0 | 0 | 149000 | 149000 | |
| 5. | Moisture collection pits | RM | 24 | 1000 | 0 | 0 | 24000 | 24000 | |
| 6. | Live fencing | Nos | 65.67 | 100 | 0 | 0 | 6567 | 6567 | |
| 7. | Centry petal terracing | Nos | 400 | 15 | 0 | 0 | 6000 | 6000 | |
| 8. | Yard water collection pit | RM | 2395 | 45.80 | 0 | 109713 | 0 | 109713 | |
| 9. | Gully controlling checkdam | RM | 2395 | 77.92 | 0 | 186617 | 0 | 186617 | |
| 10. | Stream bank stebilization for Cherkala thodu 1.50m | Nos | 21500 | 7 | 0 | 150500 | 0 | 150500 | |
| 11. | Gully controlled H type check dam in Pallithanam thodu 4.50m width | Nos | 60000 | 1 | 0 | 60000 | 0 | 60000 | |
| **Total** | | | | | | **571680** | **218567** | **744480** | |

## Kaviyanam Watershed - Sector – I – Watershed Development Activities II year action plan

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Kacherikadavu vayanashala drinking water project | Nos | 78500 | 1 | 0 | 78500 | 0 | 78500 | 10 % General & 5 % SC / ST |
| 2. | Retaining wall construction for Stream bank stebilization 1m Ht | RM | 2395 | 65.32 | 0 | 156450 | 0 | 156450 | |
| 3. | Well recharging | Nos | 12970 | 5 | 0 | 64850 | 0 | 64850 | |
| 4. | Husk trench | Nos | 165 | 300 | 0 | 0 | 49500 | 49500 | |
| 5. | Stone bunding | $M^2$ | 144 | 800.9 | 0 | 115340 | 0 | 115340 | |
| 6. | Moisture collection pits | $M^3$ | 149 | 2000 | 0 | 0 | 298000 | 298000 | |
| 7. | Live fencing | RM | 24 | 2500 | 0 | 0 | 60000 | 60000 | |
| 8. | Stream bank stebilization for Vallithanam thodu 1.50m | RM | 2395 | 109.77 | 0 | 262920 | 0 | 262920 | |
| 9. | Gully controlled check dam in Olakkanam thodu | RM | 2395 | 15.93 | 0 | 38160 | 0 | 38160 | |
| 10. | Centry petal terracing | Nos | 65.67 | 400 | 0 | 0 | 26268 | 26268 | |
| 11. | Yard water collection pit | Nos | 400 | 30 | 0 | 0 | 12000 | 12000 | |
| 12. | Stream bank stebilization for Cherkala thodu 1.50m | RM | 2395 | 113.69 | 0 | 272310 | 0 | 272310 | |
| **Total** | | | | | | 988530 | 445768 | 1434298 | |

**Kaviyanam Watershed - Sector – I – Watershed Development Activities III year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Stream bank stebilization for thodu 1.50m Ht | RM | 2395 | 86.25 | 0 | 206580 | 0 | 206580 | 10 % General & 5 % SC / ST |
| 2. | Gully controlled check dam in Cherkalathodu thodu | RM | 2395 | 16.98 | 0 | 50880 | 0 | 50880 | |
| 3. | Husk trench | Nos | 165 | 250 | 0 | 0 | 41250 | 41250 | |
| 4. | Stone bunding | $M^2$ | 144 | 936 | 0 | 134785 | 0 | 134785 | |
| 5. | Moisture collection pits | $M^3$ | 149 | 2500 | 0 | 0 | 372500 | 372500 | |
| 6. | Live fencing | RM | 24 | 3000 | 0 | 0 | 72000 | 72000 | |
| 7. | Kacherikadavu vayanashala drinking water project | RM | 2395 | 66.80 | 0 | 160000 | 0 | 160000 | |
| 8. | Retaining wall construction for Stream bank stebilization 1m Ht | RM | 2395 | 87.09 | 0 | 208600 | 0 | 208600 | |
| 9. | Improvements to the exsisting Public well near the cherakala thodu-1.50mHt | RM | 2395 | 32.77 | 0 | 78500 | 0 | 78500 | |
| 10. | Centry petal terracing | Nos | 65.67 | 350 | 0 | 0 | 22985 | 22985 | |
| 11. | Gully controlled H type check dam 4m width | RM | 2395 | 44.88 | 0 | 107500 | 0 | 107500 | |
| **Total** | | | | | | **946845** | **508735** | **1455580** | |

**Kaviyanam Watershed Sector – I – Watershed Development Activities IV year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | | Nos | 65.67 | 250 | 0 | 0 | 16418 | 16418 | 10 % General & 5 % SC / ST |
| 2. | | Nos | 400 | 20 | 0 | 0 | 8000 | 8000 | |
| 3. | | Nos | 12970 | 4 | 0 | 51880 | 0 | 51880 | |
| 4. | | Nos | 165 | 100 | 0 | 0 | 16500 | 16500 | |
| 5. | | $M^2$ | 144 | 504.1 | 0 | 72595 | 0 | 72595 | |
| 6. | | $M^3$ | 149 | 2000 | 0 | 0 | 298000 | 298000 | |
| 7. | | RM | 24 | 1000 | 0 | 0 | 24000 | 24000 | |
| 8. | | RM | 2395 | 109.77 | 0 | 262920 | 0 | 262920 | |
| 9. | | RM | 2996 | 6.36 | 0 | 19080 | 0 | 19080 | |
| 10. | | RM | 2395 | 23.92 | 0 | 57300 | 0 | 57300 | |
| 11. | | RM | 2996 | 35.88 | 0 | 107500 | 0 | 107500 | |
| 12. | | RM | 2395 | 107.08 | 0 | 256470 | 0 | 256470 | |
| 13. | | Nos | 65.67 | 250 | 0 | 0 | 16418 | 16418 | |
| **TOTAL** | | | | | | **827745** | **362918** | **1190663** | |

**Kaviyanam Watershed - Sector – II – Livelihood Activities for Land less/Asset less - II year Action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | MNREGS / other source/Bank Loan | Total |
|---|---|---|---|---|---|---|---|
| 1 | seed money for enterprising individuals | Nos | 0 | 0 | 53595 | 0 | 53595 |
| 1 | Seed money for SHGs | Nos | 0 | 0 | 214380 | 0 | 214380 |
| **Total** | | | | | **267975** | **0** | **267975** |

**Kaviyanam Watershed - Sector – II – Livelihood Activities for Land less/Asset less - III year Action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | MNREGS / other source/Bank Loan | Total |
|---|---|---|---|---|---|---|---|
| 1 | Seed money for SHGs | Nos | 0 | 0 | 107190 | 0 | 107190 |
| **III** | **Funding for Major livelihood activities** | | | | | | |
| 1 | Mini diary unit | Nos | 300000 | 1 | 150000 | 150000 | 300000 |
| 2 | Japanese quail rearing | Nos | 22800 | 1 | 10785 | 12015 | 22800 |
| **Total** | | | | | **267975** | **162015** | **429990** |

| **Funding pattern** | - |
|---|---|
| Seed money for enterprising individuals (10% of the allocation -Revolving fund) | 53595 |
| Seed money for SHGs (60 % of the allocation - Revolving fund) | 321570 |
| Funding for major livelihood activities (30% of the allocation - Grant in aid) | 160785 |
| **Total allocation** | **535950** |

**Kaviyanam Watershed - Action Plan - Sector – III – Production System & Micro Enterprises based livelihood activities - II year Action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | Total | WDF |
|---|---|---|---|---|---|---|---|
| 1 | Banana cultivation | Nos | 24000 | 7 | 168000 | 168000 | 20 % for General & 10 % for SC / ST |
| 2 | Plantain cultivation for leaves | Ha | 20775 | 2 | 41550 | 41550 | |
| 3 | Organic fertilizer distribution (100kg/Farmer) | Nos | 1800 | 49 | 88200 | 88200 | |
| **TOTAL** | | | | | **297750** | **298200** | |

**Kaviyanam Watershed - Sector – III – Production System & Micro Enterprises based livelihood activities - III year action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | Total | WDF |
|---|---|---|---|---|---|---|---|
| 1 | Organic vegetable cultivation | Nos | 24000 | 7 | 168000 | 168000 | 20 % for General & 10 % for SC / ST |
| 2 | Plantain cultivation for leaves | Nos | 20775 | 2 | 41550 | 41550 | |
| 3 | Organic fertilizer distribution (100kg/Farmer) | Nos | 1800 | 49 | 88200 | 88200 | |
| **TOTAL** | | | | | **297750** | **298200** | |

**Total Allotment - 595500**

**KAVIYANAM WATERSHED DEVELOPMENT PROJECT - ACTION PLAN**

| Sl:no | Activity | Unit | Unit cost | Target | IWMP EPA fund | IWMP Project fund | Total |
|---|---|---|---|---|---|---|---|
| 1. | Construction of a check dam with side protection | No | 65000 | 1 | 65000 | - | 62500 |
| 2. | Construction of retaining wall | Rm | 1800 | 96.222 | 173200 | - | 173200 |
| **Total** | | | | | **2,38,200** | **-** | **2,38,200** |

# CHERUVICHERYTHODU WATERSHED

| | | |
|---|---|---|
| Grama Panchayat | : | Kadannappalli - Panapuzha |
| Village | : | Panapuzha & Kadannappaly |
| Wards covered | : | II, IX & X |
| Block Panchayat | : | Thaliparamba |
| Thaluk | : | Kannur |
| District | : | Kannur |
| Total families covered | : | 471 |
| Total Population covered | : | 2077 |
| Total treatable Area | : | 517 Ha |
| River Basin | : | Peruvamba (Perumba) River |
| Average Length | : | 3. Kms. |
| Average Width | : | 4.05. Kms. |
| Total IWMP Fund | : | Rs. 77, 55,000/- |

**Boundaries**

| | | |
|---|---|---|
| North | : | Vannathipuzha River |
| South | : | Thumbotta Watershed |
| East | : | Kaviyanam Watershed |
| West | : | Kokkottuvayal Watershed |

**Introduction**

Cheruvichery can be considered as a Watershed which have an exclusive nature that embedded in Kadannappally – Panapuzha Grama Panchayat, because 98% of the total area of the watershed is in the said Panchayat and only 2% is in Pariyaram Grama Panchayat. In Kadannappally – Panapuzha, the watershed lies in 2nd, 9th and 10th wards.

