

INTEGRATED WATERSHED MANAGEMENT PROGRAMME

Detailed Project Report IWMP-II/2011-12 UZHAVOOR BLOCK PANCHAYAT

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I INTRODUCTION

Natural resources play an important role in the development of a country. The way they affect the economy is by either helping in the development or bringing it into a complete downfall. A country that tends to have more natural resources and has a way to refine it, have a better and stable economy. The most important natural resources are land, water, forest, sun, wildlife, air, mountain, minerals etc. People use these resources for their existence on earth. All living creatures depend on natural resources for their survival, growth, and development. Water supports the life system of human beings, vegetation, animals and birds, living creatures and wildlife. Similarly, forest resources, land resources and mineral resources are essential for our welfare, development, and prosperity. So soil, water and vegetation are the basic resources on which the human being as well as the living being primarily depends upon livelihood and survival. The conservation of natural resource is one of the major concerns. Thus Watershed based management has been considered as a strategy for protecting

MAIN OBJECTIVES

- To impart scientific and systematic activities to maintain the normal ecological balance between soil, water and biodiversity.
- To implement activities for rainwater harvesting which results in the increase of groundwater level and to ensure the availability of water.
- To prevent the degradation of biodiversity and undertaking activities for environmental regeneration.
- To prevent soil erosion and increase the fertility and water storage capacity of the soil.
- To provide livelihood support for those who depend the natural resources in the watershed areas.
- To create awareness and educate the people on the far-reaching implications of ecological degradation and inspire their mindset for the preservation of biodiversity.
- To enrich bio diversity by renovating and protecting the existing water resources in the area.

- To harness locally available natural resources in an optimum manner to achieve the overall goal of sustainable development.
- To give specific importance to the productivity enhancement of agriculture/horticulture/ animal husbandry activities and livelihood development.
- To promote farming and allied activities while ensuring resource conservation and regeneration.

II. GENERAL DESCRIPTION OF PROJECT AREA

Table 1 General Description

1	Name of the Block	Uzhavoor Block Panchayath
2	Name of the District	Kottayam
3	Taluk	Meenachil
4	Block	Uzhavoor and Lalam
5	Assembly constituency	Kaduthurithi, Pala
6	Parliament constituency	Kottayam
7	Distance from District Head Quarters	36.8km – 50 minutes (Kottayam Collectorate to Ramapuram Panchayath Office)
8	Geographical Area of the Watershed	5820 ha
9	Treatable Area	5820 ha
10	Longitude / Latitude	76°36'29.589"W 76°42'46.167"E 9°44'5.308"S to 9°51'25.801"N
11	SubWatershed and codes	Chalipuzha thodu-12M21b Puthuvelithodu-12M21c Ashramam Valarithodu – 12M21j Kariyilathodu kurinji-12M21g Kariyila thodu-12M21e Thamarakkad Perumkuttu1-13M 59d Thamarakkad Perumkuttu2-13M59f
12	Main Drainages	Aarattupuzha Thodu
13	Name of Catchment	Meenachil River and Moovattupuzha River
14	Livelihood Options	Agriculture, Animal Husbandry, Wage labour, Govt. jobs.

Table 2 Details of Watersheds

Sl No	Watershed code	Geographical Coordinates	Treatable Area(in Ha)	Grama panchayath	Wards
1	Chalipuzhathodu (12M21b)	76°39'12.973"E 76°41'8.021"E 9°44'17.6"N 9°46'55.421"N	1025 ha	Ramapuram and Karoor	Ramapuram GP 9,10, 11 Karoor – 3,4,6,7
2	Puthuvelithodu (12M2K)	76°37'24.306"E 76°40'40.086"E 9°47'5.913"N 9°50'15.428"N	1618 ha	Ramapuram and Veliyannoor	Ramapuram GP 1, 5, 11, 12,13,14,16, 17,18 Veliyannoor 5, 8
3	Kariyilathodu (12M21e)	76°39'24.386"E 76°40'54.699"E 9°47'6.277"N 9°49'13.818"N	543 ha	Ramapuram Gramapanc hayat	Ramapuram GP 3, 4, 6
4	Kariyilathodu kurinji (12M21g)	76°38'51.391"E 76°42'44.495"E 9°47'50.987"N 9°50'34.18"N	1691 ha	Ramapuram and Kadanadu	Kadanadu 1, 2 14 Ramapuram 2, 3, 4
5	Ashrma Valarithodu (12M21j)	76°40'32.526"E 76°41'51.665"E 9°44'5.289"N 9°47'5.329"N	570 ha	Ramapuram and Karoor	Ramapuram 7, 8 Karoor 4, 6
6	Thamarakkad Perumkutty1 (13M59f)	76°37'9.597"E 76°37'42.641"E 9°50'42.143"N 9°51'30.481"N	69 ha	Veliyannoor	Veliyannoor 6,7
7	Thamarakkad Perumkutty2 (13M59d)	76°36'30.58"E 76°37'36.417"E 9°49'34.188"N 9°51'23.451"N	305 ha	Veliyannoor	Veliyannoor 6,5,8
Total			5820 ha		

PHYSIOGRAPHY AND RELIEF

Physiographically the area falls undermidland and midupland. Lowest elevation is 26m MSL and is at Mudukol Ashramam valari Watershed and the highest

elevation is 373m MSL at Kuriyankunnu, Kariyilathodu Kurinji Watershed. The relief is subnormal to excessive.

Table 3 Agroclimatic Details

No	Name of the watersheds	Names of the villages	Topography	Average rainfall in mm
1	Chalipuzhathodu	Vellilapilly, Lalam	Moderately to steeply sloping ridges	3524
2	Puthuvelithodu	Veliyannur, Ramapuram, Vellilapilly	Moderately to steeply sloping ridges	
3	Kariyilathodu	Ramapuram, Vellilapilly	Valleys-gently sloping to flat bottom	
4	Kariyilathodu Kurinji	Ramapuram, Vellilapilly, Kadanad	Moderately to steeply sloping ridges	
5	Ashramam valari thodu	Vellilapilly, Lalam	Moderately to steeply sloping ridges	
6	Thamarakkad Perumkutty-1	Veliyannur	Moderately to steeply sloping ridges	
7	Thamarakkad Perumkutty-2	Veliyannur	Moderately to steeply sloping ridges	

DRAINAGE

Watershed is drained by seven non-perennial streams. The details of main drainages in each micro watershed are given below:

Table 4 Drainages in watershed

Nos	Watersheds	Main Drainage	Perennial/ Seasonal	Total Length
1	Chalipuzhathodu	Chalipuzhathodu	Non perennial	2.59 km
2	Puthuvelithodu	Amankara Murikkanad Thodu	Non perennial	4.08 km
3	Kariyilathodu	Vellanchirathodu	Non perennial	1.60 km
4	Kariyilathodu Kurinji	Kariyilathodu	Non perennial	6.79 km
5	Ashramam valari thodu	Lalam Thodu	Non perennial	2.31 km
6	Thamarakkad Perumkutty-1	Chirakkamattom thodu	Non perennial	0.72 km
7	Thamarakkad Perumkutty-2	Parathottil Thodu	Non perennial	2.08 km

III. CRITERIA FOR SELECTION

In the selection of watersheds in IWMP certain criteria are adopted. The indicators and scores achieved are given below:

Table 5 Criteria for Selection as per SPSP

No	CRITERIA	SCORE	RANGES & SCORES			
1	Poverty Index(% of poor population)	10	Above 80%(10)	80 to 50% (7.5)	50 to 20%(5)	Below20 % (2.5)
2	% of SC/ST population	10	More than 40%(10)	20 to 40%(5)	Less than 20% (3)	
3	Actual wages	5	Actual wages are significantly lower than minimum wages (5)	Actual wages are equal to or higher than minimum wages (o)		
4	% of small and marginal farmers.	10	More than 80%(10)	50 to 80%(5)	Less than 50% (3)	
5	Ground water status	5	Over exploited (5)	Critical (3)	Sub Critical (2)	Safe (0)
6	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)
7	Area under rain-fed agriculture	15	More than 90%(15)	80 to 90%(10)	70 to 80%(5)	Fully covered (0)
8	Drinking Water	10	No source (10)	Problematic village(7.5)	Partially covered(5)	
9	Degraded land	15	High- above 20%(15)	Medium- 10 to 20% (10)	Low less than 10% of TGA(5)	
10	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)	
11	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)	
12	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)	

Weightage criteria

No	District	Name of Project	No of micro watershed to be covered	Proposed project area (HA)	Type of Project (Hilly/Desert/Others)	Proposed Cost (Rs. in lakh)	Weightage under the criteria#													
							1	2	3	4	5	6	7	8	9	10	11	12	13	Total
1	Kottayam	IWMP 2	7	5820	Plains	698.39	35	21	0	70	0	0	105	53	30	0	60	0	105	68

IV. CLIMATE

The project area has a humid tropical climate with an oppressive summer and seasonal rainfall. From June to September receives the south-west monsoon or 'Kalavarsham' and from November to December, North - east monsoon or 'Thulavarsham' and in the summer January – May gets occasional rainfall. Average rainfall received is 325 cms and maximum temperature of the area recorded is 38.5⁰ C and minimum is 19.7⁰C. In the rainy season floods, landslides and other natural calamities do affect this area. In summer, scarcity of water is major problem.

Table 6 Average Rainfall

Year	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total
2000	14	81	65	94	116	55	283	653	257	172	85	33	1908
2001	25	38	40	276	197	665	649	297	318	401	288	16	3210
2002	7	46	43	142	420	462	353	409	72	440	299	3	2696
2003	2	83	156	168	82	576	443	508	34	495	153	26	2726
2004	11	10	89	183	721	466	378	302	235	408	109	1	2913
2005	21	9	74	273	175	662	672	277	461	390	297	72	3383
2006	15	0	114	200	553	525	605	407	453	509	367	3	3751
2007	0	24	6	245	250	637	921	326	521	379	148	10	3467
2008	0	49	254	203	50	342	555	269	370	284	103	53	2532
2009	8	2	79	70	205	460	553	225	281	187	279	86	2435
2010	10	1	96	201	355	664	569	294	367	559	456	98	3670

(Source: District Agriculture Farm, Kozha)

Temperature

The temperature is more during the months of March to May and less during November, December and January. The mean average is 26.0°C. The average annual maximum temperature is 29.8 °C and the minimum temperature is 24.4°C. The average mean monthly maximum temperature ranges from 29.2 to 33.40C and minimum temperature ranges from 19.7 to 25°C.

Relative Humidity

The relative humidity is generally high, during the morning hours its goes up to 79 % and during evening hours it is around 76%.

Wind

The general direction of wind is from east to north east during morning hours and west to northwest direction during evening hours. The wind speed ranges from 6.7 to 10.9 km/h.

Geology

The charnockites and khondalite group of the precambian metamorphics are the rock types identified in the area. The charnockite group includes hypersthene – diopside gneiss, granulites, granetiferous hypersthine – hornblendes, granulites and migmatite equivalents. The khondalite group includes garnet – biotite gneiss and garnet – siltimanite gneiss and granulites.

Geomorphology

The geomorphology is naturally divided into five well defined physiographical units namely lowland, midland, mid up land, up land and high land. The lowland is the area with an elevation of less than 20 m amsl, midland area having an elevation of 20m to 100 m amsl, mid upland having an elevation of 100m-300m amsl, upland having an elevation of 300m-600m amsl and highland area with an elevation of more than 600m -1200m amsl. The watershed elevation range is 26m MSL to 373m MSL which means it lies in between midland and mid up land. The major portion of the land is used for cultivating rubber, mixed crop etc.

V. GROUND WATER

Depth to water table	Pre Monsoon- 1.11 to 13.67 m.bgl. Post Monsoon- 0.20 to 10.27 m.bgl.
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VI. WATER SUPPLY AND IRRIGATION

Most of the houses in watershed area have wells. So majority are using their own well for drinking water. But in the very starting of summer season itself most of the wells get dried up. Public taps and water connections are also rarely seen. Natural Springs are other sources to meet the water needs of people. There are fifty six water supply schemes in the project area. There is no irrigation scheme in the watershed area.

Table 7 Details of Wells

Watersheds	Bore well			Private well			Public well		
	Wet	Dry	Total	Wet	Dry	Total	Wet	Dry	Total
Chalipuzhathodu	2	2	4	70	137	207	1	19	20
Pthuvelithodu	3	1	4	36	68	104	4	15	19
Kariyilathodu	-	3	3	27	79	106	2	3	5
Kariyilathodu Kurinji	4	3	7	125	207	332	4	29	33
Ashramamvalari thodu	3	2	5	56	127	183	8	21	29
Thamarakkad Perumkutty-1	-	-	-	7	18	25	-	4	4
Thamarakkad Perumkutty-2	1	12	13	61	64	125	1	4	5
Total	13	23	36	382	700	1082	20	95	115

(Source : Baseline Survey)

Table 8 Details of Water Supply Schemes

Sl no	Watersheds	Watersupply scheme (Nos)	No of beneficiaries
1	Chalipuzhathodu	10	1470
2	Puthuvelithodu	15	832
3	Kariyilathodu	13	895
4	Kariyilathodu Kurinji	4	610
5	Ashramamvalari thodu	5	819
6	Thamarakkad Perumkutty-1	3	250
7	Thmarakkad Perumkutty-2	6	425

Source: (Gramapanchayat documents)

VII. SOCIO ECONOMIC DETAILS

Educational institutions

No of Higher Secondary School	:	1
No of High Schools	:	1
No of Primary Schools	:	3
No of Convent School	:	2
No of Nursery School	:	10

Medical facilities

Allopathic

No of Homeo Hospital	:	2
No of Homeo Dispensary	:	1
Public Health Centers	:	6
Family Welfare Centers	:	4

Credit facilities

Bank s	:	4
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Recreation facilities

Public Library	:	4
Community hall	:	3

Table 9 Holding Size

Sl no	Watershed	0-50 cents	50-250 cents	250-500cents	Above 500 cents
1	Chalipuzhathodu	269	138	37	8
2	Puthuvelithodu	746	397	67	24
3	Kariyilathodu	344	87	34	11
4	Kariyilathodu kurinji	594	217	76	27
5	Ashramamvalari thodu	479	119	32	29
6	Thamarakkad Perumkutty-1	124	23	12	3
7	Thamarakkad Perumkutty-2	220	93	18	7
	Total	2776	1074	276	109

(Source: Baseline Survey)

Table 10 Population Details

WATERSHEDS	Male	Female	Boys	Girls	Total
Chalipuzhathodu	595	701	275	350	1921
Puthuvelithodu	1650	1846	860	1158	5514
Kariyilathodu	512	717	480	537	2246
Kariyilathodu Kurinji	1391	1512	707	574	4184
Ashramamvalari thodu	879	964	614	518	2975
Thamarakkad Perumkutty-1	225	234	104	87	650
Thamarakkad Perukutty-2	546	574	239	197	1556

(Source: Baseline survey)

Table 11 SC/ST Population Details

WATERSHEDS	SC				ST			
	Male	Female	Boys	Girls	Male	Female	Boys	Girls
Chalipuzhathodu	61	77	36	54	8	8	12	4
Puthuvelithodu	41	56	35	26	25	24	31	11
Kariyilathodu	21	27	14	9	2	5	3	7
Kariyilathodu Kurinji	56	51	32	28	8	8	4	7
Ashramamvalari thodu	81	76	49	24	2	7	4	6
Thamarakkad Perumkuty-1	-	-	-	-	-	-	-	-
Thamarakkad Perukuty-2	-	-	-	-	-	-	-	-
Total	260	287	166	141	45	52	54	35

(Source: Baseline survey)

VIII. AGRICULTURE AND PRESENT LAND USE

Table 12 Agriculture and Present Land use

S I No	Item	Area (ha)	Percentage
1	Rubber	4368.73	75.06
2	Mixed Trees	410.88	7.06
3	Mixed crops	889.60	15.29
4	Quarry	3.52	0.06
5	River	21.77	0.37
6	Waste land	18.06	0.31
7	Pond	2.37	0.04
8	Paddy	105.07	1.81
	Total	5820	100

(Source: Baseline survey)

Animal Husbandry and Dairying

Animal husbandry and dairy development play a significant role in rural development. The details of livestock in the watershed areas are shown in the table below. Livestock acquire special importance in watershed management from both socio-economic and ecological considerations. They are an integral part of the farming system. Adoption of suitable technical innovations for improving the livestock productivity is needed in the watershed areas. Proper recycling of organic manure in the area is of utmost importance for maintenance of soil fertility.

Table 13 Animal Husbandry and Dairying

Watersheds	Cow	Goat	Buffalo	Pig	Hen	Duck	Rabbit	Ox	Kaada	Fish
Chalipuzha thodu	79	65	-	20	134	19	12	2	4	10
Puthuveli thodu	186	157	19	39	328	39	26	3	5	-
Kariyila thodu	42	19	6	12	82	8	4	-	-	6
Kariyilathodu kurinji	91	141	19	20	122	19	36	3	62	36
Ashramam valari thodu	38	19	6	-	89	6	8	-	5	8
Thamarakkad Perumkuty - 1	26	38	5	6	26	4	7	-	15	-
Thamarakkad Perumkuty - 2	32	46	9	19	95	9	5	1	2	5
Total	494	485	64	116	876	104	98	9	93	65

(Source: Baseline survey)

IX. SOIL

- *ChirakKaadavu series*

ChirakKaadavu series is a member of fine, mixed, isohyperthermic family of Typic Kandiualfs. These soils have dark brown to dark reddish brown, clay loam to clay A horizon and dark yellowish brown to dark reddish brown, gravelly clay loam to clay B horizons. They have developed in alluvio-colluvium on gently sloping valleys adjoining rivers in midlands and miduplands. Quartz gravels are observed between 50 to 100 cm.

- ***Illakad series***

Ilakad series is a member of the loamy skeletal mixed isohyperthermic family of Typic Ustifluvents. These soils have strong brown to dark brown, medium acidic, gravelly clay loam to gravelly clay 'Ap' horizons and dark reddish brown to strong brown, medium acidic, gravelly sandy loam to gravelly clay loam AC horizons. They have developed on weathered gneissic rock on moderately steep to steep rolling lands at an elevation of 100-300m above MSL.

- ***Karamala series***

Karamala series is a member of the clayey-skeletal, mixed, isohyperthermic family of Typic Haplustults. The soils have yellowish red to reddish brown, strongly acidic, gravelly loam to gravelly clay loam 'Ap' horizon and yellowish red to reddish brown, medium acidic, gravelly clay loam to gravelly clay 'B' horizons. The 'C' horizon is mixture of partly weathered rock with little soil. They have developed on weathered gneissic rock on steep to very steep hill slopes at an elevation of 100-300 m above MSL.

- ***Marady series***

Marady series is a member of clayey, mixed, isohyperthermic family of Typic Kandihumults. These soils have pale brown to brown, medium acid, sandy clay loam to clay loam Ap horizon and brown to yellowish brown, strongly acid, clay B horizon. They have developed in riverine alluvium on gently sloping to nearly flat valleys of midlands.

- ***Nellapara series***

Nellapara series is a member of Fine-loamy, mixed, isohyperthermic family of Lithic Hapludolls. These soils have very dusky red to reddish brown, slightly acid to neutral, sandy clay loam to clay loam A horizon and dark reddish brown, slightly acid, clay loam subsoils. They have developed in gneissic rocks on steep to very steeply sloping hill slopes and summits of highlands. Rock outcrops is a common feature.

- ***Uzhavoor series***

Uzhavoor series is a member of Loamy-skeletal, mixed, isohyperthermic family of Typic Tropofluvents. These soils have strong brown to dark brown, medium acid, gravelly clay loam to gravelly clay 'A' horizons and strong brown, medium acid, gravelly sandy loam to gravelly clay loam 'C' horizons. They have developed over weathered gneissic rocks on moderately sloping undulating to rolling lands on the upstream of Meenachil and Manimala river.

