Integrated Watershed Management Programme (IWMP)

Detailed Project Report (DPR)

IWMP-VI-20012-13

Nemmara Block Panchayat

Technical Support Organization

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ABBREVIATIONS

APL	Above Poverty Line
AAP	Annual Action Plan
BLCC	Block Level Coordination Committee
BPL	Below Poverty Line
BRGF	Backward Regions Grant Fund
CEO	Chief Executive Officer
CSES	Centre for Socio-economic and Environmental Studies
DLCC	District Level Coordination Committee
DPC	District Planning Committee
DPR	Detailed Project Report
EPA	Entry Point Activities
FGD	Focus Group Discussion
GIS	Geographic Information System
GP	Grama Panchayat
GW	Ground Water
IEC	Information, Education and Communication
IT	Information Technology
IWMP	Integrated Watershed Management Programme
LFA	Logical Framework Analysis
LSGD	Local Self Government Department
LSGI	Local Self Government Institutions
LSS	Livelihood Support System
MCM	Million Cubic Meters
MGNREGA	Mahatma Gandhi National Rural Employment Guarantee Act
MLA LAD	Member of Legislative Assembly Local Area Development scheme
MoU	Memorandum of Understanding
MPLAD	Member of Parliament Local Area Development
MSL	Mean Sea Level
NABARD	National Bank for Agriculture and Rural Development
NGO	Non-Governmental Organization
NRAA	National Rainfed Areas Authority
NRHM	National Rural Health Mission
NRM	Natural Resource Management
OBC	Other Backward Caste
PIA	Project Implementing Agency
PRA	Participatory Rural Appraisal
PRIs	Panchayati Raj Institution

PS&M	Production System and Microenterprises
SC	Scheduled Caste
SHG	Self Help Group
SLNA	State Level Nodal Agency
SPSP	State Perspective and Strategic Plan
ST	Scheduled Tribe
TSO	Technical Support Organization
UG	User Group
VEO	Village Extension Officer
WC	Watershed Committee
WCC	Watershed Coordination Committee
WCDC	Watershed Cell cum Data Centre
WDT	Watershed Development Team
WW	Women Welfare

CHAPTER I
INTRODUCTION

1.1 Project Background

Nemmara (IWMP-6) project is located in Nemmara and Kollengode blocks of Palakkad district. The project comprises of four micro-watersheds namely Malappuram (20B39ac), Payyadore (20B39w), Payyalloor (20B39v) and Vengappara (20B39y). The project, with an area of 4832 hectares has been selected for treatment under the Integrated Watershed Management Programme (IWMP). The project area covers the grama panchayats of Elavanchery, Nemmara, Nelliyampathy, Pallasena (all in Nemmara Block), Kollangode and Muthalamada (in Kollangode Block).

1.2 Need and Scope for Watershed Development

The Integrated Watershed Management Programme (IWMP) aims to restore the ecological balance by harnessing, conserving and developing degraded natural resources such as soil, vegetative cover and water. The need for integrated watershed management arises because of the water scarcity, rapid depletion of ground water table and fragile ecosystems and the incidence of poverty in the area. Land degradation due to soil erosion, low rainwater use efficiency, high population pressure, low livestock productivity, underinvestment in water use efficiency are also observed. The scope of IWMP in the project area, therefore, includes identifying activities that will help to improve the livelihoods of the population in a sustainable manner through participatory watershed development. The expected 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 will help to provide sustainable livelihoods to the people residing in the watershed area.

1.3 Objectives of the Project

Following are the specific objectives of the project:

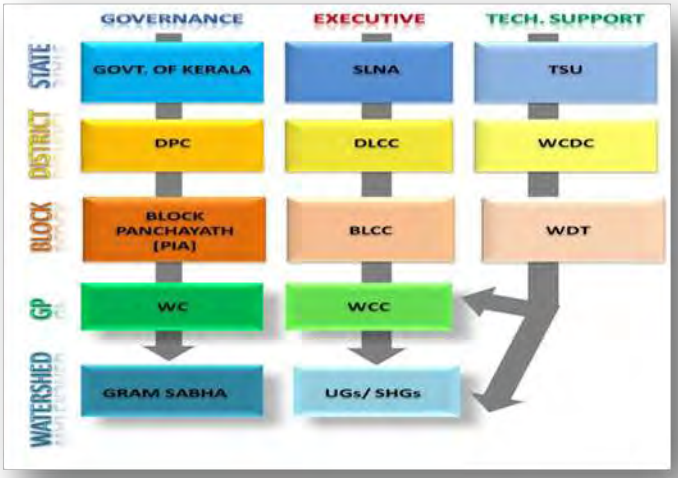
- Restoring the ecological balance
- Harnessing, conserving and developing degraded natural resources such as soil, vegetative cover and water
- Prevention of soil run-off
- Regeneration of natural vegetation

- Rain water harvesting and recharging of the ground water table
- Introduction of multi-cropping and diverse agro-based activities, and
- Promoting sustainable livelihoods

1.4 Organizational set-up of IWMP

The organizational set-up of IWMP at different levels is given below:

Figure 1.1: Institutional set up of IWMP



SLNA- State Level Nodal Agency
TSU- Technical Support Unit
DPC- District Planning Committee
DLCC- District Level Coordination Committee
WCDC- Watershed Cell cum Data Centre
PIA- Project Implementing Agency
BLCC- Block Level Coordination Committee
WDT- Watershed Development Team
WC- Watershed Committee
WCC- Watershed Coordination Committee
UG- User Groups
SHGs- Self Help Groups

1.4.1 State Level Nodal Agency (SLNA)

- SLNA is constituted by State Government with separate bank account.
- SLNA is required to review the progress and set up State Data Cell.
- SLNA have a fulltime Chief Executive Officer (CEO).
- Chairman of SLNA is Agricultural Production Commissioner.
- SLNA consist representatives of NRAA, Central Nodal Ministries, NABARD, Rural Development, Agriculture, Animal Husbandry, Forest, Ground Water, NGOs, Professional from Research Institutes, Representatives of MGNREGS, BRGF.
- SLNA sanction watershed projects on the basis of State Perspective and Strategic Plan (SPSP).
- Four to seven Professional experts (Agriculture, Water Management, Capacity Building, Social Mobilization, IT, Administration and Finance) assist the SLNA.

1.4.2 Functions of State Level Nodal Agency

- To prepare State Perspective and Strategic Plan (SPSP) and Work Implementation strategy.
- To set up State Data Cell and connect it online with National Level Data Centre.
- To provide technical support to Watershed Cell Cum Data Centre (WCDC).
- To outline capacity building strategy.
- To approve Project Implementing Agencies (PIAs) identified or selected.
- To establish monitoring, evaluation and learning systems.
- To ensure regular and quality online monitoring of watershed projects.
- To constitute a panel of evaluators for watershed projects.
- To prepare State specific process guidelines, Technology manuals etc.

1.4.3 Watershed Cell Cum Data Centre (WCDC)

- Watershed Cell Cum Data Centre is established at District level.
- WCDC oversee implementation of watershed programme.
- WCDC have independent accounts.
- Chairman of WCDC is The District Collector and have the role to secure co-ordination and convergence along with periodical review.
- Project Manager have the role to attend day to day administration of WCDC.
- WCDC have three to six fulltime staff (project area below 25,000 Ha. – 3, and above 25000 Ha – 6 Nos) comprising of experts on Agriculture, Water Management, Social Mobilization, Management and Accounts and Data Entry Operator.

1.4.4 Functions of Watershed Cell Cum Data Centre

- To identify Project Implementing Agencies (PIAs).
- To prepare strategic and Annual Action Plans for watershed projects.
- To provide Professional / Techincal support to PIAs.
- To develop capacity building plans.
- To carry out monitoring, evaluation and learning.

- To ensure timely submission of documents to SLNA.
- To facilitate Departmental co-ordination and convergence of schemes.
- To integrate Watershed Development Plans into District Plans of DPC.
- To establish District Data Centre.

1.4.5 Role of Panchayati Raj Institutions (PRIs) at District and Intermediate levels

- The full responsibility of overseeing the watershed programme in the district lies to WCDC and WCDC work in collaboration with DPC.
- The DPC approve DPR and AAPs.
- DPC integrate Watershed Development Plans with District Plans.
- PIA work in collaboration with WCDC
- Block level co- ordination committee coordinate works in project area
- Block Panchayath committee implements the project.

1.4.6 Institutional Arrangement at Project level

- Project Implementing Agency (PIA) is responsible for implementation of watershed projects.
- PIA form Watershed Development Team (WDT) with approval of WCDC.

1.4.7 Roles and Responsibilities of PIA

- To provide technical guidance to Gram Panchayat to prepare Development plans through Participatory Rural Appraisals (PRAs).
- To undertake community organization and training for the village communities.
- To inspect/authenticate project accounts.
- To encourage adoption of low cost technologies.
- To monitor project implementation.
- To set up institutional arrangements for past project operation/maintenance.
- To submit action plan for approval of WCDC.
- To submit periodical progress reports to WCDC.

- To arrange physical/financial social audit of works undertaken.
- To facilitate mobilization of additional financial resources through convergence.

1.4.8 Watershed Development Team (WDT)

- WDT is an integral part of PIA.
- WDT should have at least four members, broadly with knowledge and experience in Agriculture, Soil science, Water Management, Social Mobilization and Institutional building.
- At least one of the WDT members should be a woman.
- The WDT is working closely associated with watershed area but in collaboration with WCDC.

1.4.9 Roles and Responsibilities of Watershed Development Team

- To assist Grama Panchayath /Grama Sabha in the formation of Watershed Committee.
- To organize User groups (UGs) / Self Help Groups (SHGs).
- To conduct participatory baseline survey, training and capacity building.
- To prepare resource development / management and equitable sharing plans.
- To undertake engineering surveys.
- To monitor, check and measurement of works.
- To enhance livelihood opportunities.
- To maintain project accounts.
- To arrange physical/financial and social audit.

1.4.10 Institutional Arrangements at Village Level and People's Participation

(A) Self Help Groups (SHGs)

- With help of WDT, Watershed Committee constitutes Self Help Groups from amongst poor.
- These groups are homogeneous groups.
- SHGS will be provided with revolving fund.

(B) User Groups (UGs)

- Watershed Committee with the help of WDT constitutes User Groups.

- User Groups are direct beneficiaries of watershed activities.
- Watershed Committee facilitates resource use agreement among the User Groups.
- User Groups are responsible for operation and maintenance of assets created.

(C) Watershed Committees (WC)

- The Grama Sabha constitutes Watershed Committee to implement project with technical support of WDT.
- The Watershed Committees are registered under the Society Registration Act, 1860.or registered under Grama Panchayat committee.
- The Watershed Committee comprises of at least 10 members and 50 % of members should be representatives of SHGs/UGs/SC-ST, women and landless persons.
- The Chairman / Chairperson of Watershed Committee is Gram Panchayat President and Village Extension Officer as Convenor.
- If a watershed area covers more than one Gram Panchayat, separate committees are constituted for each Gram Panchayat.
- Separate account for each watershed committee.
- PIA release funds for Watershed Committee.

1.5 Approach and Methodology of Preparing the Detailed Project Report (DPR)

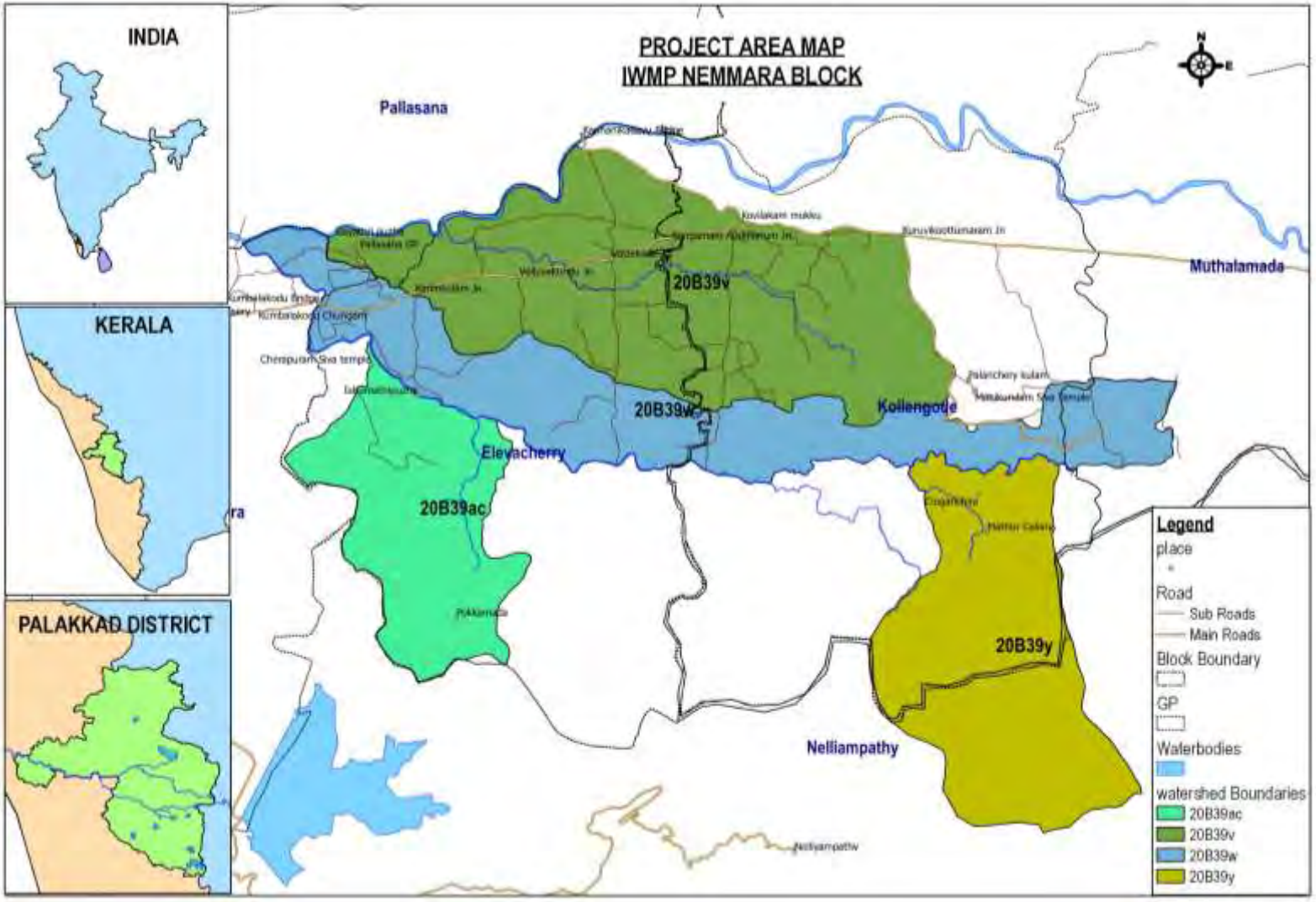
The project area lies in Nemmara and Kollengode blocks in Palakkad district. The common guidelines provide a flexible framework for the preparation of the Detailed Project Report of the projects under IWMP. The methodology for the preparation of the Detailed Project Report of IWMP-6 of Palakkad District is outlined below:

- The project comprises of four micro watersheds. A cluster approach has been followed in the preparation of DPR.
- Review of the official documents on MGNREGS at the national and state levels was done prior to the field level activities.
- Preliminary discussions with elected representatives and officials at the block and district level.
- Secondary Data: The DPR has to be based on a situation analysis of secondary data and information available from various sources. Basic information about the watershed such as

rainfall, temperature, location, topography, hydrology, hydrogeology, soils, demographic and socio-economic characteristics of the population, land-use pattern, major crops and productivity, irrigation, livestock etc. were collected from different sources such as Census of India, development reports, publications of government departments etc.

- Base line Survey: A detailed baseline survey was conducted covering all households in the project area. The database thus created is expected to facilitate the assessment of the impact of the watershed development programme on the project area during and after the implementation of the project.
- Participatory Rural Appraisal (PRA): The participation of stakeholders is essential in identifying the problems and needs of the people in the project area and in identifying suitable watershed development activities. A Logical Framework Analysis was done at the project level for identifying the important problems (through problem tree analysis) as well as for the purpose of assessing the present situation. Other PRA techniques like transect walk, social mapping, resource mapping, seasonal calendar, etc., were employed in each micro watershed area.
- Use of GIS and remote sensing for planning**:** GIS and remote sensing devices have made use in the preparation of DPR. Quantum GIS Software was used for preparation of maps. Google Earth images of the project area were also used for the planning. 1: 4000 scale cadastral maps of each village were the base map for planning.
- Depth interviews with officials, farmers, fisher folk, entrepreneurs of micro-enterprises etc. were undertaken.
- An assessment of the resources likely to be available from other sources and schemes was done in the initial stages of the plan preparation.
- Field level verification of the identified interventions was undertaken by the DPR preparation team which includes the Technical Support Organization and Watershed Development Team.
- Prioritization of the interventions was done taking into account the scientific and technical inputs.
- Identification of Entry Point Activities: The entry point activities were identified taking into account its potential as a model for replication.

Figure 1.3: Project Area Map



CHAPTER II

THE PROJECT AREA

2.1 Introduction

The project IWMP 6 is a cluster of four micro-watersheds namely Malappuram (20B39ac), Payyadore (20B39w), Payyalloor (20B39v) and Vengappara(20B39y). The total project area of the watershed is 4832.9 hectares of which 4439 hectares has been selected for treatment under Integrated Watershed Management Programme (IWMP). The project area is located in Nemmara and Kollengode blocks of Palakkad district.

Table 2.1: Basic project information

Name of the project	IWMP-VI/2012-13
District	Palakkad
Blocks	Nemmara and Kollengode
No. of micro-watersheds	4
Geographical area (Ha)	4832.9
Proposed area to be treated (Ha)	4439
Estimated Cost (Rs.in lakhs)	532.68
PIA	Nemmara Block Panchayat

2.2 Details of the Micro Watersheds in the Project Area

The details of the selected watersheds in the project area are presented in Table 2.2.

Table 2.2: Details of the selected watersheds in the project area

Name	Code	Block Panchayats covered	Grama Panchayats covered	Wards Covered	Total Area (in.Ha.)	Treatable area (in Ha)
Malappuram	0B39ac	Nemmara	Elavanchery	11p, 12p, 14p	932.70	738.8
Payyadore	20B39w	Nemmara	Elavanchery	7p, 8p, 9, 11p, 12p, 13p, 14p	1316.72	1316.72
			Nemmara	6		
		Kollangode	Kollangode	7,8,9,12p		
			Muthalamada	17		
Payyalloor	20B39v	Nemmara	Elavanchery	1p, 2, 3p, 4, 5, 6, 10, 11p, 13p	1761.29	1761.29
			Pallasena	11p		
		Kollangode	Kollangode	10, 11, 12p, 13, 14, 15, 17, 18		
Vengapara	20B39y	Nemmara	Nelliyampathy	2	822.19	622.19
		Kollangode	Kollangode	9, 12		
Total Area					**4832.9**	**4439**

2.3 Brief History

Before independence, Nemmara belonged to Kochi kingdom and was one of the important trading centres in the region. The name Nemmara is believed to have originated from the words 'Nai maariya ooru' meaning the place where ghee was traded. And also it is believed that the name "Nemmara" or "Nenmara" originated from the words "Nenmaniyude Ara", which means "The Store Room of Rice". Nemmara is known for Vela festival, popularly known as Nemmara-Vallangi Vela. This festival is celebrated after the paddy is harvested in summer. After harvest, the fields are empty and dry, and serve as an ideal venue for celebrating Vela[1].

2.4 Location

Nemmara and Kollengode block panchayats are located in Chittur Taluk in the Palakkad district. Nemmara is the entry point to the scenic and beautiful Nelliampathi hills. Project area is situated on the Thrissur Pollachi route and is spread over Nemmara and Kollengode blocks of Palakkad district.

2.5 Criteria for Selection of the Project

Integrated Watershed Management Programme is prioritized on the basis of thirteen parameters namely poverty index, percentage of SC/ST, actual wages, percentage of small and marginal farmers, ground water status, moisture Index, area under rainfed agriculture, drinking water situation in the area, percentage of the degraded land, productivity potential of the land, continuity of another watershed that has already developed/treated, cluster approach for plain or for hilly terrain. The weightage and criteria for selection of the watershed management programme is given in Table 2.3. The weightage under different criteria for IWMP 6 in Nemmara and Kollengode block Panchayats is given in Table 2.4.

Table 2.3: Criteria and weightage for the selection of watershed

No	Criteria	Maximum Score	Ranges & scores			
i	Poverty index (% of poor to population)	10	Above 80 % (10)	80 to 50 % (7.5)	50 to 20 % (5)	Below 20 % (2.5)
ii	% of SC/ ST	10	More than 40 % (10)	20 to 40 % (5)	Less than 20 % (3)	

[1] http://en.wikipedia.org/wiki/Nemmara

	population					
iii	Actual wages	5	Actual wages are significantly lower than minimum wages (5)	Actual wages are equal to or higher than minimum wages (0)		
iv	% of small and marginal farmers	10	More than 80 % (10)	50 to 80 % (5)	Less than 50 % (3)	
v	Ground water status	5	Over exploited (5)	Critical (3)	Sub critical (2)	Safe (0)
vi	Moisture index /	15	-66.7 & below (15)	-33.3 to -66.6 (10)	0 to -33.2 (0)	
	DPAP/ DDP Block		DDP Block	DPAP Block	Non DPAP/ DDP Block	Above 70 % (Reject)
vii	Area under rain-fed agriculture	15	More than 90 % (15)	80 to 90 % (10)	70 to 80% (5)	Fully covered (0)
viii	Drinking water	10	No source (10)	Problematic village (7.5)	Partially covered (5)	
ix	Degraded land	15	High – above 20 % (15)	Medium – 10 to 20 % (10)	Low-less than10% of TGA(5)	
x	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)	
xi	Contiguity to another watershed that has already been developed/ treated	10	Contiguous to previously treated watershed & contiguity within the micro watersheds in the project (10)	Contiguity within the micro watersheds in the project but non contiguous to previously treated watershed (5)	Neither contiguous to previously treated watershed nor contiguity within the micro watersheds in the project (0)	
xii	Cluster approach in the plains (more than one contiguous micro-watersheds in the project)	15	Above 6 micro-watersheds in cluster (15)	4 to 6 micro watersheds in cluster (10)	2 to 4 micro watersheds in cluster (5)	
	Cluster approach in the hills (more than one contiguous micro-watersheds in the project)		Above 5 micro-watersheds in cluster (15)	3 to 5 micro watersheds in cluster (10)	2 to 3 micro watersheds in cluster (5)	

Source: Integrated Watershed Management Programme, Preliminary Project Report (PPR), Palakkad, Department of Land Resources, Ministry of Rural Development, Government of India.

Table 2.4: Weightage under different criteria

Project name	Weightage													
IWMP 6 Palakkad District	i	ii	iii	iv	v	vi	vii	viii	ix	x	xi	xii	xiii	Average
	23	15	0	30	4	0	30	23	25	0	20	15	0	61

Source: Integrated Watershed Management Programme, Preliminary Project Report (PPR), Palakkad, Department of Land Resources, Ministry of Rural Development, Government of India.

2.6 Major Reasons for Selection of Watershed

The major reasons for the selection of the micro watersheds as per PPR of IWMP are:

- Dilapidated traditional irrigation systems
- Low productivity of land
- Strong presence of SC/ST, BPL families and marginal farmers
- Poor adaptation to climate change

2.7 Physiography, Relief and Drainage

The major physiographic units identified in Palakkad district are mid land and high land. The project area lies in high land division. One of the most important physiographic features of the project area is the Palakkad gap - wide low mountain pass in the Western Ghats. Rocky cliffs are seen in some places of the project area. The longest river in Kerala, Bharathapuzha, one of its tributary - Gayathripuzha and Ishumathipuzha (tributary of Gayathripuzha) flows through the project area. Besides this, the project area is blessed with a network of streams. Relief of the project area is normal to excessive and the drainage pattern is dendritic (looks like the branching pattern of tree roots).

Table 2.5: Physiography and drainage

Project Name	Physiography	Major Drainage
IWMP 6	Above MSL 76 m to 1595 m	Bharatapuzha

2.8 Climate

The project area experiences humid type of climate based on Thornthwaite's climatic classifications. Maximum rainfall is received during the south west monsoon followed by the north east monsoon. The rainfall distribution ranges from 1697 to 3267 mm in the last ten years. Deficient rainfall has led to crop failures and adversely affected ground water recharge[2].

[2] Ground Water Booklet of Palakkad District, Central Ground Water Board, Ministry of Water Resources, Government of India

Table 2.6: Rainfall distribution of Palakkad

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2001	3	16	0	150	117	539	395	223	119	234	230	0	2026
2002	1	0	24	51	201	351	279	361	77	328	69	6	1748
2003	0	64	80	137	42	382	332	263	26	360	46	5	1737
2004	1	3	34	70	401	589	280	453	93	285	18	0	2227
2005	22	0	10	222	97	485	973	151	360	173	105	55	2653
2006	5	0	83	65	404	502	458	348	414	245	148	0	2670
2007	1	0	0	101	159	625	1033	478	507	310	32.6	19	3267
2008	0	26.6	153.9	28.6	41.2	445.6	359	214.1	241.9	364.1	8.6	0.1	1883
2009	0	0	81.3	58	138.8	282	985	262.3	250.6	176.1	249	14.8	2497
2010	1.9	0	10.8	130.8	109.1	545.3	508.4	267.2	180	401.2	280	24	2458
2011	0.9	61.1	17.4	126	68.8	717	398.5	421.9	335.5	247.9	205	8.6	2608
2012	0	0	6.2	141.6	64.4	386.9	297.5	367	171.7	197	61.6	4	1697

Source: Compiled from Ground Water Booklet of Palakkad District, District Level Natural Resources Data Bank and Indian Meteorological Department

Table 2.7: Mean minimum and Maximum Temperature (Deg.C.) in Palakkad District

	1994	1995	1996	1997	1998	1999	2000	2007
Minimum	22.7	23.4	23.6	23.6	24.1	23.4	Not available	21.8
Maximum	32.1	32	31.4	31.1	31.2	30.9	32.6	38.4

Source: Land Resources of Kerala State, Kerala Land Use Board.

The minimum and maximum mean temperature of Palakkad district is not available for the last ten years in the Indian Meteorological Department. According to the available data, maximum temperature ranges from 30.9^0 C to 38.4^0 C whereas the minimum temperature ranges from 21.8^0 C to 24.1^0 C. The humidity is higher during the monsoon period i.e. from June to September[3].

2.9 Geology

Project area forms part of Archaen system of peninsular gneiss. The major rock type found is biotite granite gneiss. The rock minerals consist of quartz and feldspar with variable amounts of biotite. Recent alluvium predominates in the valley portion.