**The important places** in the watershed are: Cheruvichery, Kallakkamthodu, Kacherikkadavu. Karinkalchal, Painadi, Kolamba and Bhoodanam.

**Geographic Description of the Watershed:**

a. ***Location:***

The watershed is located about 45 Km away from the District Head Quarters and can be reached by road. The watershed is about 0.5 Km away from the Kadannappally- Panapuzha Panchayat Head Quarters and 5 Kms away from Pariyaram Panchayat Head Quarters. Geographically the watershed has hillocks (Bhoodanam) and medium slopes (kallakkamthodu).

b. **The geographic coordinates**

Geographically the Cheruvicherithodu watershed lies between the east longitude $75^0$17'0" and $75^0$19'0" and north latitude $12^0$ 5'30" and $12^0$ 7'0" with a total elevation of 90 ft.

**c. Average length and width of the watershed**

Kaviyanam watershed has an average length of 3 Kms and has an average width of 4.05 Kms.

**Relief & Drainage**

The topography of the watershed in general is undulating. The upper reach of the watersheds like Bhoodanam, Pollalam, Karimkalchal and Kallakkamthodu areas are hilly and rocky and the rest of the areas are with slopes and valleys. There is sludge (A piece of land filled with wet clay) at Pollalam slide with an area of 4 Ha. The watershed is slanting towards west from North - west side. The Painadi region of the watershed is about 65% slope. The highest area is Bhoodanam area.

Four main streams drain the watershed and directly entering in the river. They are:

***Cheruvichery Thodu (Kallakkam Thodu)*** which has a length of 3 Kms and an average width of 2½ meters. The average depth of the stream is 1 meter. It originates from Pollalam pond. The stream is seasonal in nature and it dries up by the end of May.

***Kolamba Thodu*** originates from Bhoodanam area and joins with Vannathipuzha River. It flows about 500 meters with an average width of 2½ meters. The average depth of the stream is 2 meters. Water is available only during monsoon.

***Thekkechalthodu*** originates from the North-east side of Bhoodanam area and it flows about 1100 meters with a width of one meter and depth of one meter before it enters in to Vannathipuzha. This stream also provides water only during monsoon.

***Karimkalchal Thodu*** has a length of one Kilometer with an average width of 1½ Meters. The average depth of the stream is one meter. It originates from Karimakalchal and at Kalikkadavu it joins with Vannathipuzha.

***Other sub-streams, which help to enrich the main streams, are as follows:***

| Sl. No. | Name of Stream | Length (M) | Width (M) | Depth (M) |
|---|---|---|---|---|
| 1. | Sub-Stream 1 | 200 | 0.50 | 0.50 |
| 2. | Sub-Stream 2 | 300 | 0.75 | 0.50 |
| 3. | Nellikkunnu Stream | 150 | 0.50 | 0.50 |
| 4. | Sub-Stream 4 | 150 | 0.50 | 0.50 |
| 5. | Varanamkulam Stream | 300 | 0.50 | 0.50 |
| 6. | Panapuzha Pig Farm Stream | 150 | 0.50 | 0.50 |
| 7. | Vaniyampara Stream | 300 | 0.50 | 0.50 |
| 8. | Paloonnuthodu Stream | 350 | 0.50 | 0.50 |
| 9. | Kanamkode Stream | 400 | 0.50 | 0.50 |
| 10. | Kooran Muricha Para Stream | 1000 | 0.50 | 0.50 |
| 11. | Chandapura SC colony Stream | 300 | 0.50 | 0.50 |
| 12. | Cherkal Stream | 150 | 0.50 | 0.50 |

**Ponds**

| Sl. No. | Name of Pond | Ownership | Length (M) | Width (M) | Depth (M) |
|---|---|---|---|---|---|
| 1. | Kanam Kulam 1 (Balamani Estate) | Private | 5 | 4 | 3 |
| 2. | Kanam Kulam 2 (Balamani Estate) | Private | 20 | 20 | 10 |
| 3. | Cherkal Kulam (Musthafa Ettikulam Estate) | Private | 4 | 3 | 2 |
| 4. | Pollalam Kulam (Jayan Estate) | Private | 5 | 5 | 4 |
| 5. | Aripatu Kulam (Aripattu Shanthakumari's) | Private | 20 | 10 | 12 |
| 6. | Vayal Veetil Gopalan Nair's Pond | Private | 15 | 8 | 10 |
| 7. | V.V. Nalini's Pond | Private | 10 | 6 | 6 |
| 8. | Kunnathu Kunhiraman's Pond | Private | 5 | 4 | 5 |
| 9. | Nayanaveettil Pond | Private | 8 | 5 | 5 |
| 10. | Madamparambu Eeswaran's Pond | Private | 8 | 5 | 5 |
| 11. | Padinhattupuram Narayan Namboothiri's Pond | Private | 8 | 5 | 5 |
| 12. | V.K. Narayana Master's Pond | Private | 8 | 5 | 6 |

Besides the above there are ponds which are exclusively used for irrigation. The ponds are:

- Pond at Meethale veettil Raman, Kallakkamthodu
- 2 pounds at N.V. Janakiamma
- V.V. Goplan Nair's Pond , Kanamthodu
- P. C. Thambai's pond
- K.M. Sasi's Pond
- Kombamkulam Vayalil Kundukulam
- Poothillathu Kesavan Master's Pond
- Iringalam Krishnan Namboothiri's Pond
- Thekkekanappuram Narayanan Namboothir's Pond

- East Temple Pond
- Puthiyillam Madhavan namboothiri's Pond
- V.K. KrishanaPoduval's Pond
- Middle Temple Pond
- Meethale Periyangattu Damodaran namboodiri's Pond
- West Temple Pond

In addition to this there are 8 seasonal public wells, 2 Public bore-wells and 5 Springs in the watershed which adds to the hydrology of the watershed.

**The Drainage density:** The drainage density of Cheruvicherythodu watershed is 29.50m/Ha.

**Present situation of the streams and other water bodies**

The number of streams, sub-streams and ponds are creating an exhilarating situation in the watershed. But the pity is that almost all the streams and springs dry up in the beginning of the summer or immediately after the rain is over. The streams face another threat of illegal encroachment. This is observed in Kallakkam Stream. Chirakkal stream has been diverted from its original path and made it enter into Kallakkam Stream instead of the Vannathipuzha as in the olden days.

Water scarcity is observed in Bhoodanam area. This is because the single bore well in the area is disfunctional for a long time and there are no alternate arrangements for the availing drinking water for the SC community living in that area. Water scarcity is also observed in Columba Side.

**Soil Type & Depth**

In the upper reaches of the watershed like Bhoodanam is with laterite rocks. The type of soil in this area is brown hydromorphic. Total area with this type of soil is 52.09 ha. Clay soil with gravels is seen in the plains like Kanamkode, Aarappal, Cheruvichery, Koolikkunnu, Kolamba etc. Total area with this type of soil is 464.91 ha.

**Agriculture & Land Use**

The watershed is rich with indigenous plants like Mango, Jack, Irul, Mahagony, Coconut and areca nut. Rubber has recently entered into the watershed and it slowly dominates the other crops and plants. The rubber has already occupied about 24% of the total cultivable land. The land use and cropping patterns are as follows:

| Crops | Land Use | % of Land use | Productivity(Tonnes /ha) |
|---|---|---|---|
| Coconut | 58.13 | 11.24 | 48 |
| Arecanut | 44.36 | 8.58 | 81 |
| Cashew | 41.87 | 8.09 | 39.25 |
| Plantain | 48.46 | 9.37 | 386 |
| Vegetables | 21.86 | 4.23 | 33.45 |

| | | | |
|---|---|---|---|
| Tubers | 19.03 | 3.68 | 334.20 |
| Paddy | 27.50 | 5.32 | 61.08 |
| Rubber | 184.08 | 35.62 | 249 |
| Uncultivable waste | 9.67 | 1.87 | 0 |
| Built Up Area | 62.04 | 12 | 0 |
| **Total** | **517** | **100** | |

**Animal Husbandry**

Poor interest in livestock maintenance among the farmers had resulted in drastic decrease in the number of domestic animals in the watershed. However, the intervention of the veterinary department and the Grama Panchayat helped to sustain some of the farmers who foster animal husbandry. Given below are the details of livestock in the watershed:

a. Hybrid Variety cows (Male) : 8
b. Hybrid Variety Cows (Female): 52
c. Indigenous Cows (Males): 9
d. Indigenous Cows(Females): 36
e. Goat(Males): 54
f. Goat (Female): 132
g. Indigenous fouls: 42
h. Hybrid Variety: 165

**Socio-Economic Details:**

The watershed has a total 471 households amongst which 167 are BPL. The total population living in these households is 2077. The female population is 1063 and the male population is 1014. There are 16 SC households in the watershed with a total population 83 – 44 males and 39 females.