- ***Vallichira series***

Vallichira series is a member of loamy-skeletal, mixed, isohyperthermic family of Typic Kandistults. These soils have dark reddish brown to dark brown, medium acid, gravelly sandy clay loam to gravelly clay loam 'Ap' horizon underlain by yellowish red to dark red, strongly to medium acid, gravelly sandy clay loam to gravelly clay B horizons. They have developed over weathered gneissic rocks on moderately sloping to moderately steep lower hill slopes of miduplands.

Table 14 Soil

Sl No	Watershed code	Watersheds	Treatable Area(in Ha)	Soil type
1	12M21b	Chalipuzhathodu	1024	Gravelly Clay loam and Sandy Clay loam
2	12M21c	Puthuvelithodu	1618	Gravelly Clay loam and Sandy Clay loam
3	12M21e	Kariyilathodu	543	Gravelly Clay loam and Sandy Clay loam
4	12M21g	Kariyilathodu kurinji	1691	Gravelly Clay loam and Sandy Clay loam
5	12M21j	Ashramamvalari thodu	570	Gravelly Clay loam and Sandy Clay loam
6	13M59d	Thamarakkad Perumkutti-1	69	Gravelly Clay loam
7	13M59f	Thamarakkad Perumkutti-2	305	Gravelly Clay loam and Sandy Clay loam

X. METHODOLOGY

The following methodology was adopted as part of preparation of Detailed Project Report of IWMP in Uzhavoor Block Panchayat. Transect walks, Participatory Resource Mapping, Focus group discussion, Base line survey, drainage line survey, GIS mapping, Institutional and capacity building etc were the major events in the process.

Transect Walk

Transect walks were conducted to identify the ridge lines to demarcate the watershed boundary. After delineation, the farmers and other stakeholders of watershed walked along the streams. It helped the team members to understand the basic characteristics of watershed area, and to ascertain the mode of treatment according to the geographical specialties in each area.

Participatory Resource Mapping

After conducting the transect walk, the groups made resource maps of the entire watershed showing boundaries of private lands and common lands, details of ownership, land use and other details like location of major gullies, location of water bodies and common lands, types of vegetation and soil types in different parts of the watershed etc.

Focused Group Discussion

Focus Group Discussions were conducted in order to gather specific opinions and suggestions with regard to the activities to be included in the DPR

Base Line survey

A detailed household level socio-economic survey was conducted in the project area to gather relevant information to develop the baseline data for the formulation of DPR.

Drainage line Survey

A team of members and the representatives of the TSO and of other stakeholders visited all prominent drains in the project area as part of surveying the status of the drains. The survey was useful in assessing the state of the drains and to ascertain the need and suitability of various interventions to protect and develop them. People's experience and knowledge attributed much to the process.

Remote Sensing Data and GIS

A remote sensing technique provides easy access to data, on vegetation and topographical features of any geographical area. This data has been used for assessment of crop coverage, wasteland and hazard prone areas in watershed area. GIS has been widely used in characterization and assessment in this particular watershed area. Basic physical characteristics of a watershed such as the drainage network and flow paths could be derived from readily available Digital Elevation Models (DEM). This has been used for the interpretation of land use and hydro geo morphology of the watershed also.

Preparation of Action Plan and Approval from Gram Sabha

Data gathered through the above process have been compiled, consolidated and analysed to develop a data base to evolve a realistic plan of actions to be implemented in the project area. The draft action plan thus prepared was placed before the concerned gram Sabha for approval. After detailed discussions, the action plan was modified by incorporating valid and feasible suggestions from the gram sabha into it and the same was approved by the Gram Sabha.

XI. INSTITUTION BUILDING AND PROJECT MANAGEMENT

The stipulations with regard to the mobilization and organization of the watershed community as laid down in the Common Guidelines have been followed in the case of this project. The institutions at various higher levels have also been constituted. The details are given below:

State Level Nodal Agency-SLNA

Chairman of SLNA is Agricultural Production Commissioner. SLNA has a fulltime Chief Executive Officer (CEO). 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 sanctions the IWMP Projects for the State and looks after the overall performance of the programme in the state. It is supported by a Technical Unit consisted of Experts from related fields. SLNA maintains A State Data Cell too.

District Level Coordination Committee-DLCC

A DLCC, as envisaged in the Guidelines, has been constitutes in the District. The DLCC, Kottayam consists of all district level officers of the line departments. The District Panchayat President is the chairman and the District Collector is the Member Secretary of the DLCC. The DLCC takes up overall responsibility for getting the Project Reports and Action Plans under IWMP properly formulated and presenting the same before the District Planning Committee for approval. A Watershed Cum Data Cell- WCDC- has been constituted under the leadership of the Project Director, PAUs, designated as District Project Manager.

Programme Implementing Agency-PIA

The Project Implementing Agency of this Project is the Block Panchayath, Uzhavoor.

Watershed committee (WC)

The Gram Sabha will constitute the Watershed Committee (WC) to implement the Watershed project with the technical support of the WDT. The Gramapanchayat President is chairman of each watershed committee and Convenor is Village Extension Officer of the concerned Gramapanchayat. The Watershed Committee will open a separate bank account to receive funds for watershed projects and will utilise the same for undertaking its activities.

Self Help Groups

SHG's are being formed in project villages. SHG's would constitute members mostly from SC's, ST's, women, landless and members belonging to very poor families. These groups would be homogeneous in nature and will have common goal. They would save money monthly as decided by them and will hold meetings regularly at least once in every month. Basic orientation and skill training will be provided to them under IWMP. They will also be given Revolving fund assistance to enable them to meet their urgent needs for starting micro enterprises.

Table 12 Self Help Groups

Watersheds	Panchayat	No:
Chalipuzha thodu	Ramapuram	23
	Karoor	17
Puthuveli thodu	Ramapuram	43
	Velivanoor	6
Kariyilathodu	Ramapuram	22
Kariyilathodu kurinji	Ramapuram	23
	Kadanadu	22
Ashramam varali thodu	Ramanuram	18
	Karoor	18
Thamarakkad Perumkutty-1	Ramapuram	16
Thamarakkad Perumkutty - 2	Ramapuram	19
Total		227

User Groups

User groups are formed in project area. The members of these will be those persons who are directly benefited by activities under watershed. Members of User Groups would take responsibility to manage the assets created under the project. They will further undertake responsibility for fixing user charges from their members. User Groups would be trained under IWMP so as to enable them to manage their assets created.

XII. PROJECT MANAGEMENT

Phase I – Preparatory phase - duration is 1 year

Phase II – Watershed Work Phase –duration is 2 to 3 years

Phase III – Consolidation and Withdrawal phase-1 to 2 years is the duration of this phase.

Various activities envisaged under these Phases are the following:

PREPARATORY PHASE

The preparatory phase of the project will be the first year of the project. The major objective of this phase is to build appropriate mechanisms for adoption of participatory approach and empowerment of local institutions (W.C, S.H.G and U.G). WDT will assume facilitating role during this phase. Major activities during this phase are inauguration, Entry Point Activities (EPA), Capacity Building to stake holders of watershed area, preparation of the DPR (Detailed Project Report) through PRA (Participatory Rural Appraisal) and FGDs (Focused Group discussion).

WATERSHED WORK PHASE

Important part of the project is this phase as all the activities envisaged in the Detailed Project Report are executed here. Activities coming under action plans like watershed development works, livelihood activities, production system and microenterprises implemented in this phase.

CONSOLIDATION AND WITHDRAWAL PHASE

The objective of this phase is to create new nature-based, sustainable livelihoods and raise productivity levels of the augmented resources and economic plans developed during the Watershed Works Phase. The following activities are proposed to be carried out during this stage.

1. **Documentation:** It is proposed to document the activities carried out during the watershed implementation period. It will help to maintain the records and identify and propagate the successful activities carried out under the project.
2. **Up-scaling of Successful Experiments:** It is proposed to identify the best practices carried out during the project period and up-scaling the same as per feasibility and propagate the same among others members of the watershed area.
3. **Evaluation:** Evaluation is a very important activity to assess the success of implementation of the project. It is proposed to carry out evaluation at the following levels.
 - a. **Social Audit:** It is proposed to conduct the social audit of the programme at the watershed level where the Gram Sabah will evaluate the programme where the beneficiaries should explain their benefits and current status of the activity. The Watershed Committee should place the books of accounts of watershed programme for approval.
 - b. **Evaluation by External Agency:** An external agency with evaluation of the programme.

With these works, all of the watershed starting from ridge to valley can be covered for water conservation / harvesting. Under MNREGA, the eligibility area is individual land of SC/ ST/BPL and common land. To cover left over area, under this work i.e., individual land of other than SC / ST/ BPL can be substituted under the ongoing programme of IWMP. Repair, restoration and renovation works of water resources and better utility of these activities can be done under IWMP in convergence with MNREGS.

XIII.CAPACITY BUILDING PLAN

Capacity building is the key mechanism to introduce participatory approach for planning, implementation and management of watershed activities. It is proposed to carry out the following institutional based training and capacity building programmes in the first two years of the project period, in order to equip various stakeholders to participate and implement the project. It is the major means by which Panchayat Raj Institutions and project staff shall be enabled to successfully undertake their work, with the communities of the project areas including women and other vulnerable sections of the society. Capacity building of all the stakeholders is essential to build their conceptual, managerial, technical and operational capabilities. The plan proposed for the entire project period is given below:-

Sl. No	Participants	Numbers	Days	Amount (Rs. 325/p)
1	Training of Trainers	77	2	50050
2	Neighborhood group two each	300	1	97500
3	Committee Members from a micro watershed	210	5	341250
4	Block/Grama Panchayat Members	50	1	16250
5	User Groups	1500	1	487500
6	SHG Training	300	2	195000
7	SHG Skill training	300	5	487500
8	Orientation training to WCC members	280	2	182000
9	Gender development in Watershed	500	1	162500
10	Official of Watersheds AO, VEO's, and others	50	5	81250
11	Field Visit (140 x Rs.600)	210	1	126000
	Total			2226800

XIV. ENTRY POINT ACTIVITIES (EPA)

Introduction of any new schemes and external interference of new groups, are not easily accepted by the community. So the EPA activities under IWMP help to build up a rapport with the village community. Well recharging, spring renovation, new well digging, drainage line treatment, community water tank are the proposed works as entry point activities in watershed areas. These particular activities are selected because water scarcity is the main problem in the areas. It is for speedy community organization and trust building among beneficiaries.

The proposed EPA activities are given below:

Table 13 Proposed Entry Point Activities

Sl	Name of EPA Activity	No	Total
1	Ambalam Check dam maintenance	1	110000
2	Aanichuvadu water supply scheme distribution pipe line change over	1	238267
3	Nenmelimangalam check dam maintenance	1	70000
4	Kondad nursery school's well construction	1	65000
5	Building cover for Central Marangad water supply scheme's tank	1	65000
6	Thamarakkad nursery school's well construction survey no: 35	1	76000
7	Maintenance for Thamarakkad homeo hospital's well	1	48000
8	Maintenance for Mundanikulam pond	1	15900
9	Maintenance for Perumkuttu water supply scheme's well	1	10000
10	Vellilapilly protection wall construction for stream at laksham veedu colony	1	139510
11	Placing pipe line for Kunnappally water supply scheme	1	231250
12	Placing pipe line for Mathalipara water supply scheme	1	218450
13	Maintenance for pipe line in Kurinjinellapara	1	90449
14	Construction of rain water harvesting tank for Nellapara nursery in Ramapuram Panchayat	1	50000
15	Construction of rain water harvesting tank for Govt. school, Kurinji	1	50000
16	Construction of rain water harvesting tank for Govt. school, Ezhachery	1	50000
17	Construction of rain water harvesting tank for Govt. school, Ramapuram	1	125000
18	Construction of rain water harvesting tank for Govt. school, Amanakara	1	125000
19	Extension of pipe line to carry water to cultural auditorium in Kadanadu Panchayat, Mattathipara ward,	1	78075
20	Construction of protection wall for Parathottal puthupparambil thodu	1	264927
21	Construction of protection wall for stream near nursery school in Thekkinkaattil Perumkuttiyodu	1	44521
22	Maintenance for water supply scheme in Idinal	1	193553
23	Protection cover for Ramapuram panchayat well	1	30000
24	Water tank construction for Kondad school	1	80000
25	Construction of rainwater harvesting tank for Pookkulam nursery in Kadanadu Panchayat	1	50000
26	Protection wall for stream near culvert in Pizhaku ward, pattathi parambu, Kadanadu panchayat	1	29246
27	Maintenance work for water supply scheme's tank in Anittamkundu	1	75616
28	Maintenance work for water supply scheme's tank in Parakkattumala	1	54566
29	Maintenance work for well in Vadakkekavu	1	22087
30	Maintenance work for Arattupuzha check dam	1	150000
31	Chirakandam Panagomala pipeline for water supply scheme	1	150000
32	Construction of protection wall for stream near cultural auditorium in Thamarakkad Perumkuttu	1	75000
	Total	32	3075417

XV. MAJOR PROBLEMS IN WATERSHED

Small and scattered land holdings:

The inhabitants of the watershed area belongs to small and marginal farmers.

Poor economic conditions of farmers:

The general economic condition of the farmers in this area is quite poor. They cannot use necessary agricultural inputs in time which adversely affects the crop yield.

Lack of utilization of resources:

The farmers are not utilizing the services of Krishi bhavan properly.

Low fertility of the soil:

The intense run off of rainwater washes away the top soil of all the watershed areas. Soil erosion decreases crop productivity due to reduced nutrient supply. Productivity in dry land areas is low and unstable due to moisture stress. And the area is prone to land sliding, so soil erosion due to such type of natural disasters is very severe.

Lack of use of improved seeds:

Farmers of this area don't generally use improved seeds of the crops they cultivate; especially of paddy. Most of them grow local varieties; which have a low yield potential.

Application of farm inputs:

Application of farm inputs like bio fertilisers and pesticides is not in accordance with the optimum recommendations. As the economic conditions of the farmers are poor, they cannot afford the recommended farm inputs due to the financial constraints. Soil testing of the area may be conducted and apply manures and bio fertilisers according to the soil testing results. It is better to avoid harmful chemical pesticides.

Crop Production:

70% of total area is covered by rubber cultivation. Other agriculture activity in the watershed area is as low as compared to other regions in the State and it is not considered as a major livelihood activity in the watershed area and also it is very low in production. Soil testing, use of organic manure and pesticides, cultivating high yielding varieties are suggestions for improving the paddy cultivation. Vegetables and fruits come from outside the watershed area. Introducing of kitchen garden may be promoted in the project area.

Water Scarcity:

Water scarcity is the major problem of the area. Most of the paddy fields are converted and cultivated with rubber. Rock mining quarries directly affected and resulted in the lowering of ground water table.

Plastic Pollution:

Careless dumping of plastic waste materials is a serious problem in the watershed area especially in Puthuvethodu watershed. As these things are non degradable it may adversely affect to the penetration of roots and infiltration of rain water.

Animal Husbandry:

The unavailability of fodder is another problem being faced by the households engaged in animal husbandry. As per the statistics, the cattle population is on decline. Therefore it is very important to increase fodder production and ensure fodder availability throughout the year. So it is proposed to carry out fodder planting and fodder seed distribution to all the households engaged in animal husbandry activities.

Labour:

Scarcity of labour is the main problem in agriculture field. Due to low wage in agriculture sector people are working in construction field and migrating to other places. In the focused Group Discussion and Participatory Rural appraisal, farmers have suggested that Grama Panchayat should prepare a work calendar for MGNREGS and labour force has to be ensured in appropriate time of agriculture production.

Marketing:

Marketing of agriculture products is a major problem in the watershed area. Ramapuram market is the nearby market where the farmers in the watershed area can sell their crops.

XVI. ACTIVITIES PROPOSED**Natural Resource Management**

Natural Resource Management under the IWMP can broadly be divided into three:

a) Soil Conservation Measures

It aims at utilizing the land as per its capability and manages it for maximizing production on sustained basis, without deterioration of natural resources. The contour bunds, tree plantations, stream retaining wall, etc are the proposed activities under the soil conservation measures, in the watershed areas.

Contour stone bunds

These are particularly suited to areas where stones are available. This will lead to the rehabilitation of degraded lands and reduced soil erosion.

Tree planting

The Agro forestry system in cultivated land has to be taken up with active involvement and participation of farmers. Tree planting is the process of planting saplings for land reclamation or landscaping purposes.

Bunds along Streams

Providing small bund banks (both side) will further stabilizes the stream bank against erosion. These bunds will stop the erosive surface runoff and protect the sliding of stream bank sides. The outer edges of the bunds will be stabilized with vegetative hedges, whereas grass stabilization will be provided on the top and inner sides.

Well Renovation

The activity of well renovation can be divided into 3 parts such as repairing, cleaning and deepening.

Repairing: the renewal or reconstruction of the existing well or the repairing or replacing of pumping equipment.

Cleaning: removing of rust, algae, sand, gravel or any other obstruction from an existing well.

Deepening: digging the existing well, to an increased depth to secure normal supply of water.

b) Water conservation measures

Well recharging, Check dams, Rainwater harvesting structure, Silpaulin pond are the proposed works for water conservation. Rain water conservation treatments in watershed catchment areas and social fencing, will improve the productivity and production of grasses. Irrigation with harvested rain water also increase biomass productivity and fodder availability for feeding of animals.

Well Recharging

Open wells have a major role to play in the artificial recharge of ground water. Roof top rainwater and surface water can be filtered and allowed to recharge the open wells through pits taken near the wells.

Silpaulin Pond

Rain water, roof water or runoff water can be collected in UV resistant plastic lined dug out ponds, in a cost effective way. Generally trapezoidal shaped storage tank are constructed, by excavating soil and dumping the excavated soil at the four sides of the tank. For hindering the seepage and percolation losses, the tank can be lined using 200 GSM UV resistant polythene film, commonly known as Silpaulin. Nylon materials can also be used for the same purpose. For this the sheet is made into the shape of the pond, by the process of thermal welding. After the thermal welding process the plastic sheet is inserted into the pond, and the sides are buried into the soil for making it stable. The pond can be further stabilized with rubble pitching and vegetative fencing.

Check Dams

“Check-dams” are small barriers built across the direction of water flow on shallow rivers and streams, for the purpose of water harvesting. The small dams retain excess water flow during monsoon in a small catchment area behind the structure. Pressure created in the catchment area helps force the impounded water into the ground. The major environmental benefit is the replenishment of nearby groundwater reserves and wells. The water entrapped by the dam, surface and subsurface, is primarily intended for domestic needs, livestock and irrigation.

Rain water harvesting structure

The principle behind the rain water harvesting, is the collection and usage of precipitation from a catchment surface. An old technology is gaining popularity in a new way. Artificial recharge to ground water is a process, by which the ground water reservoir is augmented at a rate, exceeding that obtaining under natural conditions or replenishment.

Rain water harvesting is essential because

- Surface water is inadequate to meet our demand and we have to depend on ground water.
- Due to rapid urbanization, infiltration of rain water into the subsoil has decreased drastically, and recharging of ground water has diminished.

One of the primary requirements of a water harvesting system is that of containers to store the water in a hygienic condition. This need is more pronounced in high rainfall areas where it is more feasible to store water in containers for direct use, rather than for recharging the groundwater.

Ferro cement tank

Ferro cement tank is the proposed work under the watershed area, for rain water harvesting under the IWMP project. Ferro cement consists of cement mortar which is reinforced with a cage made of wire mesh and steel bars.

c) Agronomic measures

Vegetable cultivation

The State has been depending on its neighboring states to meet the increasing need for vegetable. The vegetable cultivation is a proposed activity in the project area, that will help to make the people self sufficient. The land type and climate here are also favorable for vegetable cultivation.