[3] Ibid

2.10 Geo-morphology

Around one fourth of the project area is in the high hill ranges of the Western Ghats and the rest of the part is in the low lying undulating midland region. It is in the south end of the 'Palaghat gap'. The southern part of the project area is included in the genetic class of structural origin. Out of total area, 1.8 percent is highly dissected hills and valleys and 26.5 percent is moderately dissected hills and valleys. Major part of the project area comes under the genetic class of denudational origin-pediment-pediplain complex (68.6%). 1.7 percent is fluvial origin – active flood plain. And 3.2 percent of the project area is water bodies.

Table 2.8: Genesis Classes of Geo morphology

Genesis of Geo Morphology	Percentage
Structural origin - Highly Dissected Hills and Valleys	1.8
Structural origin - Moderately Dissected Hills and Valleys	26.5
Denudational origin-Pediment-Pediplain Complex	68.6
Fluvial origin-Active flood plain	1.7
Waterbodies	3.2
Total	**100.0**

Source: Nrsc / ISRO, Bhuvan

2.11 Ground Water

Ground water forms an important source of water supply. Rainfall is the major source of recharge to ground water. The Central Ground Water Board has categorized Nemmara block as safe and Kollengode block as critical on the stage of development and long term ground water trend. Water quality is poor due to colour change, hardness and salinity. The ground water related information on the project area is given in Table 2.8.

Table 2.9: Ground water resource details

Particulars	Block	
	Nemmara	Kollengode
Net annual GW availability (MCM)	37.91	76.23
Existing gross ground water draft for irrigation (MCM)	7.03	19.67
Existing gross ground water draft for domestic & industrial water supply(MCM)	5.11	4.66

Existing gross ground water draft for all uses (MCM)	12.14	24.33
Stage of GW development	32.02	31.91
Category	Safe	Critical

Source: Land Resources of Kerala State (2009), Kerala State Land Use Board &Ground Water Information Booklet of Palakkad District, Central Ground Water Board, Ministry of Water Resources, Government of India.

In the project area, there are two observation wells. The Piezometer abstract of two wells in the project area in the year 2012 is given in Table 2.9.

Table 2.10: Piezometer abstract of well no 148 and 149

Well No	148	149
State	Kerala	Kerala
District	Palakkad	Palakkad
Mandal/Block	Kollengode block	Kollengode block
Village	Kollengode	Elavancherry
Latitude	10°36'10"	10°35'51"
Longitude	76°42'35"	76°39'49"
Toposheet No	58B/10	58B/10
River Basin	West Coast Minor	West Coast Minor
Minor Basin	Gayathri puzha	Gayathri puzha
Rock Formation	Gneiss	Gneiss
Drilling Depth (m)	30	30
Casing Type	PVC	PVC
Casing Diameter (mm)	140	140
Casing From (m)	0 to15	0 to 9
Height of Measuring Point(m)	0.5	0.54
Elevation of Ground Level (msl)	108.428	88.998
Well Location	In the compound of Public Health Sub Centre, Nenmeni	In the compound of Government Ayurvedic Dispensary, Panangattiri

Source: Groundwater Department, Palakkad.

The water levels in these two wells mentioned above are presented in Table 2.10 and Table 2.10.

Table 2.11: Water level in well no 148 in 2012

Monitoring	Time	Water level	Reduced water level
17-Jan-12	03:40	2.75	105.68
10-Feb-12	01:58	3.02	105.41
08-Mar-12	01:50	3.50	104.93
27-Apr-12	12:30	4.61	103.82
26-May-12	09:13	5.03	103.40
18-Jun-12	02:40	5.56	102.87

24-Jul-12	12:06	4.49	103.94
07-Aug-12	12:23	4.47	103.96
22-Sep-12	11:15	3.72	104.71
15-Oct-12	02:05	4.12	104.31
21-Nov-12	03:47	4.92	103.51
17-Dec-12	12:55	6.40	102.03

Source: Groundwater Department, Palakkad.

Table 2.12: Water level in well no 149 in 2012

Monitoring	Time	Water Level	Reduced water level
17-Jan-12	04:15	2.11	86.89
10-Feb-12	02:19	2.31	86.69
08-Mar-12	02:20	2.30	86.70
27-Apr-12	01:10	3.60	85.40
26-May-12	09:32	4.03	84.97
18-Jun-12	03:00	3.58	85.42
24-Jul-12	12:29	1.63	87.37
07-Aug-12	12:46	0.81	88.19
22-Sep-12	11:30	1.28	87.72
15-Oct-12	02:25	0.73	88.27
21-Nov-12	04:10	2.35	86.65
17-Dec-12	01:35	4.03	84.97

Source: Groundwater Department, Palakkad.

2.12 Soil

The project area mostly has sandy loam soil. Soil depth of the project area ranges from moderately deep (50 to 100 cm), deep (100 to 150 cm) and very deep (150 cm or more). Soil erosion status is moderate (e2). The project area falls under seven soil slope classes namely A - Nearly level land (0-1%), B - Very gently sloping (1-3%), C – Gently sloping (3-5%), D – Moderately sloping (5-10%), E – Strongly sloping (10-15%) and F – Moderately steep to steep (15-25%). Soil series in different Grama Panchayaths in the project area are presented in Table 2.12.

Table 2.13: Grama Panchayath-wise soil series

Name of the Panchayath	Description of soil series
Kollengode	Vellamathara series (Vlm): Deep, yellowish brown, well drained, slightly eroded, sandy clay soils with sandy clay loam surface layer on very gently sloping upland, high base saturation.
	Nilipara series (Nlp): Shallow, dark reddish brown, well drained, slightly eroded, sandy clay soil with clay surface layer on moderately sloping upland.
	Kinarapalam series (Knp): Moderately deep, dark reddish brown, well drained,

	moderately eroded, sandy loam soils with sandy clay loam surface layer on gently sloping upland.
	Kavassery series (Kvs): Very deep, dark brown, moderately well drained, sandy clay soils with clay loam surface layer on nearly level lowland.
	Attayampathy series (Aty): Very deep, dark reddish brown, well drained moderately eroded, dandy clay soils with sandy clay loam surface layer on moderately slopping upland.
	Athipotta series (Apt): Deep, dark brown, poorly drained, sandy loam soils with clay surface layer on very gently sloping lowland.
	Chappakkad series (Cpk): Deep, very dark grayish brown, moderately well drained, slightly eroded, sandy clay loam soils with sandy clay surface layer on very gently sloping upland and moderately slopping upland.
	Kozhinjampara series (Kzp): Deep, dark brown, well drained, moderately, eroded, sandy clay soils with sandy clay loam surface layer on moderately slopping upland and gently sloping upland.
	Nadukulam series (Ndk): Very deep, dark brown, moderately well drained, clay soils with sandy clay loam surface layer on very gently sloping lowland.
	Nedumpara series (Ndp) : Moderately deep, dark brown, well drained, severely eroded, snady clay loam soils with clay loam surface layer on strongly sloping upland.
Elavancherry	Vittanaseeri series (Vts): Very deep, strong brown, well drained, moderately acid, slightly eroded, sandy clay loam soils with sandy clay loam surface texture, occurring gently sloping upland and moderately slopping upland.
	Tharur series (Trr): Very deep, dark brown, strongly acid, moderately well drained, slightly eroded, sandy loam soils with sandy clay loam surface texture occurring on gently sloping low lands.
	Kuthannur series (Ktn): Deep, dark brown, strongly acid, slightly eroded, sandy clay loam soils with sandy clay loam surface texture occurring on gently sloping lowlands.
	Kavassery series (Kvs): Very deep, dark brown, moderately well drained,

	moderately acid, slightly eroded, sandy clay loam soils with sandy clay loam surface texture, occurring on gently sloping low lands and moderately sloping low lands.
	Arumboorapthy series (Abp): Deep, dark brown, well drained, moderately acid, moderately eroded, sandy clay loam soils with sandy clay loam surface texture occurring on strongly sloping upland, and moderately sloping upland, moderately steep upland.
	Koduvalapara series (Kvr): Very Deep, reddish, well drained moderately acid, moderately eroded, very stony and very rocky clay loam soils with sandy clay loam surface texture, occurring on moderately steep uplands.
	Kanimangalam series (Kgm): Deep, dark, reddish brown, well drained very strongly acid, moderately eroded, sandy clay loam soils with sandy clay loam surface texture occurring on moderately sloping upland and strongly sloping upland.
	Chathamangalam series (Ctm): Dark, reddish brown, well drained, Strongly acid, slightly eroded, sandy clay loam surface texture occurring on moderately sloping upland.
	Vadavannur series (Vdr): Deep, dark brown, moderately acid, moderately well drained, slightly eroded, sandy clay loam soils, with sandy clay loam surface texture, occurring on gently sloping low lands.
	Padoor series (Pad): Deep, yellowish brown, moderately acid, slightly eroded, imperfectly trained, sandy clay loamsoils with clay loam surface texture occurring on gently sloping wetland.
	Oravumada series (Ord): moderately shallow, dark reddish brown, well drained, very strongly acid, moderately eroded, sandy clay loam soils with sandy clay loam surface texture occurring on moderstely steep upland
Nemmara	Vithanasseri series (Vts): Very deep, strong brown, well drained, moderately acid, slightly eroded, sandy clay, occurring on gently sloping uplands.
	Kuthanur series (Ktn): Deep, dark brown, strongly acid, slightly eroded, sandy clay loam soils with clay loam surface texture occurring on very gently sloping

	lowlands.
	Tharur series (Trr): Very deep, dark brown, strongly aci slightly eroded, sandy loam soils with sandy clay loan on gently sloping low lands.
Muthalamada	Kariparachella series (Kpc): Shallow, dark brown, v slightly eroded, gravelly sandy loam soils with sandy lo sloping upland.
	Nilipara series (Nlp): Shallow, dark reddish brov moderately eroded, sandy clay soil with sandy clay loam surface layer on gently sloping upland.
	Nariparachella series (Npc): Shallow, dark brown, well drained, moderately eroded, moderately acid, sandy clay soil with sandy clay loam surface layer on gently sloping upland.
	Perumachalla series (Prc): Moderatley deep, dark reddish brown, well drained, moderately acid, slightly eroded, gravelly sandy loam soils with sandy loam surface layer on gently sloping upland.
	Pudur series (Pdr): Shallow, dark brown, well drained, moderately eroded, moderately acid, sandy loam soil with sandy loam surface layer on terraced gently sloping upland.
	Karuvarapara series (Kvp): Very deep, dark grayish brown, moderately, sandy loam soil with sandy loam surface layer on terraced gently sloping upland.
	Annanagar series (Anr): Moderately shallow, dark reddish brown, well drained, moderately acid, slightly eroded, sandy clay loam soils with loamy sand surface layer on terraced very gently sloping upland.
	Karadikunnu series (Kdk): Shallow, reddish brown, well drained, neutral and slightly alkaline, slightly eroded, gravelly sandy clay loam soils with sandy loam surface on terraced very gently sloping upland.
Pallsana	Nedumpara series (Ndp): Very deep, moderately acid, slightly eroded
	Karimpparachalla series (Kmp): gravelly sandy loam soils, shallow deep

Loose soil found in project area

Source: Soil Survey Department

Surface soil samples were collected and tested by Soil Survey Organization to examine the macronutrients such as nitrogen,

phosphorus and potassium in soil. Soil in Kollengode Panchayat is rich in phosphorus and moderate in potassium nutrient. Whereas soil in Elavanchery Panchayat is deficient in potassium and moderate in phosphorous nutrients. In both Panchayats, nitrogen content in soil is low. The micro nutrients viz copper and zinc in soil is found to be adequate in Kollengode Panchayat but in some areas of Elavanchery Panchayat it is deficient[4].

2.13 Agro-Climatic Condition

The State is divided into five agro-climate zones (North Zone, South Zone, Central Zone, Special Zone on Problem Areas, High Altitude Zone) as per State Land Use Board records. The project area comes under the 'central zone'. Based on altitude, rainfall, soil and topography, the state has been delineated into thirteen agro-ecological zones. Block Panchayat has been taken as the unit for the purpose of delineation. The project area coming under Nemmara and Kollengode blocks are categorised under agro-ecological zone of Palakkad Plains. The details of the zone are presented in Table 2.13.

Table 2.14: Agro-ecological situation of the project area

Zone	Altitude Type	Rainfall pattern	Topography model	Soil type
Palakkad Plains	Type I: Up to 500 m above MSL (Low altitude zone)	Pattern II: Poorly distributed rainfall; southwest monsoon with July maximum and concentrated in 3-4 months. Northeast monsoon relatively weak.	Model-II a: Valleys less extensive, Hills with moderate gradients, Slopes having mild gradients	Red loam

Source: Kerala Agricultural University

2.14 Socio-economic and Demographic Characteristics of the Population

The socio-economic characteristics of the population in the project area have been obtained by conducting a census survey of the households in the project area. As may be seen from Table 2.16, there are 6569 households in the project area. The sex ratio in project area is 1032 females per 1000 males (See Table 2.14).

[4] Land Resource Report of Kollengode and Elavanchery Panchayat, Soil Survey Organization, Department of Agriculture (S. C. Unit), Government of Kerala.

Table 2.15: Details of the population in the project area

Micro Watershed	Sex		Total	Sex ratio
	Male	Female		
20B39v	8666	9018	17684	1041
20B39w	4686	4847	9533	1034
20B39ac	279	245	524	878
20B39y	614	591	1205	963
Total	14245	14701	28946	1032

Source: Primary Survey

Age wise classification of population in the project area is shown in Table 2.15.

Table 2.16: Age distribution of population in the project area

Micro Watershed	Age Group			Total
	Below 15 years	15 - 60 years	Above 60 years	
20B39v	3383	11840	2461	17684
20B39w	1859	6382	1292	9533
20B39ac	106	372	46	524
20B39y	249	838	118	1205
Total	5597	19432	3917	28946

Source: Primary Survey

Table 2.15 shows the number of illiterate people in the project area. Only seven per cent of population aged above six years is illiterate.

Table 2.17: Number of Illiterate people above 6 years of age

Micro Watershed	No.
20B39v	1314
20B39w	725
20B39ac	11
20B39y	81
Total	2131

Source: Primary Survey

Table 2.18: Number of households in the project area

Micro Watershed	Grama Panchayat						Total
	Kollangode	Elavanchery	Pallasena	Nemmara	Nelliyampathy	Muthalamada	
20B39v	2083	1837	90	0	0	0	4010
20B39w	439	1529	0	76	0	91	2135
20B39ac	0	133	0	0	0	0	133
20B39y	197	0	0	0	94	0	291
Total	2719	3499	90	76	94	91	6569

Source: Primary Survey

The distribution of households according to the community/caste/tribe of the head of the household is presented in Table 2.18.

Table 2.19: Distribution of households in the project area according to community/caste/tribe

Micro Watershed	SC		ST		OBC		General		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
20B39v	951	23.72	33	0.82	2413	60.17	613	15.29	4010	100.00
20B39w	487	22.81	13	0.61	1536	71.94	99	4.64	2135	100.00
20B39ac	33	24.81	2	1.50	98	73.68	0	0.00	133	100.00
20B39y	73	25.09	36	12.37	139	47.77	43	14.78	291	100.00
Total	1544	23.50	84	1.28	4186	63.72	755	11.49	6569	100.00

Source: Primary Survey

Table 2.19 presents the details about the number and proportion of families living below poverty line (BPL) and those living above poverty line (APL). About 40 per cent of the families in the project area live below poverty line.

Table 2.20: Poverty status of households

Micro Watershed	BPL		APL		Total	
	No.	%	No.	%	No.	%
20B39v	1471	36.68	2539	63.32	4010	100.00
20B39w	1012	47.40	1123	52.60	2135	100.00
20B39ac	25	18.80	108	81.20	133	100.00
20B39y	154	52.92	137	47.08	291	100.00
Total	2662	40.52	3907	59.48	6569	100.00

Source: Primary Survey

The ownership status of the dwelling places is presented in Table 2.20.

Table 2.21: Ownership status of the dwelling place

Micro Watershed	Ownership					
	Owned		Rented		Total	
	No.	%	No.	%	No.	%
20B39v	3856	96.16	154	3.84	4010	100.00
20B39w	2106	98.64	29	1.36	2135	100.00
20B39ac	132	99.25	1	0.75	133	100.00
20B39y	192	65.98	99	34.02	291	100.00
Total	6286	95.69	283	4.31	6569	100.00

Source: Primary Survey

Details about the type of the dwelling place are presented in Table 2.21.

Table 2.22: Type of dwelling place

Micro Watershed	Type							
	Pucca		Semi Pucca		Kutcha		Total	
	No.	%	No.	%	No.	%	No.	%
20B39v	1829	45.61	1816	45.29	365	9.10	4010	100.00
20B39w	1449	67.87	539	25.25	147	6.89	2135	100.00
20B39ac	119	89.47	3	2.26	11	8.27	133	100.00
20B39y	131	45.02	142	48.80	18	6.19	291	100.00
Total	3528	53.71	2500	38.06	541	8.24	6569	100.00

Source: Primary Survey

The distribution of households according to the main source of income of the household is presented in Table 2.22.

Table 2.23: Main source of income of households in the project area

Main source of income	Micro Watershed								Total	
	20B39v		20B39w		20B39ac		20B39y			
	No.	%	No.	%	No.	%	No.	%	No.	%
Agriculture	343	8.55	258	12.08	20	15.04	61	20.96	682	10.38
Daily labour	2547	63.52	1509	70.68	111	83.46	135	46.39	4302	65.49
Agriculture labour	120	2.99	46	2.15	1	0.75	0	0.00	167	2.54
Salary -Government	217	5.41	92	4.31	1	0.75	1	0.34	311	4.73
Salary - Private	192	4.79	48	2.25	0	0.0	71	24.40	311	4.73
Self employed/Business	252	6.28	73	3.42	0	0.0	10	3.44	335	5.10
Income from abroad	111	2.77	19	0.89	0	0.0	0	0.0	130	1.98
Pension	174	4.34	65	3.04	0	0.0	12	4.12	251	3.82
Others	54	1.35	25	1.17	0	0.0	1	0.34	80	1.22
Total	4010	100.00	2135	100.00	133	100.00	291	100.00	6569	100.00

Source: Primary Survey

The decline in agricultural employment is an emerging issue in the project area. There has also been an alienation of the younger generation from the agriculture sector. The details about the landless households in the project area are presented in Table 2.23. Landless households constitute about three per cent of the total number of households in the project area. 94.31 % of the total households are marginal farmer households.

Table 2.24: Details about the landless and marginal farmer households in the project area

Micro Watershed	Landless Households		Marginal Farmer Households	
	No.	% to total	No.	% to Total
20B39v	77	1.92	3830	95.51
20B39w	9	0.42	2069	96.91
20B39ac	0	0.0	127	95.49
20B39y	94	32.30	169	58.08
Total	180	2.74	6195	94.31

Source: Primary Survey

Proportion of households with electric connection in the project area is shown in Table 2.24. Only two per cent of the households in the project area do not have access to electricity.

Table 2.25: Proportion of households with electric connection

Micro Watershed	Yes		No		Total	
	No.	%	No.	%	No.	%
20B39v	3910	97.51	100	2.49	4010	100.00
20B39w	2087	97.75	48	2.25	2135	100.00
20B39ac	132	99.25	1	0.75	133	100.00
20B39y	278	95.53	13	4.47	291	100.00
Total	6407	97.53	162	2.47	6569	100.00

Source: Primary Survey

Table 2.25 presents main fuel used for cooking by households in the project area. More than half of the population use wood as main fuel for cooking.

Table 2.26: Main fuel for cooking in the households

Micro Watershed	Main fuel							
	LPG		Electricity		Wood		Total	
	No.	%	No.	%	No.	%	No.	%
20B39v	2200	54.86	93	2.32	1717	42.82	4010	100.00
20B39w	568	26.60	4	0.19	1563	73.21	2135	100.00
20B39ac	8	6.02	0	0.00	125	93.98	133	100.00
20B39y	21	7.22	0	0.00	270	92.78	291	100.00
Total	2797	42.58	97	1.48	3675	55.94	6569	100.00

Source: Primary Survey

The distribution of households according to the type of toilet facility available in the households is presented in Table 2.26. In 12 per cent of the households in the project area, toilet facility is not available.

Table 2.27: Toilet facility in the households in the project area

Micro Watershed	Type of Toilet							
	Septic Tank		Pit		No toilet		Total	
	No.	%	No.	%	No.	%	No.	%
20B39v	953	23.77	2667	66.51	390	9.73	4010	100.00
20B39w	269	12.60	1548	72.51	318	14.89	2135	100.00
20B39ac	7	5.26	122	91.73	4	3.01	133	100.00
20B39y	208	71.48	1	0.34	82	28.18	291	100.00
Total	1437	21.88	4338	66.04	794	12.09	6569	100.00

Source: Primary Survey

Table 2.27 presents participation of households in Self Help Groups. Around half of the populations have membership in SHGs of which large majority have membership in Kudumbasree SHGs.

Table 2.28: Membership in Self Help Groups

Micro Watershed	Type of SHG						No membership		Total	
	Kudumbashree		Block SHG		Others					
	No.	%	No.	%	No.	%	No.	%	No.	%
20B39v	1783	44.46	49	1.22	56	1.40	2122	52.92	4010	100.00
20B39w	1070	50.12	195	9.13	20	0.94	850	39.81	2135	100.00
20B39ac	93	69.92	0	0.00	0	0.00	40	30.08	133	100.00
20B39y	155	53.26	0	0.00	0	0.00	136	46.74	291	100.00
Total	3101	47.21	244	3.71	76	1.16	3148	47.92	6569	100.00

Source: Primary Survey

2.15 Water Supply and Irrigation

People depend on wells in their compound, piped water connection, public taps, public wells etc for drinking water. The details about the source of drinking water in the households in the project area are presented in Table 2.28. About 70 per cent of households depend on public taps and private water connection for drinking water purposes. Rainwater is not tapped effectively in the project area.

Table 2.29: Main source of drinking in the households in the project area

Major Source of Drinking Water	Micro Watershed								Total	
	20B39v		20B39w		20B39ac		20B39y			
	No.	%	No.	%	No.	%	No.	%	No.	%
Private water connection	1357	33.84	916	42.90	72	54.14	26	8.93	2371	36.09
Public tap	1562	38.95	609	28.52	0	0.00	190	65.29	2361	35.94
Well	657	16.38	263	12.32	26	19.55	44	15.12	990	15.07
Public well	167	4.16	172	8.06	17	12.78	20	6.87	376	5.72
Bore well	246	6.13	151	7.07	5	3.76	11	3.78	413	6.29
Tanker	2	0.05	3	0.14	0	0.00	0	0.00	5	0.08
Buy the water	5	0.12	0	0.00	0	0.00	0	0.00	5	0.08
Rain water harvesting	1	0.02	0	0.00	0	0.00	0	0.00	1	0.02
Others	13	0.32	21	0.98	13	9.77	0	0.00	47	0.72
Total	4010	100.00	2135	100.00	133	100.00	291	100.00	6569	100.00

Source: Primary Survey

Project area experiences water scarcity especially during summer season and drying up of existing water resources aggravate the problem. Number of private water sources like well, bore well and pond in the project area is shown in Table 2.29. Water availability in private wells is shown in Table 2.30. In about half of the wells, water gets dried up in one or more months. In one-tenth of the private wells, water is available for less than six months.

Table 2.30: Number of private water sources in the project area

Micro Watershed	Well	Bore Well	Pond
20B39v	859	470	150
20B39w	273	244	38
20B39ac	89	18	0
20B39y	37	11	12
Total	1258	743	200

Source: Primary Survey

Table 2.31: Water availability in private wells

Micro Watershed	Less than 6 months	6-11 months	Through out the year	Total
20B39v	30	268	561	859
20B39w	10	167	96	273
20B39ac	83	1	5	89
20B39y	1	36	0	37
Total	124	472	662	1258

Source: Primary Survey

Earlier majority of the project area was irrigated mainly by two sources namely Chulliyar canal and Pothundi canal by lift irrigation. Water from Gayathri puzha and Ishumathipuzha was also used to meet the irrigation requirements in the project area. But due to shortage of water in these sources, agricultural activities were very much affected. Many farms were kept idle.

2.16 Agriculture and Land Use

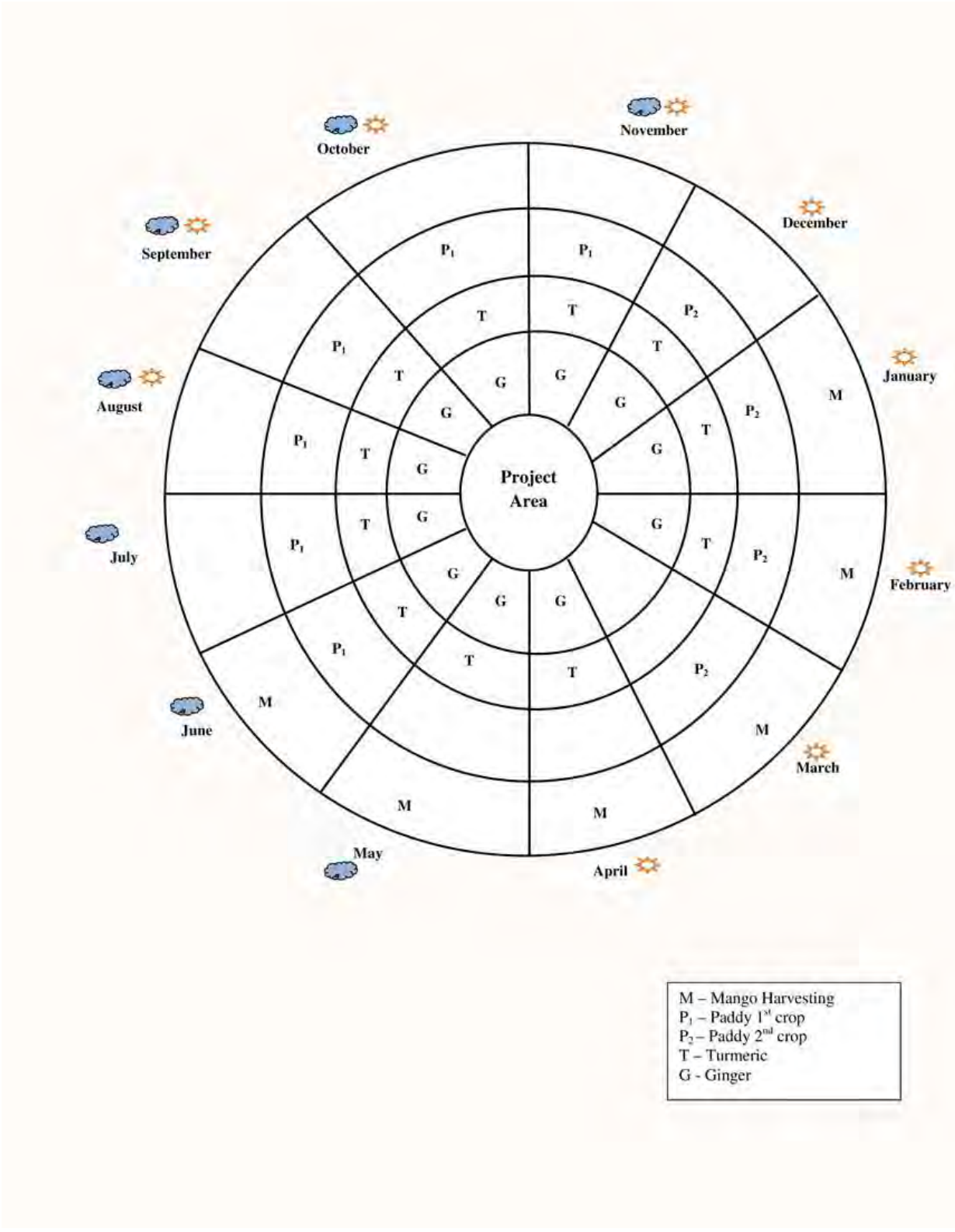
Table 2.32: Land use pattern in the project area

Land used for	Area (Ha.)	In %
Paddy	1694	34.3
Mango	188.5	3.8
Rubber	57.5	1.2
Mixed crop	1334	27.0
Vegetables	121	2.4
Coconut Plantation	47.7	1.0
Tea Plantation	268	5.4
Wasteland (rock area)	85	1.7
Forest	996.4	20.2
Open ground	1.47	0.0
Brick Furnace	33	0.7
Fallow Land	17.3	0.4
Built-up areas (buildings)	95.2	1.9
Total	4939.07	100

Source: Calculated using GIS

Paddy is the main crop cultivated in the project area. Paddy is cultivated in 1694 hectares. Two crops are cultivated viz *Virippu* (April to September) and *Mundakam* (September to January). Different high yielding varieties of paddy viz Jyothimatta, Pollacimatta, Trivenimatta, Madhuramatta, IR5, IR8, IR9, AST, Harsha, Uma, Ponmani, Kanjana, Pavizham, Sulochana etc are cultivated in the project area. Cow dung, compost, chemicals and pesticides are used for farming. Agriculture activities mainly dependent on rainfall. Other crops like turmeric, mango, coconut, arecanut, banana, tapioca, ginger, groundnut, etc and vegetables like cucumber, pumpkin, snake gourd, bitter gourd etc are also cultivated in the project area. The main problems faced by the agriculture sector are labour shortage, lack of interest among youngsters, climatic conditions, water logging, improper soil and water management, lack of repair/maintenance of ponds, extensive use of chemicals and pesticides, lack of application of fertilizers based on soil testing, increased prices of fertilizers and chemicals etc.