The watershed community is seemed to be middle class and majority of them have good houses and sanitation facilities. About 48.62% are involved in agriculture sector. 23. 38% are construction workers. The government Employees are only 5.32% and 2% are working in traditional trades. The rest (20.68) is wage labourers.

The watershed has a very good network of roads, but majority of them are mud roads. The transportation facilities also, therefore, are poor. Except 20 all households had electricity connection.

The educational level of the watershed community is average. About 82% of the watershed community members have completed their secondary education. Only a few have gone beyond SSLC and a very few have acquired collegiate education.

All Families have their own houses. Only a negligible number are residing in rented houses, they may either are migrants or temporary workers in the construction sector. The roof type of majority of the house is tiled and there are few houses with RCC roofing.

**Road Network:**

There are 20 roads passing through the watershed. Among them 3 are tarred and the others are mud roads. There is no Bus service through any one of these roads. People depend on private vehicles for transportation or some transport jeeps. The tarred roads are as follows:

1. Chandapura – Cheruvichery – Kacherikkadavu Road with a length of 3.7 Kms and a width 7.5 Meters
2. Cheruvichery – Bhoodanam Colony Road – 2.6 Kms length and 8 M width
3. Chandapura – Vannathikkadavu – Cheruvichery Vayal Road – 950 M length & 10 M width

**The mud roads are:**

1. Cheruvichery – Kottam Bypass Road – 400 m Length and 6 M width
2. Cheruvichery – Koramangalam – Koolikkadavu Road 120 M length and 3 M width
3. Cheruvichery Kottam – Poorakkadavu Road – 300 M length & 3 M width
4. Cheruvichery – Kolamba – Bhoodanam Road – 520 M length & 4 M width
5. Cheruvichery – Palookkunnu Road – 1 Kms Length and 4 M width
6. Cheruvichery – Cherkal Road – 200 M length 3 M width
7. Kolamba Waiting Shed – Nelliyodukunnu Road - ! kmLength & 3 M width
8. Karinkalchal – Bhoodanam Colony Road – 1.2 Kms length & 5 M width
9. Karinkalchal – Mudappanakkunnu Road – 1.2 Kms Length & 6 Mwidth
10. Chuzhali Temple – Kanamkodu High School Road 5.5 Ms Length & 8 M width
11. Cheruvichery – High School Road 600 M klength & 3 M width
12. Bhaskaran Peedika – High School Road – 200 M length & 3 M width
13. Cheruvichery – Koolikkadavu Road – 200 M length & 3 M width
14. Chandapura Old Age Home – Cheruvichery Road – 2 Kms Lenth & 6 M width
15. Kallakam Thodu Industrial Estate Road – 1½ Km length & 7 M width
16. Chandapura- Kallakkamthodu –Pollalam Road – 2 Kms length, 8 M width
17. Bhoodanam Colony – Pollalam Road- 1 Km length & 8 M width

**Institutions and Community based organizations:**

- Vayojana Visrama Kendram (Resting Place for the aged)
- Cheruvichery. L. P. School
- Cheruvichery Anganwadi
- Chuzhali Bhagavathi Temple
- Chanfdapura Juma Masjid
- Puthiya Bhagavathi Temple, Cheruvichery
- Vettakkorumakan Temple
- Kakkara Bhagavathi Temple
- Cultural Forum Cheruvichery
- Padashekhara Samithy, Cheruvichery
- S.N.Mekkadu reading room,Bhoodanam
- Bhoodanam Players
- Artificial weaving unit Bhoodanam
- Industrial Estate
- Rubber producers Co-operative unit Cheruvichery

**Market Facilities:**

The watershed community depends up on Chandapura and Pilathara Townships (0.5 Kms and 4 kms respectively) for their purchasing needs. For selling the produce they either go to Mathangalam or to Payyanur Bazaars.

**Hospital facilities:**

There are no major hospitals or dispensaries in the watershed. The watershed community depends on medical institutions in Mathamangalam and Payyanur for minor ailments. Pariyaram Medical College is about 8 Kms away from the watershed.

**Major Problems of the watershed**

Major problems identified through a brainstorming session in which representatives from the Neighbourhood clusters participated. The problems are categorized under four headings: Soil related, Water related, Agro-Bio Diversity Related and Animal Husbandry related. Such a categorization is in line with the activities that can be undertaken IWMP to solve the issues. The issues are listed below:

**Soil Related Problems in the watershed**

- Erosion of top soil at areas like Bhoodanam, Pollalam, Cheruvichery etc.
- Soil Degradation for e.g. Bhoodanam
- Lower Crop Production – a general feature of the watershed
- Poor Biological Fertility of the soil – Poor humus in the soil due to changed land use
- Very low soil PH

**Water Related Issues**

- Lowering water yield in the catchments
- Poor Ground water Recharging in places like Bhoodanam, Kolamba
- Poor vegetative cover on the soil surface on the upper reaches
- Bank erosion and Sedimentation of Water Sources – Chervichery thodu, , Kolamba Stream and Kaviyanam Stream and almost all ponds
- Ground water scarcity in places like Kolamba, Bhoodanam etc.
- Water Pollution near the spring in Vallikkanam Stream

**Agricultural Related Issues**

- Declining Food crop Cultivation - Mono Crops replace food crops
- Increasing mono crop (rubber) Even in the stream banks rubber cultivation is penetrating
- Shift to non-agricultural work- People migrating to towns for construction works
- High Wages & High cost of living
- Changing food habits- traditional food habits gave way to packet food habits
- Fragile land mass
- Low price

**Animal Husbandry Related issues**

- Degradation of common property resources
- Poor biomass availability
- Poor performance of Veterinary department/hospitals
- Poor service of Agricultural Department/Krishibhavans
- Poor interest of the farmers

**Activities proposed to address the issues**

Generally the activities are of three folds: Natural Resource Management Activities which covers the soil, water and bio-diversity issues, Production System Management and Micro Enterprises (PS&M) which covers the agriculture and soil problems along with economic backwardness, , which manages the livelihoods and economic backwardness of the landless, women and the indigenous communities. Given below is a brief about the activities proposed for the watershed:

| Natural Resource Management (NRM) | Production System & Micro- Enterprises (PS&M) | Livelihood Support Systems (LSS) |
|---|---|---|
| **Soil Conservation**<br>1. Gully Plugging<br>2. Stone bunding<br>3. Live fencing<br>4. Geo textiles<br>5. Centripetal Terracing<br>6. Stream bank stabilization | 1. Goat Rearing<br>2. Cow Rearing<br>3. Layer Distribution<br>4. Japanese Quail Rearing<br>5. Rabbit Rearing<br>6. Vermi Composting<br>7. Organic Fertilizer Distribution<br>8. Banana Cultivation<br>9. Organic Vegetable Cultivation | 1. Floor Cleaner Making<br>2. Mini Dairy Unit<br>3. Bag Making Un it<br>4. Soap Making Unit<br>5. Distribution of Tailoring Machine |
| **Water Conservation**<br>1. Retaining wall<br>2. Yard water collection pits<br>3. Husk Trenches<br>4. Moisture Collection Pits<br>5. Source Recharging<br>6. Check Dams<br>7. Rain Water Harvesting<br>8. VCB renovation | | |

**Cheruvicherythodu Watershed Development Project (Area – 517 Ha)**
**Master plan for Four Years - Funding pattern**

| Instal lment | Admini stration | Monitor ing | Evaluati on | Entry Point Activity | Institution & Capacity Building | DPR prepara tion | Watershe d Develop ment Activities | Livelih ood Activiti es | Product ion system & Micro Enterpr ises | Consolida tion Phase | Total IWMP project fund |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1St | 155100 | 15510 | 15510 | 310200 | 232650 | 77550 | 744480 | 0 | 0 | 0 | 1551000 |
| % | 2 | 0.2 | 0.2 | 4 | 3 | 1 | 9.6 | 0 | 0 | 0 | 20 |
| 2nd | 193875 | 15510 | 15510 | 0 | 77550 | 0 | 1287330 | 348975 | 387750 | 0 | 2326500 |
| % | 2.5 | 0.2 | 0.2 | 0 | 1 | 0 | 16.6 | 4.5 | 5 | 0 | 30 |
| 3rd | 232650 | 23265 | 23265 | 0 | 77550 | 0 | 1233045 | 348975 | 387750 | 0 | 2326500 |
| % | 3 | 0.3 | 0.3 | 0 | 1 | 0 | 15.9 | 4.5 | 5 | 0 | 30 |
| 4rd | 193875 | 23265 | 23265 | 0 | 0 | 0 | 1077945 | 0 | 0 | 232650 | 1551000 |
| % | 2.5 | 0.3 | 0.3 | 0 | 0 | 0 | 13.9 | 0 | 0 | 3 | 20 |
| **Total** | **775500** | **77550** | **77550** | **310200** | **387750** | **77550** | **4342800** | **697950** | **775500** | **232650** | **7755000** |
| % | 10 | 1 | 1 | 4 | 5 | 1 | 56 | 9 | 10 | 3 | 100 |