Production System and Micro enterprises

Animal Husbandry

Animal husbandry has been an integral part of agriculture because of its interdependence for food on crops, animal production and manures. So the cow rearing is proposed in the watershed area to improve the quantity of animals.

Cow rearing

Cattle rearing involve the breeding and general care of dairy cattle. The cow rearing is proposed in the areas as a production system, because the rural poor can raise the standard of living through the rearing of good breed of cattles. Dairy development of the area is another output of cow rearing practice in the area.

Vermi Compost

Vermi compost is the product or process of composting, using various species of earth worms to create mixture of decomposing vegetable or food waste, bedding material and vermin cast. Vermi castings contain reduced levels of contaminants and a higher saturation of nutrients. Vermi compost is an excellent, nutrient rich organic fertilizer and soil conditioner.

Biogas Plant

Biogas typically refers to a gas, produced by break down of organic matter in the absence of oxygen. Organic waste such as dead plant and animal material, animal feces and kitchen waste can be converted into gaseous fuel called bio gas. Biogas originates from biogenic material and is a type of bio fuel.

Poly House

In India traditional farming is prevalent, but now new farming technology like poly house farming provides better income in a short period of time with less labour. Poly house farming is an alternative new technique in agriculture, gaining foot hold in rural India. It reduces dependency in rain fall, and makes the optimum use of land and water resources. Poly house farming can help the farmer to generate income around the year by growing multiple crops like vegetables and flowering plants suited to the poly house condition. It is now an established fact, that poly house intervention is capable of enhancing production and productivity of horticultural crops. There is a tremendous scope of adoption of poly house technology in the region. The harvested rain water can be used to irrigate winter season vegetables, through micro irrigation system to enhance productivity and profitability. More intensive efforts in the form

of demonstration and sensitization are needed to popularize these technologies. Owing to the poor economic condition of the farmers of the region, more assistance and low cost technologies may find favourable.

Bee keeping

Honey bee farming is a great way to reduce unemployment in rural areas. This also increases the availability of pure and natural honey. Incorporating honey bee farming in current farming is always a sustainable method of farming. Honey bee farming in rubber plantations increases the income from rubber plantations by spending small amount of money and time. Rubber trees are great source of honey. Various Government agencies like Rubber Board, National Horticulture Board, and NABARD gives training and assistance to promote bee keeping.

Livelihood Activities

Studies on women's contribution to household income reveal that, women tend to contribute a higher proportion of their income for family sustenance, while men spend more for their personal comforts. Several programmes have been introduced by the central and state governments by recognizing that women empowerment, is the best strategy for poverty alleviation and for ensuring gender equality. To be empowered, it is imperative that women mobilize and organize themselves. When group of women do this process together, they reinforce each other, and the strength of the collectiveness has a great role to play. Through this they are able to identify their own problems and priorities.

Integrated Watershed Management Programme (IWMP) is also focused to deal with rural poverty. Developing Community Based Organizations (CBOs) will assist the rural poor not only soil and water conservation measures, but also to improve their livelihoods. Livelihood plans under IWMP in Uzhavoor Block Panchayath also aims to improve peoples participation and facilitation of better livelihood opportunities for the marginalized.

OBJECTIVES

- To improve the socio economic status of the people inhabited in the watershed areas.
- To create employment opportunities for the stakeholders, both men and women.
- To eliminate the migration of the inhabitants due to lack of employment opportunities.
- To empower women through generating income for their families and through offering a distinctive status for women either as entrepreneurs or as leaders.

Goat Rearing, Horticulture (Kitchen Gardens), Nursery, Bee keeping, jack fruit drier, mushroom cultivation, are some of the proposed livelihood activities in the watershed areas under the IWMP project.

The proposed activities are given below:

Goat Rearing

Goat farming is an important component in dry land farming system. It is one of the techniques to improve the economy of rural farming community. Hybrid goat rearing has been found to be highly remunerative, compared to rearing other farm animals, and it is advocated as a better substitute of livelihood for the rural poor.

Nursery

A nursery is a place where plants are propagated or grown to usable size. Nurseries are proposed in the area under the IWMP project, SHGs will select to involve in this activity in each watershed area.

Poultry Farm

Poultry farming is the raising of domesticated chickens, for the purpose of meat or eggs for food. The manure from poultry can be used to manure crops. Poultry rearing does not require much infrastructure facilities.

XVII. SCOPE FOR CONVERGENCE

The project activities of Integrated Watershed Programme Management Project in Uzhavoor is also converged with activities of various departments and other schemes in the areas. The watershed development activities can be classified into Natural Resource Management, Livelihood enhancement activities and Production system and Microenterprises. All these activities are converged with other ongoing schemes in the Block Panchayath like MNREGA and other line departments. The convergences with other schemes will help to reach the project activities to maximum stakeholders.

The main objectives and reasons for seeking convergence are:

- Avoid duplication of efforts and redundant actions.
- Enable sharing of resources for common objectives.
- Enhance effectiveness of programme delivery.
- Improve quality of service provided.
- Develop effective linkage with various development initiatives.
- Help to identify new opportunities and options.
- Ensure transparency and accountability in governance.
- Result in the effective monitoring of outcomes

Merits of Convergence

Increase in Social Capital: Collective planning and implementation among different stakeholders will enhance social capital. This will also improve management and work output.

Increase in Physical Capital: The process will aid in creating durable assets and will also improve land productivity.

Facilitation of Ecological Synergies: Regeneration of natural resource base through different activities such as, afforestation, drought proofing, flood proofing etc will lead to the effective use of resources.

Enhance economic opportunities: Income opportunities, savings and investments may be generated through activities.

Strengthen Democratic Processes: Convergence awareness and planning at the grass root level will lead to greater ownership of projects.

Facilitate Sustainable Development: Convergence efforts through creation of durable assets, rural connectivity, productivity enhancement and capacity development lead to sustainable development.

Convergence Agencies

The list of Convergence Agencies is given below:

Gramapanchyat
Forest Department
Animal Husbandry Department
Horticulture Department
Agriculture Department
Khadhi and village industries
Fisheries
Small scale industries
Sujitwa Mission
Rubber Board

Table 14 Estimate of NRM Activities with Convergence

Total Consolidation of NRM activities of IWMP with convergence										
Sl No	Name of activity	Unit rate	Volume	Unit	Total IWMP Fund(in lakh)	Convergence				
						Unit rate	Volume	Unit	Convergence fund(in lakhs)	Agency
1	Coconut trenching and mulching					53.74	19254	Nos	10	MNREGS
2	Arecanut trenching and mulching					53.74	12066	Nos	6	MNREGS
3	Vegetable promotion	500	502	Nos	2.51	500	17170	Nos	85.85	Krishibhavan
4	Banana cultivation					30	1088	Nos	0.33	Krishibhavan
5	Biofencing					16.4	49765	m	8.16	MNREGS
6	Percolation pit					377	16337	Nos	61.59	MNREGS
7	Horticulture (< 25 cents)	195	510	Nos	0.99					Horticulture mission
8	Horticulture (25 - 50 cents)	460	484	Nos	2.23					Horticulture mission
9	Horticulture (> 50 cents)	840	375	Nos	3.15				0.00	Horticulture mission
10	Tree planting	5	74275	Nos	3.71	5	33010	Nos	1.65	MNREGS
11	Fodder grass	20	946	cent	0.19				0.00	MNREGS
12	Contour stone bunds	180	31749	m3	57.15	180	367810	m3	662.06	MNREGS
13	Check dams		29	Nos	118.54				0.00	MNREGS
14	Stream retaining wall	2400	1318.86	m2	31.65				0.00	MNREGS
15	Well renovation		8	Nos	4.05				0.00	MNREGS
16	Pond renovation		8	Nos	12.70				0.00	MNREGS
17	Well construction		7	Nos	5.25				0.00	MNREGS
18	Silpaulin pond	7000	164	Nos	11.48	7000	551	Nos	38.57	MNREGS
19	Rain water harvesting structure	25000	66	Nos	16.50				0.00	MNREGS
20	Well recharging	10000	1210	Nos	121.00	10000	1605	Nos	160.50	MNREGS
Total					391.10				1035.54	

Table 15 Estimate of PSM Activities with Convergence

Total Consolidation of PSM activities of IWMP with convergence									
Sl No	Activity	No of units beneficiaries	Rate/ Unit	Unit	Funds from IWMP (Rs in lakhs)	Convergence			
						WDF (Rs in lakhs)	Volume	Funds from other agencies (Rs in lakhs)	Convergence agency name
1	Cow rearing	54	30000	Nos	16.20	1.62	506	151.80	Animal Husbandry
2	Bio gas plant	328	12500	Nos	41.00	4.10	587	73.38	Sujitwa mission
3	Bee keeping	70	7000	Nos	4.90	0.49	230	16.10	Rubber board
4	Coconut seedling	3220	65	Nos	2.09	0.21	2377	1.55	Agriculture department
5	Nutmeg	276	450	Nos	1.24	0.12	4800	21.60	Horticulture department
6	Ginger	0	50	Cent	0.00	0.00	12350	6.18	Horticulture department
7	Turmeric	0	50	Cent	0.00	0.00	10470	5.24	Horticulture department
8	Tuber crops	0	120	Cent	0.00	0.00	26550	31.86	Horticulture department
9	Poly house	0	10000	Nos	0.00	0.00	117	11.70	Horticulture department
10	Bio fertilizers	0	400	Nos	0.00	0.00	2169	8.68	Agriculture department
11	Fish farming	0	5	Nos	0.00	0.00	4000	0.20	Fisheries department
12	Vermi compost	55	8000	Nos	4.40	0.44		0.00	Sujitwa mission
Total					69.84	6.98		328.27	

Table 16 Estimate of LH Activities with Convergence

Total Consolidation of Livelihood Activities of IWMP with Convergence										
						Convergence				
Sl no	Activity	No of Beneficiaries	Rate/unit	Funds from IWMP (Rs in lakhs)	Beneficiary contribution (Rs in lakhs)	Volume	Bank Loan (Rs in lakhs)	Fund from other Agencies (Rs in lakhs)	Convergence Agency Name	Total Cost (Rs in lakhs)
1	Food processing unit	9	50000	4.50		17	4.25	4.25	Small scale industries unit	13.00
2	Goat	168	6000	5.04	5.04	717	21.51	21.51	Animal Husbandry	53.10
3	Kaada		500	0.00	0.00	187	0.47	0.47	Animal Husbandry	0.94
4	Rabbit farming	91	6000	2.73	2.73	0	0.00	0.00	Animal Husbandry	5.46
5	Heifer	10	10000	0.50	0.50	167	8.35	8.35	Animal Husbandry	1.00
6	Hen with cage	230	5000	5.75	5.75	1057	26.43	26.43	Animal Husbandry	64.35
7	Revolving Fund			44.34						
Total				62.86	14.02		61.00	61.00		154.55

Annual Action Plan

Annual Action Plan of Natural Resource Management

Annual Action Plan for Natural Resource Management

Sl No.	Activity	Unit	Total Volume	Rate (Rs)	Year 1		Year 2		Year 3		Total Amount (Rs. In Lakh)
					Physical	Financial	Physical	Financial	Physical	Financial	
Work components											
I	Soil & Moisture conservation works(Area treated in Ha)										
1	Contour stone bunding	m3	31749.00	180.00	4001.00	7.20	9591.00	17.26	18157.00	32.68	57.15
II	Water Harvesting Structures										0.00
1	Well recharging	Nos.	1210.00	10000.00	406.00	40.60	369.00	36.90	435.00	43.50	121.00
2	Silpaulin pond	Nos.	164.00	7000.00			6.00	0.42	158.00	11.06	11.48
3	Rain Water harvesting structure(private) 5000l	Nos.	66.00	25000.00			3.00	0.75	63.00	15.75	16.50
4	Pond renovation	Nos.	8.00		2.00	2.50	3.00	1.40	3.00	8.80	12.70
5	Stream retaining wall	m2	1318.87	2400.00	85.50	2.05	430.04	10.32	803.33	19.28	31.65
6	Well renovation(Public)	Nos.	8.00		1.00	0.10	6.00	3.35	1.00	0.60	4.05
7	Well construction	Nos.	7.00		1.00	0.75	4.00	3.00	2.00	1.50	5.25
8	Checkdam	Nos.	29.00	135000.00	17.00	63.44	9.00	40.46	3.00	14.64	118.54
III	Afforestation Works							0.00			0.00
1	Tree Planting(Private land)	Nos.	74275.00	5.00		0.00	34780.00	1.74	39495.00	1.97	3.71
2	Fodder grass	cent	946.00	20.00					946.00	0.19	0.19
IV	Horticulture Development							0.00		0.00	0.00
1	Vegetable promotion	Nos.	502.00	500.00			138.00	0.69	364.00	1.82	2.51
2	Horticulture (< 25 cents)	Nos.	510.00	195.00	39.00	0.08	85.00	0.17	386.00	0.75	0.99
3	Horticulture (25 - 50 cents)	Nos.	484.00	460.00	40.00	0.18	78.00	0.36	366.00	1.68	2.23
4	Horticulture (> 50 cents)	Nos.	375.00	840.00	29.00	0.24	61.00	0.51	285.00	2.39	3.15
Total											391.10

Annual Action Plan for Production System Management and Micro Enterprises											
Sl No.	Activity	Unit	Total Volume	Rate	Year 1		Year 2		Year 3		Total Amount (Rs in Lakhs)
					Physical	Financial	Physical	Financial	Physical	Financial	
	Work components										
1	Cow rearing	Nos.	54.00	30000.00	18.00	5.40	4.00	1.20	32.00	9.60	16.20
2	Bee keeping	Nos.	70.00	7000.00		0.00	52.00	3.64	18.00	1.26	4.90
3	Vermi compost Unit	Nos.	55.00	8000.00	26.00	2.08	29.00	2.32		0.00	4.40
4	Bio-gas plant (portable 0.75 m3)	m3	328.00	12500.00	103.00	12.88	105.00	13.13	120.00	15.00	41.00
5	Coconut seedling	Nos.	3220.00	65.00	824.00	0.54	754.00	0.49	1642.00	1.07	2.09
6	Nutmeg	Nos.	276.00	450.00		0.00	24.00	0.11	252.00	1.13	1.24
	Total					20.89		20.88		28.06	69.84

Annual Action Plan for Livelihood Activities											
Sl No.	Activity	Unit	Total Volume	Rate	Year 1		Year 2		Year 3		Total Amount (Rs in Lakhs)
					Physical	Financial	Physical	Financial	Physical	Financial	
	Work components										
1	Revolving Fund	SHGs				13.33		13.28		17.73	44.34
2	Goat Rearing	Nos	168	6000	44	1.32	98	2.94	26	0.78	5.04
3	Rabbit farming	Nos	91	6000	2	0.06	12	0.36	77	2.31	2.73
4	Heifer	Nos	10	10000		0	10	0.5		0	0.50
5	Hen with cage	Nos	230	5000	146	3.65	51	1.275	33	0.825	5.75
6	Food Processing Unit	SHGs	9	50000	1	0.5	1	0.5	7	3.5	4.50
	Total					18.86		18.86		25.14	62.86

XVIII. MICRO WATERSHEDS

CHALIPUZHATHODU WATERSHED 12M21b

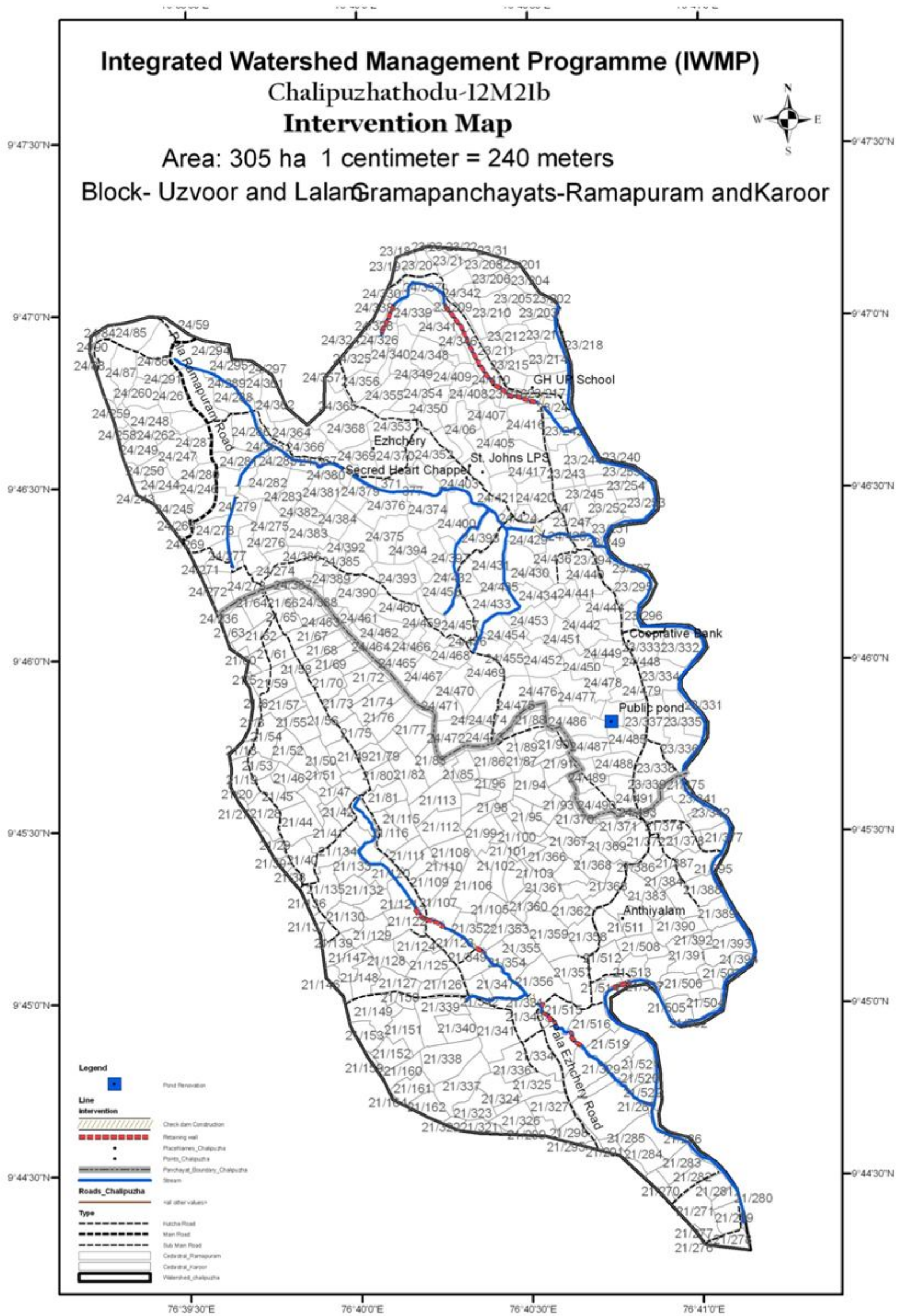
Table 17 Location and Extend of Chalipuzhathodu(12M 21b)Watershed

1	Name of the Block	Uzhavoor Block Panchayat
2	Name of the District	Kottayam
3	Name of Panchayat	Ramapuram and Karoor
4	Block	Uzhavoor
5	Geographical Location	
	Longitudes	76°39'12.973"W to 76°41'8.021"E
	Latitudes	9°44'17.6" S to 9°46'55.421"N
6	Geographical Area of the Watershed	1025 ha
7	Watershed and Watershed codes	Chalipuzhathodu(12M 21b)
8	Major Water Source	Chalipuzha stream
9	River flowing nearby the watershed area	Meenachil River
10	Livelihood Options	Agriculture, Animal Husbandry, Business, Wages, Govt. Job