Figure 2.2: Seasonal diagram



2.17 Animal Husbandry, Dairying and Poultry

Livestock and poultry are important subsidiary activity in the project area. Rearing livestock in homestead is a source of income and employment. There are two milk societies in the project area namely Elavenchery ksheera vyavasaya sahakarana sangham and Kollengode ksheera vyavasaya sahakarana sangham. The main problem in this sector identified through PRA is lack of adequate number of milk collection centres**.** The livestock population in the project area is shown in Table 2.32.

Table 2.33: Details of livestock and poultry in the project area

Micro Watershed	Cow	Duck	Hen	Goat
20B39v	765	91	3397	444
20B39w	546	58	1417	399
20B39ac	33	2	73	22
20B39y	135	21	315	91
Total	1479	172	5202	956

Source: Primary Survey

2.18 Infrastructure in the Project Area

The details of the infrastructure in the project area collected through PRA techniques are presented in Table 2.33.

Table 2.34: Infrastructure in the project area

Infrastructure	Total
Education	
Anganwady	39
Lower Primary Schools	3
Upper Primary Schools	7
High Schools	4
College	1
Health centers	6
Ayurveda Hospital	1
Clinic	1
Private Hospital	1
Banking	
Commercial banks	2
Co-operative societies/banks	4
Miscellaneous	

Old age homes	1
Maveli stores	1
Arts/ Sports club	11
Post office	7
Library	5
Milk collection centres/society	1
Krishi Bhavan	2
Veterinary Hospital	1
Village Office	2
Panchayat Office	1
Church	2
Temple	19
Mosque	4
Auditorium	2
Cultural Centre	2
Rice Mill	1
Forest office	1
VFPCK collection centre	1
Factory (Cracker, Tea)	2

Source: Primary Survey

2.19 Major Ongoing and Completed Schemes in the Project Area

The major ongoing and completed schemes in the project area are presented in Table 2.34.

Table 2.35: Major ongoing and completed schemes in the project area

Scheme/Programme	Brief description
Centrally sponsored schemes	
Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS)	Aims to enhance livelihood security in rural areas by providing at least 100 days of guaranteed wage employment in a financial year to every household whose adult members volunteer to do unskilled manual work.
Indira Awas Yojana (IAY)	To help in construction/upgradation of dwelling units of rural BPL SC/ST households and other vulnerable sections by providing lump sum financial assistance.
Total Sanitation Campaign (TSC)	To improve sanitation coverage and to ensure open defecation free community.
Pradhan Mantri Gram Sadak Yojana (PMGSY)	To provide road connectivity in rural areas of the country.
Backward Regions Grant Fund	To redress regional imbalances in development.

(BRGF)	
Western Ghat Development Programme (WGDP)	The main objectives of this programme have been eco-preservation and eco-restoration with emphasis on preservation of bio-diversity and rejuvenation of the hill ecology. The programme also focuses on the needs and implementation of the strategies for conservation of biodiversity and sustainable livelihood.
State sponsored schemes	
Jalanidhi	Project of Govt. of Kerala supported by the World bank to ensure pure and safe drinking water to all the citizens of the prioritized Grama Panchayaths.
Hill Area Development Agency (HADA)	Central role in catalyzing and facilitating development of the hill regions
Schemes implemented by Government agency / departments in the project area	
Measures and schemes for cattle protection by Diary Extension Units	Fodder Development, cattle feed subsidy, Milk shed development programme, Livestock Development for Livelihood Support (LDLS)

2.20 SWOT Analysis

The SWOT analysis presents the strengths, weakness, opportunities and threats of Integrated Watershed Management Programme in the project area. It identifies the internal and external factors, which are favourable and unfavourable to achieve the objectives of the project. SWOT analysis of the project area is presented in Table 2.35.

Table 2.36: SWOT analysis

Strength	(1) Interest of the people in watershed activities. (2) A well developed Panchayati Raj System. (3) A unit of Vegetable and Fruit Promotion Council Keralam (VFPCK) located in the project area.
Weaknesses	(1) Declining profit from paddy cultivation. (2) Paddy fields are converted for brick kilns. (3) Absence of adequate number of store houses. (4) Water resources are dried up in summer season, so paddy fields are left fallow. (5) Crop damage due to attack of wild animals. (6) Shortage of agricultural labourers.

	(7) Non adoption of rainwater conservation. (8) Fodder grass shortage. (9) Improper management of water bodies.
Opportunities	(1) Scope for improving productivity of agricultural crops by adopting modern techniques of farming. (2) Possibilities of cooperative farming and organic farming practices. (3) Scope for using fallow/wastelands for cultivation. (4) Scope for improving land area under horticulture crops as the area is suitable to grow fruit plants, medicinal plants etc. (5) Scope for breed improvement. (6) Rainwater conservation structures/measures can be adopted.
Threats	(1) Change in climatic conditions. (2) Rise in cost of agriculture machines, pesticides, chemicals etc. (3) Lack of interest among new generation towards agriculture activities. (4) Crop damage by wild animals. (5) Lack of interest among a section of the farmers to continue farming. (6) Excessive use of chemicals and pesticides. (7) Increase in cost of seeds, fertilizers, pesticides etc. (8) Spread of diseases (foot and mouth disease) among cattle. (9) Over grazing of land. (10) Delay in implementation of renovation activities of water bodies.

CHAPTER III
MICRO WATERSHEDS IN THE PROJECT AREA

3.1 Introduction

The project IWMP 6 is a cluster of four micro-watersheds namely Malappuram (20B39ac), Payyadore (20B39w), Payyalloor (20B39v) and Vengappara (20B39y). The details of each micro watershed in the project area are presented in this chapter.

3.2 Location and Extent of Micro Watersheds

The location and extent of the selected watersheds in the project area are presented in Table 3.1 to 3.4.

Table 3.1: Location and extent of Malappuram watershed (20B39ac)

Name of the watershed	Malappuram		
Code	20B39ac		
Coordinates of Watershed		Latitude	Longitude
	NW	10°35'55.18"N	76°38'19.92"E
	NE	10°35'15.04"N	76°39'27.08"E
	SE	10°33'29.20"N	76°39'22.43"E
	SW	10°33'42.38"N	76°38'23.66"E
Boundaries	N	Ishumathi River	
	S	Ridge of the Thenmala	
	E	Puzhapara Challapatta road	
	W	Ridge of Thenmala and Road in front of the Cherapuram Temple	
Geographical Area (in Ha)	932.7		
Gram Panchayats covered	Elavanchery		
Wards covered	11p, 12p, 14p.		
Block	Nemmara		

Table 3.2: Location and extent of Payyadore watershed (20B39w)

Name of the watershed	Payyadore		
Code	20B39w		
Coordinates of Watershed		Latitude	Longitude
	NW	10°36'37.94"N	76°37'22.32"E

	NE	10°35'35.55"N	76°44'31.37"E	
	SE	10°34'58.11"N	76°44'25.34"E	
	SW	10°35'51.13"N	76°37'52.20"E	
Boundaries	N	Gayathry River and Chulliyar main canal		
	S	Ishumathi River		
	E	Kottapallam - Kalliyampara Road and the ridge of the neighbouring hills		
	W	Ishumathi River		
Geographical Area (in Ha)	1316.72			
Gram Panchayats covered	Elavanchery	Kollangode	Muthalamada	Nemmara
Wards covered	7p, 8p, 9, 11p, 12p, 13p, 14p	7,8,9,12p	17	6
Block	Nemmara and Kollangode			

Table 3.3: Location and extent of Payyalloor watershed (20B39v)

Name of the watershed	Payyalloor			
Code	20B39v			
Coordinates of Watershed		Latitude	Longitude	
	NW	10°36'42.66"N	76°37'59.70"E	
	NE	10°36'43.25"N	76°42'26.20"E	
	SE	10°35'27.21"N	76°42'44.12"E	
	SW	10°35'50.33"N	76°38'59.62"E	
Boundaries	N	Gayathry River, Kollangodu Kunissery Road and TSR Govindapuram Road from Kovilakom Jn to Kuruvikoottumaram Jn.		
	S	Chulliyar Main canal		
	E	Nenmeni Road		
	W	Chulliyar main canal and border of Nemmara and Pallasana GPs.		
Geographical Area (in Ha)	1761.29			
Gram Panchayats covered	Elavanchery	Kollangode	Pallasena	
Wards covered	1p, 2, 3p, 4, 5, 6,10, 11p, 13p.	10, 11, 12p, 13, 14, 15, 17, 18	11p	
Block	Nemmara and Kollangode			

Table 3.4: Location and extent of Vengappara watershed (20B39y)

Name of the watershed	Vengappara		
Code	20B39y		
Coordinates of Watershed		Latitude	Longitude
	NW	10°34'58.40"N	76°42'29.03"E
	NE	10°34'59.35"N	76°43'38.78"E
	SE	10°32'30.18"N	76°44'17.76"E
	SW	10°32'14.50"N	76°43'1.76"E
Boundaries	N	Ishumathi River (Vazhapuzha)	
	S	Ridge of Hill south to Seethargundu estate	
	E	Ridge near Muthalamada and Kollangodu GP Boundaiy and ridge east side of Seethargundu estate.	
	W	Ridge of Hill west to seethargundu estate and road south from Kottakurissi bridge.	
Geographical Area (in Ha)	822.19		
Gram Panchayats covered	Kollangode	Nelliyampathy	
Wards covered	9, 12	2	
Block	Nemmara and Kollangode		

3.3 Physiography, Relief and Drainage of Micro Watersheds

Physiographically the project area lies above MSL 76 m to 1595 m. The four micro watersheds coming under Nemmara IWMP- 6 project falls under high land division. The geographical area of these micro watersheds ranges from 800 – 1800 hectares. Maximum relief (elevation difference between highest and lowest point) of these micro watersheds ranges from 46 m to 1496 m. Some areas of Vengappara (20B39y) and Malappuram (20B39ac) micro watersheds are hilly areas. Table 3.5 presents some characteristics of micro watersheds.

Table 3.5: Characteristics of micro watersheds

Watershed character	Project Area	20B39v	20B39w	20B39y	20B39ac
Compactness Index ($C= P/2\sqrt{\pi A}$)	3.39	1.45	2.53	1.53	1.28
Length of Main stream (KM)	18.5 KM	7 KM	16 KM	5 KM	2.5 KM
Drainage Density (KM/Sq.KM)	1	0.6	2	0.9	0.5

Average Slope (%)	1 % to 30 %	1% to 11%	1% to 11%	30%	18%
Relief(M)	46 m to 1496 m	46 M	84 M	1496 M	561 M
Elevation (M)	76 to 1595 M	80 to 126 M	76 to 160 M	99 to 1595 M	83 to 644 M
Perimeter(KM)	83.44	21.54	32.5	15.5	13.9
Area (KM^2)	48.32	17.61	13.16	8.22	9.32
Drainage inside the WS (KM)	47.16	9.86	25.8	7	4.5

Source: Calculated using GIS Maps

Table 3.6: Micro watershed wise main drains/streams/ rivers

Watershed code	Grama Panchayath	Name of the drains/streams/ rivers
20B39v	Nemmara, Pallasana, Elavanchery	Gayathri Puzha
20B39w, 20B39ac, 20B39y	Elavanchery , Muthalamada, Nemmara	Ikshumathi Puzha
20B39v	Elavanchery, Kollangode	Varari thodu
20B39v	Elavanchery	Alinkadu neerchal
20B39v	Elavanchery	Thumbikodu thodu
20B39v	Elavanchery	Chakkittamchira thodu
20B39v	Kollangode	Randilappa thodu
20B39v	Kollangode	Maripadam thodu
20B39w	Elavanchery	Adippara thodu
20B39w	Elavanchery	Njarackalmada thodu
20B39w	Elavanchery	Puzhapara thodu
20B39w	Kollangode	Koshavankodu - Thevarmani chal
20B39ac	Elavanchery	Nellikodu thodu
20B39ac	Elavanchery	Punnara thodu
20B39ac	Elavanchery	Minukkasseery thodu
20B39ac	Elavanchery	Elampilavu thodu
20B39ac	Elavanchery	Kolumbu thodu
20B39ac	Elavanchery	Thekkamari thodu
20B39ac	Elavanchery	Anappara thodu
20B39y	Kollangode	Mathur thodu
20B39y	Kollangode	Ninnuthootti thodu

Table 3.6 shows micro watershed wise list of main drains/streams/ rivers. Water conservation efficiency in the water usage are great concerns in these micro watersheds because human community living here rely upon these micro watersheds to meet their water supply needs. So more

efficient use of water and improved water conservation practices are needed. Then only these micro watersheds can continue to function as healthy ecosystems as well as productive systems.

3.4 Agriculture and Present Land Use in Micro Watersheds

The details of the land use pattern in the micro watersheds are presented in this section

Table 3.7: Present land use pattern in micro watersheds

Land used for	Micro Watershed									
	Project area		20B39ac		20B39v		20B39w		20B39y	
	Area (Ha.)	%	Area (Ha.)	%	Area (Ha.)	%	Area (Ha.)	%	Area (Ha.)	%
Paddy	1822.9	37.7	367	39.3	951	54.0	361	27.4	143.9	17.5
Mixed Crop	1666.32	34.5	258.4	27.7	672.7	38.2	614.92	46.7	120.3	14.6
Vegetable	117	2.4	19	2.0	35	2.0	63	4.8	0	0.0
Coconut	29.4	0.6	0	0.0	8.9	0.5	19.9	1.5	0.6	0.1
Wasteland (rock area)	76.3	1.6	1.1	0.1	5.2	0.3	52	3.9	18	2.2
Forest	393.89	8.2	221	23.7	11.7	0.7	73.8	5.6	87.39	10.6
Open ground	1.5	0.0	0	0.0	1.5	0.1	0	0.0	0	0.0
Mango	240.9	5.0	8.8	0.9	2.1	0.1	110	8.4	120	14.6
Brick furnace	25.16	0.5	0	0.0	0.56	0.0	7	0.5	17.6	2.1
Fallow Land	17.3	0.4	0	0.0	3.9	0.2	0	0.0	13.4	1.6
Built-up areas	83.8	1.7	0	0.0	68.7	3.9	15.1	1.1	0	0.0
Rubber	57.4	1.2	57.4	6.2	0	0.0	0	0.0	0	0.0
Tea plantation	301	6.2	0	0.0	0	0.0	0	0	301	36.6
Total	4832.9	100	932.7	100	1761.26	100	1316.72	100	822.19	100

Source: Calculated using GIS

3.5 Plant Species in Micro Watersheds

The plants types like fruit plants, oil crops, pulses etc seen in the micro watersheds in the project area are shown in Table 3.8.

Table 3.8: Plant species in micro watersheds

Crop type	Vernacular name	Common name	Scientific name	Family
Tuber crops	Kappa/Maracheeni	Tapioca	*Manihot esculenta*	Euphorbiaceae
	Chena	Elephant yam	*Amorphophallus*	Aroidae

			companulatus	
	Kachil	Yam	*Dioscorea alata*	Dioscoreaceae
	Madhurakizhangu	Sweet potato	*Ipomea batatas*	Convolvulaceae
	Koorka	Chinese potato	*Plectranthus rotundifolius*	Lamiaceae
	Koova	Arrowroot	*Curcuma angustifolia*	Zingiberaceae
Vegetable crops	Padavalanga	Snake gourd	*Trichosanthes cucumerina*	Cucurbitaceae
	Vellarikka	Cucumber melon	*Cucumis sativus*	Cucurbitaceae
	Kumbalanga	Ash gourd	*Benincasa hispida*	Cucurbitaceae
	Vazhuthananga	Brinjal	*Solanum melongena*	Solanaceae
	Thakkali	Tomato	*Solanum lycopersicum*	Solanaceae
	Pachamulaku	Chilli	*Capsicum annuum*	Solanaceae
	Cheera	Amaranthus	*Amaranthus viridis*	Amaranthaceae
Fruit crops	Vazhapazham	Banana	*Musa paradisiacal. M.sapiendum*	Musaceae
	Manga	Mango	*Mangifera indica*	Anacardiaceae
	Kaithachakka	Pineapple	*Ananas comosus*	Bromeliaceae
	Sapota	Sapota	*Achras sapota*	Saptaceae
	Naranga	Lime	*Citrus limonia*	Rutaceae
	Mathalanaranga	Pomegranate	*Punica granatum*	Lythraceae
	Chambanga	Water apple	*Syzgium aqueum*	Myrtaceae
	Kashumavu	Cashew	*Anacardium occidentale*	Anacardiaceae
	Chakka	Jack fruit	*Artocarpus integrifolia*	Moraceae
	Nellikka	Indian gooseberry	*Phyllanthus emblica*	Phyllanthaceae
	Cherry	Cherry	*Carissa charantia*	Moraceae
	Badham	Indian Almond	*Terminalia catapa*	Myrtaceae
Oil crops	Thengu	Coconut	*Cocos nucifera*	Arecaceae
	Ellu	Seasame	*Sesamum indicum*	Pedaliaceae
	Nilakkadala	Ground nut	*Arachis hypogea*	Fabaceae
Spices and condiments	Manjal	Turmeric	*Curcuma longa*	Zingiberaceae
	Inchi	Ginger	*Zingiber officinale*	Zingiberaceae
Pulses	Vanpayar	Cowpea	*Vigna unguiculata*	Fabaceae
	Cherupayar	Green gram	*Vigna radiate*	Fabaceae
	Uzhunnu	Black gram	*Phaseolus mungo*	Fabaceae

The different medicinal plants seen in the micro watersheds in the project area are shown in Table 3.9.

Table 3.9: Medicinal plants in micro watersheds

Vernacular name	Scientific name	Family	Habit
Kunni	*Abrus precatorius L.*	Fabaceae	Climbing shrub
Chittadalaodakam	*Adhatoda beddomei Clarke*	Acanthaceae	Shrub
Adalodakam	*Adhatoda zeylanica Medikus*	Acanthaceae	Shrub
Koovalam	*Aegle marmelos (L.) Corr*	Rutaceae	Thorny tree
Sathavari	*Asparagus racemosus Willd.*	Liliaceae	Climbing shrub
Veppu	*Azadarichta indica Adr.Juss.*	Meliaceae	Tree
Brahmi	*Bacopa monnieri (L.) Pennel*	Scrophulariaceae	Herb
Karuka	*Cynodon dactylon (L.) Pers*	Poaceae	Herb
Kayyonni	*Eclipta prostrate (L.) L.*	Asteraceae	Herb
Aal	*Ficus religiosa L.*	Moraceae	Tree
Kudumpuli	*Garcinia gummi gutta (L.) Robs*	Clusiaceae	Tree
Mylanchi	*Lawsonia inermis L.*	Lythraceae	Shrub
Chempakam	*Michelia champaka L.*	Magnoliaceae	Tree
Elengi	*Mimosops elengi L.*	Sapotaceae	Tree
Karivepu	*Murraya koenigii (L.) Spreng*	Rutaceae	Shrub
Thulasi	*Ocimum sanctum L.*	Lamiaceae	Shrub
Keezharnelli	*Phyllanthus amarus Schum. & Thonn.*	Euphorbiaceae	Herb
Ramacham	*Veteveria zizaniodes (L.) Nash*	Poaceae	Herb

3.6 Infrastructure in Micro Watersheds

Details of different kinds of infrastructure available in the micro watersheds are given below.

Table 3.10: Infrastructure in micro watersheds

Facilities	20B39ac	20B39w	20B39y	20B39v	Total
Education					
Anganwady	1	15	3	20	39
Lower Primary Schools	0	2	1	0	3
Upper Primary Schools	0	4	0	3	7
High Schools	0	1	0	3	4
College	0	0	0	1	1
Health					
Health centers	0	4	0	2	6
Ayurveda Hospital	0	1	0	0	1
Clinic	0	0	0	1	1
Private Hospital	0	0	1	0	1
Banking					
Commercial banks	0	1	0	1	2
Co-operative societies/banks	0	2	0	2	4
Miscellaneous					
Old age homes	0	0	0	1	1
Maveli stores	0	0	0	1	1
Arts/ Sports club	0	5	0	6	11
Post office	0	2	1	4	7
Library	0	1	0	4	5
Milk collection centres/society	0	1	0	0	1
Krishi Bhavan	0	1	0	1	2
Veterinary Hospital	0	0	0	1	1
Village Office	0	0	0	2	2
Panchayat Office	0	1	0	0	1
Church	0	0	0	2	2
Temple	0	5	0	14	19
Mosque	0	0	0	4	4
Auditorium	0	0	0	2	2
Cultural Centre	0	1	0	1	2
Rice Mill	0	0	0	1	1
Forest office	0	0	0	1	1
VFPCK collection centre	0	1	0	0	1
Factory (Cracker, Tea)	0	0	1	1	2

Source: Primary Survey

Details of aided and Government schools in the project area are shown in Table 3.11.

Table 3.11: Details of aided and Government schools in the project area

Name and code of the micro watershed	Payyalloor (20B39v)	Payyadore(20B39w)	Payyadore (20B39w)	Payyalloor (20B39v)	Payyalloor (20B39v)	Payyadore (20B39w)	Payyalloor (20B39v)
Name of the Grama Panchayat	Kollangode	Elavanchery	Elavanchery	Kollangode	Kollangode	Elavanchery	Elavanchery
Ward Number	16	7	13	18	15	7	4
Name of the school	PKDUPS , Kollangode	RPMHS, Panangatiri	DMUPS, Elavanchery	BSSHSS, Kollangode	TKDUPS, Payyalloor	AUPS, Panangatiri	GUPS, Vattekkad
Government/ Aided	Aided	Aided	Aided	Aided	Aided	Aided	Government
Girls only/ Boys only/ Co-ed	Co-ed	Co-ed	Co-ed	Co-ed	Co-ed	Co-ed	Co-ed
Total number of students	476	1034	312	1170	218	887	229
Boys	284	579	172	989	114	453	112
Girls	192	455	140	181	104	434	117
Total number of teachers	15	47	18	48	12	34	7
Male	2	13	3	11	4	7	0
Female	13	34	15	37	8	27	7
Total number of non teaching staffs	1	5	1	5	1	1	1
Male	1	5	1	4	1	1	1
Female	0	0	0	1	0	0	0
Is all rooms electrified?	No	No	No	No	No	No	Yes
Is there sufficient number of toilets?	Yes	Yes	Yes	Yes	No	Yes	Yes
What are the sources of drinking water?	Open well & pipe connection	Open well, pipe connection & bore well	Pipe connection	Open well	Open well	Tank & pipe connection	Pipe connection

Source: Primary Survey

CHAPTER IV
PROBLEMS TO BE ADDRESSED

4.1 Introduction

The treatment in a watershed depends on the specific problems faced by the locality. The four watersheds in the project area face many common problems because of the similarities existing among the micro watersheds. The major problems identified through PRA techniques which have led to the identification of the interventions to be undertaken under the IWMP project are conversion of paddy fields, shortage of agriculture labourers, attack of wild animals, improper water conservation practices, lack of rainwater harvesting methods, improper waste management, pollution of canals and streams, drinking water scarcity etc. The details about these problems and the suggested interventions are given below.

4.2 Problems in the Micro Watershed Areas and Possible Interventions

One of the major agriculture crops in all the micro watersheds is paddy. A good number of households depend on the income from paddy farming. The low productivity and profitability of paddy farming is a major problem. Along with them, the shortage of agricultural labourers led to withdrawal from paddy cultivation. Another problem seen in the agriculture sector is that paddy fields are being used for setting up brick kilns. Lack of enthusiasm among farmers to adopt good agricultural practices like farm mechanization and organic farming is also affecting the agriculture sector. Inadequate protection of the bunds of paddy fields is yet another problem adversely affecting the paddy cultivation. By strengthening/constructing mud bunds around paddy fields in sloppy areas helps to store/hold water. It also helps to recharge ground water and prevent soil erosion. The farms also face attack from

wild animals (peacock, wild boar and dear). Solar fencing around areas near the forest helps to prevent this problem. Another needed intervention is repair and maintenance of existing irrigation canals on a regular basis in order to increase paddy production.

Scarcity of water for drinking and for agricultural purposes is yet another problem faced by the project area. Rainwater harvesting structures/practices are suggested under IWMP project. Rainwater falling on rooftops can be channelized to wells. Another way to tap rainwater is by

digging rainwater pits during summer season to prevent excess drainage of rain water. Mulching coconut basins is another method for rainwater storage and also for groundwater recharge. Construction of subsurface dykes also helps to increase groundwater level.

Existing ponds in the project area are widely used for agriculture practices. But these ponds require regular maintenance/repair by digging up soil and clay. Fish farming (pisciculture) can be promoted in ponds suitable for it. Construction of percolation tanks across streams helps to improve the storage capacity of ponds. In the project area, construction of adequate number of check dams helps for multi purpose uses like storage of surface water, rain water harvesting, recharging of ground water table and in increase productivity of land.