**Cheruvicherythodu Watershed - Sector – I – Watershed Development Activities - I year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS /Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Shuttertype check dam at Kalakkam thodu 5,50m width | Nos | 232901 | 1 | 62901 | 170000 | 0 | 232901 | 10 % General & 5 % SC / ST |
| 2. | Well recharging | RM | 2395 | 51.67 | 15645 | 108115 | 0 | 123760 | |
| 3. | Husk trench | RM | 2996 | 6.36 | 0 | 19080 | 0 | 19080 | |
| 4. | Stone bunding | RM | 2395 | 151.33 | 24414 | 338040 | 0 | 362454 | |
| 5. | Moisture collection pits | Nos | 12970 | 5 | 0 | 64850 | 16500 | 81350 | |
| 6. | Retaining wall construction for stream bank stebilization 1,00m Ht | $M^2$ | 80.39 | 552.2 | 0 | 44395 | 0 | 44395 | |
| 7. | Live fencing | Nos | 165 | 145.4 | 0 | 0 | 24000 | 24000 | |
| 8. | Centry petal terracing | $M^3$ | 149 | 1000 | 0 | 0 | 149000 | 149000 | |
| 9. | Yard water collection pit | RM | 24 | 1000 | 0 | 0 | 24000 | 24000 | |
| 10. | Gully controlling checkdam | Nos | 65.67 | 300 | 0 | 0 | 19701 | 19701 | |
| 11. | Stream bank stebilization for Kalakkam thodu 1.50m | Nos | 400 | 20 | 0 | 0 | 8000 | 8000 | |
| 12. | Shuttering thodu VCB near the old age home | Nos | 232901 | 1 | 62901 | 170000 | 0 | 232901 | |
| **Total** | | | | | **102960** | **744480** | **241201** | **1088641** | |

**Cheruvicherythodu Watershed-Watershed-Sector–I–Watershed Development Activities II year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Rain water harvesting tank 10000 ltr capacity for common | Nos | 12970 | 15 | 0 | 194550 | 0 | 194550 | 10%General & 5 % SC / ST |
| 2. | Source recharging | RM | 2996 | 14.85 | 0 | 44520 | 0 | 44520 | |
| 3. | Husk trench | RM | 2395 | 156.82 | 0 | 375600 | 0 | 375600 | |
| 4. | Stone bunding | Nos | 217500 | 1 | 0 | 217500 | 0 | 217500 | |
| 5. | Moisture collection pit | $M^2$ | 144 | 640 | 0 | 92160 | 0 | 92160 | |
| 6. | Live fencing | RM | 2395 | 88.72 | 0 | 212500 | 0 | 212500 | |
| 7. | Centry petal terracing | Nos | 165 | 200 | 0 | 0 | 33000 | 33000 | |
| 8. | Yard water collection pit | $M^3$ | 149 | 3000 | 0 | 0 | 447000 | 447000 | |
| 9. | Gully controlling checkdam | RM | 24 | 2500 | 0 | 0 | 60000 | 60000 | |
| 10. | Stream bank stebilization for Kanamkodu thodu 1.50m | Nos | 65.67 | 400 | 0 | 0 | 26268 | 26268 | |
| 11. | Gully controlled H type check dam in Kanamkodu thodu 4m width | Nos | 400 | 30 | 0 | 0 | 12000 | 12000 | |
| 12. | Geotextiles | Nos | 1 | 1 | 0 | 150500 | 0 | 150500 | |
| 13. | Stream bank stebilization for Vellakanam thodu 0,60m Ht | Nos | 12970 | 15 | 0 | 194550 | 0 | 194550 | |
| 14. | Rain water harvesting tank 5000 ltr capacity for individuals | RM | 2996 | 14.85 | 0 | 44520 | 0 | 44520 | |
| **Total** | | | | | | 1287330 | 578268 | 1865598 | |

**Cheruvicherythodu Watershed - Sector – I – Watershed Development Activities III year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/ Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Well recharging | Nos | 12970 | 15 | 0 | 194550 | 0 | 194550 | 10%General & 5 % SC / ST |
| 2. | Husk trench | $M^2$ | 144 | 1262 | 0 | 181740 | 0 | 181740 | |
| 3. | Stone bunding | RM | 2996 | 14.85 | 0 | 44520 | 0 | 44520 | |
| 4. | Moisture collection pit | RM | 2395 | 223.91 | 0 | 536285 | 0 | 536285 | |
| 5. | Live fencing | RM | 21500 | 5 | 0 | 107500 | 0 | 107500 | |
| 6. | Centry petal terracing | RM | 2395 | 65.32 | 22842 | 156450 | 0 | 179292 | |
| 7. | Yard water collection pit | Nos | 165 | 200 | 0 | 0 | 33000 | 33000 | |
| 8. | Gully controlling checkdam | $M^3$ | 149 | 3000 | 0 | 0 | 447000 | 447000 | |
| 9. | Stream bank stebilization 1.50m | RM | 24 | 3500 | 0 | 0 | 84000 | 84000 | |
| 10. | Gully controlled H type check dam 4m width | Nos | 65.67 | 400 | 0 | 0 | 26268 | 26268 | |
| 11. | Retaining wall construction for stream bank stebilization 1,00m Ht | Nos | 400 | 30 | 0 | 12000 | 0 | 12000 | |
| 12. | Geotextiles | Nos | 12970 | 15 | 0 | 194550 | 0 | 194550 | |
| **Total** | | | | | **22842** | **1233045** | **590268** | **1846155** | |

**Cheruvicherythodu Watershed - Sector – I – Watershed Development Activities - IV year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Gully controlling check dam | RM | 2996 | 8.49 | 0 | 25440 | 0 | 25440 | 10%General & 5 % SC / ST |
| 2. | Stream bank stabilization 1.50m | RM | 2395 | 156.37 | 0 | 374530 | 0 | 374530 | |
| 3. | Gully controlled H type check dam 4m width | Nos | 21500 | 4 | 0 | 56000 | 0 | 56000 | |
| 4. | Retaining wall construction for stream bank stebilization 1,00m Ht | RM | 2395 | 56.61 | 0 | 135590 | 0 | 135590 | |
| 5. | Geotextiles | Nos | 12970 | 20 | 0 | 259400 | 0 | 259400 | |
| 6. | Well recharging | $M^2$ | 144 | 534.6 | 0 | 76985 | 0 | 76985 | |
| 7. | Husk trench | Nos | 150000 | 1 | 0 | 150000 | 0 | 150000 | |
| 8. | Stone bunding | Nos | 165 | 200 | 0 | 0 | 33000 | 33000 | |
| 9. | Moisture collection pit | $M^3$ | 149 | 2500 | 0 | 0 | 372500 | 372500 | |
| 10. | Live fencing | RM | 24 | 3000 | 0 | 0 | 72000 | 72000 | |
| 11. | Centry petal terracing | Nos | 65.67 | 300 | 0 | 0 | 19701 | 19701 | |
| 12. | Yard water collection pit | Nos | 400 | 28 | 0 | 0 | 11200 | 11200 | |
| **TOTAL** | | | | | | **1077945** | **508401** | **1586346** | |

**Cheruvicherrythodu Watershed - Sector – II – Livelihood Activities for Land - less/Asset less - II year Action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | MNREGS / other source/Bank Loan | Total |
|---|---|---|---|---|---|---|---|
| 1 | seed money for enterprising individuals | Nos | 0 | 0 | 69795 | 0 | 69795 |
| 2 | Seed money for SHGs | | | | 279180 | 0 | 279180 |
| **TOTAL** | | | | | **348975** | **90315** | **439290** |

**Cheruvicherrythodu Watershed - Sector – II – Livelihood Activities for Land less/Asset less - III year Action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | MNREGS / other source/Bank Loan | Total |
|---|---|---|---|---|---|---|---|
| 1 | Seed money for SHGs | | 0 | 0 | 139590 | 0 | 139590 |
| | Funding for Major livelihood activities | | | | | | |
| 1 | Mini diary unit | Nos | 300000 | 1 | 150000 | 150000 | 300000 |
| 2 | Bag unit | Nos | 119000 | 1 | 59385 | 59615 | 119000 |
| **Total** | | | | | **348975** | **209615** | **558590** |

| **Funding pattern** | - | - |
|---|---|---|
| Seed money for enterprising individuals (10% of the allocation - Revolving fund) | | 69795 |
| Seed money for SHGs (60 % of the allocation - Revolving fund) | | 418770 |
| Funding for major livelihood activities (30% of the allocation - Grant in aid) | | 209385 |
| **Total allocation** | | **697950** |

**Cheruvicherrythodu Watershed - Sector – III – Production System & Micro Enterprises based livelihood activities - II year Action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | Total | WDF |
|---|---|---|---|---|---|---|---|
| 1 | Organic fertilizer distribution | 1800/100kg | 1800 | 152 | 271750 | 273600 | 20 % for General & 10 % for SC / ST |
| 2 | soap making unit | Nos | 25000 | 1 | 25000 | 25000 | |
| 3 | Plantain cultivation for leaves | Ha | 22750 | 4 | 91000 | 91000 | |
| **TOTAL** | | | | | **387750** | **484800** | |