Table 18 Watershed Characterof Chalipuzhathodu

Chalipuzhathodu Watershed	
Relief	Subnormal to Excessive
Drainage	Well Drained
Average Slope	Moderately steep to steep
Perimetre km	17.87
Area (km2)	10.24
Main Stream (km)	2.59
Drainage Density (km/sq.km)	2.45
Drainage inside the WS (km)	6.36
Shape index(compactness index)	0.63

Uzhavoor Chalipuzha action plan with map



PUTHUVELITHODU WATERSHED(12M 21c)

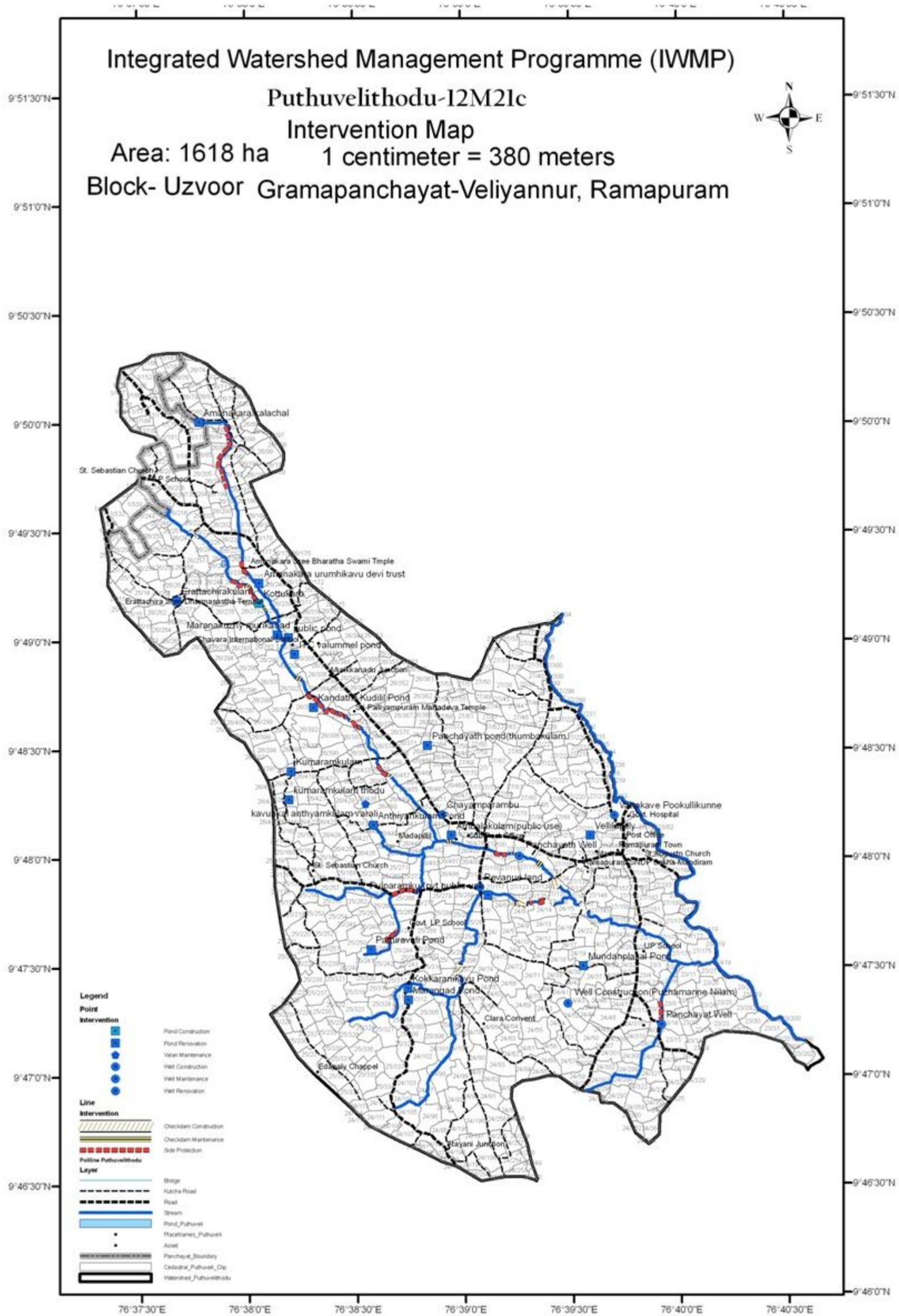
Table 19 Location and Extend of Puthuvelithodu (12M 21c) Watershed

1	Name of the Block	Uzhavoor Block Panchayat
2	Name of the District	Kottayam
3	Name of Panchayat	Ramapuram
4	Block	Uzhavoor
5	Geographical Location	
	Longitudes	76°37'24.306"W 76°40'40.086"E
	Latitudes	9°47'5.913" S 9°50'15.428"N
6	Geographical Area of the Watershed	1618 ha
7	Watershed and Watershed codes	Puthuvelithodu (12M 21c)
8	Major Water Source	Amankara Murikkanad thodu
9	River flowing nearby the watershed area	Meenachil River
10	Livelihood Options	Agriculture, Animal Husbandry, Business, Wages, Govt. Job

Table 20 Watershed Characterof Puthuvelithodu

Puthuvelithodu Watershed	
Relief	Subnormal to Normal
Drainage	Well Drained
Average Slope	Moderately steep to steep
Perimeter km	25.99
Area (km ²)	16.68
Stream km	4.08
Drainage Density (km/sq.km)	1.08
Drainage inside the WS (km)	18.14
Shape index(compactness index)	0.55

Uzhavoor Puthuvelithodu action plan with map



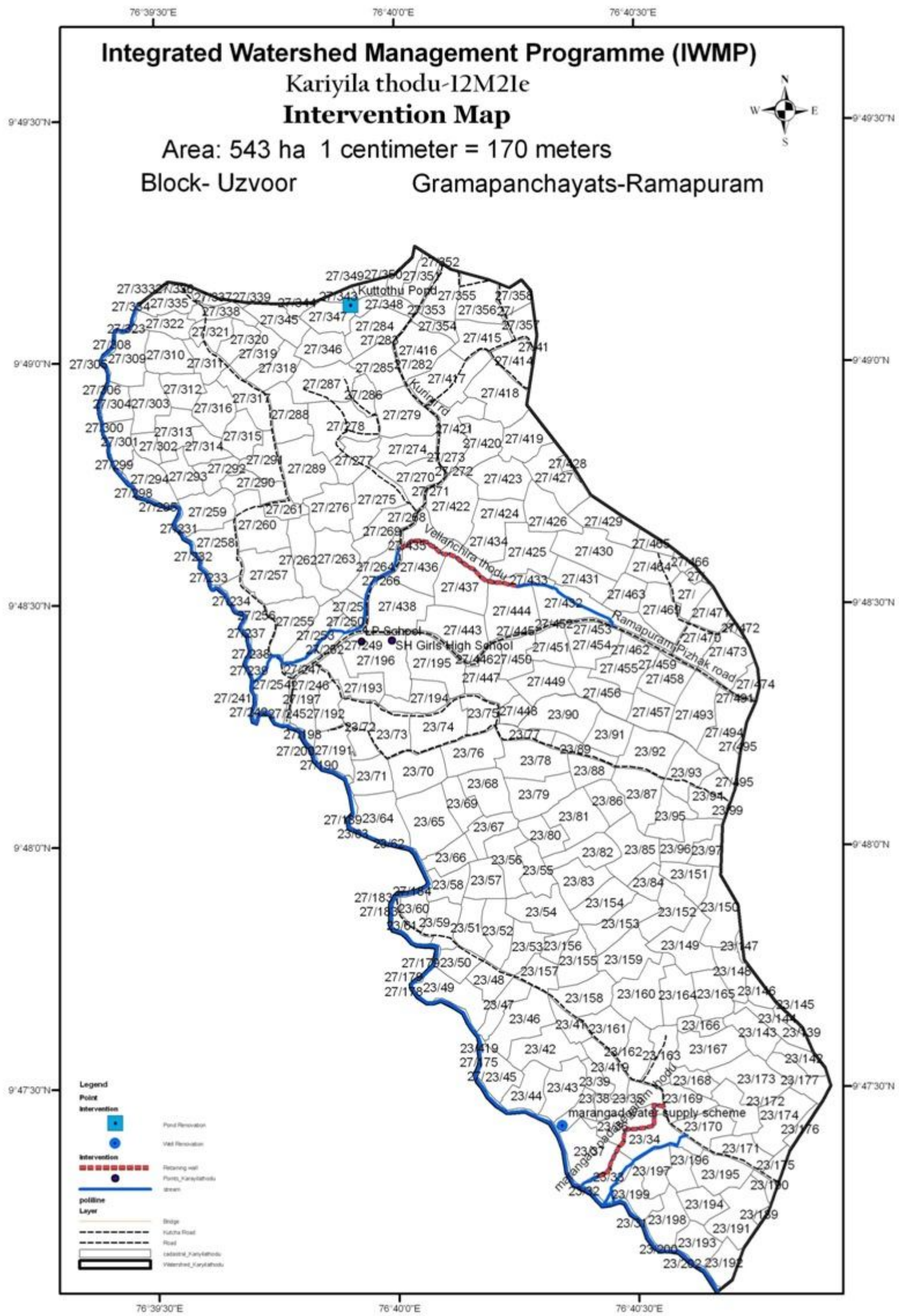
KARIYILATHODU WATERSHED(12M 21e)**Table 21 Location and Extend of Kariyilathodu(12M 21e) Watershed**

1	Name of the Block	Uzhavoor Block Panchayat
2	Name of the District	Kottayam
3	Name of Panchayat	Ramapuram
4	Block	Uzhavoor
5	Geographical Location	
	Longitudes	76°39'24.386"W 6°40'54.699"E
	Latitudes	9°47'5.913" S 9°50'15.428"N
6	Geographical Area of the Watershed	543 ha
7	Watershed and Watershed codes	Kariyilathodu (12M 21e)
8	Major Water Source	Vellanchira thodu
9	River flowing nearby the watershed area	Meenachil River
10	Livelihood Options	Agriculture, Animal Husbandry, Business, Wages, Govt. Job

Table 22 Watershed Characterof Kariyilathodu

Kariyilathodu watershed	
Relief	Subnormal to Excessive
Average Slope	Moderately steep to steep
Drainage	Well drained
Perimetre km	11.82
Area (km ²)	5.32
Main Stream (km)	1.60
Drainage Density (km\sq.km)	3.14
Drainage inside the WS (km)	8.56
Shape index(compactness index)	0.69

Uzhavoor Kariyilathodu action plan with map



KARIYILATHODU KURINJI WATERSHED(12M 21g)

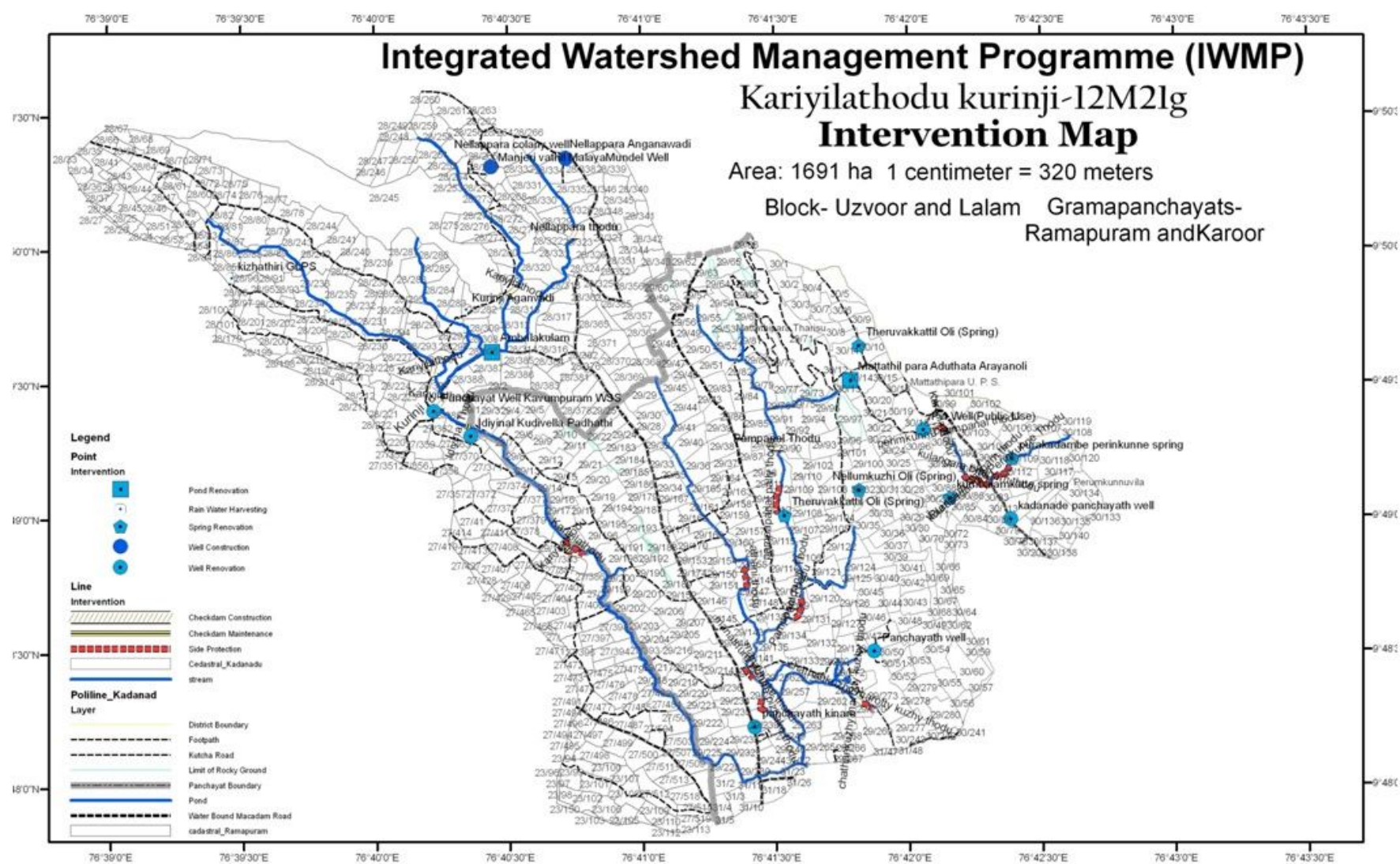
Table 23 Location and Extend of Kariyilathodu Kurinji(12M21g) Watershed

1	Name of the Block	Uzhavoor Block Panchayat
2	Name of the District	Kottayam
3	Name of Panchayat	Kadanad
4	Block	Uzhavoor
5	Geographical Location	
	Longitudes	76°38'51.391"W 76°42'44.495"E
	Latitudes	9°47'50.987"S 9°50'34.18"N
6	Geographical Area of the Watershed	1691 ha
7	Watershed and Watershed codes	Kariyilathodu Kurinji (12M 21g)
8	Major Water Source	Kariyila thodu
9	River flowing nearby the watershed area	Meenachil River
10	Livelihood Options	Agriculture, Animal Husbandry, Business, Wages, Govt. Job

Table 24 Watershed Character of Kariyilathodu Kurinji

Kariyilathodu Kurinji watershed	
Relief	Subnormal to Excessive
Average Slope	Moderately steep to steep
Drainage	Well Drained
Perimetre (km)	21.78
Area (km ²)	16.71
Main Stream (km)	6.79
Drainage Density (km/sq.km)	1.42
Drainage inside the WS (km)	23.86
Shape index(compactness index)	0.66

Uzhavoor Kariyilathodu Kurinji action plan with map



ASHRAMAM VALARI THODU WATERSHED(12M21j)

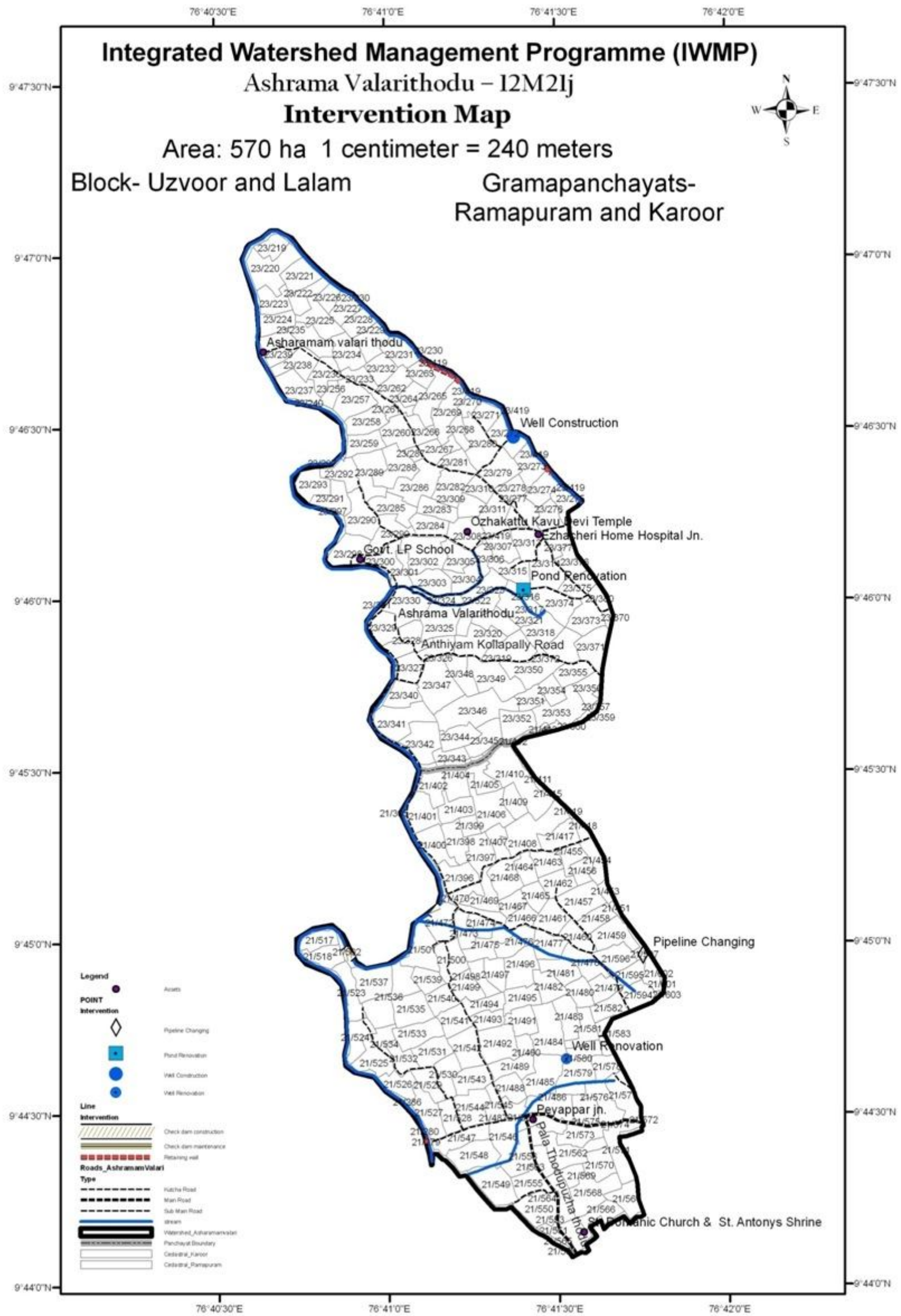
Table 25 Location and Extend of Ashramam valari thodu(12M 21j) Watershed

