INTEGRATED WATERSHED MANAGEMENT PROGRAMME

IWMP-2/2011-12

DETAILED PROJECT REPORT

TUNERI BLOCK PANCHAYATH

KOZHIKKODE DISTRICT

Technical support organisation

Integrated Rural Technology Centre

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1. INTRODUCTION

Soil, Water, Animals, Plants and Forests are the Nation most vital and basic natural resources. In rural areas, livelihood and natural resources such as land, water vegetation and livestock are inter-linked. Watershed management brings the best possible balance between ecosystem and human system. These are vital indicators of a sustainable environment and good quality human life. Soil erosion is the single most important cause of land degradation. Soil erosion causes enormous loss to our country. A good deal of our land has already been degraded. Soil erosion also affects the environment in several ways.

Integrated Watershed Management Programme initiatives promote two vital objectives - water conservation and soil enrichment: thus enabling farmers to extend the cultivation cycle and return to multiple cropping for sustainable production. Integrated approach and total participation of village communities are the main features.

1.1 Project background

Watershed management is the process of guiding & organizing, land and other resource usage in a watershed ensuring the sustenance of the environment (mainly the soil and water resources) ie., need to recognize the interrelationships between *land use, soil-water, and slope of terrain.* Unifying focus in watershed management is in how various human activities affect the relationship between water and other natural resources .Watershed management provides a basis for actions concerning the development and conservation of soil and water.

Watershed management is a single window, integrated area development programme. Integrated watershed management cannot perhaps be achieved just by following integration of resources using multidisciplinary approach with the funding or support provided alone under any watershed programme. This may also involve harmonized use of resources available from other ongoing or existing sectoral and development schemes in the area or district. Such resources can be dovetailed with the watershed programmes that will not only help useful convergence of various schemes and programmes for overall development of the area but also in effective monitoring.

Watershed management is the study of relevant character of a watershed aimed at the sustainable distribution of its resources and the process of creating and implementing plans, programmes, and projects to sustain and enhance watershed functions that affect the plant, animal, and human community within watershed boundaries. Features of a watershed that agencies seek to manage include water supply, water quality, and drainage, storm water runoff water rights and the overall planning and utilization of the watershed.

Watershed management implies the wise use of soil, water, and bio resources in a watershed to obtain optimum production with minimum disturbance to environment. The basic objective of watershed management is to solve the problems of soil and water based on the concept that all the resources are interdependent and must therefore be considered together. Among all the interventions envisaged in watershed management measures, water resource development and management gain primary importance. A new concept of training and capacity building in integrated watershed management is most important both for field level project staff and officers. Apart from enhancing technical skill of project staff, this would also provide opportunities to community members develop their capacity to sustain the programme as the future custodians of the programme at the time of withdrawal.

Programme will be sustainable only if it continues to operate after withdrawal of monetary or technical supports. In Integrated Watershed Management Programme the participation of local community is assured since the different works on private lands and public land as well as importance of "participation" for sustainability in watershed management programmes.

Watershed Management Concerns

PREVENTING deterioration of existing
Relationships between the uses of natural
Resources within a watershed

RESTORING sustainable relationships which
had been destroyed due to actions in the past

THERE BY ENSURE THE BEST USE OF
RESOURCES IN A WATERSHED

Collective participation of people is imperative due to inter dependence of beneficiaries. Transfer of responsibility within their community is a key requisite for ensuring the sustainability.

1.2 Need and Scope for Watershed Development

Watershed approach has emerged as a sustainable strategy to conserve the natural resources i.e. water, forest, soil in an integrated manner, particularly in the rain fed and drought areas. The Watershed Approach aimed at augmentation and stabilization of production and productivity, minimizing ecological degradation, reduction in regional disparity, opening up of greater opportunities for employment of rural poor in the rain fed areas. Management of land resources under the watershed programme includes both cultivated rain fed land as well as uncultivated land under ownership of private land owners, Panchayath, revenue department etc. The watershed approach would result in improving the productivity of not only agriculture and allied commodities but also the overall production of bio-mass for enhancement of self-employment opportunities and thus the overall income of the rural household.

Integration of the treatment measures for soil, water, biomass and the atmosphere i.e. factors constituting the local environment is utmost essential. Such integration alone will optimize biomass production. Achieving the highest sustainable biomass production potential is the best indicator for a sustainable, healthy ecosystem. The integrated and holistic approach of watershed development has been focused for sustainable development of the society.