**Cheruvicherrythodu Watershed Sector – III – Production System & Micro Enterprises based livelihood activities - III year action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | Total | WDF |
|---|---|---|---|---|---|---|---|
| 1 | Banana cultivation | Nos | 24000 | 6 | 141750 | 144000 | 20 % for General & 10 % for SC / ST |
| 2 | Organic vegetable cultivation | Nos | 24000 | 9 | 216000 | 216000 | |
| 3 | Rabbit rearing | Nos | 30000 | 1 | 30000 | 30000 | |
| **TOTAL** | | | | | **387750** | **390000** | |

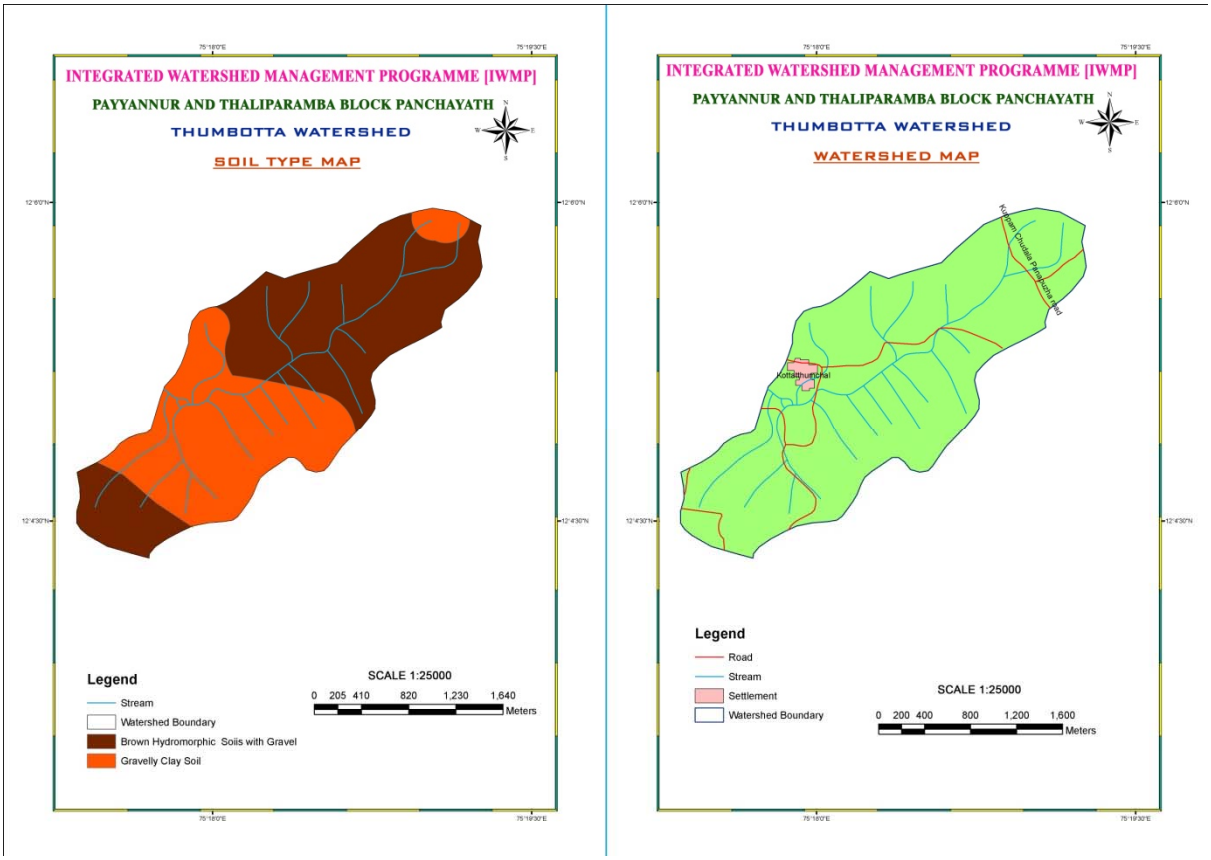
**Total Allotment – 775500**

**CHERUVICHERYTHODU WATERSHED DEVELOPMENT PROJECT**
**ENTRY POINT ACTIVITY - ACTION PLAN**

| Sl:no | Activity | Unit | Unit cost | Target | Project Cost Allocated for EPA | Additional Amount met from IWMP | Total Project Cost |
|---|---|---|---|---|---|---|---|
| 1. | Deepening of existing panchayath well | No | 22960 | 1 | 22960 | - | 22960 |
| 2. | Supplying pipe line ,oh tank ,pump house | No | 302000 | 1 | 287240 | 14760 | 302000 |
| **Total** | | | | | **310200** | **14760** | **324960** |

# THUMBOTTA WATERSHED

| | | |
|---|---|---|
| Grama Panchayat | : | Kadannappalli - Panapuzha |
| Village | : | Kadannappaly |
| Wards covered | : | XII |
| Block Panchayat | : | Thaliparamba |
| Thaluk | : | Kannur |
| District | : | Kannur |
| Total families covered | : | 339 |
| Total Population covered | : | 1456 |
| Total treatable Area | : | 459 Ha |
| River Basin | : | Peruvamba (Perumba) River |
| Average Length | : | 3.25. Kms. |
| Average Width | : | 4.15. Kms. |
| Total Project Cost | : | Rs. 68, 85, 000/- |
| Boundaries Watershed | : | North: Kaviyanam & Cheruvichery |
| | : | South: Pariyaram Panchayat |
| | : | East: Pariyaram Panchayat |
| | : | West: Kokkottuvayal Watershed |




## Introduction

Thumbotta watershed covers the 12th ward of Kadannappalli – Panapuzha Grama Panchayat and has a total area of 459 Ha. The watershed is formed based on the main stream Tumbotta (Padiyil) stream.

**The important places** in the watershed are Peruvalanga, Padiyil, Thumbotta, Puthoorkunnu, Vayattupoyil etc.

## Geographic Description of the Watershed:

### a. *Location:*

The watershed is located about 35 Km away from the District Head Quarters and can be reached by road. The watershed is about 2.5 Km away from the Kadannappally- Panapuzha Panchayat Head Quarters and 8 Kms away from Pariyaram Panchayat Head Quarters. Geographically the watershed has hillocks and medium slopes.

### b. The geographic coordinates:

Geographically the watershed area lies between the east longitude $75^0$17’30” and $75^0$19’0” and north latitude $12^0$ 4’30” and $12^0$ 6’0” with a total elevation of 112 ft.

### c. Average length and width of the watershed

Thumbotta watershed has an average length of 3.25. Kms and has an average width of 4.15 Kms.

**Relief & Drainage**

Thumbotta watershed has a slanting nature towards the west direction. The upper areas of the watershed have a sloping nature of $30^{0.}$ Vayattupoyil, Peruvalnga, Pothoorkunnu, etc are the upper regions of the watershed and that constitute about 50% of the total geographic area. About 40% are observed as midlands (Mavuppadi, Thumbotta,etc). The Padiyil agricultural field and other agricultural field and adjacent land are considered as plains which constitute about 10% of the total geographic area of the watershed.

**Drainage**

Thumbotta watershed is the catchment area of Thumbotta (Padiyil) stream. This stream is a joined version of two smaller streams originating from Pariyaram Panchayat which joins together at Varanakulam and flowing towards west about 3 Kms with 6 meters width and 2 meters depth before it get out of the watershed. There are fifteen sub-streams that drain the watershed and are as follows:

- Chunda Stream
- Varanakulam Stream
- Valiyakurukkootty Stream
- Kolakkara Stream
- Peruvalanga Stream
- Balanmada – Eachikkundu Stream
- Neeralathumkund Stream
- Cheroonathumchal
- Parothumchal
- Thykkodichal
- Alakkamthodu
- Manthar – Chengalam Stream
- Kanichatte Thodu
- Oushadhi Thodu,
- Anchanapoil Thodu
- Mavuppadi Kakkathummoola thodu

The wells and ponds are considered as the main water sources for domestic and irrigation purposes. The table given below shows the details of ponds in the watershed.

| SL No | Name of Pond | Ownership |
|---|---|---|
| 1. | Padiyil Pond | Public |
| 2. | Puthukulam Pond | Public |
| 3. | Vellalathu Temple Pond - I | Private |
| 4. | Vellalathu Temple Pond - II | Private |
| 5. | E.T.Kunjiraman Pond | Private |
| 6. | Rayaroth Pond | Private |
| 7. | P.R. Chandhukutti Pond | Private |
| 8. | Babu Pond | Private |
| 9. | Parakasan Pond | Private |
| 10. | Mavuppadi Pond | Private |

Besides this, the number of wells in the watershed is: Public wells -8, Household wells-281, Perennial wells-219, and Seasonal wells-62

**The Drainage density:** The drainage density of Thumbotta watershed is 33.77 m/Ha.

**Present situation of the streams and other water bodies**

The number of streams, sub-streams and ponds are creating an exhilarating situation in the watershed. But the pity is that almost all the streams and some of the ponds and wells dry up in the beginning of the summer or immediately after the rain is over.