1	Name of the Block	Uzhavoor Block Panchayat
2	Name of the District	Kottayam
3	Name of Panchayat	Ramapuram and Kadanad
4	Block	Uzhavoor
5	Geographical Location	
	Longitudes	76°40'32.526"W 76°41'51.665"E
	Latitudes	9°44'5.289"S 9°47'5.329"
6	Geographical Area of the Watershed	570 ha
7	Watershed and Watershed codes	Ashramam valari thodu (12M 21j)
8	Major Water Source	Lalam thodu
9	River flowing nearby the watershed area	Meenachil River
10	Livelihood Options	Agriculture, Animal Husbandry, Business, Wages, Govt. Job

Table 26 Watershed Character of Ashramam valari thodu

Ashramam valarithodu watershed	
Relief	Subnormal to Normal
Drainage	Well Drained
Average Slope	Gently slopping to strongly slopping
Perimetre (km)	16.52
Area (km2)	5.72
Main Stream (km)	2.31
Drainage Density (km\sq.km)	1.12
Drainage inside the WS (km)	6.44
Shape index(compactness index)	0.51

Uzhavoor Ashramam valari thodu action plan with map



THAMARAKKAD PERUMUTTY-1 WATERSHED(13M 59d)

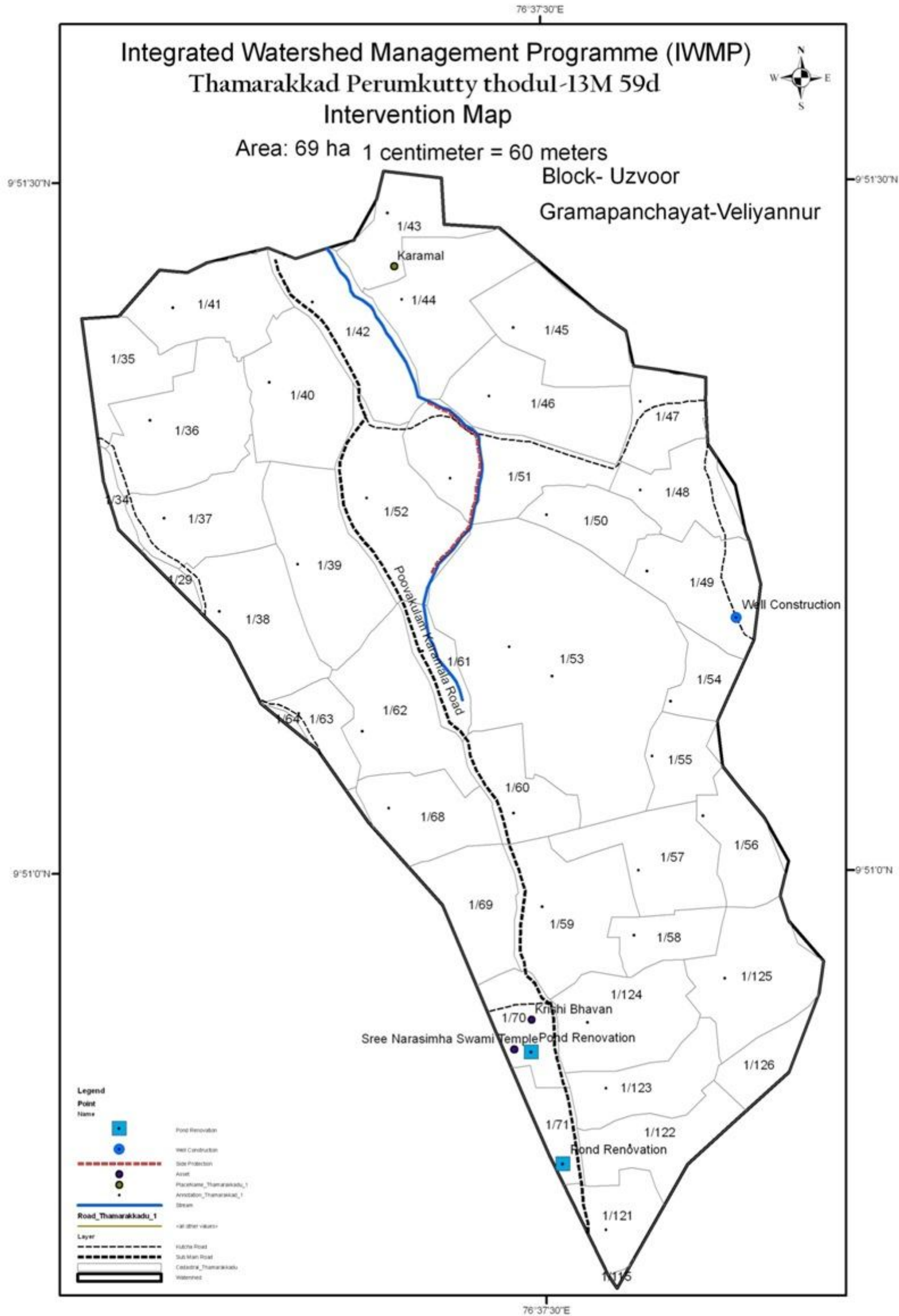
Table 27 Location and Extent of Thamarakkad Perumkutty-1 (13M 59d) Watershed

1	Name of the Block	Uzhavoor Block Panchayat
2	Name of the District	Kottayam
3	Name of Panchayat	Veliyannur
4	Block	Uzhavoor
5	Geographical Location	
	Longitudes	76°37'9.597"W 76°37'42.641"E
	Latitudes	9°50'42.143"S 9°51'30.481"N
6	Geographical Area of the Watershed	69 ha
7	Watershed and Watershed codes	Thamarakkad Perumkutty-1 (13M 59d)
8	Major Water Source	Chirakkamattom thodu
9	River flowing nearby the watershed area	Meenachil River
10	Livelihood Options	Agriculture, Animal Husbandry, Business, Wages, Govt. Job

Table 28 Watrshed Character of Thamarakkad Perumkutty-1

Thamarakkad Perumkutty-1 watershed	
Relief	Subnormal to Normal
Average Slope	Moderately steep to steep
Drainage	Well Drained
Perimetre (km)	3.97
Area (km ²)	0.74
Stream (km)	0.72
Drainage Density (km\sq.km)	0.97
Drainage inside the WS (km)	0.72
Shape index(compactness index)	0.76

Uzhavoor Thamarakkad Perumkutty-1 action plan with map



THAMARAKKAD PERUMUTTY-2 WATERSHED(13M 59f)

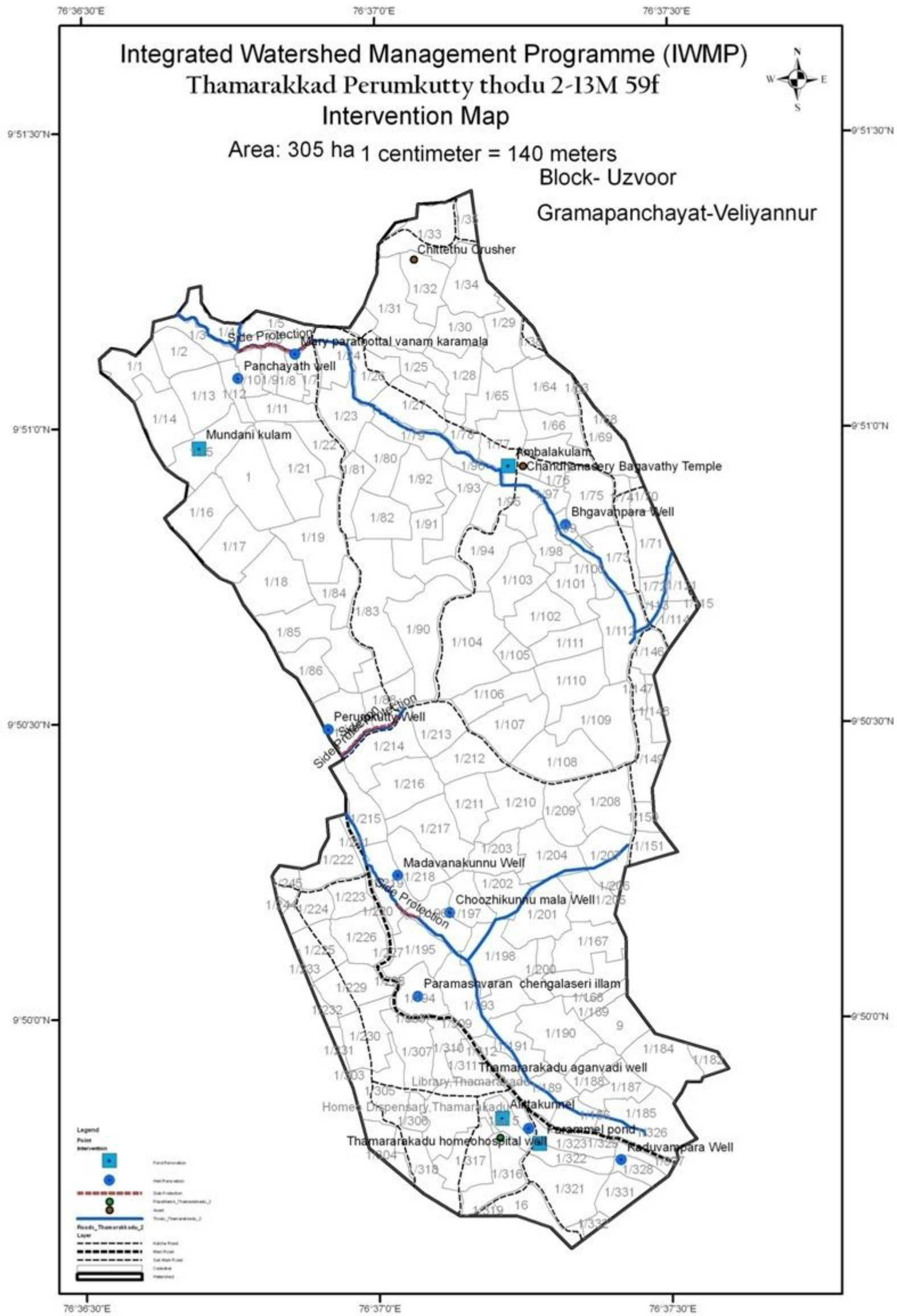
Table 29 Location and Extent of Thamarakkad Perumkutty-2 (13M 59f) Watershed

1	Name of the Block	Uzhavoor Block Panchayat
2	Name of the District	Kottayam
3	Name of Panchayat	Veliyannur
4	Block	Uzhavoor
5	Geographical Location	
	Longitudes	76°36'30.58"W 76°37'36.417"E
	Latitudes	9°49'34.188"S 9°51'23.451"N
6	Geographical Area of the Watershed	305 ha
7	Watershed and Watershed codes	Thamarakkad Perumkutty-2 (13M 59f)
8	Major Water Source	Parathottil thodu
9	River flowing nearby the watershed area	Meenachil River
10	Livelihood Options	Agriculture, Animal Husbandry, Business, Wages, Govt. Job

Table 30 Watershed Character of Thamarakkad Perumkutty-2

Thamarakkad Perumkutty-2 watershed	
Relief	Subnormal to Normal
Average Slope	Moderately steep to steep
Drainage	Well Drained
Perimetre (km)	9.74
Area (km ²)	3.39
Stream (km)	2.08
Drainage Density (km/sq.km)	1.34
Drainage inside the WS (km)	4.55
Shape index(compactness index)	0.67

Uzhavoor Thamarakkad Perumkuttu-2 action plan with map



XIX. WATERSHED DEVELOPMENT FUND

One of the mandatory conditions for selection of villages in Watershed Development Programmes is people's contribution towards Watershed Development Fund (WDF). The contributions to WDF shall be a minimum 10% of the cost of works executed on individual lands. However, in case of SC/ST and persons identified below the poverty line, the minimum contribution shall be 5% of the cost of works executed on their lands. Contribution to the Fund in respect of community property may come from all the beneficiaries, which shall be a minimum of 5% of the development cost incurred.

It should be ensured that the contribution comes from the beneficiary farmers and is not deducted from the wages paid to the labourers who are engaged to treat the private lands. These contributions would be acceptable either in cash/ voluntary labour or material. A sum equivalent to the monetary value of the voluntary labour and materials would be taken from the watershed project account and deposited in this Fund. The Gram Panchayat shall maintain the Watershed Development Fund separately. The Chairman and Secretary, Gram Panchayat will operate the WDF account jointly. Individuals as well as community organizations should be encouraged to contribute generously to this Fund. The proceeds of this Fund shall be utilized in maintenance of assets created on community land or for common use after completion of project period. Works taken up for individual benefit shall not be eligible for repair/maintenance out of this Fund.

XX. EXPECTED OUTCOME FROM EACH INTERVENTION

Employment

Seasonal employment has always been a problem in the village. Most of the villagers are engaged in agriculture and allied activities. However, the availability of water is very low. Lack of fodder makes animal husbandry very difficult too. Therefore animal husbandry alone does not keep them engaged full time. Thus the people mainly depend upon casual labour either in the village itself or outside it.

The project plans for creation of both wage employment and self employment opportunities. Wage employment would be created by engaging people in physical works. Self employment would be created by providing the people with cash support in the form of direct livelihood activities like agriculture, animal husbandry and enterprise development.

Table 31 Employment

No	Names of Watershed	Wage Employment										Self Employment				
		No of man days in '00s					No of beneficiaries					No of beneficiaries				
		SC	ST	Others	Women	Total	SC	ST	Others	Women	Total	SC	ST	Others	Women	Total
1	Chalipuzhathodu	44	1	1135	720	1900	44	1	1135	720	1900	27	1	284	576	887
2	Puthuvelithodu	41	2	1745	1102	2890	41	2	1745	1102	2890	24	1	436	881	1343
3	Kariyilathodu	14	1	572	361	948	14	1	572	361	948	8	1	143	289	441
4	Kariyilathodu kurinji	39	4	1676	1058	2778	39	4	1676	1058	2778	23	3	419	847	1292
5	Ashramam valarithodu	25	1	633	402	1061	25	1	633	402	1061	15	0	158	322	495
6	Thamarakkad Perumkutty1	1	0	85	54	140	1	0	85	54	140	1	0	21	43	65
7	Thamarakkad Perumkutty2	5	0	379	238	622	5	0	379	238	622	3	0	95	190	288
	Total	169	9	6226	3935	10339	169	9	6226	3935	10339	101	5	1556	3148	4811

Table 32 Seasonal Migration

No	Watersheds	No:of persons migrating	No of days per year of migration	Major reasons for migrating	Expected reduction in no of persons migrating
1	Chalipuzhathodu	58	5763	Lack of job opportunities in the agriculture and allied sectors. Low productivity and poor income from land. Rural economic activities getting weakened. Weak infrastructure and support services for agriculture. Better livelihoods, Changing life styles.	41
2	Puthuvelithodu	88	5200		62
3	Kariyilathodu	29	3556		21
4	Kariyilathodu kurinji	85	2032		60
5	Ashramam valari thodu	32	3216		23
6	Thamarakkad Perumkutty1	4	253		3
7	Thamarakkad Perumkutty2	19	2342		13
	Total	331	22362		223

Ground Water Table

Watershed areas get enough rainfall but demand for ground water has been increasing all the time because of the geographical specialties. Proper water harvesting structures and percolation tanks would go a long way in increasing water table depth.

Table 33 Details of Average Ground Water

No	Watersheds	Sources	Pre project level	Expected post project
1	Chalipuzhathodu	Open wells	7.5	5
		Bore wells	83	66
		Others – Ponds	4.2	4
2	Puthuvelithodu	Open wells	8.5	6
		Bore wells	98	78
		Others – Ponds	5.2	5
3	Kariyilathodu	Open wells	6.5	5
		Bore wells	88	70
		Others – Ponds	4.5	4
4	Kariyilathodu kurinji	Open wells	6	4
		Bore wells	78	62
		Others – Ponds	4	4
5	Ashramam valari thodu	Open wells	7	5
		Bore wells	93	74
		Others – Ponds	5	5
6	Thamarakkad Perumkutty1	Open wells	8	6
		Bore wells	108	86
		Others – Ponds	6	5
7	Thamarakkad Perumkutty2	Open wells	9	6
		Bore wells	123	98
		Others – Ponds	7	6

Drinking Water

Majority of the people in the watershed area suffer lack of drinking water especially in summer seasons. As a result of watershed development activities, it is expected that the quantity and quality of drinking water would improve.

Table 34 Drinking Water

No	Watershed	Availability of drinking water (no. of months in a year)		Quality of drinking water		Comments
		Pre Project	Expected Post project	Pre Project	Expected post project	
1	Chalipuzhathodu	9	10	Turbulence, hardness, high iron and salinity are the major issues observed. High presence of e coli is observed in almost all open wells and ponds. They are also present in number of open wells as well.	Reduced concentration of dissolved salts, less incidence of turbulence, a check regarding the saline intrusion, better bacteriological quality etc. are the major expected post project benefits	The issues listed are culled from varies studies conducted in the area by other agencies. There is also a variation in quality issues during different seasons.
2	Puthuvelithodu	8	10			
3	Kariyilathodu	11	12			
4	Kariyilathodu kurinji	10	11			
5	Ashramam valari thodu	7	9			
6	Thamarakkad Perumkutty1	11	12			
7	Thamarakkad Perumkutty2	9	10			

Crops

Agriculture primarily depends upon water availability but this is what is lacking in Uzhavoor Block Panchayat. This problem can be changed with the land and water management interventions in the project area. The earthen bunds and rain water harvesting systems help to percolate water to underground and preserve moisture in the soil. This will help additional area coming under cultivation and increasing productivity too.

Table 35 Crops

No	Name of the crop	Current Status		Expected post project status	
		Area (ha)	Productivity (ton)	Area (ha)	Productivity (ton)
1	Rubber	4125.91	7327.98	4208.42	7693.76
2	Coconut	678.58	2412.65	692.16	2533.28
3	Tapioca	315.45	18.21	321.76	19.11
4	Vegetables	111.35	162.96	144.75	211.51
5	Fruits	126.89	14.23	129.42	14.92
6	Pepper	203.49	120.65	207.56	126.68
7	Arecanut	30.48	27.35	31.09	28.70
8	Grains	79.66	2.24	81.24	2.34
9	Plantain	228.16	24.24	232.73	25.45
10	Spices	104.46	1.65	106.55	1.72

Livestock

The watershed areas have poor livestock population. The interventions like provision of good quality cows and buffalos, the establishment of a fodder bank and other such related activities would spur up the dairy development in the villages. It is expected that the post project period would see a substantial increase in livestock population and yield from them.

Table 36 Livestock

No	Name of the Animal	Current Status	Expected post project status
		No	No
1	Cow	494	603
2	Goat	485	586
3	Buffalo	64	107
4	Pig	116	139
5	Hen	876	1093
6	Duck	104	138
7	Rabbit	98	129
8	Ox	9	22
9	Kaada	93	123
10	Fish	65	88

XXI. EXIT PROTOCOL

While preparing the detailed Action Plan/Treatment Plan, the Gram Sabha/Gram Panchayat, under the technical guidance of WDT, shall evolve proper Exit Protocol for the watershed development project. The Exit Protocol shall specify a mechanism for maintenance of assets created, augmentation including levy and collection of user charges, utilization of the Watershed Development Fund etc. Mechanism for equitable distribution and sustainability of benefits accrue under the watershed development project should also be clearly spelt out in the Exit Protocol. While approving the Action Plan for the watershed, the ZP/DRDA shall ensure that the detailed mechanism for such Exit Protocol forms part of the Action Plan/Treatment Plan.