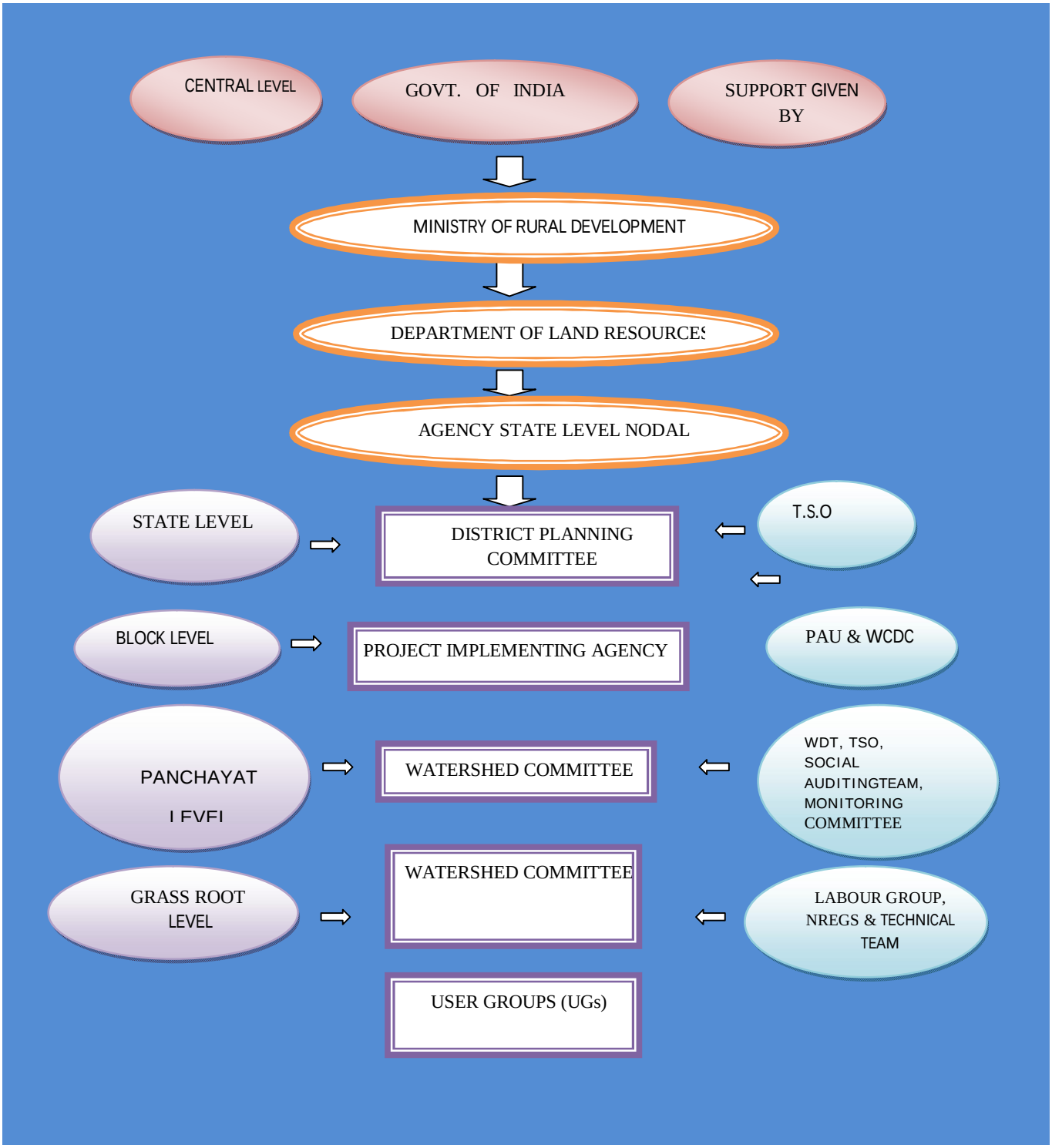
Due to undulating topography and steep slopes and coarse to medium sedimentary materials, the area is commonly subjected to soil and water erosion hazards. Uncontrolled grazing has resulted in reduction in vegetation and acceleration in erosion. The mounting pressure on arable and non arable land due to increasing human and animal population has resulted environmental degradation. The village is socio-economically highly backward. In order to enhance and stabilize production through improved technology and efficient use of natural resources for overall development of the inhabitants of the area, the villages needs to be brought under “Integrated Watershed management Programme”.