Water scarcity is observed in Peruvalanga and Puthurkunnu area. The authorities have made no arrangements to reach drinking water to these areas. Therefore, the watershed community is forced to walk long distance to collect their drinking water.

**Rainfall and Climate**

Climate in the Thumbotta watershed is similar to that of other watersheds in the cluster. The maximum temperature of the watershed is $36^{o}$ C and the minimum temperature is $28^{o}$ C. The temperature is in its peak between February and May.

The watershed obtains usual rainfall. Maximum Rainfall is obtaining during the South-west Monsoon. 58% of the rainfall is during the South – west Monsoon and 42% is from the North-east monsoon. The average rainfall in the watershed is 3697.6 mm.

**Soil Type & Depth**

Commonly brown hydromorphic soil is seen in the top portion of the watershed like Puthoorkunnu, Peruvalanga, etc. The midland area like Thumbotta, Mavuppadi, etc has alluvial type of soil (Clay with gravel). The geographic area with the first type of soil is 256.91ha and with the second type is 202.09 ha.

**Agriculture & Land Use**

Nearly 80% of the total geographic area of the watershed is under crops. The remaining 20% occupies the water bodies, roads, buildings, rocky lands etc. 50% of the total area under crops are used for mono crop cultivation especially rubber. 40% used for for multi crops and the remaining 10% is paddy fields. Rubber and cashew cultivation is predominant in higher region of the watershed. The midland is the region of coconut, and areca nut cultivation. Paddy cultivation is common in lowland.

**The land use pattern of the watershed is show below:**

| Crops | Area (Ha) | % | Productivity |
|---|---|---|---|
| Built up | 19.8 | 4.31 | 0 |
| Paddy | 45.9 | 10 | 101.95 |
| Rubber | 158.8 | 34.6 | 214.45 |
| Coconut | 68.85 | 15 | 5698 |
| Areca nut | 65.44 | 14.26 | 119.01 |
| Cashew | 32.54 | 7.09 | 30.52 |
| Plantain | 26.36 | 5.74 | 209.86 |
| Vegetables | 22.95 | 5 | 35.12 |
| Tubers | 18.36 | 4 | 322.44 |
| **Total** | **459** | **100** | **0** |

**Animal Husbandry**

Livestock maintenance among the farmers had become very poor during the recent years. There is specific reason for that. The main reason is that people did not get adequate fodder to feed the animals. The second one is poor interest among the farmers. However, a statistics is available from the watershed about the livestock in the watershed.

a. Hybrid Variety cows (Male) : 11
b. Hybrid Variety Cows (Female): 52
c. Indigenous Cows (Males): 6
d. Indigenous Cows(Females): 34
e. Goat(Males): 28
f. Goat (Female): 88
g. Indigenous fouls: 67
h. Hybrid Variety: 212

**Socio-Economic Details:**

The demographic features of the watershed show that there is a total population of 1456 living in 339 households. Out of these households 144, i.e., 42.47% are BPL. As in the case of majority of the watersheds, here also the female population (753) is more than that of the male population (703).

The general economic situation of the watershed community is that of middle class. There is little difference in the physical appearance between the rich and the poor. But it is true that there are poverty stricken families in the watershed, especially those among the SC communities. Statistics shows that out of the total 339 families in the watershed nearly half (144) families are categorized as BPL. This is about 42.47% of the total households in the watershed.

Majority of the people in the watershed community are classified as working class. Around 63% of the total working class in the watershed is in the agricultural sector and the economy is built upon agriculture. Therefore, any change in the climate or in the structure of the soil will definitely affect the economy of the watershed. Only a few percentages are salaried. A very good percentage of working class population (26%) is daily wagers working mainly in construction sector. The rest 11% are exclusively living on casual labour either in farm sector or in non-farm sector.

There is a very good network of roads, booth pucca and kucha, in the watershed and this enables the inhabitants of the watershed to move one place to another. This mobility has influenced the culture and development of the watershed community since they establish close contacts with outside communities. However, the conveyance facilities are yet to be improved so that people live in interior places can also have access to places like markets and places in the nearby townships.

Educationally and culturally the watershed community is comparatively better because they have easy access to educational institutions in and around the Grama Panchayat. Clubs and cultural associations are the contributors towards this cultural growth and development of the watershed community.

**Road Network:**

There are five important roads and several smaller ones in the watershed. Three roads are tarred and one is partially tarred (100 Meters). The roads are as follows:

1. Chandapura – Pariyaram Medical College Road with a length of 2.5 Kms and a width 6 Meters
2. Puthurkunnu Colony Road – 1 Kms length and 4.5 M width
3. Thumbotta – Peruvalanga Road – 3 Kms length & 3 M width
4. Thankayam Mavuppadi Road – 2 Kms length & 4 M width.
5. Puthurkunnu- Pariyaram Ayurveda College Road – 750 M length and 6 M width

**Institutions and Community based organizations:**

- Cultural Centre, Puthurkunnu
- Anganwadi, Puthurkunnu
- Anganwadi, Peruvalanga
- Milk Marketing Coop. Society
- Thumbotta Sports Club
- Arangu Arts & Cultural Forum

**Market Facilities:**

The watershed community depends up on Pariyaram and Pilathara Townships (2.5 Kms and 5 kms respectively) for their purchasing needs. For selling the produce they either go to Mathangalam or to Payyanur Bazaars.

**Hospital facilities:**

There are no major hospitals or dispensaries in the watershed. The watershed community depends on medical institutions in Payyanur or Thaliparamba for treatments. Pariyaram Medical College is about 2.5 Kms away from the watershed.

**Major Problems of the watershed**

Major problems identified through a brainstorming session in which representatives from the Neighbourhood clusters participated. The problems are categorized under four headings: Soil related, Water related, Agro-Bio Diversity Related and Animal Husbandry related. Such a categorization is in line with the activities that can be undertaken IWMP to solve the issues. The issues are listed below:

**Water Related Issues:**

- Most of the streams became seasonal
- Water contamination due unsafe disposal of plastic wastes and other wastes
- Poor Ground water recharging
- In Peruvalanga and Puthoorkunnu area severe water scarcity is experienced
- The extensive use of chemicals in the agricultural lands enhances water pollution

**Soil Related Issues**

- In the upstream areas of the watershed severe soil erosion is experienced (Puthurkunnu,, Peruvalanga areas)
- The soil fertility is gradually decreasing
- The changing chemical structure of the soil and disappearing micro organisms

- The decreasing capacity of the soil to absorb and hold water
- Unsafe disposal of plastic goods in the soil.

**Issues related to Agriculture and Bio Diversity**

- Low Agricultural Production
- Increasing plant diseases (Mandari, Mahali, Bunchy Top, Quick wilt etc.)
- Unavailability of skilled labourers
- Unavailability of seeds with ensured germination
- Wild Attack
- Lack of irrigation facilities
- Many traditional plants are at the verge of extinction like Anjili *(Artocarpus hirsutus)* Njaval, Ponchembakam *(Michelia chembaka)*, Maruthu *(Terminalia paniculata)*

**Issues related to Animal Husbandry**

- Farmers lost interest in Animal Husbandry
- Unavailability of sufficient fodder
- Abandoning of paddy cultivation affected the availability of straw
- Deterioration of common grazing lands due to change in land use pattern

**Activities proposed to address the issues**

| **Natural Resource Management (NRM)** | **Production System & Micro-Enterprises (PS&M)** | **Livelihood Support Systems (LSS)** |
|---|---|---|
| **<u>Soil Conservation</u>**<br>1. Gully Plugging<br>2. Stream bank stabilization<br>3. Live fencing<br>4. Stone bunding<br>5. Centripetal Terracing<br>**<u>Water Conservation</u>**<br>1. Pond renovation<br>2. Yard water collection pits<br>3. Husk Trenches<br>4. Moisture Collection Pits<br>5. Source Recharging<br>6. Rain Water Harvesting tank<br>7. Water collection pit<br>8. Pump house construction | 1. Goat Rearing<br>2. Cow rearing<br>3. Quail Rearing<br>4. Mushroom Cultivation<br>5. Organic Fertilizer Distribution<br>6. Banana Cultivation<br>7. Organic Vegetable Cultivation<br>8. Rabbit rearing | 1. Floor Cleaner Making Unit<br>2. Candle Making Unit<br>3. Mini Dairy Unit<br>4. Tailoring Unit<br>5. Soap Making<br>6. Distribution of Tailoring Machines<br>7. Saree Painting |