The active intervention period of most of the projects is about five years after which the PIA is expected to withdraw and move to other watersheds/areas. Maintenance of the infrastructure was a serious handicap prior to the concept of people's participation. All contributions mentioned previously were kept in a separate account called the Watershed Development Fund (WDF) in the name of the watershed associations to be operated after the exit of the PIA. Wherever participants could be convinced about the philosophy of cost-sharing, overall contribution per watershed went beyond 5-10 per cent of the stipulation since it was meant for the welfare of the community and the maintenance of the infrastructure created under the watershed programme. Despite several guidelines, this aspect is not dealt with adequately till date. Hence, in most of our sample watersheds the WDF has not been utilized fully. Due to changes/replacement of political/elected representatives in the local bodies and lack of proper guidance to Watershed Committees this account remains unutilized with the PIA. So the following must be kept after withdrawal – 1. Must have an office in each watershed to continue the process. 2 All NRM activities in the concerned area to be followed on accord of WC. 3 A paid secretary to be maintained in each watershed.

ANNEXURE – Detailed Estimates

1. Detailed Estimate: Silpaulin pond (4*3*2m3)

SI No	Description	Quantity	NREGS			PWD	
			Rate	Unit	Amount	Rate	Amount
1	Silpaulin Pond, Size(Top: 4 x 3, Bottom: 3 x 2)						
	Earth Work Excavation	18	100.04	1 m3	1800.72	235.625	4241.25
2	Silpaulin (Geo Membrane Sheet 200 Micron)	40	68	1 Sq m	2720.00	68	2720
3	Lump sum for fixing the silpaulin				29.28		38.75
	Total				4550.00		7000

(Source: PWD Department)

2. Detailed Estimate: Vegetable promotion

SI No	Description	PWD			
		Number	Rate	Amount	unit
1	Earthwork (10x(1.5+0.9/2)x0.30)				
	Unskilled	3.6	71.1	255.96	
	Say			256	m2
2	Side Construction (10 x 0.84)m	8.4	5	42.00	m2
3	For planting seeds	1	240.00	240.00	
4	Cost of Panthal (10 x 3 m)	30.0	148.84	4465.2	m2
	Total			5003.20	
	Say			5003	10m2
				500.00	m2

(Source: PWD Department)

3. Detailed Estimate: Centripetal terraces around coconut trees and mulching (2m diameter)

Item No.	Description	No.		L	B	D	Qty	Rate	Unit		Amount
1	Clearing light jungle including uprooting of thick vegetation and small trees of girth upto 30cm and removal of rubbish up to a distance of 150 m outside the periphery of the area cleared.	1	3.14	1.00	1.00		3.14	164.00	100	m ²	5.15
2	Earth work excavation in ordinary soil and depositing on bank with initial lead up to 50m and lift up to 1.5m including breaking, clods, watering, ramming and sectioning of spoil bank, etc. Complete.	1	3.14	1.00	1.00	0.15	0.47	486	10	m ³	22.84
3	Cutting and collecting of dry or green leaves, bark or trees, debris etc. and mulching including all cost and labour charges.	1	3.14	1.00	1.00		3.14	82	10	m ²	25.75
											53.74
	Total no. of labourers required	0									
	No. of days estimated for completing the work (@40 labours per day)	0									
4	Mate	0						125	E		0.00
5	Ayah	0						125	E		0.00
6	Rent for tools	0						5	E		0.00
7	Name Board										500.00
8	Photo										200.00
9	Rent for shed										250.00
10	First Aid Box										250.00
11	Drinking water facilities										250.00
	Total for work site facilities										1450.00
	Total										1503.74
	Unforeseen items if any										96.26
	Total										1600.00

(Source: PWD Department)

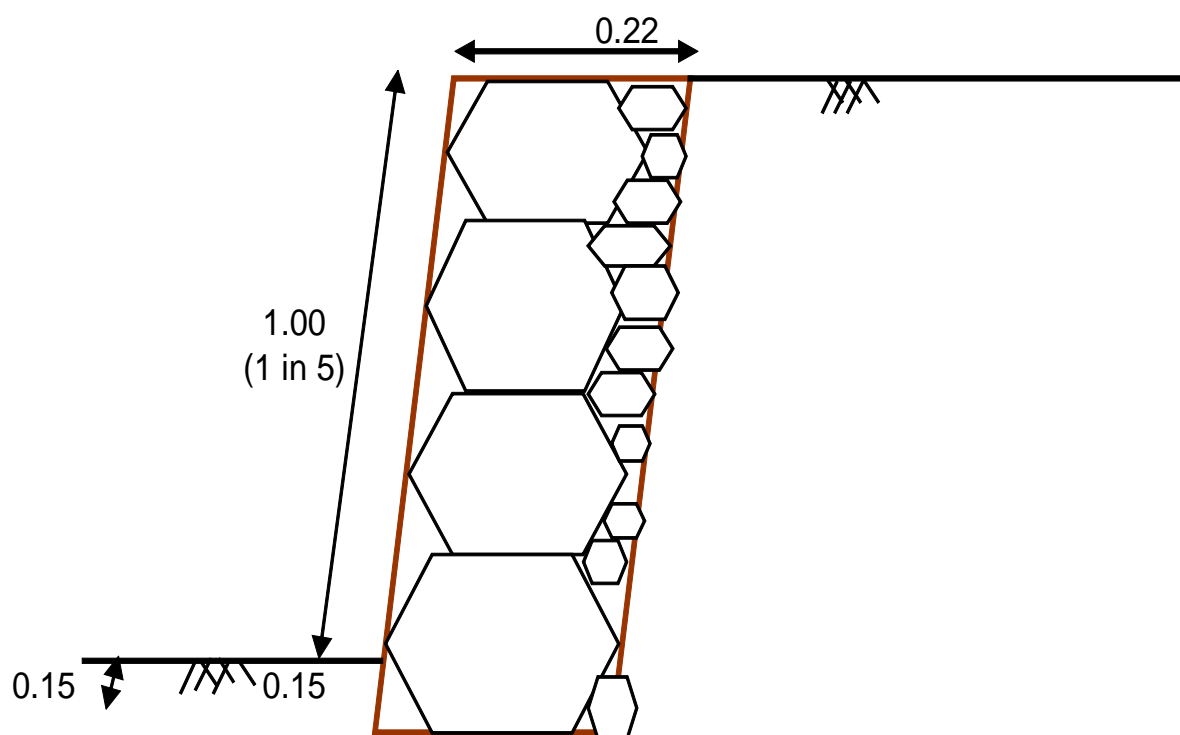
4. Detailed Estimate: Contour Stone Bunding with collected jungle stones.

Item No	Description	No.	L	B	D	Qty	Rate	Unit	Amount
1	Contour bunding using collected jungle stones of size 15 to 22 cms. stones laying with 1 in 5 batter and filling the back of stone packing with earth so as to get a top width of 45 to 50 cms. Including foundation of 15 to 20 cms.								
	Battered area of bund	1	1.00	1.15		1.15	18036.00	100 m2	207.414
	Say								207
	Total no. of labourers required	2							
	No. of days estimated for completing the work (@40 labours per day)	1							
	Mate	1				24	24		
	Ayah	1				240	240		
	Rent for tools	2				5	10		
	Name Board						500		
	Photo						200		
	Rent for shed						250		
	First Aid Box						250		
	Drinking water facilities						250		
	Total for work site facilities						1724		1724
	Total								1931
	Unforeseen, if any								69
	Grand Total								2000

Data:

Sl.no.	Description	P.W.D Rate				NREGS Rate	
		Number	Rate	Amount	Unit	Rate	Amount
1	Contour bunds using collected jungle stones of size 15 to 22 cms. stones laying with 1 in 5 batter and filling the back of stone packing with earth so as to get a top width of 45 to 50 cms. Including foundation of 15 to 20 cms.						
	Out turn fixed for a man mazdoor (@25% work load fixed for bund with quarrying)			2.090		2.090	
	Man days required for 100m2 bund			47.840			
	Cost for bunds @377/E	47.840	377	18036.00	100	M3	164
				180.36	1	M3	78.46
2	Man days			47.84	100	M3	47.84
				0.478	1	M3	0.478

(Source: PWD Department)



Contour Stone Bunding with collected jungle stones.

5. Detailed Estimate: Construction of Irrigation well 6m Deep

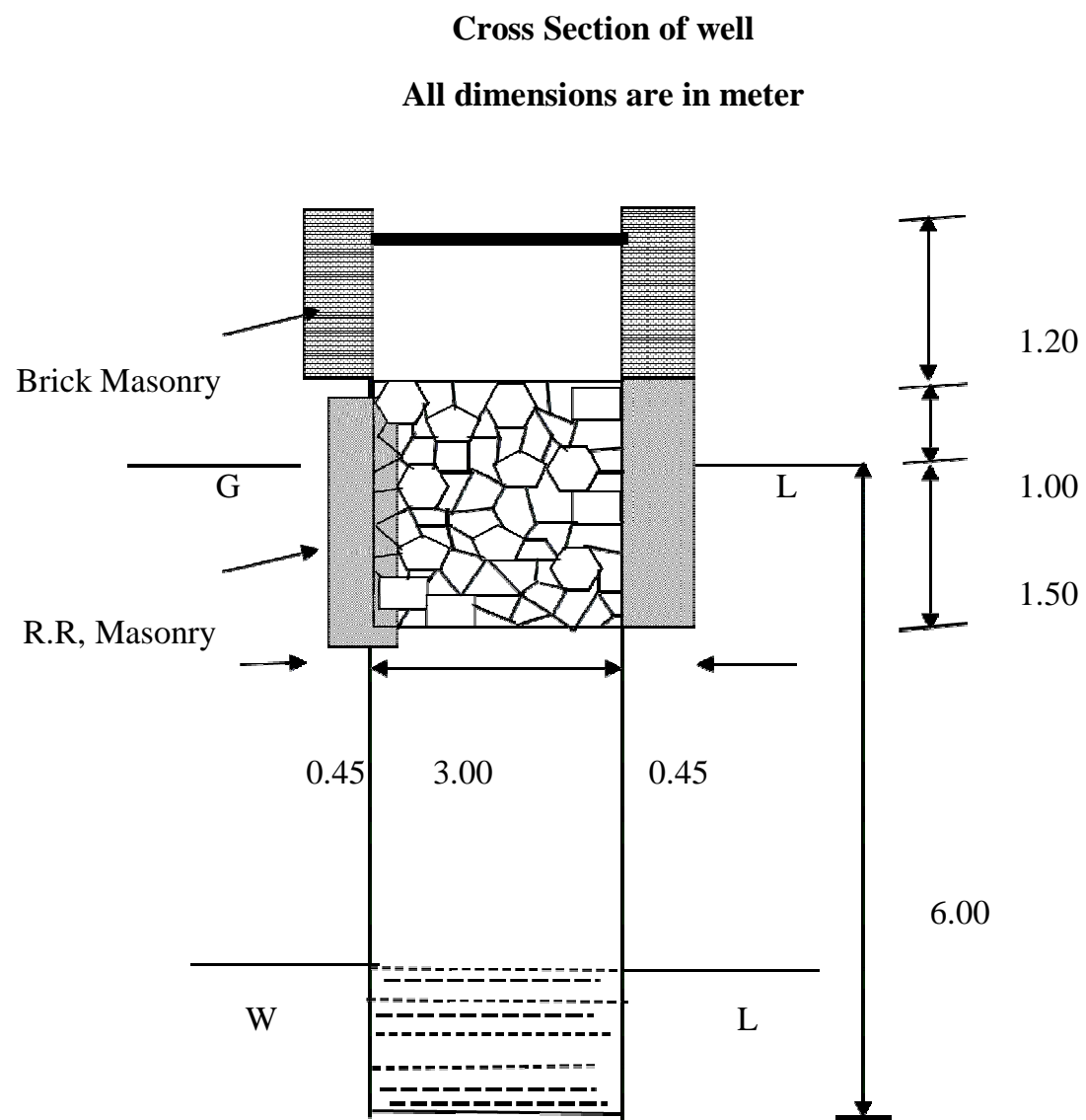
Item No.	Description	No.	L	B	D	Qty	Rate	PWD Rate		
								Unit	Amount	
1	Clearing light jungle including uprooting of thick vegetation and small trees of girth up to 30cm and removal of rubbish up to a distance of 150 m outside the periphery of the area cleared.	1	10	10		100	188.50	100	m ²	188.50
2	Earth work excavation in ordinary soil and depositing on bank with initial lead up to 50m and lift up to 1.5m including breaking clods, watering, ramming and sectioning of spoil bank, etc. complete.	3.14	1.5	1.5	0.45	3.18	1117	10	m ³	355.21
3	Earthwork excavation in hard soil and depositing with initial lead up to 50m and lift up to 1.5m including neat banking.	3.14	1.5	1.5	1.05	7.42	2064	10	m ³	1531.49
4	-do- For the first depth of 1.5m after the initial depth of 1.5m	3.14	1.5	1.5	1.5	10.6	2477	10	m ³	2625.62
5	-do- For the second depth of 1.5m	3.14	1.5	1.5	1.5	10.6	2972	10	m ³	3150.32
10	Earthwork excavation in hard soil and depositing on bank with initial lead up to 50m and lift up to 1.5m including breaking, clods, watering, ramming and sectioning of spoil bank etc. complete.-Foundation	3.14	3.45	0.45	1.5	7.31	2356	10	m ³	1722.24
11	Random rubble masonry in cement mortar 1:6 (one coat cement and six sand) using 72kg of cement /1m ³ masonry for wall with hammer dressed close finished joints without pinning's and pointing the exposed faces of masonry with the same mortar simultaneously during the course of construction, including cost and conveyance of all materials, labour charges etc. complete as directed by dept officers at site	3.14	3.45	0.45	2.5	12.19	3316.08	1	m ³	40423.05
12	Brick work in cement mortar 1:6 using country burnt bricks nominal size 22.9x11.2x7cm. For super structure in ground floor up to 5m height.									
	Pillar	2	0.45	0.45	1.20	0.49	5178	1	m ³	2537.22
13	Plastering with cement mortar 1:4, 12mm thick one coat using 54kg of cement /10m ² plastering, floated hard and toweled smooth including cost and conveyance of all materials labour charges etc. complete as directed by dept. Officers at site									
	Side of brickwork	2	1.80	1.20		4.32				
	Top of brick wall	2	0.45	0.45		0.41				
	Top of RR wall	3.1	3.45	0.50		5.42				
						10.15	1816.60	10	m ²	1843.85
14	Providing GI pipes, pulley, rope, etc. - LS									1500.00
										55877.50
	Total no. of unskilled labourers required	40								
	No. of days estimated for completing the work (@3 labours per day)	13								
	Total									55877.5
	Unforeseen, if any									122.5
	Grand Total									56000

Data:

SI No	Description	PWD Rate				NREGS Rate	
		Number	Rate	Amount	Unit		
1	Clearing light jungle including uprooting of thick vegetation and small trees of girth up to 30cm and removal of rubbish up to a distance of 150 m outside the periphery of the area cleared.						
	Unskilled labour	0.5	377	188.50	100 m ²	164	82
2	Earthwork excavation in ordinary soil and depositing with initial lead up to 50m and lift up to 1.5m including neat banking.-surface cutting						
	Unskilled	2.9625	377	1117	10m ³	164	485.85
3	Earthwork excavation in hard soil and depositing with initial lead up to 50m and lift up to 1.5m including neat banking.-surface cutting						
		5.475	377	2064	10m ³	164	897.9
4	-do- For the first depth of 1.5m after the initial depth of 1.5m	6.57	377	2477	10m ³	164	1077.48
5	-do- For the second depth of 1.5m	7.884	377	2972	10m ³	164	1292.976
10	Earthwork excavation in hard soil and depositing on bank with initial lead up to 50m and lift up to 1.5m including breaking, clods, watering, ramming and sectioning of spoil bank etc. complete						
	Unskilled	6.25	377	2356.25		164	1025
	Say			2356	10m ³		
11	Random rubble masonry in cement mortar 1:6 (one coat cement and six sand) using 72kg of cement /1m3 masonry for wall with hammer dressed close finished joints without pinning's and pointing the exposed faces of masonry with the same mortar simultaneously during the course of construction, including cost and conveyance of all materials, labour charges etc. complete						
	blasted rubble	1	420	420	m ³	420	420
	conveyance	1	785.00	785	m ³	785	785
	sand	0.3	2777	833.1	m ³	2777	833.1
	conveyance	0.3	522.00	156.6	m ³	522	156.6
	cement	72	5.94	427.68	T	5.94	427.68
	conveyance	72	0.47	34.128	T	0.474	34.128
	rubble mason	0.7	471	329.7	E	471	329.7
	man	0.35	377	131.95	E	164	57.4
	women	0.7	282.75	197.925	E	164	114.8
				3316.08	m ³		3158.408
12	Brick work in cement mortar 1:6 using country burnt bricks nominal size 22.9x11.2x7cm. For super structure in ground floor.						
	materials						
	Brick	460	7192	3308.32	/1000 No	7192	3308.32
	sand	0.24	2777	666.48	m ³	2777	666.48
	cement	0.58	5.94	3.45	T	5.94	3.4452
	labour						
	rubble mason	0.7	471	329.70	E	471	329.7
	man	0.35	377	131.95	E	164	57.4
	women	0.7	377	263.90	E	164	114.8
	conveyance						
	Brick	460	694.00	319.24	/1000 No	694	319.24
	sand	0.24	522.00	125.28	m ³	522	125.28
	cement	0.058	474.00	27.49	Kg	474	27.492
	hire charges for scaffolding materials			2.50			2.5
				5178.31			4954.657
	Say			5178	m ³		4955
13	Plastering with cement mortar 1:5, 12mm thick one coat using 43kg of cement /10m2 plastering, floated hard and toveled smooth including cost and conveyance of all materials labour charges etc. complete as directed by dept. Officers at site						
	materials						

	sand	0.15	2777	416.55	m ³	2777	416.55
	cement	43	5.94	255.42	Kg	5.94	255.42
	conveyance						
	sand	0.15	522.00	78.3	m ³	522	78.3
	cement	43	0.474	20.382	Kg	0.474	20.382
	labour						
	brick mason	0.9	471	423.9	Each	471	423.9
	man	0.55	377	207.35	Each	164	90.2
	women	1.1	377	414.7	Each	164	180.4
				1816.60	m ²		1465.152

(Source: PWD Department)



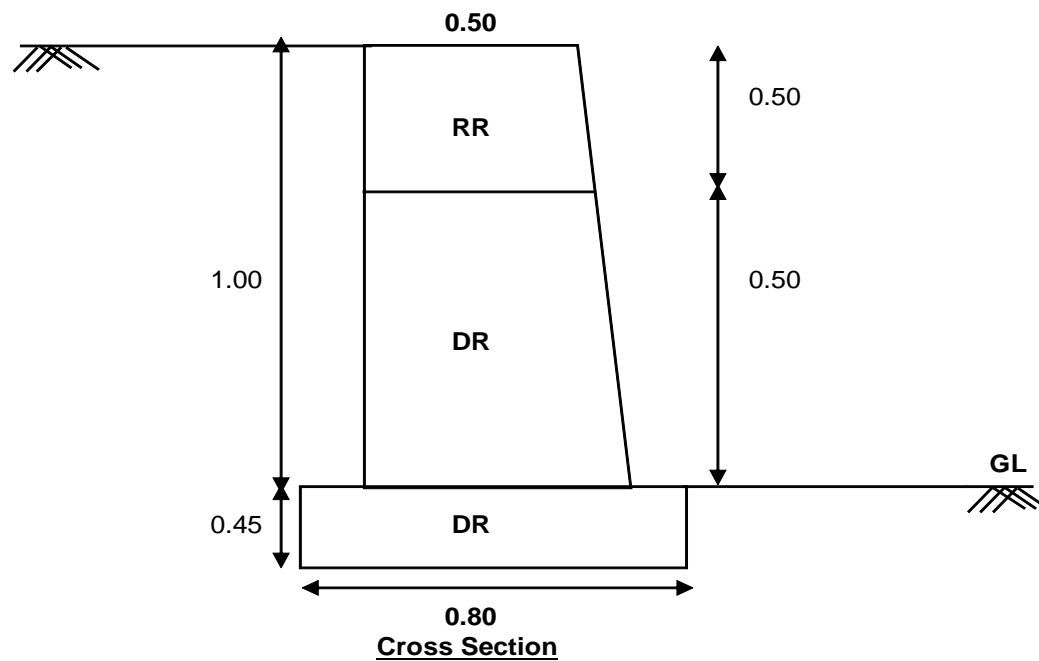
6. Detailed Estimate: Stream retaining wall using stone masonry