Soil erosion is another problem faced by the project area. Soil is eroded from the sides of paddy fields, channels, ponds, hilly areas etc. One way to prevent this is by constructing stone walls or by stacking large rocks in sloppy areas. This method also prevents formation of barren hills. Growing fodder grass at side bunds of ponds, streams (*thodukal*) etc not only strengthens bunds but also increase fodder grass production which will be really helpful for dairy farmers.

Improper waste management is another problem in the project area. Water bodies are polluted due to dumping of waste. Better waste management strategy can be adopted in households by promoting use of pipe and post compost or by installing of bio gas plants.

Afforestation is a simple intervention possible to increase tree cover in barren lands or degraded forest areas in the project area. This will help to reduce environmental hazards and mitigate global warming.

In order to improve the livelihood of the population, promoting nursery raising is a viable solution. This will help to grow plants like medicinal plants, fruit plants, vegetable seeds etc that can be reared for sale.

The discussion on the problems of the project area indicates that watershed development activities have long term impact on the ecosystem of the project area. In order to ensure that the benefits of the project reaches different sections of the population, particularly the vulnerable, the involvement of the community is essential right from the beginning of the project. Community participation has to be ensured in planning, management and implementation of the project. The interventions identified as part of this exercise of preparing the Detailed Project has tried to ensure that the

vulnerable sections of the society such as those living below poverty line, small and marginal farmers, women, landless families, SC/ST communities etc are benefitted out of the watershed development activities under the project. Community involvement is also essential to sustain the systems developed under the project and the positive outcomes of the project.

CHAPTER V
WATERSHED INTERVENTIONS

5.1 Introduction

The major objective of Integrated Watershed Management Programme (IWMP) is to restore the ecological balance by harnessing, conserving and developing degraded natural resources such as soil, vegetative cover and water. The watershed approach would result in improving the productivity of not only agriculture but also the overall production of bio-mass for enhancement of self-employment opportunities and thus the overall income of the rural households. Based on the problems identified through participatory methods and the inputs from several rounds of discussions with stakeholders including experts, suitable interventions for watershed development of the project area have been identified. The specific interventions under IWMP are broadly classified into Information, Education & Communication (IEC) Activities, Entry Point Activities (EPA), Natural Resource Management (NRM), Production System and Microenterprises, and Livelihood Support Plan.

5.2 Information, Education & Communication (IEC) Activities

Information, Education and Communication (IEC) is an important component and it has a vital role in creating awareness, mobilizing people and lays the basis for successful implementation of IWMP.

The main IEC activities of the project are:

1. Preparation of brochures, stickers, boards, banners, etc on IWMP project and the concepts of watershed and watershed management.

2. Conduct competitions like essay writing, wall painting, quiz, elocution etc on IWMP Project and the importance of watershed management.

3. Awareness programmes such as magic shows.

4. Exposure Visits: Visits to research institutions, horticulture & agriculture university/colleges in order to explore the possibilities of getting expertise from such institutions in the implementation of the project.

5. Formation of *Paristhithi Sena* – During the period of awareness programmes, *paristhithi sena* will be formed with students, youth, members of Self Help Groups and User Groups and environmental activists as members. The Sena will help to ensure sustainability of the watershed management activities and in protecting the environment.

6. Awareness programmes such as Documentary and street play: With the participation of local clubs, students etc. propagate the problem faced by the people in the project area and the needed interventions through videos/films and street play.

7. Medical camps: To create awareness among people about the relationship between health and environment.

8. Animal Health Camp: For better health management of cattle.

9. Eco - friendly School: To create awareness among students about the need and ways of environmental protection. A campaign may be organized to make students aware about the harmful effects of throwing waste into water bodies and public places.

5.3 Entry Point Activities (EPA)

Entry point activities aim to mobilize the community in support of the subsequent interventions under the project. EPA helps to create rapport with the village community. Entry point activities are identified with a view to showcase them as model interventions which, in turn, would generate the interest of the community in watershed development activities. Community participation is essential to maximize the impact of the project and to ensure the sustainability of the project outcomes. Entry point activities identified in the project area are presented below:

5.3.1 Soil and water conservation activities at Government Upper Primary School, Vattekkad.

With student strength of 250, the above school is in ward 4 of Elevanchery Gramma Panchayat, located 300 m towards west of Vattekkad junction in the Nemmara - Govindapuram road. Due to water logging, the play ground of the school is unusable during the monsoon season. Gardening and horticulture practices are not effective in school. The following activities are proposed in this school under IWMP project.

5.3.1.1 Construction of drains

5.3.1.2 Construction of recharge pits

5.3.1.3 Construction of rain water harvesting tanks

5.3.1.4 Construction of filtering media

5.3.2 Renovation of public wells in Payyaloor and Payyadore micro watershed areas.

Majority of the people in the project area depends upon public wells for drinking water purposes. Renovating 15 open wells in Payyalloor and Payyadore micro watershed areas in Elavenchery Grama Panchyath will help to improve the drinking water availability in the locality.

5.3.3 Extension of pipeline for Varnattupadam drinking water scheme.

Varnattupadam drinking water scheme was introduced in Kollengode Panchayat in 2007-08. Through this scheme drinking water shortage of 125 households in Mookkarsamkunnu areas (ward 16) was sorted out. But around 70 households are still not benefited. By extending pipeline under Varnattupadam drinking water scheme to 300 meters and integrating with IWMP project, areas like Mookkarshanamkunnu and Naykkathara areas will be relieved from drinking water scarcity.

5.4 Natural Resource Management (NRM)

Natural resource management aims to maintain and to improve natural resource base. Management of natural resources helps to enhance livelihood of the local community on a sustainable basis. The main NRM activities identified for the project area are as follows:

1. **Construction of check dams:**

Check dams can be constructed across a stream to slow down the flow of rainwater to the sea. Check dams can be either made of temporary materials such as rock, log, brush etc or of permanent masonry materials like stone, concrete block etc. Construction of adequate number of check dams in the project area helps in water conservation and increase in ground water.

2. **Construction of shutter for existing check dams**

Shutters of some of the existing check dams in the project area are damaged. Maintenance is required for proper water conservation.

3. **Side protection of river and streams**

Embankment of rivers and streams are partially eroded. Side protection is needed to prevent soil erosion.

4. **Renovation of ponds:**

Existing ponds require regular or annual maintenance/repair. Fish farming (pisciculture) can be promoted in suitable ponds. Bund strengthening of ponds can be done by planting fodder grass which prevents soil erosion.

5. **Mulching coconut and mango tree basins:**

Mulching is an effective method for conserving soil moisture in coconut and mango tree basins, which can be done before rainy season (May-June). Mulching tree basins can be done by using green or dry leaves or coir pith or husk which adds organic matter to soil and also reduces soil temperature.

6. **Construction / strengthening of mud bunds:**

Maintenance/repair of mud bunds (*Varambu pothiyal*) is necessary to do paddy farming. These bunds store water in paddy fields. It also helps in ground water recharging and prevents soil erosion.

7. **Digging of rainwater pits (*mazha kuzhikal*):**

One way of storing/harvesting rainwater is by digging rainwater pits. It also helps to recharge groundwater.

8. **Promote well recharging (open well and bore well):**

This artificial recharging method of injecting rainwater to recharge wells improves availability of fresh water in the project area, reduce drinking water shortage and raise water level in wells.

9. **Construction of subsurface dyke:**

Construction of sub surface dyke at the foot of the hill ranges will help to improve ground water retention. The structure obstructs natural ground water flow, thereby increasing the ground water level and enhancing the aquifer storage for use in lean months. A trench is excavated down to fresh bed rock or an impervious layer like the clayey lithomarge across the ground water flow direction and an impervious barrier/ wall is erected within the trench and the same will be refilled. Well or pond established upstream of the barrier can extract the impounded groundwater. The dyke once established does not require frequent maintenance. The dyke will not be visible from surface and will not hinder any type of land use. The subsurface dyke is not becoming popular due to the high cost and the difficulty in constructing the barrier underground with masonry, concrete etc. However, introduction of LDPE film for creating the subsurface dyke reduces the cost and makes installation time shorter and process simpler. Since the film is flexible, any settlement of the filled

material within the trench will not affect the film. Further no seismic vibrations will affect the film as it is flexible.

10. Solar fencing:

Construction of solar fences in agricultural areas near to forest helps to prevent crop damage due to the attack of wild animals (peacock, wild boar).

11. Repair and maintenance of irrigation canals:

Sides of irrigation canals are often damaged. So repair and maintenance of existing irrigation canals on a regular basis is essential to increase paddy production. This activity can be converged with irrigation department.

12. Stone walls (*Kallukayyala*):

Construction of stone walls or stacking large rocks in sloppy areas is an ideal way to prevent soil erosion in the project area. These stone walls help to reduce soil erosion and thus prevent formation of barren hills.

13. Afforestation:

Afforestation or planting trees in barren lands or degraded forest areas helps to increase tree cover. This helps to reduce various environmental hazards and more importantly helps to mitigate global warming.

5.5. Production System and Microenterprises

According to the Common Guidelines for Watershed Development Projects (2008), 10 per cent of the total project cost is to be assigned to support the production system and micro enterprises. This component aims to (a). promote diversified production/farming system based livelihood activities/ interventions (b). encourage farmers to adopt and upscale successful experiences of proven technologies, integrated farming systems and improved farming practices for livelihood augmentation.

The activities / interventions planned under this component are:

1. Horticulture

Plants can be grown in plastic bags by filling suitable soil and organic manure. For encouraging horticulture seeds of pea, horse gram etc can be distributed. The programme can be converged

with the activities of Vegetable and Fruit Promotion Council, the Agriculture Department and MGNREGA. Suitable flower plants, medicinal plants etc can also be grown in the project area.

2. Fodder cultivation

Green fodder is essential for dairy animals. It can be grown along the boundaries of residential plots, along the bunds in the paddy field, coconut plantation etc. It will help to reduce the expenditure on cattle feed.

3. Supply of cow, goat, duck, chicks etc.

Poor and landless households can be given cow, goat, duck, chicks etc to start up poultry farm. This will be a livelihood support. Beneficiaries shall be selected based on specific criteria.

4. Nursery raising:

Nursery raising is an economically viable option for livelihood. In a multipurpose commercial nursery, all kinds of plants like fruit plants, timber trees, medicinal plants, vegetable seeds etc can be produced for sale. This programme can be implement by converging with activities of the farmers group or with MGNREGA.

5. Distribution of Dhaincha seedlings

Distribution of Dhaincha will be great support for farmers. This green manure crop can be grown in all soil conditions. Using Dhaincha before paddy cultivation will help to improve the bio content of the land. Dhaincha can grown when sufficient moisture is available. Sowing it during March – April is best for seed production.

6. **Solid waste treatment units:**

Should commence solid waste treatment units like biogas plants and vermicompost in the project area. Installation of biogas plants help to generate fuel which can be used for cooking. The biogas slurry can be used as manure/fertilizer (for plantations, homestead gardens etc). Installation of vermicompost units helps to convert all types of biodegradable wastes (like farm/ garden/kitchen/livestock wastes) into nutrient rich vermicompost by using earthworms as biological agents. Households can earn additional income by making saleable compost from these plants.

5.6 Livelihood Support

The Common Guidelines for Watershed Development Projects (2008) gives priority to livelihood support for landless/asset less persons. Nine per cent of the total project cost is assigned to support the livelihood activities of landless/asset less households. This aims to maximize the

utilization of potential generated by watershed activities and in creating sustainable livelihoods for households within the watershed area.

The guiding principles for livelihood improvement initiatives are:

1. Livelihood improvement initiatives emphasize on natural resource based activities and conform to principles of equity, gender sensitivity and transparency. It strives to:-

a) Enhance livelihood opportunities for the poor through investment into asset creation and improvement in productivity and income.
b) Improve access of the marginalized communities including SC/ST, landless/ asset less people, women etc to the benefits.
c) Select the beneficiaries in a transparent manner.

2. Livelihood initiatives for landless/asset less households should aim at improved household income, participation and division of labour, access to information, knowledge, appropriate technologies and resources.

The activities/interventions related to livelihood improvement for the project area are as follows:

1. Eco-friendly products (Paper bag, files, cloth bags): The unemployed youths, housewives, etc. can be organized as a group and they can be given training on production of different eco-friendly products (bamboo).
2. Should commence tailoring units, units for preparing Amritham powder, vegetable retail shops, food processing units, manufacturing unit of agarbathi, candle, karpooram etc.
3. Encourage to do lease farming.

5.7 Sustainable Management Practices for Watershed Area

Micro watershed management involves integrating people, land and water. Management practices aims at long term well being of the local community. Following are some of the micro watershed management practices suggested for the project area:

- Regular maintenance of ponds, wells and drainages.
- Prevent dumping of waste into water bodies.
- Keep the drainages waste free.
- Manage waste in home by using compost pits, bio gas plants etc.

- Reuse the plastic items.
- Install and maintain rain water harvesting structures and harvest maximum rain water using filtered tanks.
- Regularly clean the rain water harvesting structures to ensure purity of drinking water. Also ensure that stored rain water is not contaminated.
- Undertake vegetable cultivation/horticulture in yard or terrace using sacks and polythene covers.
- Plant trees and preserve existing trees and shrubs to prevent soil erosion.
- Do not spray pesticides indiscriminately.
- Prevent over grazing by domestic animals (like goats, cows etc).

CHAPTER VI

INSTITUTION BUILDING AND PROJECT MANAGEMENT

6.1 Institutional Arrangements of IWMP

By adopting the principles and guidelines of Integrated Watershed Management Programme (IWMP), appropriate institutional arrangements are made at various levels in order to have an effective and professional management of watershed projects.

6.1.1 Institution Building at State and District Level

Department of Local Self Government is the nodal department for the implementation of IWMP at the state level. State Level Nodal Agency (SLNA) is coordinating and providing guidelines for the effective planning and implementation of the individual IWMP projects. District Planning Committee (DPC) is responsible for the planning and implementation of the projects at the district level. To help the DPC and to coordinate the project level activities Watershed Cell Cum Data Centre (WCDC) is working at the District level.

Table 6.1: Details of District Level Coordination Committee (DLCC)

Sl. No	Name	Designation
1	T.N. Kandamuthan (President, Palakkad District Panchayat)	Chairman
2	K. Ramachandran (The District Collector, Palakkad District)	Member Secretary
3	T.V. George (Project Manager, IWMP)	Convenor
4	Joint Programme Coordinator (MGNREGA)	Member
5	District Planning Officer	Member
6	District Animal Husbandry Officer	Member
7	District Soil Survey Officer	Member
8	District Soil Conservation Officer	Member
9	Deputy Director of Fisheries	Member
10	Executive Engineer, Minor irrigation/LSGD, Kerala Water Authority	Member
11	Divisional Forest Officers	Member
12	District Officer, Ground Water Department	Member
13	Representative, Kerala Rural Water Supply Agency	Member

14	District Mission Co-ordinator, Kudumbasree	Member
15	District Co-ordinator, *Information Kerala Mission*(*IKM*)	Member
16	District Co-ordinator, Horticulture Mission	Member

6.1.2 Institution Building at Block Level

Nemmara Block Panchayat is the Project Implementation Agency (PIA) for this IWMP project. They are responsible for all the activities under the project starting from the preparation of Detailed Project Report (DPR) till the completion of project. A Block Level Coordination Committee (BLCC) has been formed for the timely implementation of the project and to provide help to the PIA in technical and administrative matters related to the project. Watershed Development Team (WDT) has been formed and started working under the PIA. Details of PIA are given below.

Table 6.2: Details of Project Implementation Agency (PIA)

Name of the Project	IWMP 6
Programme Implementation Agency	Nemmara Block Panchayath
Implementation Officer	Block Development Officer, Nemmara Block Panchayath
Address of PIA	Block Development Officer, Nemmara Block Panchayath, Nemmara P.O, Vithanassery, Palakkad – Pin – 678509.
Telephone	04923-244218, 04923-242244
Email	bdonemmara@yahoo.in iwmpnemmara@gmail.com

Table 6.3: Details of Block Level Coordination Committee (BLCC)

Sl. No	Name	Designation
1	Srimathi. P. Geetha (President - Nemmara Block Panchayath)	Chairman
2	Sri. K. Vasudevan (President - Kollengode Block Panchayath)	Co-Chairman
3	Sri. K. C. Sethumadhavan (Secretary - Nemmara Block Panchayath)	Member Secretary
4	Sri. Vijayakumar (Assistant Director –Agriculture)	Technical Expert
5	Sri. M. Mayan (Vice President - Nemmara Block Panchayath)	Member
6	Srimathi. Sreeja Rajeev (Development Standing Committee Chairman - Nemmara Block Panchayat)	Member
7	Sri. Pradeep Kumar (Assistant Executive Engineer - LSGD)	Member
8	Sri. K. Sivaraman (President - Elavanchery Grama Panchayath)	Member
9	Srimathi. Pradeepa (President - Kollengode Grama Panchayath)	Member
10	Srimathi. K. Santhakumari (President - Pallasana Grama Panchayath)	Member
11	Srimathi Lakshmikutty Ramakrishnan (President - Nemmara Grama Panchayath)	Member
12	Sri. R. Chithirampilla (President - Nelliyampathy Grama Panchayath)	Member
13	Sri. S. V. Selvan (President - Muthalamada Grama Panchayath)	Member
14	Srimathi. M. V. Suma (Extension Officer Women Welfare - (EOWW))	Member
15	Representative, Watershed Cell cum Data Centre (WCDC)	Member
16	Representative, Watershed Development Team (WDT)	Member
17	Representative, Technical Support Organization (TSO)	Member

Table 6.4: Details of Watershed Development Team (WDT)

Sl. No	Name	Age	Sex	Designation	Qualification
1	Reshma B.	23	F	Engineer	B.Tech. Civil
2	Sathikumari V.	35	F	Social Mobilizer	M.A. Sociology
3.	Ansu Jose	31	F	Data Entry Operator	B.Com, A' Level (DOEACC)
4.	Unniram A.H.	23	M	Agriculture Specialist	B Sc. Agriculture

6.1.3 Institution Building at Grama Panchayat (GP) Level

Watershed management works are implemented at Grama Panchayat level. The GPs supervise, support and advise Watershed Committee. The different institution formed as part of IWMP are given below.

6.1.3.1 Watershed Committee (WC)

Watershed Committee has a pivotal role to play during and after the project implementation period. The dates of Neerthada Gramasabha convened in each watershed are given below. These Grama Sabhas constitutes the WCs for each watershed. These WCs will work as the subcommittees of GPs. In the case of Watersheds spread over more than one GP, separate subcommittees are formed in each GP to manage the watershed development project in the GP.

Table 6.5: Date of meetings

Sl No.	Name and code of Micro Watershed	Grama Panchayat	Date of meeting
1	Payyalloor, 20B39v	Elavanchery, Pallasana, Kollengode	(1) Payyalloor Watershed formation Committee meeting held on 5/27/2013 (2) Pallassana Sub Committee formation meeting held on 7/9/2013 (3) Pallassana Sub Committee formation meeting held on 7/20/2013 (4) Kollengode Sub Committee formation meeting held on 7/16/2013

2	Payyadore, 20B39w	Elavanchery, Nemmara, Kollengode, Muthalamada	(1) Payyadore Watershed formation Committee meeting held on 5/28/2013 (2) Muthalamada Sub Committee formation meeting held on 6/7/2013 (3) Nemmara Sub Committee formation meeting held on 7/8/2013 (4) Elavanchery Sub Committee formation meeting held on 7/6/2013
3	Vengappara, 20B39y	Kollengode, Nelliyampathy	(1) Vengappara Watershed formation Committee meeting held on 6/29/2013 (2) Vengappara watershed Gramasabha meeting held on 6/29/2013
4	Malappuram, 20B39ac	Elavanchery	(1) Malappuram Watershed formation Committee meeting held on 5/30/2013 (2) Elevanchery Subcommittee formation meeting held on 7/12/2013 (3) Malappuram watershed Gramasabha meeting held on 7/8/2013

Table 6.6: Details of Watershed Committees in the project area

Sl. No.	Name and code of the Micro Watershed	Name of the Committee Members
1.	Payyalloor - 20B39v	President: Srimathi. Pradeepa [Kollengode] Secretary: Sri. Lalu [VEO – Kollengode]
	Pallasana Sub Committe	President: Vijayan Secretary: Achuthan Mash Members: K. Geetha, Madhavan Kutty, Viswanathan, Baby, Viswanathan, Mohandas
	Elavanchery Sub Committee	Members: Ambika, Bindhu G, Subrahmanyan,

		R. Radhakrishnan, Somasundaran Chettiyar, Shabu, M Raveendran, Chamukkuttan, Shivasankaran
	Kollengode Sub Committee	President: K. Balakrishnan Members: K Majeendran, Chandran, Ramachandra Ayyar, Natarajan, Ratheesh Ambattukalam, Shanavas, Prema, Malathi, Siddique
2.	Payyadore -20B39w	President: Sri. K. Sivaraman [Elevanchery] Secretary: Sri. Prabhu Ram [VEO – Elevanchery]
	Nemmara Sub Committee	President: Sethumadhavan Secretary: Narayanan Members: C Bhaskaran, Muraleedharan, Janaki, Sundhari, Kavitha, Parukuttiyamma, Adv. K. Kuttappan, Murukankutty
	Elavanchery Sub Committee	President: Giridharan A Secretary: Sashidharan T Members: K Velappan , Pankajakshi, Shanthini , Geetha, Aarumukhan K , A. Kaladharan, Venugopal C. V, Balachandran C , Chandran M, K. N Velayudhan, Somasundharam Chettiyar, C Velayudhan
	Kollengode Sub Committee	Members: M Chandran, C Prabhakaran, T Sahadevan, Anil Kumar, S Divakaran, Sulaiman, Suseela, Latha, Kanakalatha, Bhaskaran

	Muthalamada Sub Committee	Members: Aravindakshan R Anjanamehira, Arul R Anjanamehira, Idumban , Vasu, Haridas P, Manikandan G, Krishnaswami
3.	Vengappara- 20B39y	President: Sri. K. Sivaraman [Elevanchery] Secretary: Sri. Prabhu Ram [VEO – Elevanchery]
4.	Malappuram - 20B39ac	President: Srimathi. Pradeepa [Kollengode] Secretary: Sri. Lalu [VEO – Kollengode]

6.1.3.2 Self Help Groups (SHGs)

There are 407 SHGs working in the project area already. These SHGs are registered in the Block. These groups are organized through credit and thrift activities. Some of the groups are also engaged in micro-enterprises also. These SHGs are formed either under SGSY scheme or under Kudumbasree. Both women and men SHGs are active in the project area. Details of the SHGs in the project area are given below.

Table 6.7: Details of Self Help Groups (SHGs) working in the project area

Watershed	Grama Panchayath	Ward No	Kudumbasree	Block SHG	Total
Payyalloor 20B39v	Kollangodu	10p	8	15	23
	Kollangodu	11	6	5	11
	Kollangodu	12p	4	7	11
	Kollangodu	13	11	1	12
	Kollangodu	14	6	3	9
	Kollangodu	15	13	7	20
	Kollangodu	17	6	6	12
	Kollangodu	18	6	10	16
	Elavanchery	1p	8	3	11

	Elavanchery	2	10	5	15
	Elavanchery	3p	11	4	15
	Elavanchery	4	11	2	13
	Elavanchery	5	7	1	8
	Elavanchery	6	9	2	11
	Elavanchery	10	9	1	10
	Elavanchery	11p	5	1	6
	Elavanchery	13p	1	3	4
	pallasana	11p	5		5
Payyadore 20B39w	Elavanchery	1p	4	0	4
	Elavanchery	7p	8	4	12
	Elavanchery	8p	9	3	12
	Elavanchery	9	8	2	10
	Elavanchery	11p	11	2	13
	Elavanchery	12p	10	18	28
	Elavanchery	13p	10	4	14
	Elavanchery	14p	11	7	18
	Kollangodu	7p	3		3
	Kollangodu	9p	11	10	21
	Kollangodu	12p	4	7	11
	Kollangodu	16p	10	4	14
	Nemmara	6p	7	0	7
	Muthalamada	17p	9		9
Malappuram	Elavanchery	11p	2	0	2

20B39ac	Elavanchery	12p	3	8	11
	Elavanchery	14p	1	0	1
Vengappara 20B39y	Kollangodu	9p	4	1	5
	Kollangodu	12p	0	0	0
	Nelliyampathy	2	0		0
		Total	261	146	407

6.1.3.3 User Groups (UGs)

User groups are proposed to be formed to manage the different activities or assets created under the programme on a long term basis. The user groups are expected to collect user charges from their members, oversee the works and manage the benefits.

6.2 IWMP Project Management

Table 6.8: Implementation phases of IWMP

Phase	Name	Duration
I	Preparatory Phase	1-2 years
II	Watershed Works Phase	2-3 years
III	Consolidation and Withdrawal Phase	1-2 years

Activities under each phase are mentioned below.

6.2.1 Preparatory Phase:

• Institution building, training and empowerment of institutions like watershed committee (WC), user groups (UGs) and self help groups (SHGs).

• Preparation of Detailed Project Report with detailed action plans through participatory exercises (PRA exercises, Focused Group Discussions).

• Entry Point Activity shall be taken up during this phase to establish credibility of the Watershed Development Team (WDT) and create a rapport with the village community.

6.2.2 Watershed Works Phase:

• This phase is the heart of the programme in which the DPR will be implemented.

• Execution of action plans (NRM works, Agriculture and allied sectors works, Livestock improvement measures, Fisheries development)

6.2.3 Consolidation and Withdrawal Phase:

• In this phase the resources augmented and economic plans developed in Phase II becomes the foundation to create new nature-based, sustainable livelihoods and raise productivity levels.

• Bridging the gaps for post project sustainability.

• Building the capacity of the community based organizations to carry out the new agenda items during post project period.

• Preparation of project completion report with details about status of each intervention.

• Documentation of successful experiences as well as lessons learnt for future use.