**Thumbotta Watershed Development Project (Area – 459 Ha) - Master plan for Four Years - Funding pattern**

| Installment | Administration | Monitoring | Evaluation | Entry Point Activity | Institution & Capacity Building | DPR preparation | Watershed Development Activities | Livelihood Activities | Production system & Micro Enterprises | Consolidation Phase | Total IWMP project fund |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1St | 137700 | 13770 | 13770 | 275400 | 206550 | 68850 | 660960 | 0 | 0 | 0 | 1377000 |
| % | 2 | 0.2 | 0.2 | 4 | 3 | 1 | 9.6 | 0 | 0 | 0 | 20 |
| 2nd | 172125 | 13770 | 13770 | 0 | 68850 | 0 | 1142910 | 309825 | 344250 | 0 | 2065500 |
| % | 2.5 | 0.2 | 0.2 | 0 | 1 | 0 | 16.6 | 4.5 | 5 | 0 | 30 |
| 3rd | 206550 | 20655 | 20655 | 0 | 68850 | 0 | 1094715 | 309825 | 344250 | 0 | 2065500 |
| % | 3 | 0.3 | 0.3 | 0 | 1 | 0 | 15.9 | 4.5 | 5 | 0 | 30 |
| 4rd | 172125 | 20655 | 20655 | 0 | 0 | 0 | 957015 | 0 | 0 | 206550 | 1377000 |
| % | 2.5 | 0.3 | 0.3 | 0 | 0 | 0 | 13.9 | 0 | 0 | 3 | 20 |
| **Total** | **688500** | **68850** | **68850** | **275400** | **344250** | **68850** | **3855600** | **619650** | **688500** | **206550** | **6885000** |
| % | 10 | 1 | 1 | 4 | 5 | 1 | 56 | 9 | 10 | 3 | 100 |

**Thumbotta Watershed - Sector – I – Watershed Development Activities - I year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Moisture collection pits | $M^3$ | 149 | 1500 | 0 | 0 | 223500 | 223500 | 10 % General & 5 % SC / ST |
| 2. | Live fencing | RM | 24 | 2300 | 0 | 0 | 55200 | 55200 | |
| 3. | Husk trench | Nos | 165 | 200 | 0 | 0 | 33000 | 33000 | |
| 4. | Centry petal terracing | Nos | 65.67 | 200 | | 0 | 13134 | 13134 | |
| 5. | Stone bunding | Nos | 80500 | 1 | 0 | 80500 | 0 | 80500 | |
| 6. | Gully controlling structures in Padiyil thodu | RM | 2395 | 242.3 | 0 | 580460 | 0 | 580460 | |
| 7. | Storage ferro cement tank (EPA) | $M^3$ | 149 | 1500 | 0 | 0 | 223500 | 223500 | |
| 8. | Conveying ,laying pipe line with motor and electric connection (EPA) | RM | 24 | 2300 | 0 | 0 | 55200 | 55200 | |
| **Total** | | | | | | **660960** | **324834** | **985794** | |

**Thumbotta Watershed - Sector – I – Watershed Development Activities II year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Renovation of the existing open dug out pond at padikulaM | Nos | 96500 | 1 | 0 | 96500 | 0 | 96500 | 10 % General & 5 % SC / ST |
| 2. | Construction of a pump house and supplying and erection motor near Padikulam | Nos | 332500 | 1 | 0 | 332500 | 0 | 332500 | |
| 3. | Construction of catch pit near Padikulam (continuing work item no:2,3) | Nos | 66500 | 1 | 0 | 66500 | 0 | 66500 | |
| 4. | Well recharging | RM | 2395 | 206.5 | 0 | 494600 | 0 | 494600 | |
| 5. | Stone bunding | Nos | 36080 | 1 | 0 | 36080 | 0 | 36080 | |
| 6. | Live fencing | Nos | 12970 | 9 | 0 | 116730 | 0 | 116730 | |
| 7. | Husk trench | RM | 24 | 2000 | 0 | 0 | 48000 | 48000 | |
| 8. | Centry petal terracing | Nos | 165 | 600 | 0 | 0 | 99000 | 99000 | |
| 9. | Yard water collection pit | Nos | 65.67 | 700 | 0 | 0 | 45969 | 45969 | |
| **Total** | | | | | | **1142910** | **200969** | **1343879** | |

**Thumbotta Watershed - Sector – I – Watershed Development Activities - III year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Construction of 20,000 ltr. capacity Ferro cement tank attached to the Puthoorkunnu Anganwadi | $M^2$ | 144 | 119.4 | 0 | 17198 | 0 | 17198 | 10 % General & 5 % SC / ST |
| 2. | Stone bunding | Nos | 12970 | 27 | 0 | 350190 | 0 | 350190 | |
| 3. | Well recharging | Nos | 727327 | 1 | 0 | 727327 | | 727327 | |
| 4. | Stream bank protection along Padiyil thodu at peruvalanga,padikanam | Nos | 400 | 600 | 0 | 0 | 24000 | 24000 | |
| 5. | Gully controlling structures in Valiya kurukkudi thodu | RM | 24 | 3500 | 0 | 0 | 84000 | 84000 | |
| 6. | Yard water collection pit | Nos | 65.67 | 200 | 0 | 0 | 13134 | 13134 | |
| 7. | Live fencing | $M^3$ | 149 | 2600 | 0 | 0 | 387400 | 387400 | |
| 8. | Centry petal terracing | $M^2$ | 144 | 119.4 | 0 | 17198 | 0 | 17198 | |
| 9. | Moisture collection pit | Nos | 12970 | 27 | 0 | 350190 | 0 | 350190 | |
| **Total** | | | | | | **1094715** | **508534** | **1603249** | |

**Thumbotta Watershed - Sector – I – Watershed Development Activities - IV year action plan**

| Sl No. | Name of Activity | Unit | Unit Cost | Target | EPA | IWMP Fund | MNREGS/Other Source | Total | WDF |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Yard water collection pit | Nos | 400 | 20 | 0 | 0 | 8000 | 8000 | 10 % General & 5 % SC / ST |
| 2. | Live fencing | RM | 24 | 4000 | 0 | 0 | 96000 | 96000 | |
| 3. | Centry petal terracing | Nos | 65.67 | 230 | 0 | 0 | 151041 | 151041 | |
| 4. | Moisture collection pit | $M^3$ | 149 | 2600 | 0 | 0 | 387400 | 387400 | |
| 5. | Stone bunding | $M^2$ | 144 | 1660 | 0 | 239050 | 0 | 239050 | |
| 6. | Well recharging | Nos | 12970 | 10 | 0 | 129700 | 0 | 129700 | |
| 7. | Gully controlling structures | RM | 2996 | 10.61 | 0 | 31800 | 0 | 31800 | |
| 8. | H Type gully controlling structures in Anjanapoyil thodu | Nos | 14600 | 5 | 0 | 73000 | 0 | 73000 | |
| 9. | H Type gully controlling structures in Alakamthodu | Nos | 14600 | 4 | 0 | 58400 | 0 | 58400 | |
| 10. | Stream bank stabilization along Mavupadi thodu | RM | 2395 | 67.50 | 0 | 161665 | 0 | 161665 | |
| 11. | Stream bank stabilization along alakam thodu | RM | 2395 | 78.41 | 0 | 187800 | 0 | 187800 | |
| 12. | Gully controlling structures in Mavupadi thodu | | | | | **957015** | **642441** | **1599456** | |
| 13. | H type gully controlling structures in Mavupadi thodu | | | | | | | | |
| **TOTAL** | | | | | | | | | |

**Thumbotta Watershed - Sector – II – Livelihood Activities for Land less/Asset less - II year Action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | MNREGS / other source/Bank Loan | Total |
|---|---|---|---|---|---|---|---|
| 1 | seed money for enterprising individuals | Nos | 0 | 0 | 61965 | 0 | 61965 |
| 2 | Seed money for SHGs | | 0 | 0 | 247860 | 0 | 247860 |
| **TOTAL** | | | | | **309825** | **0** | **309825** |

**Thumbotta Watershed - Sector – II – Livelihood Activities for Land less/Asset less - III year Action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | MNREGS / other source/Bank Loan | Total |
|---|---|---|---|---|---|---|---|
| 1 | Seed money for SHGs | Nos | 0 | 0 | 123930 | 0 | 123930 |
| **II** | **Funding for Major livelihood activities** | | | | | | |
| 1 | Mini diary unit | Nos | 300000 | 1 | 150000 | 150000 | 300000 |
| 2 | Non Woven bag manufacturing unit | Nos | 72000 | 1 | 35895 | 36105 | 72000 |
| **TOTAL** | | | | | **309825** | **186105** | **495930** |

| **Funding pattern** | - |
|---|---|
| Seed money for enterprising individuals (10% of the allocation -Revolving fund) | 61965 |
| Seed money for SHGs (60 % of the allocation - Revolving fund) | 371790 |
| Funding for major livelihood activities (30% of the allocation - Grant in aid) | 185895 |
| **Total allocation** | **619650** |

**Thumbotta Watershed - Sector – III – Production System & Micro Enterprises based livelihood activities - II year Action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | Total | WDF |
|---|---|---|---|---|---|---|---|
| 1 | Organic fertilizer distribution | 1800/100kg | 1800 | 152 | 273600 | 273600 | 20 % for General & 10 % for SC / ST |
| 2 | Japanese quail rearing | Nos | 21650 | 1 | 21650 | 21650 | |
| 3 | Distribution of tailoring machines | Nos | 7000 | 7 | 49000 | 49000 | |
| **TOTAL** | | | | | **344250** | **344250** | |

**Thumbotta Watershed - Sector – III – Production System & Micro Enterprises based livelihood activities: III year action plan**

| Sl No | Name of Activity | unit | Unit cost | Target | IWMP fund | Total | WDF |
|---|---|---|---|---|---|---|---|
| 1 | Banana cultivation | Nos | 24000 | 5 | 120000 | 120000 | 20 % for General & 10 % for SC / ST |
| 2 | Organic vegetable cultivation | Nos | 24000 | 7 | 168000 | 168000 | |
| 3 | Rabbit rearing | Nos | 25000 | 1 | 25000 | 25000 | |
| 4 | Saree painting | Nos | 31250 | 1 | 31250 | 31250 | |
| **TOTAL** | | | | | **344250** | **360750** | |