Detailed Estimate												
Name of work		Stream retaining wall using stone masonry										
Item	Description	No	L	B	D	Qty	Rate	Unit		PWD Rate		NREGS Rate
										Amount	Rate	Amount
1	Clearing light jungle including uprooting of thick vegetation and small trees of girth upto 30cm and removal of rubbish upto a distance of 150 m outside the periphery of the area cleared.	1	1.00	0.80		0.8	377.0	100	m ²	3.016	164	1.312
3	Earth work excavation in hard soil and depositing on bank with initial lead up to 50m and lift upto 1.5m including breaking clods, watering, ramming and sectioning of spoil bank, etc. complete.	1	1.00	0.80	0.30	0.24	2064.08	10	m ³	49.5378	1000.4	24.01
4	Dry stone masonry for retaining walls including cost and conveyance of all materials											
	Foundation	1	1.00	0.80	0.45	0.36						
	Super structure	1	1.00	0.58	0.50	0.29						
	Total					0.65	1906	1	m ³	1238.9	1756.85	1141.95
5	RR Masonry in cm 1:6 including cost & conveyance of all materials	1	1.00	0.55	0.50	0.275	3316.1	1	m ³	911.922	3158.41	868.56
6	Plastering to the top of RR masonry in cm 1:4, 15mm thick.	1	1.00	0.55		0.55	1796.00	10	m ²	98.78	1445	79.475
7	Back filling the available earth during the course of construction including consoildation, etc. complete.	1	1.00	0.50	1.00	0.5	765	10	m ³	38.25	589	29.45
										2340.41		2144.76
	Say									2340		2145
	Total									2340		2145
	Unforeseen, if any									60		55
	Grand Total									2400		2200

Data:

SI No	Description	Number	Rate	Amount		NREGS		
1	Clearing light jungle including uprooting of thick vegetation and small trees of girth up to 30cm and removal of rubbish up to a distance of 150 m outside the periphery of the area cleared.							
	Unskilled labour	1	377	377.00	100m²	164	164	
3	Earthwork excavation in hard soil and depositing on bank with initial lead up to 50m and lift up to 1.5m including breaking, clods, watering, ramming and sectioning of spoil bank etc. complete							
	Unskilled	3.6	377	1357.2		164	590.4	
	Unskilled	2.5	282.8	706.875		164	410	
	Say			2064.075	10m³		1000.4	
4	Dry rubble masonry for foundation.							
	Rubble	1.05	420	441		420	441	
	Labour							
	Mason	0.8	471	376.8		471	376.8	
	Unskilled	0.7	377	263.9		164	114.8	
	Conveyance							
	Rubble	1.05	785	824.25		785	824.25	
				1905.95			1756.85	
	Say			1906	m³		1757	
5	Random rubble masonry in cement mortar 1:6 (one coat cement and six sand) using 72kg of cement /1m3 masonry for wall with hammer dressed close finished joints without pinnings and pointing the exposed faces of masonry with the same mortar simultaneously during the course of construction, including cost and conveyance of all materials, labour charges etc. complete as directed by dept officers at site							
	blasted rubble	1	420	420	m ³			420
	conveyance	1	785	785	m ³			785
	sand	0.3	2777	833	m ³			833
	conveyance	0.3	522	157	m ³			157
	cement	72	5.94	428	kg			428
	conveyance	72	0.474	34	kg			34
	rubble mason	0.7	471	330	E	0.7	471	329.7
	Unskilled	0.35	377	132	E	0.35	164	57.4
	Unskilled	0.7	377	264	E	0.7	164	114.8
				3383.00				3158.9
	Say			3383	m³			
6	Plastering with cement mortar 1:4, 12mm thick one coat using 54kg of cement /10m2 plastering, floated hard and toweled smooth including cost and conveyance of all materials labour charges etc. complete as directed by dept. Officers at site							
	materials							
	sand	0.15	2777	417	m3			
	cement	43	5940	255	tone			
	conveyance							
	sand	0.15	522	78	m3			
	cement	43	0.474	0	kg			
	labour							
	brick mason	0.9	471	424	Each			
	Unskilled	0.55	377	207	Each			
	Unskilled	1.1	377	415	Each			
				1796.00	10m²			
7	Back filling the available earth during the course of construction including consolidation, etc. complete.							
	Rate for 10m ³							
	Conveying the available earth-Head Load 100m	10	50.1	501.00				
	Consolidating the available earth-unskilled labour	0.7	377	263.90				
				764.90				
	Say			765	10m³			

(Source: PWD Department)



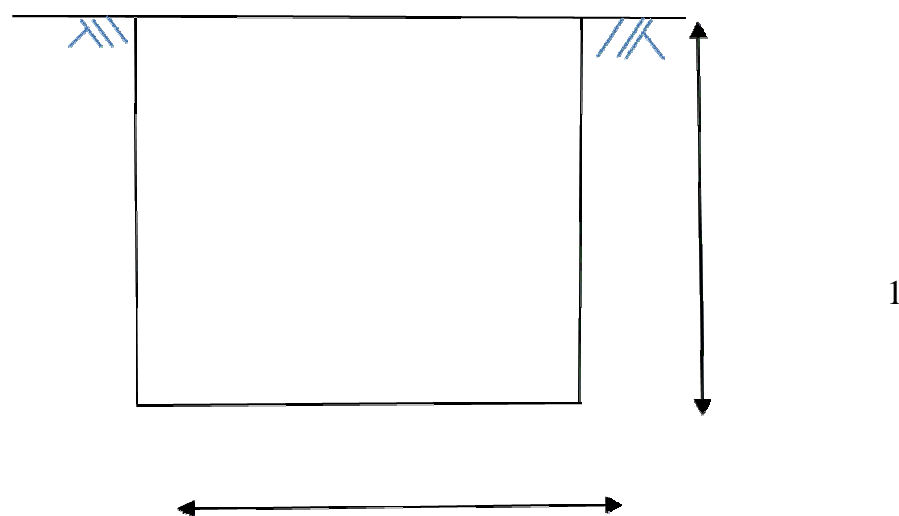
7. Detailed Estimate: Construction of percolation pits

Item	Description	No	L	B	D	Qty	Rate	Unit	Amount
1.1	Clearing grass and other overgrowths of vegetation and small trees of girth up to 30cm and removal of rubbish up to a distance of 150m outside the periphery of the area cleared.	1	10.00	10.00		100	188.50	100 m ²	188.5
1.2	Earthwork excavation in ordinary soil and depositing on bank with initial lead up to 50m and lift up to 1.5m including breaking, clods, watering, ramming and sectioning of spoil bank etc. complete	1	1.00	1.00	0.45	0.45	1376.05	10 m ³	61.92
1.3	Earthwork excavation in hard soil and depositing on bank with initial lead up to 50m and lift up to 1.5m including breaking, clods, watering, ramming and sectioning of spoil bank etc. complete	1	1.00	1.00	0.55	0.55	2299.7	10 m ³	126.48
Total									376.9m³

Data:

SI No	Description	Number	Rate	Amount	Unit
1	Clearing grass and other overgrowths of vegetation and small trees of girth up to 30cm and removal of rubbish up to a distance of 150m outside the periphery of the area cleared.				
	Unskilled labour	0.5	377	188.50	100 m ²
2	Earthwork excavation in ordinary soil and depositing on bank with initial lead up to 50m and lift up to 1.5m including breaking, clods, watering, ramming and sectioning of spoil bank etc. complete				
	Unskilled	3.65	377	1376.05	10 m ³
3	Earthwork excavation in hard soil and depositing on bank with initial lead up to 50m and lift up to 1.5m including breaking, clods, watering, ramming and sectioning of spoil bank etc. complete				
	Unskilled	6.1	377	2299.7	10 m ³

(Source: PWD Department)



1
Typical Cross Section of a Rain Water Pit

8. Detailed Estimate: Fodder grass farming

Item	Description	No	L	B	D	Qty	Rate	Unit	Amount	
1.1	Clearing grass and other overgrowths of vegetation and small trees of girth up to 30cm and removal of rubbish up to a distance of 150m outside the periphery of the area cleared.	1	10.00	10.00		100	188.50	100 m ²	188.5	
1.2	Earthwork excavation in ordinary soil and depositing on bank with initial lead up to 50m and lift up to 1.5m including breaking, clods, watering, ramming and sectioning of spoil bank etc. complete	1	10.00	10.00	0.15	15	1376.05	10 m ³	2064.08	
1.3	For planting grass	2					377	100 m ²	7.54	
Total									2260.12	100m²
									22.60	/m²

Data:

Sl No	Description	Number	Rate	Amount	Unit
1	Clearing grass and other overgrowths of vegetation and small trees of girth up to 30cm and removal of rubbish up to a distance of 150m outside the periphery of the area cleared.				
	Unskilled labour	0.5	377	188.50	100 m ²
2	Earthwork excavation in ordinary soil and depositing on bank with initial lead up to 50m and lift up to 1.5m including breaking, clods, watering, ramming and sectioning of spoil bank etc. complete				
	Unskilled	3.65	377	1376.05	10 m ³

(Source: PWD Department)

9. Detailed Estimate: Horticulture

A) For holdings less than 25 cents

Sl no	Planting materials	Quantity	Rate	Amount
1	Colocasia	5 pits	Rs.8 per tuber	40
2	Champa	2	Rs. 20/seedling	40
3	Guava	2	Rs 20/seedling	40
4	Plantain	5	Rs 15/seedling	75
Total				195

B) For holdings between 25 and 50 cents

Sl no	Planting material	Quantity	Rate	Amount
1	Horticulture crops (Mango)	1	Rs 50/seedling	50
2	Yalm	10	18 per tuber	180
3	Guava	2	Rs20/seedling	40
4	Champa	2	Rs20/seedling	40
5	Plantain	10	Rs 15/seedling	150
Total				460

C) For holdings above 50 cents

Sl no	Planting material	Quantity	Rate	Amount
1	Horticulture crops (Mango)	2	Rs 50/seedling	100
2	Yalm	20	18 per tuber	360
3	Guava	2	Rs20/seedling	40
4	Champa	2	Rs20/seedling	40
5	Plantain	20	Rs 15/seedling	300
Total				840

(Source: Land Use Board Department)

10. Detailed Estimate: Well Recharging Structure

No	Description	Nos.	Length	Unit	Rate	Amount. Rs.
1	160 mm PVC Gutter Pipe		25	Meter	84	2100.00
2	160 mm PVC Stopper	1		NO	52	52.00
3	160 mm PVC Dropper	1		NO	60	60.00
4	160 mm GI Clamp	19		NO	30	570.00
5	63 mm PVC Pipe		27	Meter	52	1404.00
6	63 mmX50mm PVC Reducer	3		NO	32	96.00
7	PVC Bent 63mm	9		NO	27	243.00
8	63 mm Tee	6		NO	55	330.00
9	63mm MTA	1			27	27.00
10	63 mm Thread End Cap	1		NO	28	28.00
11	63 mm Steel Clamp	20		NO	3	60.00
	Nails, screws, solvent cement etc.					150.00
12	Filter Tank and filter Materials	1		NO	-	3000.00
13	Labour & Supervision charges				-	
	Plumber	3		Each	471	1413
	Helper	1		Each	377	377
14	63mm elbow pvc	2			45	90
	Grand Total					10000/-

(Source: PWD Department)

11. Detailed estimate: Hen with cage

Description	Amount
5 hen (4female+1male)	Rs 5000/-
Cage size 4.5m*2.5m*2m welded mesh	
GI Pipe 25*25mm	
GI sheet roofing	
Total	5000/-

(Source: Animal Husbandry Department and Market Rate)

12. Detailed Estimate: Food Processing Unit (Squash, Jam, Jelly etc.)

SI No	Description	No	Rate	Amount(Rs.)
1	Juice making machine from fruits (Hand operated)	1	15000	15000
2	Oven	1	6000	6000
3	Aluminium Plate	4	1250	5000
4	Refractometer	1	8000	8000
5	Mixture machine	1	10000	10000
6	Small tools and implements (measuring instruments etc.)			6000
	Total			50000

13. Detailed Estimate: Rabbit farming

Items	Amount
4 rabbit each of 6 months old-3 female+1male (Rs. 500/rabbit)	2000
Cage of bamboo 4 nos (Rs. 1000/rabbit)	4000
Total	6000

(Source: Animal Husbandry Department)

14. Detailed Estimate: Vermi compost unit (3*2*1.5m3)

a) Labour cost					
Sl no	Description	Labour required	Unit	Rate(Rs)	Amount
1	Leveling and compacting soil for laying the base of the tank	1/2	man	400	200
2	For construction of tank brick work	Mason-1	man	650	
		Assistant-1	man	400	1050
3	Plastering of tank	Mason-1	man	650	1050
		Assistant-1	man	400	
b) Material cost					
Sl no	Item	Rate (Rs)	Unit	Quantity	Amount
1	Concrete block of 30cm*20cm*15cm dimension	30	nos	20	600
2	Country bricks 20cm*10cm*5cm	6	nos	200	1200
3	Cement	350	bag	2	700
4	River sand	40	c.ft	20	800
5	Permanent roofing using GI pipe and GI sheet				1500
6	Transportation of materials				
	Country bricks, concrete blocks, cement	300			300
7	Chicken mesh net for cover	300			300
8	Cost of cow dung(1 tank)	2	Kg	50	100
9	Cost of worm	1	worm	200	200
	Total				8000

(Source: Sujitwa mission)

15. Detailed Estimate: Biogas

Type	Quantity	Rate
Portable Biogas with water jacket	0.75m3	12500/-

(Source: Sujitwa mission)

16. Detailed Estimate: Well construction

Estimate of Well construction		
Sl No	Description	Rate
1	Earth work excavation in hard soil for in initial level $1*3.14*1.7*1.7*1.5=13.6m^3$ say $14m^3@Rs 2064/10m^3$	2890
2	Earth work excavation in hard soil for 1st depth $1*3.14*1.2*1.2*1.5=6.78m^3$ say $7m^3 @ Rs 2580/10m^3$	1806
3	Earth work excavation in hard soil for 2nd depth $1*3.14*1.2*1.2*1.5=6.78m^3$ say $7m^3 @Rs 3225/10m^3$	2258
4	Earth work excavation in medium rock for 3rd depth $1*3.14*1.2*1.2*1.5= 6.78m^3$ say $7m^3 @Rs 9333/10m^3$	6533
5	Earth work excavation in medium rock for 4th depth $1*3.14*1.2*1.2*1.5=6.78m^3$ say $7m^3@ Rs 11666/10m^3$	8166
6	Earth work excavation in medium rock for 5th depth $1*3.14*1.2*1.2*1.5=6.78m^3$ say $7m^3@ Rs 14583/10m^3$	10208
7	Earth work excavation in medium rock for 6th depth $1*3.14*1.2*1.2*1.5=6.78m^3$ say $7m^3@ Rs 18228/10m^3$	12760
8	Under PCC for initial depth using about 20mm jelly $2*3.14(1.7*1.7-1.2*1.2)0.05=0.455m^3$ say $0.455m^3 @ Rs 65.54/10dm^3$	2982
9	Dry rubble work for well staining in the initial depth $3.14(1.7*1.7-1.2*1.2)0.7$ say $1.015m^3@Rs 1709.60/m^3$	1735
10	Brick work in cm 1:6 for super structure using cement sand block $3.14(1.4*1.4-1.2*1.2)0.8=1.306m^3$ say $1.31m^3@Rs 4436.54/m^3$	5812
11	Brick work in cement mortar 1:6 for pillar using cement, sand, brick $2*0.3*0.3*2=0.36m^3$ say $0.36m^3@Rs 4285.18/m^3$	1543
12	Platform PCC using about 20mm jelly $1*3.14(2.2*2.2-1.5*1.5)0.1=0.813m^3$ say $0.813@Rs64.54/m^3$	5382
13	Plastering in cement mortar 1:4 12mm thick I) side wall inner: $1*2*3.14*1.2*0.8=6.03m^2$, II)side wall outer: $1*2*3.14*1.7*0.8=8.54m^2$, III) Top of side wall: $3.14(1.7*1.7-1.2*1.2)=1.413$, IV) Side of the pillar: $8*0.3*0.2=4.8m^2$ V) Top of the pillar: $2*0.3*0.3=0.18m^2$ VI) top of the platform: $3.14(2.2*2.2-1.5*1.5)=8.13m^2$ VII) Side of the platform: $2*3.14*2.2*0.1=1.38m^2$	30.473m2
	$30.473m^2*1820.95m^2=5548$	5548
14	Supplying and fixing of 40mm diameter GI pipe for pulley road $1*3*298m$	894
15	Pulley rope and kettle	1000
	Total	69517
	Add 7 % tax	4866
	Total amount	74384

(Source: PWD Department)

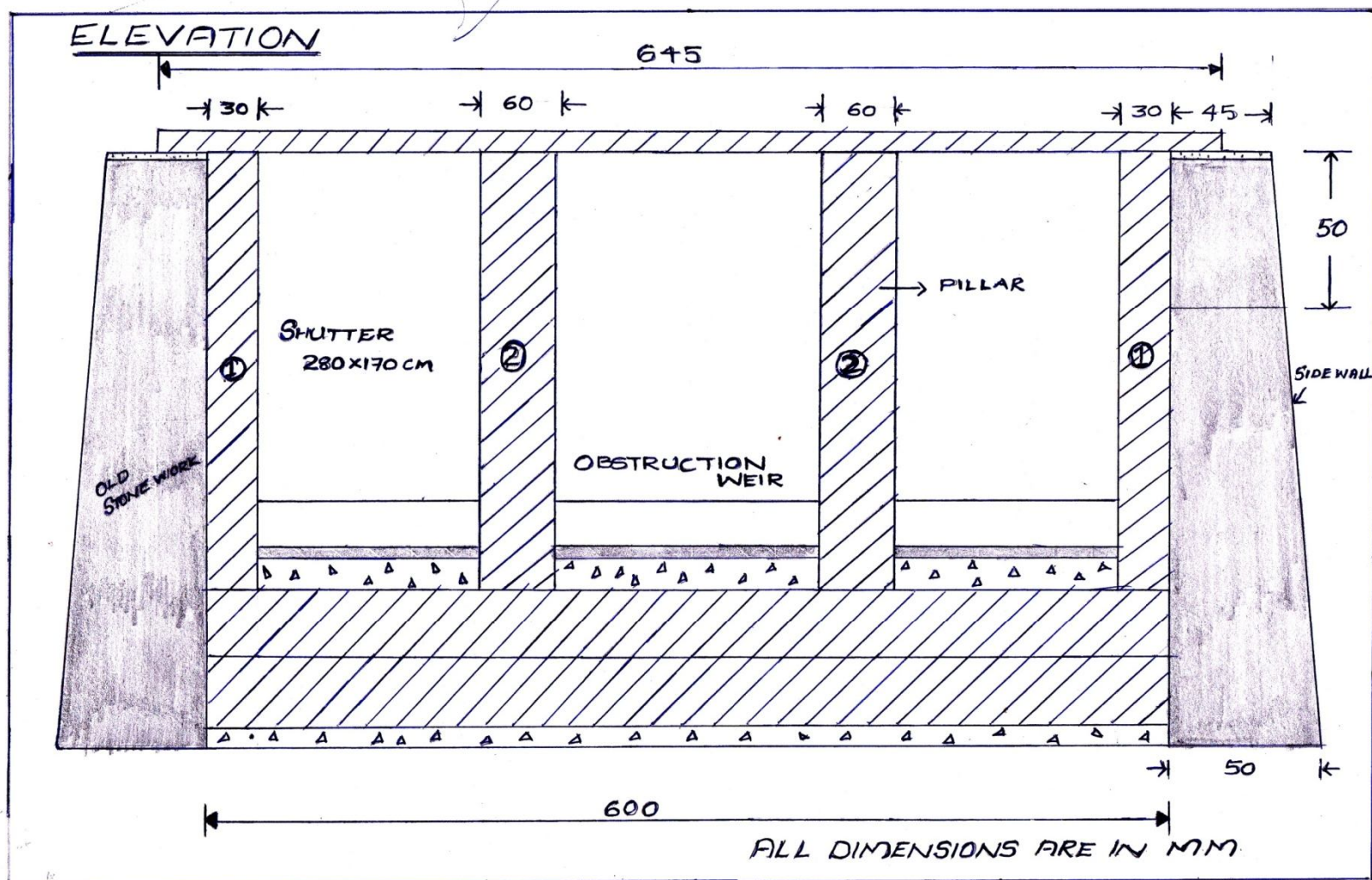
17. Detailed Estimate: Well Protection Wall