CHAPTER VII
DETAILED ACTION PLAN

Table 7.1: Funding pattern of IWMP

BUDGET COMPONENT	Share of the Total Budget (%)	2012-13	2013-14	2014-15	2015-16	Amount (Rs in lakhs)
MANAGEMENT COST						
Administrative Costs	10	13.32	13.32	13.32	13.32	53.268
Monitoring	1	1.33	1.33	1.33	1.33	5.3268
Evaluation	1	0.00	1.78	1.78	1.78	5.3268
PREPARATORY PHASE						
Entry point activities	4	21.31				21.3072
Institution and capacity building	5	9.22	6.77	5.74	4.91	26.634
Detailed Project Report (DPR)	1	5.33	0	0	0	5.3268
WATERSHED WORKS PHASE						
Watershed Development Works	56	117.91	79.98	55.30	45.11	298.3008
Livelihood activities for the asset less persons	9	14.39	14.39	9.58	9.58	47.9412
Production system and micro enterprises	10	15.98	15.98	10.66	10.65	53.268
CONSOLIDATION PHASE	3	0	0	0	15.9804	15.9804
TOTAL	**100**					**532.68**

Action Plan for Institution and Capacity Building Activities

Table 7.2: Plan for Istitution Building

Sl. No.		No. of activity	Estimated expenditure (Rs. In Lakhs)
1	User Group formation	170	0.85
2	SHG Formation	30	0.20
3	Formation of Federation	4	0.05
4	Formation of Watershed Committees	4	0.06
			1.16

Table 7.3: Plan of Information, Education & Communication (IEC) activities

Sl. No.	Activity	Estimated expenditure (Rs. in lakhs)	Expected Outcome	
1	Brochures	1.25	Aware the watershed community regarding the project.	1st Phase
2	Wall Painting (Walls of schools, hospitals etc.)	0.5	Create awareness among the importance of watershed management in the project area	1st Phase
3	Magic / Monkey Show	0.3	Aware the importance of peoples participation in Natural resource management	1st Phase

4	Setting of Water testing lab at Elavanchery Grama Panchayat PHC and provide training to the health workers and community groups.	5	To ensure the regular testing of drinking water in the project area and provide guidance to the wise use of the water.	1st phase
5	Exposure visit	0.5	Make confident the progressive farmers and local leaders to undertake good and innovative practices in natural resource management.	2nd Phase
6	Formation of *Paristhithi Sena*	0.5	This sena will become a social vigilance group in the community for the motivation for the protection of the environment. Ensuring the participation of Local Club, Library, youthgroups, farmers, etc. in the best management of the watershed area.	2nd phase onwards
7	Awareness through documentary, street play, local channels	0.5	Reach the message to the laymen	1st, 2nd and 3rd phases
8	Medical camp	0.5	Improvement of the public health	2nd Phase
9	Animal Health camp	0.75	Improvement of the animal husbandry	2nd Phase
10	Eco friendly school Programme	1	Make a eco-friendly generation for the protection of the environment	2nd Phase
11	Observation of Various Importance Days like World Environmental Day, Water Day, Earth Day etc.	2	Create awareness on the people regarding the importance of environment protection.	1st, 2nd and 3rd phases
	Total	**12.8**		

Table 7.4: Training Programmes

Sl. No.	Phase	Name of the Capacity Building Programme	Objectives /Subjects to be covered	Participants	Duration	No. of Batches	No. of Participants	Rough Estimate (Rs. In Lakhs)	Expected Outcome
1	1st	Workshop on IWMP	To familiarise the IWMP:Concept, Administrative setups, funding pattern, stages of programme. To familiarise of the basics of watershed Introduce the Project area: Boundaries, including GP Wards, Micro Watersheds, area, fund, following activities in the project area etc. The scope of watershed development in their area Various activities proposed under NRM, PS&M and LSS. To ensure their participation for the success of the project To understand the problems facing by various sectors.	Elected Representatives- Block Panchayat, Grama Panchayat	1 day	1	60	0.10	Smooth and effective implementation of the projects, through solving any issues pop up while implementation, with regard to financial transparency, peoples participation etc.
2	1st	Workshop on IWMP		Officers from implementing offices – Block Panchayat, GP, Agriculture, School, Dairy, Health etc.	1 day	1	60	0.10	
3	1st	Workshop on IWMP		Kudumbasree, MGNREGS	1 day	6	300	0.6	
4	1st	Workshop on IWMP		Social Activists – Political Party Representatives, Library, Club, Residential Association etc.	1 day	2	100	0.20	
5	1st	Workshop on IWMP	To collect suggestions from various stake holders for adopting suitable management practices in the project area.	Farmers and Agricultural Workers – Paddy, Plantations, Horticulture, Dairy and Poultry etc.	1 day	2	100	0.20	

6	1st	Training of Watershed Committee	Natural Resource Mangement Roles and Responsibilities of Watershed Committee.	Watershed Committee Members Watershed Sub Committee Members	1 Day	6	300	0.60	Empowered of watershed committee which is necessary for effective implementation of the project and proper maintenance of common created assets under the programme.
7	1st and 2nd	Training for Management of Natural Resources and Common Assets.	Natural Resource Mangement and Roles and Responsibilities of User Group	User Groups	Half day	30	1500	0.10	Awareness among the UGs to take up the responsibility of creating common assets as well as their future maintenance
8	2nd	Training programme on production system and Micro enterprises (PS&M)	To motivate the community to initiate various PS&M. To generate additional income from such activities. To attain self sustainability To ensure the Productivity and sustain the production system.	SHGs: Interesting on rearing cattle, fodder cultivation, Pisiculture, Horticulture, Ornamental Fish farming etc. Progressive Farmers Young groups or persons who are interested in production system and micro enterprises.	3 days	6	180	2.34	Increase the standard of living through increase in per capita income, attain self sustainability etc.

9	2nd	Training programme on Livelihood Support System (LSS)	To motivate the community to initiate various livelihood activities using the benefit of the project. To generate additional income from such activities. To attain self sustainability and improve the livelihood of the poor people.	SHGs which selected for livelihood benefits. Asset less / land less poor people.	3Days	6	180	2.34	Improved livelihood condition of the land less poor people.
10	2nd	Skill Development Training.	To motivate the community to initiate various PS&M. To promote conservation of natural resources. To aware the people for good plastic waste management system. To improve livelihood	SHGs members or any interesting in involving handicraft production sector	5 Days	10	180	5.04	Improved standard of living through increase in per capita income, attain self sustainability, protection of natural resources and better practice for plastic waste management
11	2nd & 3rd	Training programme of '*Paristhithi Sena*' in Watershed Management	To Encourage the paristhithi Sena for under take the activities for the best management of Watershed.	Members of Paristhithi Sena	10 Days Camp	3	200	1.054	Ensure the best management of the Watershed Area
								12.674	

Table 7.5: Entry Point Activities

Sl. No.	Activity	Watershed	Expected Out come	Estimated Amount (Lakhs)	No of beneficiaries	Area benefitted (ha)
1	Water and Soil Conservation activities at Government Upper Primary School, Vattekkad.	20B39v	To avoid water logging in the school ground and solve the water shortage of the school.	14.97	300	10
2	Public Well Renovation of Payyalloor and Payyadore Watershed area	20B39v and 20B39w	Protection of Public well in the Project area	5.54	1205	45
3	Extension of pipeline for Varnattupadam drinking water scheme	20B39v	Safe drinking water to the people	0.7972	350	-
			Total Amount	**21.3072**	**1859**	**55**

1. Water and Soil Conservation activities at Government Upper Primary School, Vattekkad.

The above school is located 300m to west from Vattekkad junction in the Nemmara-Govindapuram road. It is in Elevanchery Gramma Panchayat at ward 4. There is crucial water shortage in the summer season and in the monsoon season the condition of school ground is very bad due to the water logging. The rain water is retained in the ground and there is no runoff. There is also small spring comes from the basement of the building. There are 250 students in the school. Due to this reason the ground is not useful around 4 months of period. Gardening and horticulture practices are also not so effective. So the proper water and soil management is essential for the use of ground as well as solve the water shortage in the school. This project includes the construction of drain, Percolation pit, Rain water harvesting tank and Filtering media.

Activity 1: ***CONSTRUCTION OF DRAIN***

Estimate Amount : 6,30,000/-

The estimate is prepared for the construction of CC drain having width of 0.5 m and height of 0.6m.There is about 115 m length of drain is to be constructed. The proposed drain is covered with MS grills, consisting L section (25x25x4mm) provided at the end, 10mm bars with 50mm c/c spacing is welded to it and 8mm bars are fixed across the 10mm bars with 50mm c/c. The total cost of the CC drain is RS: **6,30,000/-** (SIX LAKH THIRTY THOUSAND ONLY). The estimate is prepared on the basis of PWD rates and 6% taxes are also included in it.

Activity 2: ***CONSTRUCTION RECHARGE PIT***

Estimate Amount : 1,27,000/-

The estimate is prepared for the construction of Recharge pit having inner dia 1.5m. The pit is protected by using precast ring with inner dia 1.5 m, thickness 0.1m and 0.45m height. Inside the pit broken stone having size 40mm and 20mm, sand and gravel are placed. The total cost of the Percolation pit is RS: **1,27,000/-** (One lakh Twenty Seven Thousand). The estimate is prepared on the basis of PWD rates and 6% taxes are also included in it.

Activity 3: CONSTRUCTION OF RAIN WATER HARVESTING TANK

Estimate Amount : 6,70,000/-

The estimate is prepared for the construction of Rain water harvesting tank having size 10 x 4 x 2.5m. Tank is constructed 0.45m below ground level. It is constructed to solve the problem of water scarcity for about 3 months. The over flow pipe is connected to the drain. The total cost of the Rain water harvesting tank is RS: **6,70,000/-** (SIX LAKH SEVENTY THOUSAND ONLY). The estimate is prepared on the basis of PWD rates and 6% taxes are also included in it.

Activity 4: ***CONSTRUCTION OF FILTERING MEDIA – G U P SCHOOL VATTEKKAD***

Estimate Amount : 70,000/-

The estimate is prepared for the construction of Filtering media having length 2m and 0.6m height. In the excavated pit 20mm broken stone is placed 0.35m height. Plastic sheet is placed above the broken stone then red earth is filled above it. The total cost of the Filtering media is RS: **70,000/- (**SEVENTY

THOUSAND ONLY). The estimate is prepared on the basis of PWD rates and 6% taxes are also included in it.

2. Public Well Renovation of Payyalloor and Payyadore Watershed area

A large number of people in the project area are depending public wells for drinking water purpose in the project area. The condition of the platform, protection wall, etc. of the well are very poor. By renovating these wells the project can attract and ensure the participation of the people in various watershed management activities.

Table 7.6: List of Well which proposed for the renovation work

Sl. No	Name of Well	GP	Ward No	Estimate Amount	No of beneficiaries	Area benefitted (ha)
1	Karippayi Open Well	Elavanchery	1	23000	80	2
2	Karimkulam - karippayi Road Open Well	Elavanchery	1	51000	85	4
3	Aalekkulam Open Well	Elavanchery	7	24000	70	2
4	Moochikkal Open Well	Elavanchery	8	52000	85	4
5	Peringottukavu SC Colony Open Well	Elavanchery	11	30000	75	2.5
6	Aanditharakkadu Open Well	Elavanchery	11	43000	90	3.5
7	Elevancherythara Open Well	Elavanchery	12	23000	75	2
8	Neelikkulamparambu (SD Colony) Open Well	Elavanchery	12	46000	82	4
9	Kammanthara Open Well	Elavanchery	12	23000	78	2
10	Kulappullippadam Open Well	Elavanchery	2	51000	80	4
11	Kollathara Open Well	Elavanchery	4	51000	84	4
12	Thumbana Open Well	Elavanchery	3	42000	88	3.5
13	Kollampotta Open Well	Elavanchery	3	45000	80	3.5
14	Vadakkumuri Open Well	Elavanchery	3	23000	75	2
15	Mandapamkudam - Naduppadam Open Well	Elavanchery	4	27000	82	2
	TOTAL			**554000**	**1209**	**45**

Extension of pipeline for Varanattupadam drinking water scheme.

Varanattupadam drinking water scheme was introduced in Kollengode Panchayat in 2007-08. Through this scheme drinking water shortage of 125 households in Mookkarsamkunnu areas (ward 16) was sorted out. But around 70 households are still not benefited. By extending pipeline under Varnattupadam drinking water scheme to 300 meters and integrating with IWMP project, areas like Mookkarshanamkunnu and Naykkathara areas will be relieved from drinking water scarcity. The project is expected the cost of Rs.79720/-.

Table 7.7: Action Plan for 4 Years

(Rs. In Lakhs)

Sl. No.	Type of Activity		Year 1		Year 2		Year 3		Year 4		Grant Total	
			IWMP	Expecting WDF	IWMP	Expecting WDF	IWMP	Expecting WDF	IWMP	Expecting WDF	IWMP	Expecting WDF
1	Watershed Development Works	20B39ac	20.2202	0.927663	6.84737	0.279663	6.81158	0.18644	3.57158	0.321442	37.4507	1.715211
		20B39w	27.4634	1.787705	28.3774	2.109365	18.1145	1.14514	22.26819	0.591137	96.2235	5.633344
		20B39v	51.7245	1.588181	28.747	1.678181	23.7458	2.13713	16.04584	1.219126	120.263	6.622614
		20B39y	18.5003	0.41712	16.0084	0.430957	6.63181	0.59686	3.22311	0.29008	44.3636	1.73502
	Total		**117.9084**	**4.720669**	**79.98017**	**4.498166**	**55.30369**	**4.06557**	**45.10872**	**2.421785**	**298.3008**	**15.70619**
2	Production System and Micro Enterprises	20B39ac	0.6972	0.10458	3.5196	0.52794	2.0916	0.31374	2.0916	0.31374	8.4	1.26
		20B39w	2.113548	0.317032	6.340644	0.951097	6.340644	0.951097	6.340644	0.951097	21.14	3.17
		20B39v	1.580064	0.23701	4.740192	0.711029	4.740192	0.711029	4.740192	0.711029	15.80	2.37
		20B39y	2.104356	0.315653	1.975068	0.29626	1.975068	0.29626	1.975068	0.29626	7.93	1.19
	Total		**6.495168**	**0.974275**	**16.5755**	**2.486326**	**15.1475**	**2.272126**	**15.1475**	**2.272126**	**53.27**	**7.99**
3	Revolving Fund to SHGs for starting Micro enterprises and enhance the livelihood of Landless people.	20B39ac	2.268	0	2.268	0	1.512	0	1.512	0	7.56	0
		20B39w	4.27	0.00	4.27	0.00	2.84	0.00	2.84	0.00	14.22	0
		20B39v	5.71	0.00	5.71	0.00	3.80	0.00	3.80	0.00	19.02	0
		20B39y	2.14	0.00	2.14	0.00	1.43	0.00	1.43	0.00	7.14	0
	Total		**14.388**	**0**	**14.388**	**0**	**9.582**	**0**	**9.582**	**0**	**47.94**	**0**
	Grant Total		**129.67**	**4.20**	**121.05**	**4.20**	**79.29**	**2.90**	**69.65**	**2.90**	**399.66**	**13.99**

Table 7.8: Action Plan For Malappuram Watershed -20B39ac											
Sl. No.	GRAMA PANCHAYAT	Ward/s	Type of Land (i) Private (ii)Community (iii) Others (pl. specify)	Type of Treatment (i)Ridge area (R) (ii)Drainage line (D) (iii)Land dev. (L)	Category	Sub Category	Name of the Activity	No. of units	Unit(No./ cu.m./ rmt)	Estimated cost (Rs. in lakh)	Month of Execution
2012-2013											
1	Elavanchery	12	**ii**	**ii**	Water Harvesting Structure	Check Dam	Construction of Shutter in njarakkal mada check dam	5	No.	1.00000	**February - May**
2	Elavanchery	12	**ii**	**ii**	Soil Protection	Stream Bank Protection	Side protection of Pokkamada-Elampilavu Thodu	260	M	4.00000	April-May
3	Elavanchery	12	**ii**	**ii**	Water Harvesting Structure	Stream Bank Protection	Side protection of Pokkamada -Kolubu thodu	100	M	4.00000	April-May
4	Elavanchery	12	ii	ii	Water Harvesting Structure	Stream Bank Protection	Ellaneer thode cada canal protection	200	M	0.31284	September-October
5	Elavanchery	12	i	ii	Water Harvesting Structure	Pond Renovation	Desilting and Construction of retaining wall and fixing over flow pipe in Parasseri kozhalode pond	5600	M^2	7.20000	February-May
6	Elavanchery	12	ii	ii	Water Harvesting Structure	Well rennovation	rennovation of kolumbu public well	1	No.	0.60000	April-May
7	Elavanchery	11,12	i	ii	Water Harvesting Structure	Well Recharging	Roof water harvesting and well recharging(open wells and Bore wells)	5	No.	0.93254	August-September
8	Elavanchery	11,12	i	ii	Water Harvesting Structure	Contour Bund	Stone bunds (Contour Bund)	450	M	1.93694	August-December

9	Elavanchery	11,12	i	iii	Water Harvesting Structure	Contour Bund	Protection of earthern bunds (varambu Pothiyal)	300	M	0.15510	October-November
10	Elavanchery	11,12	i	i	Water Harvesting Structure	perculation pits	Rain water harvesting pits	60	M	0.08280	April-may, September-October
										20.22021	
2013-14											
11	Elavanchery	12	ii	ii	Water Harvesting Structure	Check Dam	Construction of retaining wall and check dams in kollapa nellikode thode	1	No.	3.74000	February-May
12	Elavanchery	11,12	i	i	Water Harvesting Structure	Well Recharging	Roof water harvesting and well recharging(open wells and Bore wells)	5	No.	0.93254	August-September
13	Elavanchery	11,12.	i	i	Water Harvesting Structure	Contour Bund	Stone bunds (Contour Bund)	450	M	1.93694	August-December
14	Elavanchery	11,12	i	iii	Water Harvesting Structure	Contour Bund	Protection of earthern bunds (varambu Pothiyal)	300	M	0.15510	October-November
15	Elavanchery	11,12	i	i	Water Harvesting Structure	perculation pits	Rain water harvesting pits	60	M	0.08280	April-may, September-October
										6.84737	
2014-15											
16	Elavanchery	12	ii	ii	Water Harvesting Structure	Stream Bank Protection	Side protection of punnara thode	100	M	3.74000	February-May
17	Elavanchery	12	ii	ii	Water Harvesting Structure	Check Dam	Construction of Adiyana in pokamada-Kolumbu thode (4 no.s)	4	No.	1.00000	February-May
18	Elavanchery	11,12	i	i	Water Harvesting Structure	Well Recharging	Roof water harvesting and well recharging(open wells and Bore wells)	3	No.	0.62169	August-September

19	Elavanchery	11,12	i	i	Water Harvesting Structure	Contour Bund	Stone bunds (Contour Bund)	300	M	1.29129	August-December
20	Elavanchery	11,12	i	iii	Water Harvesting Structure	Contour Bund	Protection of earthern bunds (varambu Pothiyal)	200	M	0.10340	October-November
21	Elavanchery	11,12	i	i	Water Harvesting Structure	perculation pits	Rain water harvesting pits	40	M	0.05520	April-may, September-October
										6.81158	
2015-2016											
22	Elavanchery	12	i	i	Water Harvesting Structure	Pond Renovation	Renovation of Kollumbu pond	9000	M^2	1.50000	February-May
23	Elavanchery	11,12	i	i	Water Harvesting Structure	Well Recharging	Roof water harvesting and well recharging(open wells and Bore wells)	3	No.s	0.62169	August-September
24	Elavanchery	11,12	i	i	Water Harvesting Structure	Contour Bund	Stone bunds (Contour Bund)	300	M	1.29129	August-December
25	Elavanchery	11,12	i	iii	Water Harvesting Structure	Contour Bund	Protection of earthern bunds (varambu Pothiyal)	200	M	0.10340	October-November
26	Elavanchery	11,12	i	i	Water Harvesting Structure	perculation pits	Rain water harvesting pits	40	M	0.05520	April-may, September-October
										3.57158	**37.45074**

Table 7.9: Action Plan For Payyadore Watershed -20B39W											
Sl. No.	GRAMA PANCHAYAT	Ward/s	(i)Community (ii)Drainage line (D) (iii)Others (pl. specify)	(i)Village Cluster (V) (ii)Drainage line (D) (iii)Land dev. (L)	Category	Sub Category	Name of the Activity	No. of units	Unit(No./ cu.m./ rmt)	Estimated cost (Rs. in lakh)	Month of Execution
2012-2013											
1	Elavanchery	14	ii	ii	Water Harvesting Structure	Check Dam	Construction of check dam shutter with lock in kayathamkadu	6	Nos	0.60000	April-May
2	kollangode	7	**i**	**iii**	Water Harvesting Structure	Pond Renovation	Renovation of Thekkinchira kallana	800	M^2	1.00000	**February - May**
3	Elavanchery	11	**i**	**iii**	Water Harvesting Structure	Pond Renovation	Renovation of Adipara Chira	100	M	4.00000	**February - May**
4	Muthalamada	17	**i**	**iii**	Water Harvesting Structure	Pond Renovation	Renovation of Kalliyampara Ana	8000	M^2	3.00000	**February - May**
5	nenmara	6	**i**	**iii**	Water Harvesting Structure	Well Renovation	renovation of Edakkampadam well	1	no	0.55000	**February - May**
6	Nenmara	6	**i**	**iii**	Water Harvesting Structure	Well Renovation	Renovation of well(sundari w\o Thankappan)	1	no	0.55000	**February - May**
7	Nenmara	6	**ii**	**iii**	Water Harvesting Structure	Well Renovation	Public well Chennakalay	1	no	0.50000	**February - May**
8	Nenmara	6	**ii**	**iii**	Water Harvesting Structure	Well Renovation	Public well Chennakalay	1	no	0.50000	**February - May**
9	Kollangode	12	**ii**	**iii**	Water Harvesting Structure	Well renovation	Renovation of Public Well at Maruthi Colony	1	no	0.50000	**February - May**

10	Kollangode	12	**ii**	**iii**	Water Harvesting Structure	Well renovation	Mannampallam Public well rennovation	1	no	0.50000	**February - May**
11	Elavanchery	7	**ii**	**iii**	Water Harvesting Structure	Well renovation	Rennovation of modakode kosakuzhi	1	no	0.50000	**February - May**
12	Elavanchery	7	**ii**	**iii**	Water Harvesting Structure	Well renovation	Rennovation of oochukulam public well	1	no	0.50000	**February - May**
13	Elavanchery	8	**ii**	**iii**	Water Harvesting Structure	Well renovation	Rennovation of nellencheri public well	1	no	0.50000	**February - May**
14	Elavanchery	11	**ii**	**iii**	Water Harvesting Structure	Well renovation	Rennovation of kootalapara public well	1	no	0.50000	**February - May**
15	Elavanchery	9	**ii**	**iii**	Water Harvesting Structure	Well renovation	Rennovation of modankadu public well	1	no	0.50000	**February - May**
16	Elavanchery	9	**ii**	**iii**	Water Harvesting Structure	Well renovation	Rennovation of aandithara public well	1	no	0.50000	**February - May**
17	Elavanchery	14	**ii**	**iii**	Water Harvesting Structure	Well Renovation	Padinjamuri public well rennovation	1	no	0.50000	**February - May**
18	Elavanchery	14	**ii**	**iii**	Water Harvesting Structure	Well Renovation	kayathamkadu public well rennovation	1	no	0.50000	**February - May**
19	Elavanchery	13	**ii**	**iii**	Water Harvesting Structure	Well Renovation	Thunjan college well rennovation	1	no	0.50000	**February - May**
20	Elavanchery	12	**ii**	**iii**	Water Harvesting Structure	Well Renovation	kottayamkadu public well rennovation	1	no	0.50000	**February - May**
21	Elavanchery, kollengode, Nemmara and Muthalamada area.		**i**	**iii**	Water Harvesting Structure	Well Recharging	Roof water harvesting and well recharging(open wells and Bore wells)	31	no	6.21690	**August-September**

22	Kollengode	12	**i**	**iii**	Water Harvesting Structure	Contour Bund	Stone bunds (Contour Bund) maruthi colony area,mannampalam area	800	m	3.45600	**August-December**
23	Elavanchery, kollengode, Nemmara and Muthalamad area.		**i**	**iii**	Water Harvesting Structure	Contour Bund	Protection of earthern bunds (varambu Pothiyal)	950	m	0.46530	**October-November**
24	Elavanchery, kollengode, Nemmara and Muthalamad area.		**i**	**iii**	Water Harvesting Structure	perculation pits	Rain water harvesting pits and Perculation Tanks	500	no	0.62519	**April-May , September-October**
										27.463385	
2013-2014											
25	Muthalamada	17	**ii**	**ii**	Water Harvesting Structure	Check Dam	Formation of 1Check Dams in Palakapandi(Ikshumathi)puzha near Kalyampara	1	No.	3.74000	**February - May**
26	Elavanchery	8	**ii**	**ii**	Soil & Moisture Conservation	Contour Bunding	Protection of Leading Channel to Pookottukulam pond	30	M	1.20000	**August-September**
27	Muthalamada	18	**i**	**iii**	Soil & Moisture Conservation	Contour Bunding	Stone Bunding for preventing Soil Erosion in Muthalamada Area	900	M	3.84400	**August-December**
28	Kollangode	12	**i**	**iii**	Water Harvesting Structure	Pond Renovation	Renovation of Chandrante Kulam	85	M	3.40000	**February - May**
29	Nenmara	6	**i**	**iii**	Water Harvesting Structure	Pond Renovation	Renovation of Pattaramkulam	40	M	1.60000	**February - May**
30	Nenmara	6	**i**	**iii**	Water Harvesting Structure	Pond Renovation	Renovation of edakkampadam pond	30	M	1.33000	**February - May**
31	Muthalamada	17	**i**	**iii**	Water Harvesting Structure	Pond Renovation	Renovation of Neeloori Pottakkulam	3200	M^2	1.50000	**February - May**

32	Muthalamada	17	**i**	**iii**	Water Harvesting Structure	Pond Renovation	renovation of jayadevante Kulam	4200	M^2	1.00000	**February - May**
33	Elavanchery, kollengode, Nemmara and Muthalamad area.		**i**	**iii**	Water Harvesting Structure	Well Recharging	Roof water harvesting and well recharging(open wells and Bore wells)	31	no	6.21690	**August-September**
34	Muthalamada	18	**i**	**iii**	Water Harvesting Structure	Contour Bund	Stone bunds (Contour Bund) parayampalam area	800	m	3.45600	**August-December**
35	Elavanchery, kollengode, Nemmara and Muthalamad area.		**i**	**iii**	Water Harvesting Structure	Contour Bund	Protection of earthern bunds (varambu Pothiyal)	950	m	0.46530	**October-November**
36	Elavanchery, kollengode, Nemmara and Muthalamad area.		**i**	**iii**	Water Harvesting Structure	perculation pits	Rain water harvesting pits and Perculation Tanks	500	no	0.62519	**April-May , September-October**
										28.377385	
2014-2015											
37	kollangode	7	**ii**	**ii**	Water Harvesting Structure	Check Dam	Gully Plugging in Thekkinchira Thodu	3	No.	0.21000	**April-May**
38	kollangode	7	**ii**	**ii**	Water Harvesting Structure	Check Dam	2 Check dams in Thekkinchira Thodu	2	No.	4.00000	**February - May**
39	kollangode	16	**i**	**iii**	Water Harvesting Structure	Dyke	Formation of Dyke at South side of Dharmikulam	60	M	2.70000	**August-October**