**Total Allotment -688500**

**ENTRY POINT ACTIVITY - ACTION PLAN**

| Sl:no | Activity | Unit | Unit cost | Target | IWMP EPA fund | IWMP Project fund | Total |
|---|---|---|---|---|---|---|---|
| 1. | Construction of open dug out well | No | 1,00,000 | 1 | 100000 | - | 100000 |
| 2. | Pump house | No | 32,400 | 1 | 32400 | - | 32400 |
| 3. | Storage Ferro cement tank | No | 64,400 | 1 | 30000 | 34400 | 64400 |
| 4. | Conveying laying pipe line with motor and electric connection | No | 6,25,000 | 1 | 113000 | 512000 | 625000 |
| | Total | | | | **275400** | **546400** | **821800** |

**Annexure – 1**

**LOG FRAMEWORK ANALYSIS – LFA**

| Narrative Summary | Expected Results | Objectively Verifiable indicators (OVI) | Means of Verifications (MOV) | Risk/Assumptions |
|---|---|---|---|---|
| **Goal: (Overall Objective)**<br><br>The degraded Natural TRIO restored and the production improved in the watersheds of Payyanur Block Panchayat under the coverage of IWMP by more efficient utilization of natural resources through the proper and effective implementation of Integrated Watershed Management Programme plan. | • The income of families will increased<br>• Living standard will improve<br>• Increase of ground water table<br>• Irrigation during off-season | • Purchase power of villagers will increase<br>• Annual expenditure and saving of households<br>• Household assets<br>• Number of people migrating for employment opportunity<br>• Cropping pattern | • Impact assessment study<br>• Evaluation report<br>• Compare between baseline survey and evaluation report<br>• Physical observation<br>• Physical Verification and FGD with farmers | Political Intervention will not affect the smooth implementation of the programmes |

**LFA …. Contnd…..**

| **Specific Objective 1** | **Outcome** | **Objectively Verifiable indicators (OVI)** | **Means of Verifications (MOV)** | **Risk/Assumptions** |
|---|---|---|---|---|
| Watershed communities mobilized, organized and capacitated along with other institutional arrangements to take up the effective implementation of the project | SHGs and UGscapacitated for taking up the responsibility<br>Participation of the watershed community ensured<br>DPR satisfying all sections of the community prepared | Active involvement of the UGs in the planning process<br>No. of groups formed and capacitated<br>No. of trainings organized and conducted<br>No. of watershed committees formed and strenghtened | DPR prepared and submitted<br>Document on the processes of UG formation<br>Training registers<br>Photographs | Favourable climatic conditions and the readiness of the UGs and WCs in attending the trainings |
| **Activities to realize the Objective** | **Outputs** | **Objectively Verifiable indicators (OVI)** | **Means of Verifications (MOV)** | **Risk/Assumptions** |
| Meetings of watershed communities and concerned ward members | Groups formed and office bearers elected | Increased participation of the community<br>Interest shown by the community in the process of planning<br>PRA conducted in the watershed | Discussion with Villagers/Farmers<br>List of families<br>Minutes of the meetings<br>Photographs | Favourable climatic conditions, cooperation of the ward members and positive approach of the watershed community |
| Participatory Rural Appraisal (PRA) | Primary data regarding the socio-economic situation of the watershed community collected | Reliable data used in the process of DPR preparation | PRA Report of each watershed<br>Photographs and videos<br>Draft copy of Maps prepared by the watershed committee | Favourable climatic conditions, People understand the importance of PRA and they actively participate in the exercise |

**LFA .... Contnd.....**

| **Specific Objective 2** | **Outcome** | **Objectively Verifiable indicators (OVI)** | **Means of Verifications (MOV)** | **Risk/Assumptions** |
|---|---|---|---|---|
| Total agriculture production increased | • Modern agriculture techniques for enhancing of agriculture productivity<br>• Increased Agriculture income<br>• Soil moisture content increased | • Net area under agriculture increased<br>• vegetation cover in the project area present<br>• Percentage of farmers cultivating the crops incrreased | • Impact assessment study<br>• Evaluation report<br>• Discussion with Villagers/Farmers<br>• Trend analysis of crop cultivation | Maintenance of the Structure after the project completion |
| **Activities to realize the Objective** | **Outputs** | **Objectively Verifiable indicators (OVI)** | **Means of Verifications (MOV)** | **Risk/Assumptions** |
| 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 | |
| Use of advance water conservation techniques. | Optimum utilization of available water | Number of households having drip irrigation system of their houses | Physical verification | |
| 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 | |

**LFA …. Contnd…..**

| **Specific Objective – 3** | **Outcome** | **Objectively Verifiable indicators (OVI)** | **Means of Verifications (MOV)** | **Risk/Assumptions** |
|---|---|---|---|---|
| Per capita income of BPL and marginal farmers increased through Various livelihood activities | • No. of migrating families from the project area reduced<br>• Employment available within the project area.<br>• Unemployment decreased | • Number of people migrating for employment opportunity<br>• Number of people engaged in livelihood activities.<br>• Number of people involved in self employment activities | • Impact assessment study<br>• Physical verification/ Photographs<br>• FGDs and PRA | Adequate financial support availed by the banks and other financial institutions |
| **Activities to realize the Objective** | **Output** | **Objectively Verifiable indicators (OVI)** | **Means of Verifications (MOV)** | **Risk/Assumptions** |
| 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 | People show interest in taking up risk |
| 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 | Appropriate faculties available for imparting training and the line departments cooperates |
| | Women entrepreneurs provided with an opportunity to interact with service providers | Number of Women entrepreneurs started self employment programmes | Physical verification<br>Direct interaction with the trained | |

**LFA …. Contnd…..**

| **Specific Objective – 4** | **Outcome** | **Objectively Verifiable indicators (OVI)** | **Means of Verifications (MOV)** | **Risk/Assumptions** |
|---|---|---|---|---|
| Local institutions strengthened | • Presence of strong and dynamic local governance<br>• People's participation and representation increased | • Number of meetings initiated by the local leaders.<br>• Number of peoples' organization present in the grass root level | • Impact assessment study<br>• Evaluation report, FGD, Observations | Interest of the People. |
| **Activities to realize the Objective** | **Output** | **Objectively Verifiable indicators (OVI)** | **Means of Verifications (MOV)** | **Risk/Assumptions** |
| 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 | Prticipants take part in the training programme understanding the importance |
| 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 | Favourable Climatic Condition and Prticipants take part in the training programme understanding the importance |

# 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** | |
| • Reduced soil erosion<br>• Better water availability<br>• Better quality of water | • Reduced deforestation<br>• Enhanced minor forest produce availability | • Improved water availability<br>• Better crop production<br>• More biomass availability | • Enhanced fuel (biomass) availability<br>• Enhanced cattle milk production<br>• Enhanced other economic activities like vermin composting, sericulture, orchard etc | • Reduced migration<br>• More employment<br>• Improved Health condition<br>• Improved adaptive capacity to climate change<br>• 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.

**Acknowledgement**

In this process of DPR preparation, we need to acknowledge the support and guidance provided by the Project Director, PAU, Kannur, the Joint Director and Chief Executive of SLNA, The Payyanur Balock Panchayat President and her team, Block Panchayat Secretary and his colleagues, Agriculture officers of the concerned Grama Panchayats, The Concerned Grama Panchayat Presidents and their team, The MGNREGS supervisors in the Block Panchayat and in the Grama Panchayat and last, but not least, the elected members of the Grama Panchayats and the watershed committee members. A special mention is required here for the support and cooperation rendered to us by the participating Watershed Neighbourhood Clusters.

We know that we should not forget that this detailed document with every data and its analysis with worked out engineering measures and budget provisions is a result of the restless effort of the Technical Support Organization (SUSTHIRA, Centre for Development Studies and Action, Pariyaram). This Detailed Project Report is realized on the stipulated time is only because the dedicated service of the TSO.

**Conclusion**

Many projects fail to yield due results because of the lack of proper sustaining mechanisms. People have to feel that the projects are beneficial to them and it would contribute to their well being. Many projects do not come to this level because of the lack of Operation and Maintenance Programmes. In this context, measures need to be devised to see that a group of people will be properly trained in the various details of operation and maintenance of the project and they will see that the projects initiated are maintained profitably and overall success is achieved. People who are drawn from the watershed sangams and other baseline groups will be given enough training and these people will constitutes a 'Watershed Vikasana Samithi' and it will register as a legal body and look after all future operations in connection with the operation and maintenance of the project. This approach will certainly sustain the project and its benefits.

The basics for the existence of human beings are his means of livelihood - soil, water and biomass. All our developmental programmes should have been focused on the conservation and protection of these basic resources, but unfortunately this had not been the focus of development till recently. As the statistics and studies conducted worldwide have revealed, existence and even survival of the human on this planet earth is in danger, a situation which had been knowingly or unknowingly had been created by himself, as he gave top priority for his own luxury. As of now, we have recognized that it is high time to stop the over exploitation of our natural resources and we must learn to protect and conserve the natural resources to the maximum.

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.

**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.