1.3 Main Objectives

- Main objective of IWMP is to preserve and conserve the ecology, restore and develop degraded natural resources by arresting soil loss, improving soil health and soil moisture.
- Rain water harvesting and recharging of ground water level thereby enabling multi cropping and introduction of diverse agro based activities which help to provide sustainable livelihood to the people residing in watershed area.
- To promote livestock development, fisheries management, and to encourage dairying and marketing of dairy products.
- Improving the capacity of community to manage common natural resource.
- Enhancing the effective use of rain water and, improve vegetative cover to reduce soil erosion through better rain water management.
- Conserving as much rain water as possible in the place where it falls and also increasing the ground water level to get water throughout the year.
- Utilizing the available land to its maximum productivity by adopting various or suitable measures according to the land capability and without any environmental degradation.
- Agro Forestry and Social Forestry Intervention to reduce the Carbon deposit in the atmosphere.
- Local Economic development through lively hood activities.
- Ensure people's participation in Watershed development Project.

1.4 Organizational Setup

Figure No: 1 *Organization Set Up*

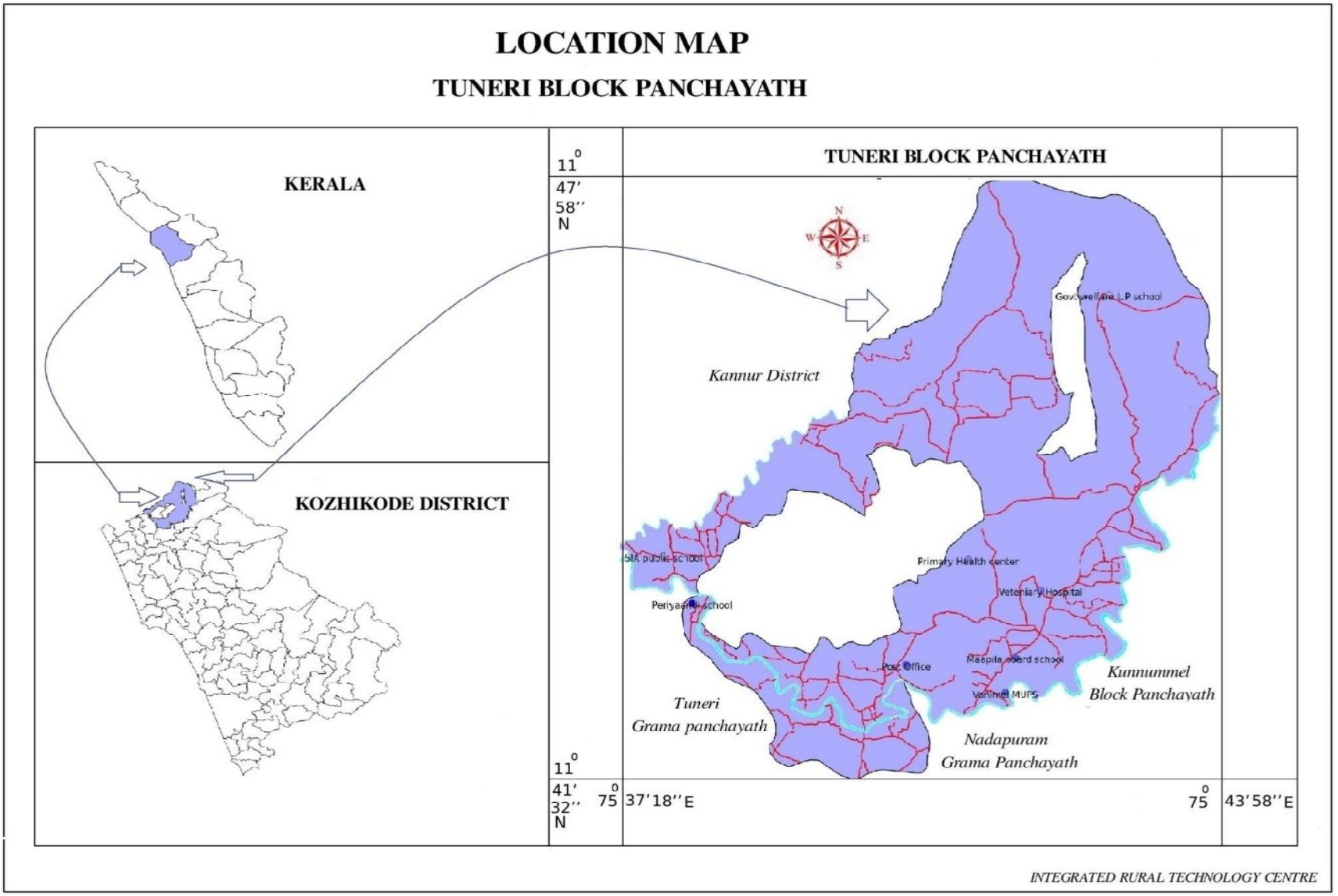


1.5 Funding Pattern

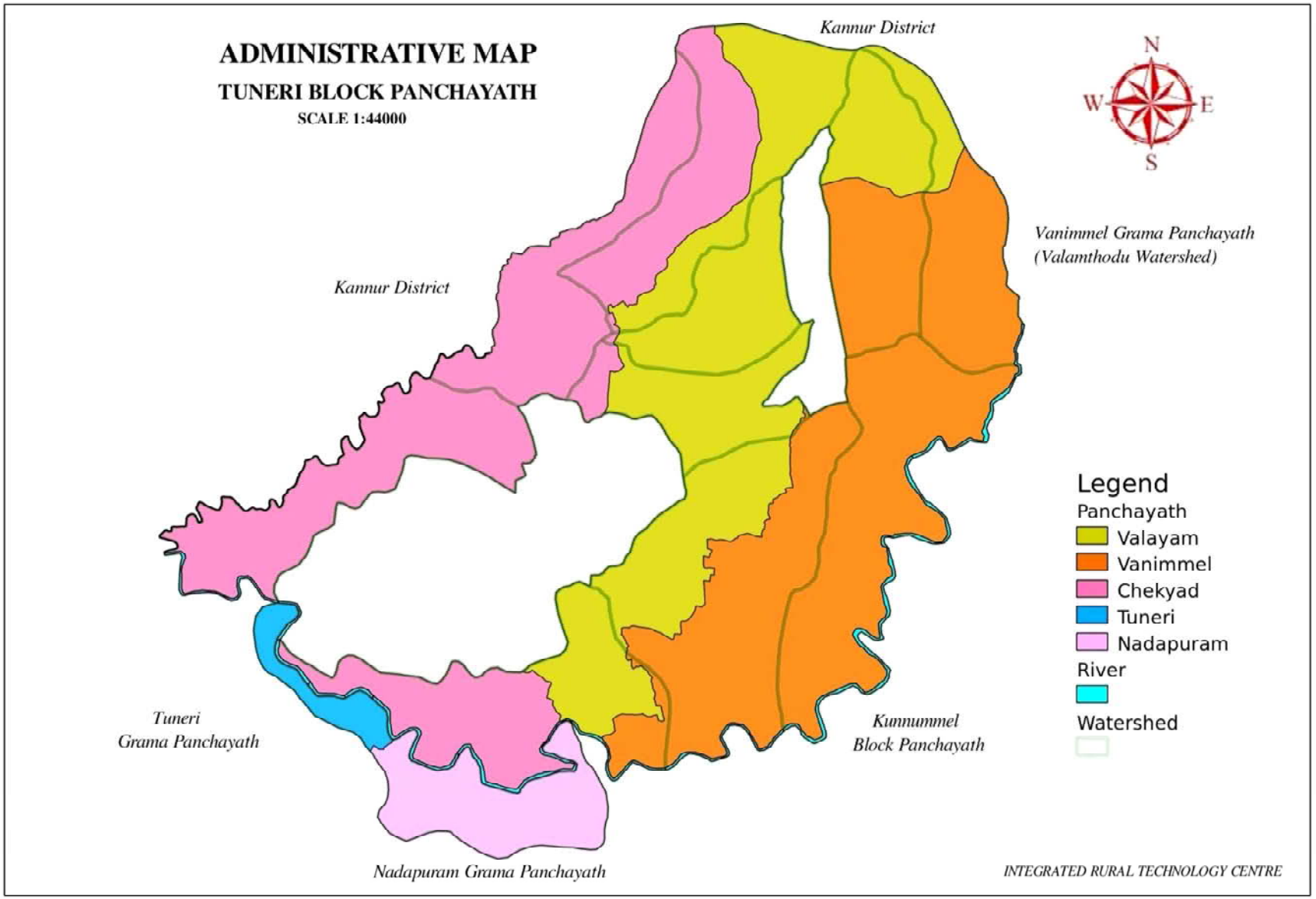
Table No: 1 *Details of funding pattern*

Sl. No	Particulars	Percentage Of Fund	Amount (Rs)
1	Administration Cost	10.00%	85,68,000
2	Monitoring	1.00%	8,56,800
3	Evaluation	1.00%	8,56,800
4	Entry Point Activities	4.00%	34,27,200
5	Institution & Capacity Building	5.00%	42,84,000
6	DPR	1.00%	8,56,800
7	Watershed Development Works	56.00%	4,79,80,800
8	Livelihood Activities	9.00%	77,11,200
9	Production System & Micro Enterprises	10.00%	85,68,000
10	Consolidation Phase	3.00%	25,70,400
Total		100.00%	8,56,80,000