40	Elavanchery	9	**i**	**iii**	Water Harvesting Structure	Dyke	Formation of Dyke across Puzhapara Thodu	70	M	3.00000	**August-October**
41	kollangode	7	**ii**	**ii**	Water Harvesting Structure	Stream Bank Protection	Side protection of thekkinchira thode 30 Mtrs after culvert up to proposed check dam	30	M	1.18062	**February - May**
42	Elavanchery, kollengode, Nemmara and Muthalamad area.		**i**	**iii**	Water Harvesting Structure	Well Recharging	Roof water harvesting and well recharging(open wells and Bore wells)	21	nos	4.14460	**August-September**
43	Elavanchery	13	**i**	**iii**	Water Harvesting Structure	Contour Bund	Stone bunds (Contour Bund) kunnu area	500	m	2.15215	**August-December**
44	Elavanchery, kollengode, Nemmara and Muthalamad area.		**i**	**iii**	Water Harvesting Structure	Contour Bund	Protection of earthern bunds (varambu Pothiyal)	600	m	0.31020	**October-November**
45	Elavanchery, kollengode, Nemmara and Muthalamad area.		**i**	**iii**	Water Harvesting Structure	perculation pits	Rain water harvesting pits and Perculation Tanks	350	no	0.41679	**April-May , September-October**
										18.114360	
2015-2016											
46	Elavanchery	14	**ii**	**ii**	Water Harvesting Structure	Check Dam	Construction of Check Dam Near Cherapuram Bridge	1	No.	9.00000	**February - May**

47	Elavanchery	11	**ii**	**ii**	Water Harvesting Structure	Stream Bank Protection	Side protection of Ikshumathi river near Nellikodu Smasanam	167.5	M	6.70000	**February - May**
48	Elavanchery, kollengode, Nemmara and Muthalamad area.		**i**	**iii**	Water Harvesting Structure	Well Recharging	Roof water harvesting and well recharging(open wells and Bore wells)	21	nos	4.14460	**August-September**
49	Elavanchery	14	**i**	**iii**	Water Harvesting Structure	Contour Bund	Stone bunds (Contour Bund) kayathamkadu area	400	m	1.69660	**August-December**
50	Elavanchery, kollengode, Nemmara and Muthalamad area.		**i**	**iii**	Water Harvesting Structure	Contour Bund	Protection of earthern bunds (varambu Pothiyal)	600	m	0.31020	**October-November**
51	Elavanchery, kollengode, Nemmara and Muthalamad area.		**i**	**iii**	Water Harvesting Structure	perculation pits	Rain water harvesting pits and Perculation Tanks	350	nos	0.41679	**April-May , September-October**
										22.268190	**96.22332**

Table 7.10: Action Plan For Payyalloor Watershed -20B39V

Sl. No.	GRAMA PANCHAYAT	Ward/s	Type of Land (i) Private (ii)Community (iii) Others (pl. specify)	Type of Treatment (i)Ridge area (R) (ii)Drainage line (D) (iii)Land dev. (L)	Category	Sub Category	Name of the Activity	No. of units	Unit(No./ cu.m./ rmt)	Estimated cost (Rs. in lakh)	Month of Execution
2012-2013											
1	Elavanchery	**1**	**ii**	**iii**	Land Development (Productive use)	Irrigation	Rennovation of karripayi lift irrigation	1	No.	**2.00000**	December-May
2	Elavanchery	2	ii	**iii**	Land Development (Productive use)	Irrigation	Thootipadam lift irrigation	1	No.	**10.00000**	December-May
3	Kollangode	10	i	**iii**	Water Harvesting Structure	Pond Renovation	Renovation of Paparukulam	75	M	3.00000	February-May
4	Kollangode	13	ii	**iii**	Water Harvesting Structure	Pond Renovation	Renovation of Pulikottukulam-Michabhoomokulam (Side protection)	40	M	1.60000	February-May
5	Kollangode	15	ii	**iii**	Water Harvesting Structure	Well Renovation	Reconstruction of Public well at Ward 15	1	No.	1.00000	February-May
6	Elavanchery	1	ii	**iii**	Water Harvesting Structure	Well Renovation	Melekaripayi well renovation	1	No.	0.50000	February-May
7	Pallassana	11	ii	**iii**	Water Harvesting Structure	Well renovation	Rennovation of muniyalum parambu public well	1	No.	0.50000	February-May
8	Pallassana	11	ii	**iii**	Water Harvesting Structure	Well renovation	Rennovation of thottumkolumbu public well	1	No.	0.50000	February-May

9	Elavanchery	3	ii	**iii**	Water Harvesting Structure	Well Renovation	Pananthurava public well rennovation	1	No.	0.50000	February-May
10	Elavanchery	3	ii	**iii**	Water Harvesting Structure	Well Renovation	chamaparambu public well rennovation	1	No.	0.50000	February-May
11	Elavanchery	6	ii	**iii**	Water Harvesting Structure	Well Renovation	koundathara public well rennovation	1	No.	0.50000	February-May
12	Elavanchery	1	i	**iii**	Water Harvesting Structure	Pond Renovation	Karimkulam side protection	150	M	6.00000	February-May
13	Pallassana	11	ii	**iii**	Water Harvesting Structure	Well Renovation	Renovation of thPublic Well(Desilting) near kosakuzhi pond	1	No.	0.50000	February-May
14	Elavanchery		ii	**ii**	Water Harvesting Structure	Stream Bank Protection	sides protection of varari thodu using retaining walls. (60 m at Elavanchery W-6 and other Damaged Turnings)	60	M	2.40000	February-May
15	Elavanchery	2	ii	**ii**	Water Harvesting Structure	Check dam	construction of check dam shutter in gayathri river	6	No.	0.52800	April-may
16	Elavanchery	6	ii	**ii**	Water Harvesting Structure	Check dam	Construction of Shutter in Valluvanchira Check Dam	2	No.	0.20000	April-may
17	Elavanchery	6	ii	**iii**	Water Harvesting Structure	Pond Renovation	Kallattukolumbu public area(michaboomi)pond protection	50	M	2.00000	February-May
18	Elavanchery	6	**ii**	ii	Water Harvesting Structure	Check dam	construction of check dam in varari thode at Ward 6	1	No.	3.40000	February-May
19	Elavanchery, kollengode, Pallassana.		i	**iii**	Water Harvesting Structure	Well Recharging	Roof water harvesting and well recharging(open wells and Bore wells)	21	No.	4.14460	August-September
20	Elavanchery & Kollangodu	6 15	i	**iii**	Water Harvesting Structure	Contour Bund	Stone bunds (Contour Bund) manjappara area, mannathikolumbu area and PKM UP school land.	600	m	2.58258	August-December

21	Elavanchery, kollengode, Pallassana.		i	**iii**	Water Harvesting Structure	Contour Bund	Protection of earthern bunds (varambu Pothiyal)	2200	m	1.08570	October-November
22	Elavanchery, kollengode, Pallassana.		i	**iii**	Water Harvesting Structure	perculation pits	Rain water harvesting pits and Perculation Tanks	650	no	0.83358	April-may, September-October
23	Elavanchery	2	ii	**iii**	Water Harvesting Structure	Pond Renovation	side protection of kulappulipadam padinjarekulam	100	m	4.00000	February-May
24	Elavanchery	2	ii	**iii**	Water Harvesting Structure	Check dam	maintanance of check dam in vararithode near poonthurapadam	1	no	0.80000	April-may
25	Elavanchery	4			Water Harvesting Structure	well construction	construction of new open well in vattekkad school	1	no	2.65000	February-May
										51.724460	
2013-2014											
26	Kollangode		ii	**ii**	Water Harvesting Structure	Stream Bank Protection	sides protection of varari thodu using retaining walls. (150 m at joining Maripadam thodu)	150	M	6.90051	February-May
27	Pallassana	11	i	**iii**	Water Harvesting Structure	Pond Renovation	narichikolambu Chira Renovation (1M depth)	3000	M^2	4.20000	February-May
28	Kollangode	12	i	**iii**	Water Harvesting Structure	Pond Renovation	Renovation of Konganchathi kulam	65	M	2.60000	February-May
29	Kollangode	17	ii	**iii**	Water Harvesting Structure	Pond Renovation	Renovation of Varanattu Eri - Public Pond	80	M	3.20000	February-May
30	Kollangode	16	i	**iii**	Water Harvesting Structure	Pond Renovation	Thayamkulam pond side protection	80	M	3.20000	February-May
31	Elavanchery, kollengode, Pallassana.		i	**iii**	Water Harvesting Structure	Well Recharging	Roof water harvesting and well recharging(open wells and Bore wells)	21	no	4.14460	August-September

32	Kollengode	9	i	**iii**	Water Harvesting Structure	Contour Bund	Stone bunds (Contour Bund) viruthi area	600	m	2.58258	August-December
33	Elavanchery, kollengode, Pallassana.		i	**iii**	Water Harvesting Structure	Contour Bund	Protection of earthern bunds (varambu Pothiyal)	2100	m	1.08570	October-November
34	Elavanchery, kollengode, Pallassana.		i	**iii**	Water Harvesting Structure	perculation pits	Rain water harvesting pits and Perculation Tanks	700	no	0.83358	April-may, September-October
										28.746970	
2014-2015											
35	Elavanchery	3	i	**iii**	Water Harvesting Structure	Pond Renovation	Side protection of panamthurava pottakulm	75	M	3.00000	February-May
36	Elavanchery	6	i	**iii**	Water Harvesting Structure	Pond Renovation	Manjapara pond Side protection	45	M	1.80000	February-May
37	Elavanchery	4	i	**iii**	Water Harvesting Structure	Pond Renovation	Tharakulam side protection	90	M	3.60000	February-May
38	Elavanchery	5	i	**iii**	Water Harvesting Structure	Pond Renovation	Mannathupara Anganwadi Kulam side protection	35	M	1.40000	February-May
39	Kollangode	15	i	**iii**	Water Harvesting Structure	Pond Renovation	renovation of Vilanganpadam Chira	110	M	4.40000	February-May
40	Kollangode	13	i	**iii**	Water Harvesting Structure	Pond Renovation	Renovation of Poricholam Kulam	60	M	2.40000	February-May
41	Elavanchery, kollengode, Pallassana.		i	**iii**	Water Harvesting Structure	Well Recharging	Roof water harvesting and well recharging(open wells and Bore wells)	21	no	4.14460	August-September
42	Elavanchery	3	i	**iii**	Water Harvesting Structure	Contour Bund	Stone bunds (Contour Bund) pananthurava area	400	m	1.72172	August-December

43	Elavanchery, kollengode, Pallassana.		i	iii	Water Harvesting Structure	Contour Bund	Protection of earthern bunds (varambu Pothiyal)	1500	m	0.72380	October-November
44	Elavanchery, kollengode, Pallassana.		i	iii	Water Harvesting Structure	perculation pits	Rain water harvesting pits and Perculation Tanks	465	no	0.55572	April-may, September-October
										23.745840	
2015-2016											
45	Elavanchery	2,4	ii	ii	Water Harvesting Structure	Check dam	construction of check dam in varari thode between Ward 2&4	1	**No.**	**2.50000**	February-May
46	Kollangode	15	i	ii	Soil & Moisture Conservation	Countour Bunding	work for preventing soilerosion near Gramakulam	60	M	2.40000	December-February
47	Elavanchery	10	i	iii	Water Harvesting Structure	Pond Renovation	Renovation Pond near Telephone Exchange	100	M	4.00000	February-May
48	Elavanchery, kollengode, Pallassana.		i	iii	Water Harvesting Structure	Well Recharging	Roof water harvesting and well recharging(open wells and Bore wells)	21	no	4.14460	August-September
49	Pallassana	11	i	iii	Water Harvesting Structure	Contour Bund	Stone bunds (Contour Bund) Thottumkolumbu area	400	m	1.72172	August-December
50	Elavanchery, kollengode, Pallassana.		i	iii	Water Harvesting Structure	Contour Bund	Protection of earthern bunds (varambu Pothiyal)	1400	m	0.72380	October-November
51	Elavanchery, kollengode, Pallassana.		i	iii	Water Harvesting Structure	perculation pits	Rain water harvesting pits and Perculation Tanks	500	no	0.55572	April-may, September-October
										16.045840	**120.263110**

Table 7.11: Action Plan For Vengappara Watershed -20B39y											
Sl. No.	GRAMA PANCHAYAT	Ward/s	Type of Land (i)Private (ii)Community (iii)Others (pl. specify)	Type of Treatment (i)Ridge area (R) (ii)Drainage line (D) (iii)Land dev. (L)	Category	Sub Category	Name of the Activity	No. of units	Unit(No./ cu.m./ rmt)	Estimated cost (Rs. in lakh)	Month of Execution
2012-2013											
1	Kollangode	9	ii	ii	Water Harvesting Structure	Check dam	2 Check Dams at Mathur Thodu and its tributaries	2	Nos	7.48000	**February-May**
2	Kollangode	9	ii	ii	Water Harvesting Structure	Check dam	Adiyana at tributary of Mathur thodu	1	Nos	0.55000	**February-May**
3	Kollangode	9	ii	ii	Water Harvesting Structure	Stream Bank Protection	Side protection of Mathur thode	100	M	**3.12840**	**February-May**
4	Kollangode	9	ii	i	Water Harvesting Structure	Ground Water recharge structure	Rennovation of thamarapadam well	1	No	0.50000	**August-September**
5	Kollangode	9	ii	i	Water Harvesting Structure	Ground Water recharge structure	Recharge Mathur Well	1	No	0.20723	**August-September**
6	Nelliyampathy	2	ii	iii	Water Harvesting Structure		Distribution of Water Harvesting Tank at Neglliyampathy	8	Nos.	2	**August-September**
7	Kollangode	9	i	i	Water Harvesting Structure	Well Recharging	Roof water harvesting and well recharging(open wells and Bore wells)	8	No.s	1.63150	**August-September**

8	Kollangode	9	**i**	**i**	Water Harvesting Structure	Contour Bund	Stone bunds (Contour Bund)	450	M	1.93694	**August-December**
9	Kollangode	9	**i**	**iii**	Water Harvesting Structure	Contour Bund	Protection of earthern bunds (varambu Pothiyal)	450	M	0.23265	**October-November**
10	Kollangode	9	**i**	**i**	Water Harvesting Structure	perculation pits	Rain water harvesting pits	600	M	0.83358	**April-may, September-October**
										18.500295	
2013-2014											
11	Kollangode	9	**ii**	**ii**	Water Harvesting Structure	Check dam	3Check Dams at Mathur Thodu and its tributaries	3	Nos	11.22000	**February-May**
12	Kollangode	9	**i**	**i**	Water Harvesting Structure	Well Recharging	Roof water harvesting and well recharging(open wells and Bore wells)	9	No.s	1.78525	**August-September**
13	Kollangode	9	**i**	**i**	Water Harvesting Structure	Contour Bund	Stone bunds (Contour Bund)	450	M	1.93694	**August-December**
14	Kollangode	9	**i**	**iii**	Water Harvesting Structure	Contour Bund	Protection of earthern bunds (varambu Pothiyal)	450	M	0.23265	**October-November**
15	Kollangode	9	**i**	**i**	Water Harvesting Structure	perculation pits	Rain water harvesting pits	600	M	0.83358	**April-may, September-October**
										16.008415	
2014-2015											
16	Kollangode	9	**i**	**i**	Water Harvesting Structure	Pond Renovation	Mathur Pond Renovation	1700	M^2	3.25870	**February-May**
17	Kollangode	9	**i**	**i**	Water Harvesting Structure	Ground Water recharge structure	Desilting of Irrigation well near mathur pond	1	No	0.15000	**April-may,**

18	Kollangode	9	**i**	**i**	Water Harvesting Structure	Well Recharging	Roof water harvesting and well recharging(open wells and Bore wells)	6	No.s	1.22100	**August-September**
19	Kollangode	9	**i**	**i**	Water Harvesting Structure	Contour Bund	Stone bunds (Contour Bund)	300	M	1.29129	**August-December**
20	Kollangode	9	**i**	**iii**	Water Harvesting Structure	Contour Bund	Protection of earthern bunds (varambu Pothiyal)	300	M	0.15510	**October-November**
21	Kollangode	9	**i**	**i**	Water Harvesting Structure	perculation pits	Rain water harvesting pits	400	M	0.55572	**April-may, September-October**
										6.631810	
2015-2016											
22	Kollangode	9	**i**	**i**	Water Harvesting Structure	Well Recharging	Roof water harvesting and well recharging(open wells and Bore wells)	6	No.s	1.22100	**August-September**
23	Kollangode	9	**i**	**i**	Water Harvesting Structure	Contour Bund	Stone bunds (Contour Bund)	300	M	1.29129	**August-December**
24	Kollangode	9	**i**	**iii**	Water Harvesting Stru..	Contour Bund	Protection of earthern bunds (varambu Pothiyal)	300	M	0.15510	**October-November**
25	Kollangode	9	**i**	**i**	Water Harvesting Structure	perculation pits	Rain water harvesting pits	400	M	0.55572	**April-may, September-October**
										3.223110	**44.36363**

Plan for Production System and Micro Enterprises

Table 7.12: Malappuram Watershed (20B39ac)

Sl. No.	Activity	2012-2013	2013-2014	2014-2015	2015-2016	Total	Expecting WDF
1	Nursery Formation		1.428			1.428	
2	Horticulture development (Distributing seeds of pea, horse gram etc.and irrigation facilities)	0.118	0.3528	0.353	0.353	1.176	0.118
3	Bio Fertilizer and pesticides manufacturing unit	0.118	0.3528	0.353	0.353	1.176	0.118
4	Distribution of daincha seeds	0.084	0.252	0.252	0.252	0.84	0.084
5	Distribution of Jathi(Nutmeg)and mango seedlings	0.076	0.2268	0.227	0.227	0.756	0.076
6	Fodder grass cultivation	0.067	0.2016	0.202	0.202	0.672	0.067
7	Formation of Compost /Biogas Plant for the production of organic manure and bio-gas	0.067	0.2016	0.202	0.202	0.672	0.067
8	Cattle farm(cow, goat, rabbit etc.)	0.084	0.252	0.252	0.252	0.84	0.084
9	Poultry farm	0.084	0.252	0.252	0.252	0.84	0.084
	Total	**0.697**	**3.5196**	**2.092**	**2.092**	**8.4**	**0.697**

Table 7.13: Payallur Watershed (20B39v)

Sl. No.	Activity	2012-2013	2013-2014	2014-2015	2015-2016	Total	Expecting WDF
1	Nursery Formation	0	0	0	0	0	0
2	Horticulture development (Distributing seeds of pea, horsegram etc.and irrigation facilities)	0.221	0.664	0.664	0.664	2.212	0.221
3	Bio Fertilizer and pestisides manufacturing unit	0.221	0.664	0.664	0.664	2.212	0.221
4	Distribution of Dhaincha seeds	0.158	0.474	0.474	0.474	1.58	0.158
5	Distribution of Jathi (Nutmeg)and mango seedlings	0.142	0.427	0.427	0.427	1.422	0.142
6	Fodder grass cultivation	0.158	0.474	0.474	0.474	1.58	0.158
7	Formation of Compost /Biogas Plant for the production of organic manure and bio-gas	0.158	0.474	0.474	0.474	1.58	0.158
8	Cattle farm(cow, goat, rabbit etc.)	0.316	0.948	0.948	0.948	3.16	0.316
9	Poultry farm	0.205	0.616	0.616	0.616	2.054	0.205
	Total	**1.58**	**4.74**	**4.74**	**4.74**	**15.8**	**1.58**

Table 7.14: Payadore Watershed (20B39w)

Sl. No.	Activity	2012-2013	2013-2014	2014-2015	2015-2016	Total	Expecting WDF
1	Nursery Formation	0	0	0	0	0	0
2	Horticulture development (Distributing seeds of pea, horsegram etc.and irrigation facilities)	0.296	0.888	0.888	0.888	2.959	0.296
3	Bio Fertilizer and pestisides manufacturing unit	0.296	0.888	0.888	0.888	2.959	0.296
4	Distribution of daincha seeds	0.211	0.634	0.634	0.634	2.114	0.211
5	Distribution of Jathi(Nutmeg)and mango seedlings	0.19	0.571	0.571	0.571	1.902	0.19
6	Fodder grass cultivation	0.211	0.634	0.634	0.634	2.114	0.211
7	Formation of Compost /Biogas Plant for the production of organic manure and bio-gas	0.211	0.634	0.634	0.634	2.114	0.211
8	Cattle farm(cow, goat, rabbit etc.)	0.423	1.268	1.268	1.268	4.227	0.423
9	Poultry farm	0.275	0.824	0.824	0.824	2.748	0.275
	Total	**2.114**	**6.341**	**6.341**	**6.341**	**21.14**	**2.114**

Table 7.15: Vengappara Watershed (20B39y)

Sl. No.	Activity	2012-2013	2013-2014	2014-2015	2015-2016	Total	Expecting WDF
1	Nursery Formation	1.446	0	0	0	1.348	1.446
2	Horticulture development (Distributing seeds of pea, horsegram etc.and irrigation facilities)	0.111	0.333	0.333	0.333	1.11	0.111
3	Bio Fertilizer and pesticides manufacturing unit	0.111	0.333	0.333	0.333	1.11	0.111
4	Distribution of daincha seeds	0.079	0.238	0.238	0.238	0.793	0.079
5	Distribution of Jathi(Nutmeg)and mango seedlings	0.071	0.214	0.214	0.214	0.714	0.071
6	Fodder grass cultivation	0.063	0.19	0.19	0.19	0.635	0.063
7	Formation of Compost /Biogas Plant for the production of organic manure and bio-gas	0.063	0.19	0.19	0.19	0.635	0.063
8	Cattle farm (cow, goat, rabbit etc.)	0.079	0.238	0.238	0.238	0.793	0.079
9	Poultry farm	0.079	0.238	0.238	0.238	0.793	0.079
	Total	**2.104**	**1.975**	**1.975**	**1.975**	**7.932**	**2.104**

Livelihood Action Plan

The activities proposed under the livelihood action plan below are meant for improving livelihood of the poor and marginalized people in the project area. It is proposed to earmark 9 percent of the total allotted amount for the activities under this plan. Major portion of this component is suggested to give to the SHGs working in the project area as revolving funds for improving their livelihood improvement/income generation activities. Out of the total 407 SHGs in the project area, 190 will be given revolving funds of Rs.25, 000/- per SHG during the project period. The beneficiary SHGs will be selected mainly on the basis of criteria currently used to rate the SHGs. If any change in the criteria is required with regard to the selection of beneficiary SHGs, same will be decided at the time of selection considering the suitable factors and according to State level policies.

Table 7.16: Distribution of Seed money under livelihood plan

20B39ac

			2013-14		2014-15		2015-16		2016-17		Total	
Sl No.	**Livelihood Activity**	Unit Cost	Physical	Financial	Physical	Financial	Physical	Financial	Physical	Financial	Physical	Financial
1	Unit of eco-friendly products (paper cary bags, plates, cloth bags etc.)	**12500**	2	25000	1	12500		0		0	3	37500
2	Lease farming	17400		0	1	17400		0		0	1	17400
4	Tailoring units	157000		0		0		0		0	0	0
5	Vegetable retail shops	25000		0		0		0		0	0	0
6	Cattle rearing /2Nos	14000		0		0		0	0	0	0	0
7	Poultry/ 10 Nos	20500	1	20500	2	41000	1	20500		0	4	82000
8	Goat / 2 Nos	3000	2	6000		0	1	3000	1	4100	4	13100
9	Food Processing Unit	23000		0		0		0		0	0	0
			5	51500	4	70900	2	23500	1	4100	12	150000

20B39w

			2013-14		2014-15		2015-16		2016-17		Total	
Sl No.	**Livelihood Activity**	Unit Cost	Physical	Financial	Physical	Financial	Physical	Financial	Physical	Financial	Physical	Financial
1	Unit of eco-friendly products (paper cary bags, plates, cloth bags etc.)	**12500**	5	62500	2	25000	2	25000	1	12500	10	125000
2	Lease farming	17400	1	17400	2	34800	2	34800	2	34800	7	121800
4	Tailoring units	157000	1	157000	1	157000	1	157000	1	157000	4	628000
5	Vegetable retail shops	25000	1	25000		0		0	1	25000	2	50000
6	Cattle rearing /2Nos	14000	2	28000	2	28000	2	28000	0	0	6	84000
7	Poultry/ 10 Nos	20500	1	20500	1	20500	1	20500	0	0	3	61500
8	Goat / 2 Nos	3000	5	15000	5	15000	0	0	1	1700	11	31700
9	Food Processing Unit	23000	1	23000		0		0		0	1	23000
			17	348400	13	280300	8	265300	6	231000	44	1125000

20B39v

			2013-14		2014-15		2015-16		2016-17		Total	
Sl No.	**Livelihood Activity**	Unit Cost	Physical	Financial	Physical	Financial	Physical	Financial	Physical	Financial	Physical	Financial
1	Unit of eco-friendly products (paper cary bags, plates, cloth bags etc.)	**12500**	10	125000	6	75000	5	62500	5	62500	26	325000
2	Lease farming	17400	5	87000	5	87000	5	87000	5	87000	20	348000
4	Tailoring units	157000	1	157000		0		0	1	157000	2	314000
5	Vegetable retail shops	25000	1	25000	1	25000	1	25000	1	25000	4	100000

6	Cattle rearing /2Nos	14000	3	42000	3	42000	3	42000	3	42000	12	168000
7	Poultry/ 10 Nos	20500	1	20500	1	20500	1	20500	1	20500	4	82000
8	Goat / 2 Nos	3000	5	15000	5	15000	3	9000	3	9000	16	48000
9	Food Processing Unit	23000	1	23000	1	23000	1	23000	2	46000	5	115000
			27	494500	22	287500	19	269000	21	449000	89	1500000

20B39y

			2013-14		**2014-15**		**2015-16**		**2016-17**		**Total**	
Sl No.	**Livelihood Activity**	Unit Cost	Physical	Financial	Physical	Financial	Physical	Financial	Physical	Financial	Physical	Financial
1	Unit of eco-friendly products (paper cary bags, plates, cloth bags etc.)	**12500**	3	37500	3	37500	2	25000	2	25000	10	125000
2	Lease farming	17400	2	34800	1	17400	1	17400	0	0	4	69600
4	Tailoring units	157000	0	0	1	157000		0	0	0	1	157000
5	Vegetable retail shops	25000	1	25000		0	1	25000		0	2	50000
6	Cattle rearing /2Nos	14000	1	14000	0	0	1	14000	1	14000	3	42000
7	Poultry/ 10 Nos	20500	1	20500	1	20500	1	20500		0	3	61500
8	Goat / 2 Nos	3000	4	12000	4	12000	3	9000	2	15900	13	48900
9	Food Processing Unit	23000	1	23000		0	1	23000		0	2	46000
			13	166800	10	244400	10	133900	5	54900	38	600000

Table 7.17: Distribution of money for JLG/SHG Federations under Livelihood PIllan