Estimate of well protection wall								
Sl No	Description	No	L*B	H	Qty	Rate	Unit	Amount
1	Clearing grass	2	3.14*1.2	6.8	51.24	188.5	100m2	97
2	Removing water from well	1	3.14*(1.2)2	2.5	11.3	25	m3	283
3	Removing loose soil	1	3.14*(1.2)2	0.5	2.26	1799	10m3	407
4	Earth work excavation in ordinary soil for well in fifth depth	1	3.14*(1.2)2	1	4.52	1799	10m3	813
5	Earth work excavation in hard soil for initial depth	1	3.14(1.7)2-(1.2)2	0.8	3.64	2064	10m3	752
6	Under PCC initial depth about 20mm jelly	2	3.14(1.7)2-(1.2)2	0.05	0.455	65.54	10dm3	2982
7	Dry rubble work for well attaining in the initial depth	1	3.14(1.7)2-(1.2)2	0.7	1.015	1709.6	m3	1735
8	Brick work in cement mortar 1:6 for super structure using cement, sand, rock	1	3.14(1.5)2-(1.2)2	0.8	2.83	4436.54	m3	9027
9	Brick work in cement mortar 1:6 for pillar using cement, sand, rock	2	0.3*0.3	2	0.36	4285.18	m3	1543
10	Platform PCC using about 20mm jelly	1	3.14((2.2)2-(1.5)2)	0.1	0.813	64.54	10dm3	5382
11	Plastering in cement mortar 1:4 12m thick							
a	side wall inner	1	2*3.14*1.2	0.8	6.03		m2	
b	side wall outer	1	2*3.14*1.2	0.8	8.54		m2	
c	Top of side wall	1	3.14(1.7)2-(1.2)2		1.413		m2	
d	Side of the pillar	8	0.3*0.3		4.8		m2	
e	Top of the pillar	2	0.3*0.3		0.18		m2	
f	Top of the platform	1	3.14(2.2)2-(1.5)2		8.13		m2	
g	Side of the platform	2	3.14*2.2	0.1	1.38		m2	
	Total				30.473		m2	
					30.473	1820.95	10m2	5548
12	Supplying and fixing of 40mm diameter GI pipe for pulley rode	1		3		298	m	894
13	Pulley rope and kettle	1				1000		1000
	Total							30463
	Add 7% tax							2133
	Total amount							32596

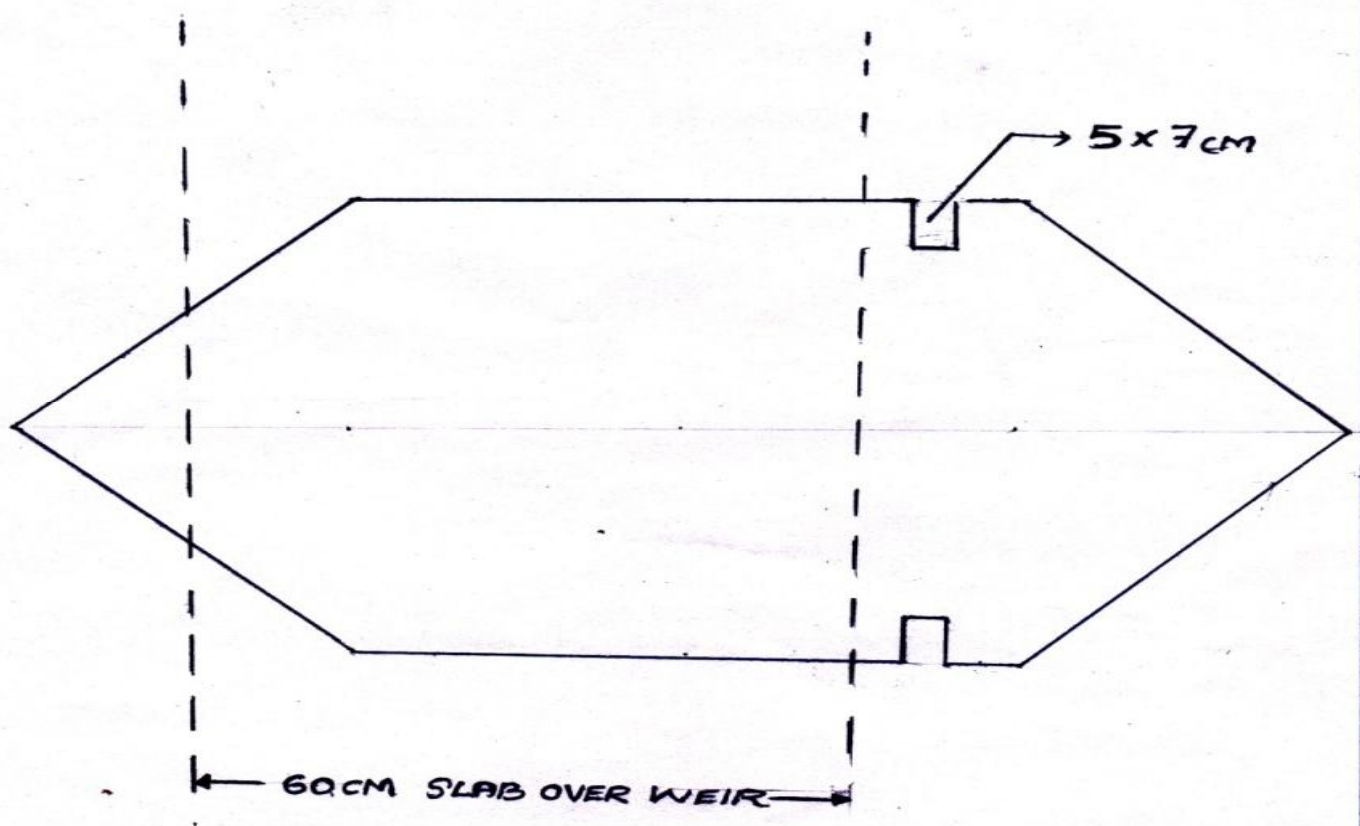
(Source: PWD Department)

18. Detailed Estimate: Check dam construction

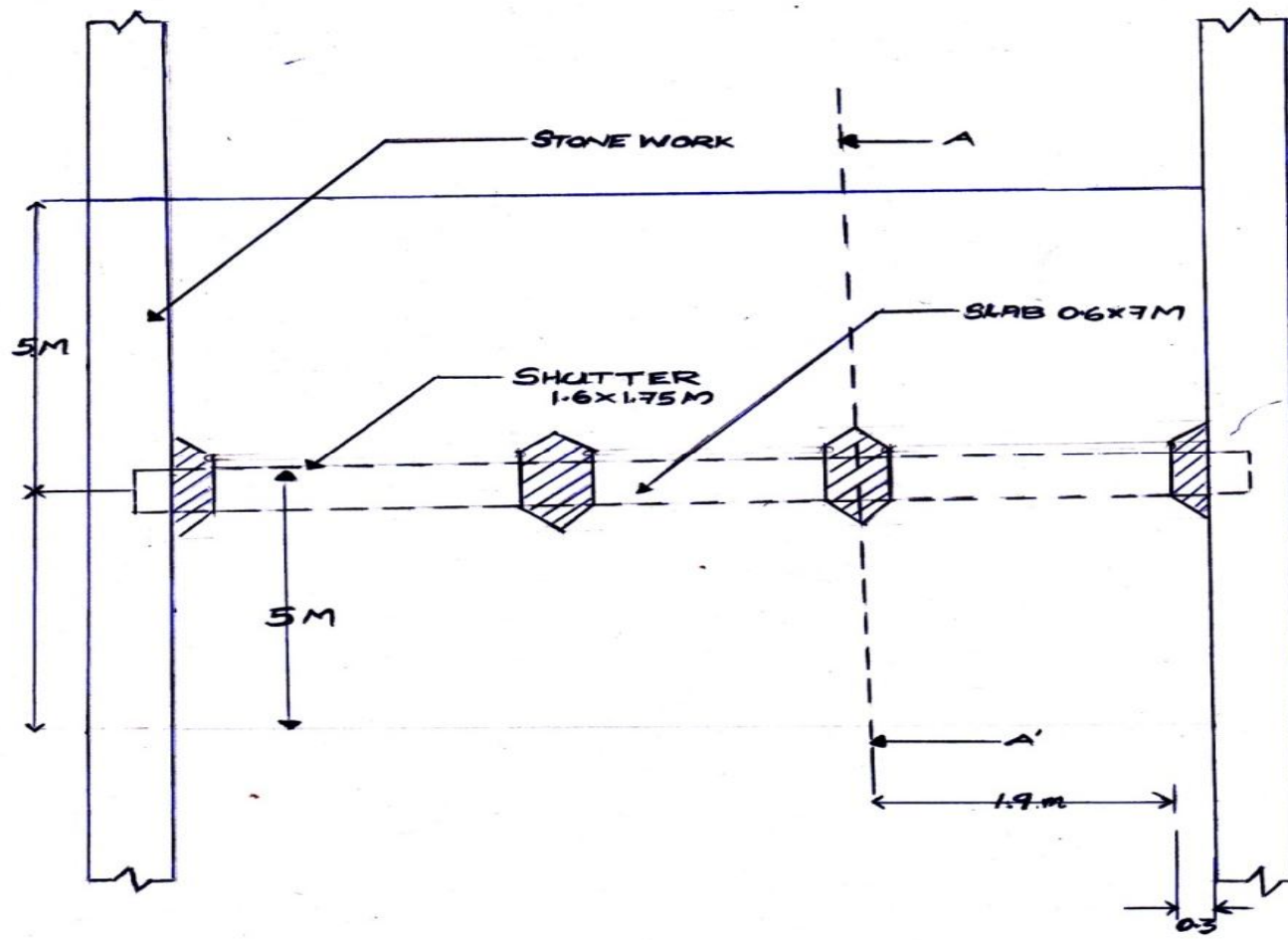
Estimate of check dam									
Sl No	Description	No	L	B	D	Qty	Rate	Unit	Amount
1	Clearing light jungle vegetation and small tree of growth up 30cm	1	6	20		120	377	100m2	452
2	Earth work excavation in ordinary soil for								
a)	Foundation	1	6	1.8	1.5	16.2			
b)	Bed on 2 sides of weir	2	6	5	0.75	45			
	Total					61.2	1116.86	10m3	6835
3	PCC 1:4:8 for using 40mm nominal size broken stone for								
a)	Foundation	1	6	1.8	0.15	1.62			
b)	Top of basement	2	6	5	0.15	9			
c)	top of side walls	2	20	0.45	0.1	1.8			
	Total					12.42	4614.48	m3	57316
4	Random rubble masonry in cc1:6 for								
a)	Basement weir	2	6	4.9	0.5	29.4			
b)	Side wall	1	0.5	0.45	20	4.5			
	Total					33.9	2050.09	m3	69498
5	RCC 1:2:4 using 20mm metal for reinforced concrete work including all labour material from work and conveyance charges complete for								
a)	Foundation	1	6	1.6	0.6	5.76			
b)	Basement	1	6	1.4	0.5	4.2			
c)	Pillar1	2	0.3	0.9	2	1.08			
d)	Pillar2	2	0.6	0.9	2	2.16			
e)	Obstruction weir	3	1.6	1.2	0.35	2.1			
f)	Slab over weir	1	7	0.6	0.12	0.5			
	Total (pillar)					3.24	149.62	10dm3	4847600
	Total					12.56	120.64	10dm3	151524
	Total								200000
6	Plastering with (M1:3 12mm thick for								
a)	Pillar1	2	1.2		2	4.8			
b)	Pillar2	2	2.4		2	9.6			
c)	Slab over weir	1	7.6		0.12	0.92			
d)	Obstruction weir	3	1.55		1.6	7.44			
	Total					22.76	1866.99	10m2	4249
7	Wood works (shutter)	3	1.6	1.75	0.05	0.42	516.94	10dm3	21711
8	Reinforcement for RCC work (80Kg/m3 1:11/2:3)					1360	63.9	Kg	86904
	Total								446964
	Add 7% tax								31287
	Total cost								47825



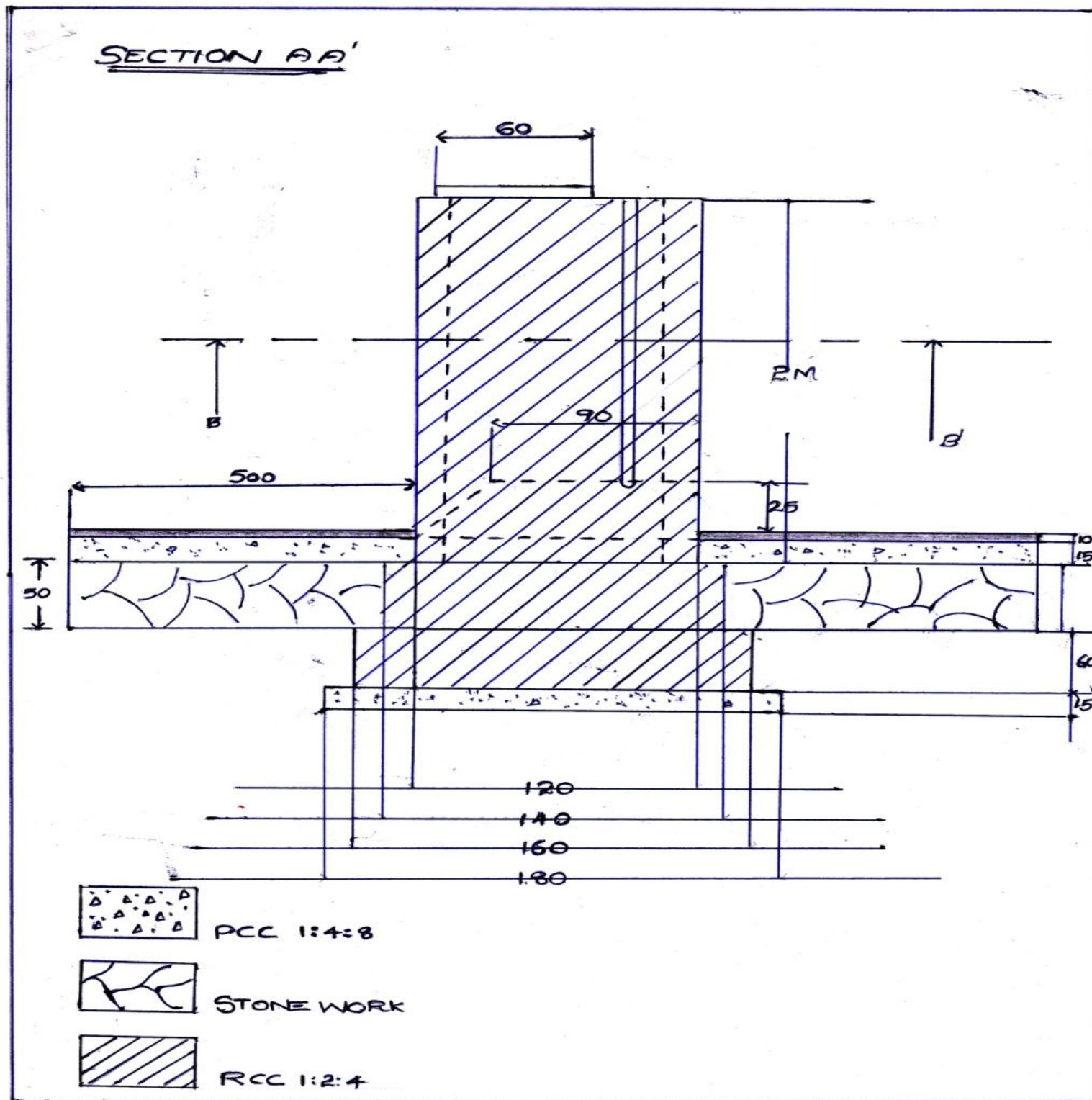
SECTION B B'



PROJECT PLAN
TOP SECTION



 RCC 1:2:4



19. Detailed Estimate: Rain water harvesting tank (Capacity: 5000Ltrs)

Sl No	Description of works	Qty	Unit	Rate	Amount
1	Excavation in hard soil for foundation	6.934	C.um	215	1490.81
2	RCC 1:2:4 using 10 mm broken stone below base slab	0.46	C.um	4850	2231
3	Steel reinforcement for floor concrete and pillar	0.561	Qtl	5985	3357.585
4	Floor concreting in RCC 1:5/2:3 using 10mm broken stone including form work and excluding reinforcement	0.66	C.um	6223	4107.18
5	RCC 1:5/2:3 using 10 mm broken stone for central pillar with form work and excluding reinforcement	0.013	C.um	11020	143.26
6	Making steel cage for wall dome and filter chamber with 2mm & 3mm bars including supply of material and labour	0.56	Qtl	8425	4718
7	Supply and winding with 1 layer of 5 gauge, 20mm*20mm welded mesh over the steel cage including material and labour	7.54	Sq.m	210	1583.4
8	Supplying and winding with three layers of 10 gauge, 5*5 mm GI chicken mesh around the cylindrical steel cage, including material and labour	7.91	Sq.m	150	1186.5
9	Supplying and winding with two layers of 10 gauge, 5*5 mm GI chicken mesh for dome and filler chamber including material and labour	6.65	Sq.m	125.6	835.24
10	Plastering with CM 1:2, 12mm thick each on both sides of tank wall applied in layers and finished smooth with cement flushing coat including material and labour	13.25	Sq.m	398.61	5281.583
	Total				24934.56
	Say				25000/-

(Source: PWD Department)

20. Detailed Estimate: Tree planting

SI No	Item	Cost
1	Cost of seedling	Rs 2
2	Transportation cost	Rs 3
	Total	Rs 5

(Source: Social Forestry Department)

21. Detailed Estimate: Bee Keeping

SI No	Item	Nos	Rate	Amount
1	ISI bee boxes with bees and hive stand (5 frames)	3	Rs. 1600 / one	4800
2	Honey extractor	1	Rs. 1500 / one	1500
3	Smoker	1	Rs. 200 / one	200
4	Bee knife	1	Rs.100 / one	100
5	Queen cage	1	Rs. 50 / one	50
6	Queen gate	1	Rs. 150 / one	150
7	Bee veil	1	Rs. 100 / one	100
8	Bee capturing nest	1	Rs.100 / one	100
	Total			7000

(Source: Agriculture Department)