	20B39ac															
				2013-14			2014-15			2015-16			2016-17			
Sl No.		Unit Cost	No. of Units	Grant from IWMP	From Loan	Beneficiary Contribution	Grant from IWMP	From Loan	Beneficiary Contribution	Grant from IWMP	From Loan	Beneficiary Contribution	Grant from IWMP	From Loan	Beneficiary Contribution	Total
1	Nutritional food production units for SHG federation	220000	0	0			0			0			0			0
2	Eco Friedly Products Manufacturing Unit	364000	1	182000	145600	36400	18200			0			0			200200
			1													200200
	20B39w															
				2013-14			2014-15			2015-16			2016-17			
Sl No.		Unit Cost	No. of Units	Grant from IWMP	From Loan	Beneficiary Contribution	Grant from IWMP	From Loan	Beneficiary Contribution	Grant from IWMP	From Loan	Beneficiary Contribution	Grant from IWMP	From Loan	Beneficiary Contribution	Total
1	Nutritional food production units for SHG federation	220000	2	110000	88000	22000				110000	88000	22000				220000

2	Eco Friedly Products Manufacturing Unit	364000	1	182000	145600	36400							0			182000
3	Eco Friedly Products Manufacturing Unit (Small)	136898	1							0			68449	54759.2	13689.8	68449
			4													470449
	20B39v															
				2013-14			2014-15			2015-16			2016-17			Total
Sl No.		Unit Cost	No. of Units	Grant from IWMP	From Loan	Beneficiary Contribution	Grant from IWMP	From Loan	Beneficiary Contribution	Grant from IWMP	From Loan	Beneficiary Contribution	Grant from IWMP	From Loan	Beneficiary Contribution	
1	Nutritional food production units for SHG federation	220000	0	0			0			0			0			0
2	Eco Friedly Products Manufacturing Unit	364000	3	0			182000	145600	36400	182000	145600	36400	182000	145600	36400	546000
			3													546000

	20B39y															
				2013-14			2014-15			2015-16			2016-17			
Sl No.		Unit Cost	No. of Units	Grant from IWMP	From Loan	Beneficiary Contribution	Grant from IWMP	From Loan	Beneficiary Contribution	Grant from IWMP	From Loan	Beneficiary Contribution	Grant from IWMP	From Loan	Beneficiary Contribution	Total
1	Nutritional food production units for SHG federation	220000		0			0			0			0			0
2	Eco Friedly Products Manufacturing Unit	364000	1				182000	145600	36400	0			0			182000
2	Eco Friedly Products Manufacturing Unit (Small)	87950	1							43975	35180	8795				43975
			2													225975

Table 7.18: Scope of Convergence

Sl. No.	Type of intervention	Department/Schemes which can be converged with IWMP
1.	Renovation of Pond	1. MGNREGA
2.	Varambu Pothiyal and Contour Bund	1. MGNREGA
	Rain water harvesting Pit	1. MGNREGA
3.	Afforestration	1. MGNREGA 2. LSGI 3. Department of Social Forestry
4.	Horticulture	1. Department of Agriculture 2. MGNREGA 3. LSGI
5.	Dairy development	1. Department of Dairy development 2. LSGI
6.	Waste Management Activities	1. Total Sanitation Campaign 2. Nirmal Bharat Abhiyan 3. NRHM 4. LSGI
7.	Exposure Visit	1. ATHMA

Works to be converged with MGNREGS

Table 7.19: Details of works to be converged between iwmp & mgnregs

Nenmmara block panchayat

PAYALLUR WATER SHED (20B39V)

SL NO	PANCHAYAT	WARD	NAME OF WORK	EXPECTED MONTH & YEAR OF EXECUTION UNDER-IWMP
1	Elavanchery	3	Deepening of chulliyar sub canal from vattekad thoombana to panamthurava	
2	Elavanchery	5	Rennovation of perrumkulam (publicpond)and side protection by planting bamboos on the bunds	
3	Elavanchery	6	Kallattukolumbu public area(michaboomi)pond protection *	2014-15 FEBRUARY-MAY
4	Elavanchery	3	Side protection of panamthurava pottakulam*	2015-16 FEBRUARY-MAY
5	Elavanchery	3	Pandamkode irrappikal chira protection	
6	Elavanchery	5	Illathu padam pond side protection	
7	Elavanchery	6	Manjapara pond rennovation *	2015-16 FEBRUARY-MAY
8	Elavanchery	1	Karimkulam side protection*	2013-14 FEBRUARY-MAY
9	Elavanchery	4	Nedunganamkode pond side protection	
10	Elavanchery	4	Tharakulam side protection *	2015-16 FEBRUARY-MAY
11	Elavanchery	5	Naduvanthoni pond side protection	
12	Elavanchery	2	Poonthurapadam vararipond side protection	
13	Elavanchery	4	Panandhara pond side protection	
14	Elavanchery	4	Karadimooli kulam side	
15	Elavanchery	3	Thoombana pond side protection	
16	Elavanchery	5	Mannathuparapotta (anganvadikulam) side protection *	2015-16 FEBRUARY-MAY
17	Elavanchery	3	Kollampotta yasodas pond side protection	
18	Elavanchery	6	Kallu pond (kallukulam) side protection	
19	Elavanchery	10	Rennovation of pond near telephone exchange*	2016-17 FEBRUARY-MAY

20	Elavanchery	6	Thayamkulam pond side protection	
21	Elavanchery	6,4,2,5	Side protection of varari thode by planting bamboos on the bunds	
22	Elavanchery	3,2,1	Side protection of gayathri river by planting bamboos on river bank	
23	Pallassana	11	Side protection of gayathri river by planting bamboos on river bank	
24	whole IWMP project area of elavanchery & pallassana panchayats		Thenginu thadamedukal	
25			Rain water harvesting pits	
26			Protection of earthern bunds(varambu pothiyal)	
27			Mulching for mango trees	
28			bio-fencing	

PAYADDORE WATER SHED (20B39W)

SL NO	PANCHAYATH	WARD	NAME OF WORK	EXPECTED MONTH & YEAR OF EXECUTION UNDER-IWMP
1	Elavanchery	13,1	Maintanance work of chulliyar lb canal up to tail end	
2	Elavanchery	12	Side protection of sankaramkudam temple pond	
3	Elavanchery	9	Side protection of aale pond	
4	Elavanchery	7	Panangatiri aalam pond side protection	
5	Elavanchery	11	Aanditharakadu sankam kulam side protection	
6	Elavanchery	11	Renovation of Adiparachira *	2013-14 FEBRUARY-MAY
7	Elavanchery	7,8,9,11, 12,13,14	Protection of ikshumathi river from chooralkadavu to kumbalakode by planting bamboos on river bank	
	Nemmara	6	Renovation of Pattaramkulam	2014-15 FEBRUARY-MAY
	Nemmara	6	renovation of choppankuzhi pond	
	Nemmara	6	Renovation of edakkampadam pond	2014-15 FEBRUARY-MAY
8	whole IWMP project area of elavanchery & nenmmara panchayats		Thenginu thadamedukal	
9			Rain water harvesting pits	
10			Protection of earthern bunds(varambu pothiyal)	
11			Mulching for mango trees	
12			bio-fencing	

MALAPPURAM WATER SHED (20B39ac)

SL NO	PANCHAYATH	WARD	NAME OF WORK	EXPECTED MONTH & YEAR OF EXECUTION UNDER-IWMP
1	Elavanchery	11	Vallavadikuzhi deepening	
2	Elavanchery	12	Punnara pond deepening	
3	Elavanchery	12	Kuttan pond deepening	
4	Elavanchery	12	Kollumbu pond deepening*	2016-17 FEBRUARY-MAY
5	Elavanchery	11	Challapotta public pond rennovation	
6	whole IWMP project area of elavanchery & pallassana panchayats		Thenginu thadamedukal	
7			Rain water harvesting pits	
8			Protection of earthern bunds(varambu pothiyal)	
9			Mulching for mango trees	
10			bio-fencing	
* This work is integrating with IWMP Project. Non-stared works to be iplemented total under MGNREGS				

Table 7.20: Details of works to be converged between iwmp & mgnregs

KOLLENGODE BLOCK PANCHAYAT

PAYALLUR WATER SHED (20B39V)

Sl. No.	GP	Ward/s	Name of the Activity	EXPECTED MONTH & YEAR OF EXECUTION UNDER-IWMP
1	kollengode	12	Renovation of arayakulam	
2	kollengode	15	Renovation of Kulachuvadu Kulam	
3	kollengode	15	Renovation of Maripadam Kulam	
4	kollengode	15	renovation of Vilanganpadam Chira*	2014-15 February-may
5	kollengode	15	renovation of chakrattu kolumbu thekke potta	
6	kollengode	18	Renovation of Churikkattukulam	
7	kollengode	15	Renovation of Cheerani potta	
8	kollengode	15	renovation of chakrattu kolumbu Vadakke potta	
9	kollengode	15	renovation of chakrattu kolumbu Naduvilmuri	
10	kollengode	14	Renovation of Panankavu kulam	
11	kollengode	14	Renovation of Velanpottakulam	
12	kollengode	10	Renovation of Paparukulam*	2013-14 February-

				may
13	kollengode	13	Renovation of Pulikottukulam-Michabhoomokulam *	2013-14 February-may
14	kollengode	10	Renovation of Peechampadamkulam	
15	kollengode	11	Renovation of Ambattukulam	
16	kollengode	13	Renovation of Thachamakkukulam	
17	kollengode	13	Renovation of Poricholam Kulam*	2014-15 February-may
18	kollengode	12	Renovation of Parassery Kulam	
19	kollengode	12	Renovation of Navunjikulam	
20	kollengode	13	Renovation of Pothanchira kulam	
21	kollengode	12	Renovation of Konganchathi kulam*	2014-15 February-may
22	kollengode	12	Renovation of Pedamuri kulam	
23	kollengode	15	Renovation of Cheerani kulam	
24	kollengode	17	Renovation of Mangattu eri	
25	kollengode	17	Renovation of Varanattu Eri - Public Pond*	2014-15 February-may
26	kollengode	17	Renovation of Mannamkulam Pond	
27	kollengode	17	Renovation of Kovilakom Mathakkodu kulam	
28	kollengode	18	Renovation of Onarkottu Kulam	
29	kollengode	16	Thayamkulam pond side protection*	2014-15 February-may
30	whole IWMP project area of Kollangode panchayat		Thenginu thadamedukal	
31			Rain water harvesting pits	
32			Protection of earthern bunds(varambu pothiyal)	
33			Mulching for mango trees	
34			bio-fencing	

PAYADDORE WATER SHED (20B39W)

Sl. No.	GP	Ward/s	Name of the Activity	EXPECTED MONTH & YEAR OF EXECUTION UNDER-IWMP
1	kollangode	7	Bund Strengthening of Thekkinchira Thodu	
2	Muthalamada	18	Side Protection of parayampallom SC Colony	

3	Kollangode	12	Soil protection work near Mannampallam public well area	
4	kollangode	7	Renovation of Thekkinchira kallana*	2013-14 February-may
5	kollangode	7	Renovation of Thekkinchira kulam	
6	kollangode	7	Renovation of Thekkinchira vadakke kulam	
7	Kollangode	16	Renovation of Dharmi kulam	
8	Kollangode	12	Renovation of Chandrante Kulam*	2013-14 February-may
9	Kollangode	12	Renovation of Sedumadhavante kulam	
10	Muthalamada	17	Renovation of Neeloori Pottakkulam*	2013-14 February-may
11	Muthalamada	17	Renovation of Poola Eri	
12	Muthalamada	17	Renovation of Panayeri kulam	
13	Muthalamada	17	Renovation of Kalliyampara Ana*	2013-14 February-may
14	Muthalamada	17	renovation of jayadevante Kulam*	2013-14 February-may
15	Muthalamada	17	Renovation of Elanthikkal Eri	
16	Muthalamada	17	Renovation of Karatteri Michabhoomi Kulam	
17	whole IWMP project area of Kollangode panchayat		Thenginu thadamedukal	
18			Rain water harvesting pits	
19			Protection of earthern bunds(varambu pothiyal)	
20			Mulching for mango trees	
21			bio-fencing	

VENGAPPARA WATER SHED (20B39Y)

Sl. No.	GP	Ward/s	Name of the Activity	EXPECTED MONTH & YEAR OF EXECUTION UNDER-IWMP
1	kollengode	9	Side protection of Mathur thode by by planting bamboos on the bunds *	2013-14 February-may
2	kollengode	9	Thenginu thadamedukal	

3	kollengode	9	Rain water harvesting pits	
4	kollengode	9	Protection of earthern bunds(varambu pothiyal)	
5	kollengode	9	Mulching for mango trees	
6	kollengode	9	bio-fencing	
* This work is integrating with IWMP Project. Non-stared works to be iplemented total under MGNREGS				

Table 7.21: Additional Works needed for the project area management.

MALAPPURAM WATER SHED			
SL NO	**NAME OF WORK**	**PANCHAYATH**	**WARD**
1	Construction of retaining wall and check dams in kollapa nellikode thode	Elavanchery	11
2	Construction of retaining wall and check dams in punnara thode	Elavanchery	11
3	Construction of masonry wall in annapara, oomanadi thodes	Elavanchery	11,8
4	Solar fencing in minnukkasseri forest boundary	Elavanchery	12

PAYALLUR WATER SHED			
SL NO	**NAME OF WORK**	**PANCHAYATH**	**WARD**
1	deepening of chulliyar sub canal from vattekad thoombana to panamthurava	Elavanchery	3
2	pananthurava thootipadam cada canal rennovation	Elavanchery	2
3	construction of over bridge across varari thode in valuvanchira	Elavanchery	6
4	Check dam across gayathripuzha and a lift irrigation project in pallassana GP		
5	construction of over bridge across chulliyar sub canal in pananthurava	Elavanchery	3

PAYADDORE WATER SHED			
SL NO	**NAME OF WORK**	**PANCHAYATH**	**WARD**
1	Fixing solar pannel (lamps) in public places	Muthalamada	18

2	Construction of retaining wall in side of palakapandi river, paathipara river,kalliyapara river.	Muthalamada, kollengode	
3	Maintanance work of chulliyar lb canal up to tail end	Elavanchery, nenmmara	
4	Panangatiri chooral kadavu check dam repair work(reconstruction of side wall)	Elavanchery	8
5	Edaykampadam lift irrigation and canal rennovation	Nenmmara	6
6	Check dam near apparus motor shed across ikshumathi river	kollengode	12
7	Check dam near chandrans motor shed across ikshumathi river	kollengode	12
8	Construction of check dams in njarakkal mada,adipara water streams(thodes)	Elavanchery	11,12

CHAPTER VIII
EXPECTED OUTCOMES

8.1 Expected Outcomes

The expected outcomes of the IWMP project are shown in Table 8.1.

Table 8.1: Expected outcomes

Sl. No	Activity	Target Group	Pre project period status	Post project period status
1	Construction/ repair of check dams	Farmers	• Inadequate water conservation measures • Lack of adequate irrigation facility	• Water conservation • Use of irrigation facility for paddy, plantations, horticulture
2	Renovation of irrigation canals	Farmers	• Irrigation canals are damaged	• Smoothen water flow • Expansion of area irrigated • Production enhancement
3	Construction of dykes	Watershed community	• Lack of adequate soil and water conservation measures	• Rain water conservation • Sufficient water availability
4	Management of water resources	Watershed community	• Water resources are polluted	• Water availability in summer seasons • Better irrigation facility
5	Construction of bunds	Watershed community	• Sloppy areas not treated properly • Soil erosion problem	• Prevention of soil erosion • Rise in ground water

			• Low water table	level
6	Livelihood activities	Poor people (landless or asset less)	• 40 per cent of families live below poverty line.	• 34 SHGs will get aid for strengthening their livelihood activities in every year. • Generate employment opportunities for minimum 170 people every year. • Empowerment of land less, asset less poor people.
7	Production system	Small and marginal farmers, asset less households	• Shortage of labourers	• Rise in production of milk, paddy, vegetables etc

8.2 Watershed Develop Fund and Exit Protocol

The main source of financial assistance for the post implementation period is Watershed Development Fund (WDF). One of the mandatory conditions for the selection of villages for watershed projects is people's contribution towards WDF. The Contribution to WDF shall be a minimum 10 % of the cost of NRM works executed on private land only. However, in case of SC/ST, small and marginal farmers, the minimum contribution shall be 5 % of cost of NRM works executed on their land. These contributions would be acceptable either in cash at the time of execution of works or voluntary labour. A sum equivalent to the monetary value of the voluntary labour would be transferred from the watershed project account to the WDF bank account that will be distinct from the Watershed Committee (WC) bank account. User charges, sales proceeds and other contributions, disposal amounts of intermediate usufruct rights shall also be deposited in the WDF bank account. Income earned from assets created under the project on common property resources shall also be credited to WDF.

For other cost intensive farming system based livelihood activities/interventions such as Aquaculture, Horticulture, Agro-Forestry, Animal Husbandry etc. on private land directly benefiting the individual farmers, the contribution of farmers will be 20 percent for general category and 10 percent for SC/ST beneficiaries and the project funds will meet the cost of farming system activity to a maximum limit of an amount equal to double of the unit cost of the project for watershed development (i.e. Rs 12,000/15,000 per ha, as the case may be). Farmers' contribution i.e. 20 percent for general category and 10 percent for SC/ST of this amount (i.e. a maximum of Rs 4800/6000 and Rs 2400/3000 as the case may be, respectively for general category and SC/ST beneficiaries) will go to WDF.

The Secretary, Watershed Committee (WC) shall maintain a completely separate account of the income and expenditure of the WDF. Rules for operation of the fund should be prepared by the Watershed Committee (WC) and ratified by the Gram Sabha. The WDF bank account should be operated by the President of the Gram Panchayat and any member from the SHG nominated by the Gram Sabha. Alternatively, the guidelines for the management and utilization of the WDF may be evolved by the concerned Nodal Ministry.

After completion of Phase II, at least 50% of the WDF funds shall be reserved for maintenance of assets created on community land or for common use under the project. Works taken up on private land shall not be eligible for repairing/ maintenance out of this Fund. The remaining money may be used as a revolving fund to advance loans to the villagers of the project area who have contributed to the fund. Individuals as well as charitable institutions should be encouraged to contribute generously to this Fund.

CHAPTER IX
SUMMARY AND CONCLUSION

Nemmara (IWMP – 6) project is located in Nemmara and Kollengode blocks of Palakkad district. The project comprises of four micro-watersheds namely Malappuram (20B39ac), Payyadore (20B39w), Payyalloor (20B39v) and Vengappara (20B39y). The project area is spread over the Grama Panchayaths of Elavanchery, Nemmara, Kollangode, Muthalamada, Pallasena and Nelliyampathy. There are 6569 households in the project area and the total population is 28946. The total project cost of the Nemmara IWMP – 6 project is Rs. 532.68 lakhs.

Department of Local Self Government is the nodal department for the implementation of IWMP at the state level. State Level Nodal Agency (SLNA) is coordinating and providing guidelines for the effective planning and implementation of the individual IWMP projects. District Planning Committee (DPC) is responsible for the planning and implementation of the projects at the district level. To help the DPC and to coordinate the project level activities, Watershed Cell Cum Data Centre (WCDC) is working at the district level. The Nemmara Block Panchayat is the Programme Implementing Agency (PIA) of the Nemmara IWMP-6 project. A Block Level Coordination Committee (BLCC) has been formed for the timely implementation of the project and to provide help to the PIA in technical and administrative matters related to the project. Watershed Development Team (WDT) has been formed under the PIA. Centre for Socio-economic & Environmental Studies (CSES) is the Technical Support Organisation (TSO).

A cluster approach was followed in the preparation of DPR. The preparation of the DPR involved several rounds of discussions with elected representatives, officials and other stakeholders. A situational analysis was undertaken using secondary data and information collected from different sources. A baseline survey covering all the households in the project area was also conducted. A Logical Framework Analysis was done at the project level for identifying the important problems (through problem tree analysis) as well as for the purpose of assessing the present situation. Other PRA techniques like transect walk, social mapping, resource mapping, seasonal calendar, etc., were employed in each micro watershed area. GIS and remote sensing devices have been made use of in the preparation of DPR. Quantum GIS Software was used for the preparation of maps. 1:4000 scaled cadastral maps of each village formed the base map for planning. Depth interviews

with officials, farmers, fisher folk, entrepreneurs of micro-enterprises etc. were also undertaken. Field level verification of the identified interventions was undertaken by the DPR preparation team.

The four micro watersheds in the project area face many common problems because of the similarities existing among the micro watersheds. The major problems identified through PRA techniques which have led to the identification of the interventions to be undertaken under the IWMP project are conversion of paddy fields, shortage of agriculture labourers, attack of wild animals, improper water conservation practices, lack of rainwater harvesting methods, improper waste management, pollution of canals and streams, drinking water scarcity, lack of livelihood opportunities etc. The suggested interventions for the above mentioned problems are: (a) to provide rain water harvesting structures to the community (b) maintenance of wells and ponds for the availability of fresh water (c) increase depth of canals to hold more water (d) construction of mud bunds for side protection (e) construction of culverts (f) repair and maintenance of irrigation canals (g) afforestation (h) solar fencing (i) improve livelihood opportunities by promoting fodder cultivation, horticulture, supply of cow, goat, duck, chicks etc. The scope for convergence with other schemes and programmes have been examined in identifying interventions under IWMP. The interventions under IWMP is expected to help in restoring the ecological balance of the project area, conserving the natural resources and in improving the livelihood opportunities of the people.

Table 9.1: Project at a glance

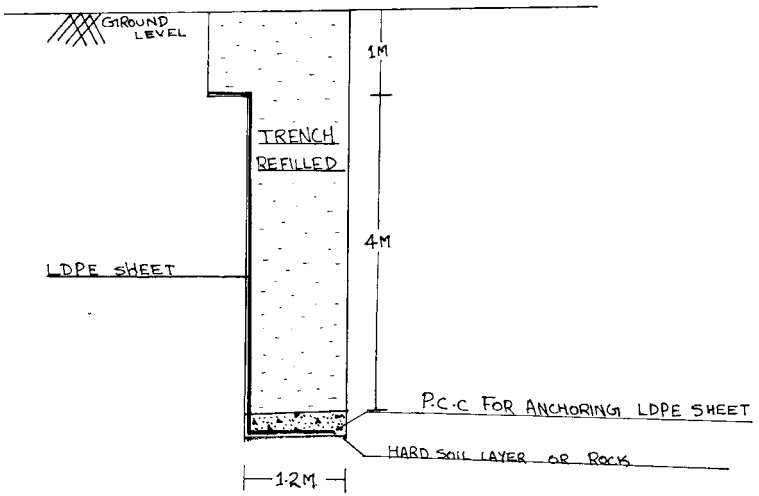
Name of the Project	IWMP 6
District	Palakkad
Blocks Covered	Nemmara and Kollengode
Name & Code of micro-watersheds	Malappuram - 20B39ac, Payyadore - 20B39w, Payyalloor - 20B39v, Vengappara- 20B39y
Gram Panchayats covered	Elavanchery, Nemmara, Kollangode, Muthalamada, Pallasena, Nelliyampathy
Total Population	28946
Name of the PIA	Nemmara Block Panchayat
Project Area (in Ha.)	4439
Project Cost (Rs. In Lakhs)	532.68
No. of micro-watersheds	4

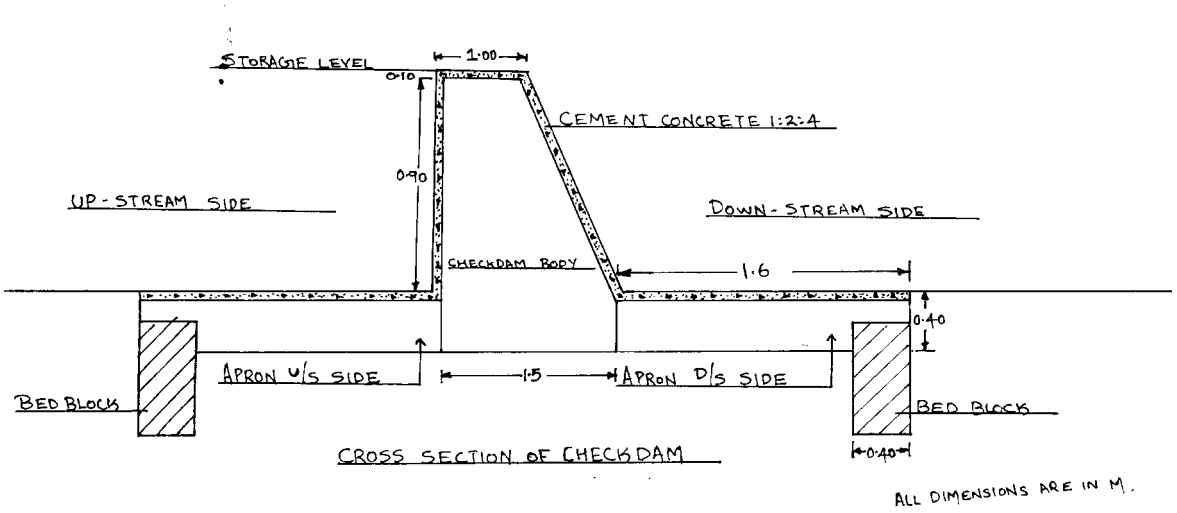
Detailed Estimate

1	POND DESILTING	FOR 100m² OF AREA	RATE	NOS	LENGTH	BREADTH	DEPTH	quantity	AMOUNT	MATERIAL (COST AND CONVEYANCE)	LABOUR	tax	GRAND TOTAL
		Earth work excavation in or under water and depositing on bank with initial lead up to 50m and lift up to 1.5M	1340.2/10m³	1	10	10	1.5	150m³	**20103.00**		**20103.00**	**1206.18**	**21309.18**
2	**RAIN WATER PITS**	**FOR 10 NOS OF PITS**											
		Earth work excavation in ordinary soil	1117/10m³	10	1	1	1	10m³	**1117.00**		**1117.00**	**67.02**	**1184.02**
3	**FOR MAKING EARTHERN BUNDS**	**FOR 10m OF LENGTH**											
		Earth work excavation in ordinary soil and depositing with lead up to 50m and lift up to 1.5m including neat banking.	1117/10m³	1	100	(1.10+0.60)/2	0.70	5.95m³	**664.62**		**664.62**	**39.8769**	**704.49**
4	**FOR STRENGTHENING PADDY BUNDS**	**FOR 10m OF LENGTH**											
		Earth work excavation in ordinary soil and depositing with lead up to 50m and lift up to 1.5m including neat banking.	1117/10m³	1	10	2.1	0.2	4.2m³	**469.14**		**469.14**	**28.1484**	**497.29**

5	**CENTRIPITAL TERRACING**	**FOR 10 NOS**													
		Earth work excavation in ordinary soil	1117	/10m^3	10	3.14 X (2.25-0.25)		0.3	18.84	m^3	**2104.43**		**2104.43**	**126.2657**	**2230.69**
6	**FEEDER CULTIVATION**	**FOR 100m^2 OF AREA**													
		Earth work in ordinary soil for planting feeder grass	75.4	/10m^2	1	10	10		100	m^2	754.00				
		cost of labour for planting grass. 2no of labours for planting 100m^2 of grass	377	/labour	2				2	man	754.00				
											1508.00		**1508.00**	**90.48**	**1598.48**
7	**WEEDS REMOVAL**	**FOR 100m^2 OF AREA**													
		cost of labour for removing water weeds from ponds,river etc.of an area of 100m^2	377	/labour	2						**754.00**		**754.00**	**45.24**	**799.24**
8	**PLANTING SCREW PINE ,BAMBOO ETC.**	**FOR 10m^2 OF AREA**													
		Cost of labour to collect screw pine stems for an area of 10m^2	377	/labour	2						754.00				
		Earth work in ordinary soil for making pits for planting screw pines @22 pits/10m^2	1117	/10m^3	22	0.3	0.3	0.5	0.99	m^3	110.58				
											864.58		**864.58**	**51.8749 8**	**916.46**

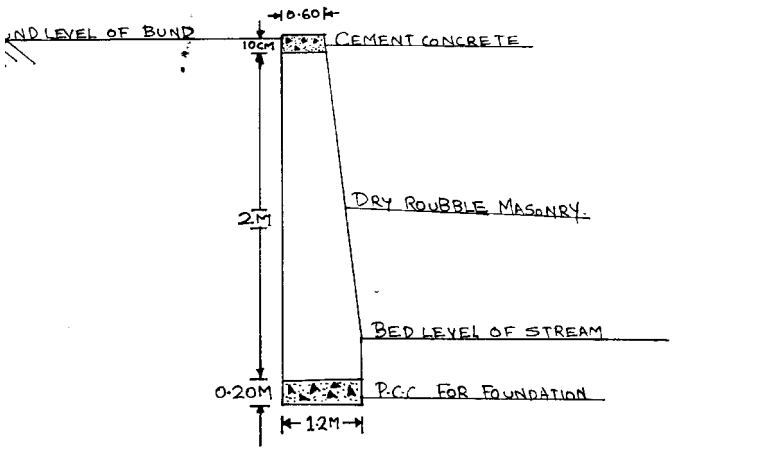
9	**STONE BUNDING**	**FOR 10m OF LENGTH**													
		Cost of stones localy available includingCharge for Head load lead of 200m	351	/m^3	1	10	0.65	0.6	3.9	m^3	1368.90	639.6	729.3		
		cost of labour charge of mason for making stone bunds @ 0.35 mason/m^3	471	/mason					1.365	mason	642.92		642.92		
		cost of labour charge of helper for making stone bunds @1.40 labour/m^3	377	/labour					5.46	labour	2058.42		2058.42		
											4070.24	**639.6**	**3430.635**	**244.2141**	**4314.45**
10	**MULCHING**	**FOR 15NOS OF PCOCONUT,MANGO TRE ETC.**													
		cost of labour charge for collecting localy available plants ,husks,etc for mulching for 15 plants	377	/labour					1	labour	377.00				
		cost of labour charges for putting soil above plants	1117	/10m^3	15	3.14 X (2.25-0.25)		0.05	4.71	m^3	526.11				
											903.11		**903.11**	**54.18642**	**957.29**
11	**PROVIDING WOODEN SHUTTERS FOR CHECK DAMS**														
		Vengai wood wrought and put up	535.536	/10dm^3	1	1.5	1.5	0.05	0.1125	m^3	**6024.7781**	**5630.17**	**394.65**	**361.4867**	**6386.26**
12	**SUB SURFACE DYKE**	**FOR 10m LENGTH OF DYKE**													
		Earth work excavation for 1st 1.5m depth	2064.08	/10m^3	1	10	1.25	1.5	18.75	m^3	3870.15		3870.15		

		Earth work excavation for a depth of 1.5m to 3m	2214.88	/10m^3	1	10	1.25	1.5	18.75	m^3	4152.9		4152.9		
		 SUB SURFACE DYKE (DAM)													
		Earth work excavation for a depth of3m to 4.5m	2365.68	/10m^3	1	10	1.25	1.5	18.75	m^3	4435.65		4435.65		
		Earth work excavation for a depth of 4.5m to 5m	2516.48	/10m^3	1	10	1.25	0.5	6.25	m^3	1572.8		1572.8		
		P.C.C 1:4:8, for anchoring LDPE sheet	4432.22	/m^3	1	10	1.25	0.2	2.5	m^3	11080.558	8700.8	2379.75		
		Cost of LDPE Sheet	120	/m^2	1	10	4		40	m^2	4800	4800			
		Cost for refilling the trench	2505.16	/10m^3	1	10	1.25	5	62.5	m^3	15657.25		15657.25		
											45569.308	**13500.8**	**32068.5**	**2734.158**	**48303.47**

13	**CHECK DAM**	**FOR CHECK DAM OF LENGTH 6m**													
														
		earth work excavation													
		For bed blocks			2	6	0.4	0.65	3.12						
		Aprons			2	6	1.2	0.5	7.2						
		Check dam body			1	6	1.5	0.5	4.5						
		Wing walls			2	5	0.7	0.5	3.5						
			1263.00	/10m^3					18.32	m^3	2313.816		2313.816		

		providing steel bars (if required)	566.00	/nos	40				40	nos	22640	6455.2	16192		
		cement concrete 1:4:8 for bed block	4432.22	/m^3	2	6	0.4	0.5	2.4	m^3	10637.335	8352.768	2284.56		
		cement concrete 1:3:6													
		For aprons			2	6	1.6	0.4	7.68						
		check dam body			1	6	1.5	0.5	4.5						
		check dam body (super structure)			1	6	(1.3+1.00)/2	0.9	6.21						
		Wing walls			2	5	(0.90+0.50)/2	0.9	3.15						
					2	5	0.9	0.5	4.5						
			4789.29	/m^3					26.04	m^3	124713.11	99923.55	24787.476		
		cement concrete 1:2:4													
		for aprons			2	6	1.6	0.1	1.92						
		check dam body			1	6	3.2	0.1	1.92						
		Wing walls			2	5	0.5	0.1	0.5						
			6511	/m^3					4.34	m^3	28257.74	20484.8	7772.94		
		shuttering													
		for bed block			2	6	1.55		18.6						
		Aprons			2	6	2.2		26.4						

					4	1.2	0.5		2.4						
		wing wall			2	5	4		40						
		check dam body			1	6	3.6		21.6						
					2	1.5	1		3						
			1989.73	/10m^2					112	m^2	22284.976	12462.52	9822.40		
		plastering													
		apron			2	6	1.6		19.2						
		check dam body			1	6	3.2		19.2						
		wing walls			2	5	2.5		25						
			1862.51	/10m^2					63.4	m^2	11808.313	5176.9904	6631.323		
		reinforcement 100kg for 100m^3	4839.41	/100kg					2500	kg	120985.25	94536.25	26449		
											343640.54	**247392.08**	**96253.515**	**20618.43**	**364258.97**
14	**SIDE PROTECTION**	**FOR 10m LENGTH**													
		earth work excavation	1263.00	/10m^3	1	10	0.6	0.6	3.6	m^3	454.68		454.68		
		cement concrete 1:4:8	4432.2	/m^3	1	10	0.6	0.2	1.2	m^3	5318.667	4176.384	1142.28		

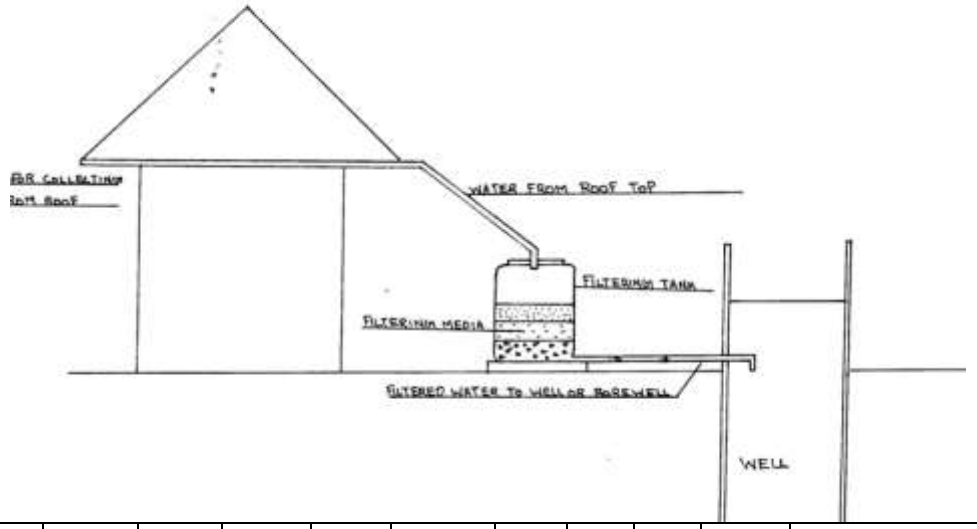


RETAINING WALL OR SIDE PROTECTION USING D.R. MASONRY.

		D.R masonry	1524.8	/m³	1	10	0.9	2	18	m³	27446.4	15913.8	11532.6		
		1:2:4 coping concrete	6511	/m³	1	10	0.6	0.1	0.6	m³	3906.6	2832	1074.6		
											37126.348	**22922.184**	**14204.16**	**2227.581**	**39353.93**
15	**WELL RENOVATION**	**FOR PUBLIC WELLS**													
		Dismantling and stalking broken wall etc													
		Well lining			3.14	3.40	0.40	0.90	3.84						

		Protection wall			3.14	3.40	0.40	0.90	3.84						
		Pillar			3.00	0.35	0.35	1.00	0.37						
			434	/m^3					8.05	m^3	3495.531		3495.53		
		Earth work excavation for parapit and platform	1263.00	/10m^3	3.14	5.20	0.40	0.40	2.61	m^3	329.9562		329.9562		
		RR masonry for platform	2882.49	/m^3	3.14	5.20	0.40	0.40	2.61	m^3	7530.447	5634.963	1895.48		
		Rough stone dry packing for aprons and revetments.	1525.00	/m^3	3.14	4.60	1.00	0.25	3.61	m^3	5506.775	3192.485	2313.57		
		Brick work in mud mortar for well lining	3187.00	/m^3	3.14	3.44	0.23	0.90	2.24	m^3	7125.913	4714.595	2412.35		
		Brick work in cement morter 1:6 . For Protection wall	4155.00	/m^3	3.14	3.44	0.23	0.90	2.24	m^3	9290.294	6878.06	2412.35		
		Brick work in cement mortar 1:6 for pillar	3881.0	/m^3	3.00	0.35	0.23	1.00	0.24	m^3	937.2615	744.3996	192.74		
		Cement concrete 1:2:4	6511.00	/m^3	3.14	4.60	1.00	0.075	1.08	m^3	7053.366	5113.176	1940.19		
		Plastering with cement mortar													
		Outer side of parapet wall			3.14	3.60	0.90		10.17						
		Inner side of parapet wall			3.14	3.20	0.90		9.04						
		Top portion			3.14	3.40	0.23		2.46						
		Pillar			3.00	1.16	1.00		3.48						
			1862.00	/10m^2					25.15	m^2	4683.355	2053.83	2630.80		

		Conveying and laying GI 50mm dia pipes	42	/nos	2	3.20			6.4	m	268.8		268.80		
		Supplying and fixing Iron pulley including all charges.	66	/nos	1				2	nos	132		132.00		
		Bailing out water with (5 H P) engine and pump set	1256.00	/day	1.00	2.00			2.00	days	2512.00	966.00	1546.00		
		Desilting	2571.20	/10m^3	1.00	3.14 X (1.6 X 1.6)		1.50	12.06	m^3	3100.2501		3100.25		
											51965.95	**29297.513**	**22670.02**	**3117.957**	**55083.91**
16	**WELL RECHARGING**														
		Earth work excavation for tank base	1263.00	/10m^3	1.00	1.5	1.5	0.3	0.675	m^3	85.2525		85.2525		
		RR masonry for block	2882.49	/m^3	1.00	1.50	1.50	0.50	1.13	m^3	3242.801	2426.5575	816.24375		
		Cement concrete 1:2:4	6511.00	/m^3	1.00	1.5	1.5	0.1	0.225	m^3	1464.975	1062.00	402.975		
		Plastering with cement mortar			1.00	1.50	1.5		2.25						
					4.00	1.5	0.5		3						

															
			1862.51	/10m^2					5.25	m^2	977.81775	428.694	549.12375		
		supplying and fixing pipefittings	351	/m	30.00				30	m	10530	8834	1696		
		sintex tank	5	/litre	0.00				250	litre	1250	1250			
		filtering materials	L.S								2000	2000			
											19550.847	**16001.252**	**3549.595**	**1173.051**	**20723.90**

Backyard Poultry

Sl No	Particulars	Nos / units	Unit rate (Rs)	Cost (Rs)
1	Cost of a Chicken Coop having 10 Sq. Ft.	5	2000	10000
2	Cost of 2 month old Chicks @ Rs.100/Chicks	50	100	5000
3	Cost of Medicine			500
4	Cost of feed @ Rs. 10 per Kg			5000
5	Total			20500

Backyard Ducker

Sl No	Particulars	Nos / units	Unit rate (Rs)	Cost (Rs)
1	Cost of 3 month old Ducks	120	130	15600
2	Cost of Medicine			500
3	Cost of feed			8900
4	Total			25000

Vegetable Retail Shop

Sl No	Particulars	Nos / units	Unit rate (Rs)	Cost (Rs)
1	Room rent to store vegetable @ Rs.600/month	1	2000	2000
2	Amount Required to make shelves	4	1500	6000
3	Equipments			5000
4	Amount required to purchase vegetable for a day including transportation			12000
5	Total			25000

Food Processing Unit

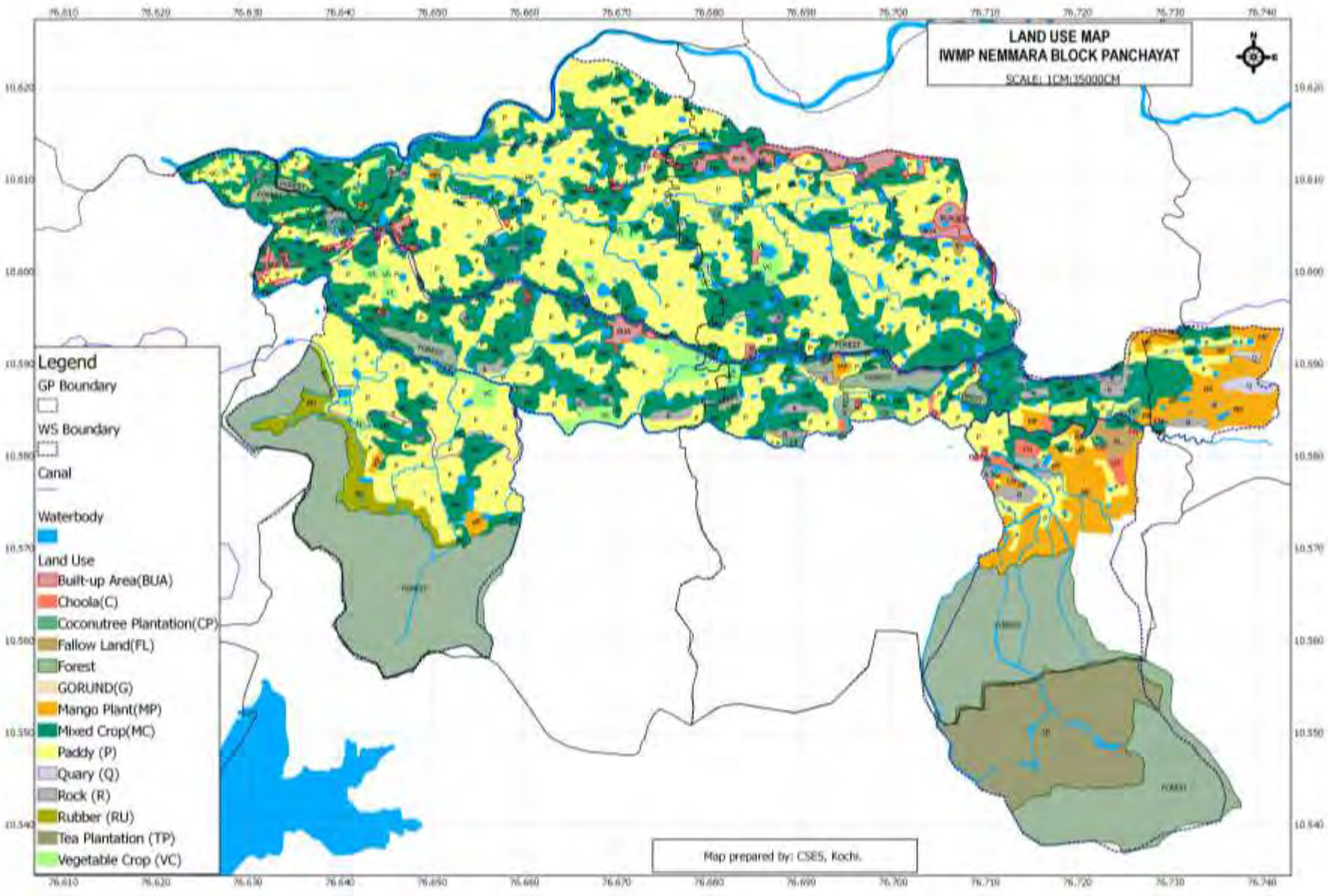
Sl No	Particulars	Nos / units	Unit rate (Rs)	Cost (Rs)
1	Cost of Mixer Grinder	1	6500	6500
2	Cost of Frying Pan	1	500	500
3	Cost of Raw Material	500	30	15000
4	Packing Cover			1000
	Total			23000

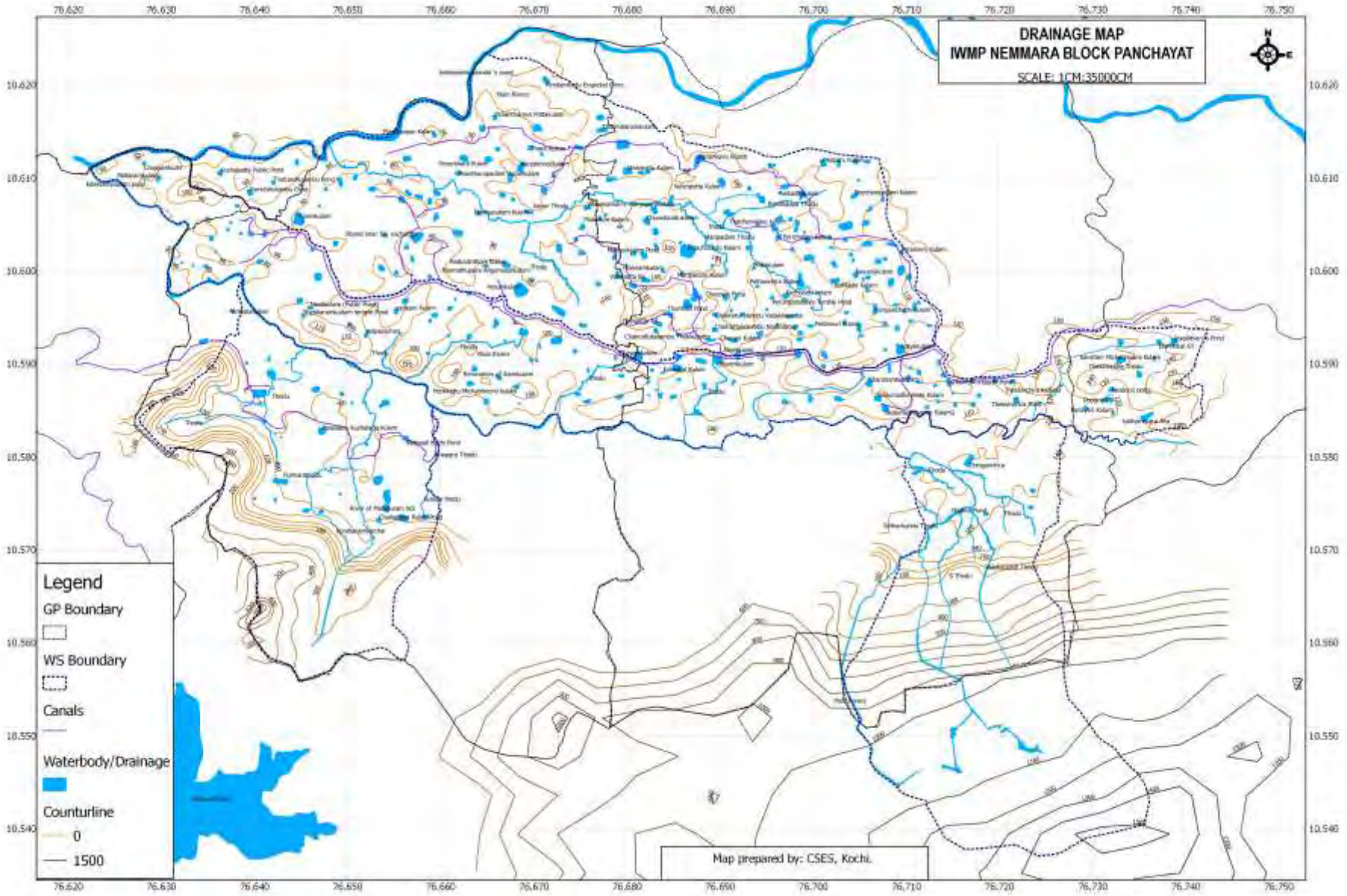
Nutritional food Processing Unit				
Sl No	**Particulars**	**Nos / units**	**Unit rate (Rs)**	**Cost (Rs)**
1	Flour mill	1	6500	6500
2	Cost of Frying Pans	10	1500	15000
3	Cost of Raw Material	500	200	100000
4	Packing Cover			1000
5	Wage 5 for persons	5	6000	30000
6	Shed			60000
7	Sealing Machine			3500
	Other Expense			4000
	Total			**220000**

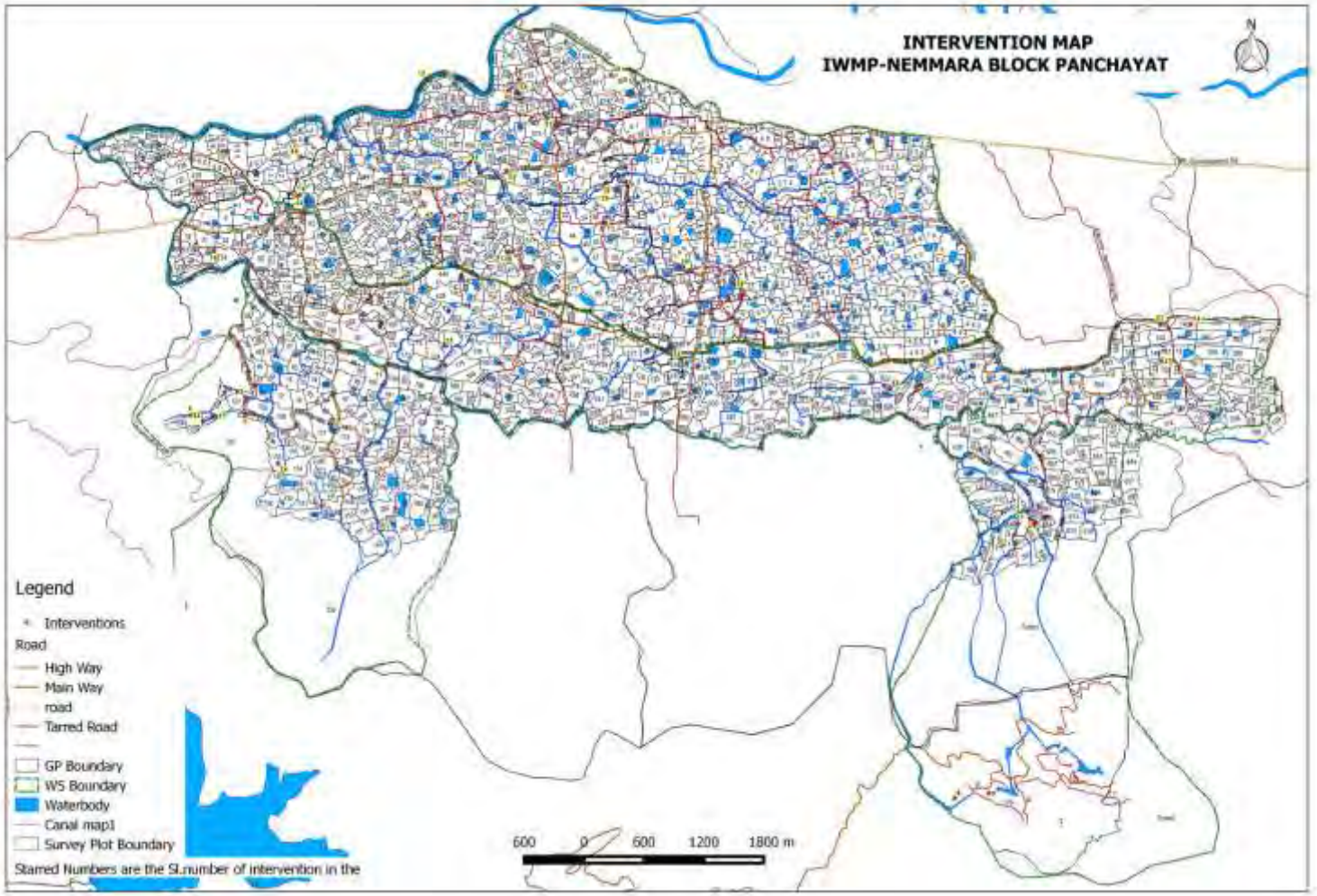
Eco Fiendly Products manufacturing Unit

Sl No	**Particulars**	**Nos / units**	**Unit rate (Rs)**	**Cost (Rs)**
1	Materials			100000
2	Room rent	2	2000	4000
3	10 Nos of Stiching Machine @ 10000/No	10	8000	80000
4	Accessories		50000	50000
5	Cutting Machine	1	100000	100000
	Labour Cost	5	6000	30000
	Total			364000

MAP


LAND USE MAP
IWMP NEMMARA BLOCK PANCHAYAT
SCALE: 1CM=35000CM
Legend
GP Boundary
WS Boundary
Canal
Waterbody
Land Use
Built-up Area(BUA)
Chocla(C)
Coconutree Plantation(CP)
Fallow Land(FL)
Forest
GORUND(G)
Mango Plant(MP)
Mixed Crop(MC)
Paddy (P)
Quary (Q)
Rock (R)
Rubber (RU)
Tea Plantation (TP)
Vegetable Crop (VC)
Map prepared by: CSES, Kochi.


DRAINAGE MAP
IWMP NEMMARA BLOCK PANCHAYAT
SCALE: 1CM:35000CM
Legend
GP Boundary
WS Boundary
Canals
Waterbody/Drainage
Counturline
0
1500
Map prepared by: CSES, Kochi.


INTERVENTION MAP
IWMP-NEMMARA BLOCK PANCHAYAT
N
Legend
Interventions
Road
High Way
Main Way
road
Tarred Road
GP Boundary
WS Boundary
Waterbody
Canal map1
Survey Plot Boundary
Starred Numbers are the SLnumber of intervention in the
600 0 600 1200 1800 m