Map


LOCATION MAP
TUNERI BLOCK PANCHAYATH
KERALA
KOZHIKODE DISTRICT
TUNERI BLOCK PANCHAYATH
11° 47′ 58″ N
11° 41′ 32″ N
75° 37′18″E
75° 43′58″E
Kannur District
Tuneri Grama panchayath
Nadapuram Grama Panchayath
Kunnummel Block Panchayath
Primary Health center
Veterinary Hospital
Post Office
INTEGRATED RURAL TECHNOLOGY CENTRE

Map 2


ADMINISTRATIVE MAP
TUNERI BLOCK PANCHAYATH
SCALE 1:44000
Kannur District
Kannur District
Vanimmel Grama Panchayath
(Valamthodu Watershed)
Tuneri
Grama Panchayath
Kunnummel
Block Panchayath
Nadapuram Grama Panchayath
N
W
E
S
Legend
Panchayath
Valayam
Vanimmel
Chekyad
Tuneri
Nadapuram
River
Watershed
INTEGRATED RURAL TECHNOLOGY CENTRE

2. GENERAL DISCRIPTION OF THE PROJECT AREA

Table No: 2 *Details of Project wise Profile of the selected watersheds*

1	Name of the Block	Tuneri	
2	Name of Gram Panchayaths	Chekyad	
		Valayam	
		Vanimel	
		Nadapuram	
		Tuneri	
3	Name & census code of villages covered	Vanimel	00024700
		Valayam	00024600
		Nadapuram	00025400
		Chekyad	00024500
		Vilangad	00024800
		Tuneri	00024400
4	Names & Codes of micro watershed	Aroonda II	29M9c
		Kalikolumb	29M9d
		Koodalai Puncha	29M9e
		Kundilavalappil	29M9g
		Payyerikkavu	29M9i
		Kayalottuthazhe	29M9j
		Jathiyeri	29M11a
		Mankavilthodu	29M12a
		Puthukayam - Mannolthodu	29M13a
		Chelathodu	29M14a
		Vishnumangalam	29M25a

2.1 TUNERI BLOCK PANCHAYATH- A Brief History

Tuneri block panchayath lies in the Vadakara Taluk in Kozhikode district. The Gramapanchayths included in this block are Chekkayad, Nadapuram, Edacheri, Purameri, Tuneri, Valayam and Vanimel. It extends to an area of 143.97km2, and includes the villages like Chekyad, Edacheri, Purameri, Tuneri, Valayam, Vanimel and Vilangad and Nadapuram .All the Panchayaths in Tuneri Block which is lying in the northern part of Kozhikode district has its own historical background. The stories and songs of 'Vadakkan veera gadha', praising thacholi othenan and Unnniyarcha are very popular in this area.

Thickly grown Chekky plants were presently known in Chekyad. Most of the places in this region were under Kuttipuram and Ayancheri kovilakams.two yogis who treated and saved Kuttipuram Thampuran we given two houses and land in that region. That two yogis took bath in a stream which was subsequently known as yogithode and today known as Choyithode is also an existing myth. In olden days, about 500yr. back, a market was functional in Parakkadavu in Chekkayad gramapanchayths which is still known as Pazhayangadi.It is said that commodities from outside were brought to this market through small ships.

Feudal system was existed in this area. The lands were given to the tenants for 12 years lease. but the full control of the land lies with the lords. In the olden days itself, the area was educationally and culturally developed one. The present Govt. L.P. School was established during the year 1911. Another residence type of school was commenced by chathothramangurukkal in his house at chekyad during 1928 period. Most of the existing educational institutions in this block panchayath area are the transformation of ancient school. Along with the heroic song Vadakkanveeragada, thee name of udhayavarma Thampuran also become popular in nationalist movement. Sri.Purammeri E.K.sankharanvarma was the secretary of state congress conference held at Vadakara during freedom struggle. His daughter Koumdithamburatti gave all her bangles to Gandhiji when he visited Vadakara during 1924.These incidence are all still in the minds of the people.

2.2 GENERAL DESCRIPTION (*Source Censes data 2011*)

District	Kozhikode
Block Panchayath	Tuneri
Area	143.97sq.km.
Division	13
Total Population	207643
Male	99863

Female	107780
Density of population	879
Sex ratio	1078
Literacy	90.4
Literacy (Male)	92.56
Literacy (Female)	88.56

2.3 CRITERIA AND WEIGHTAGE FOR SELECTION OF WATERSHED

Table No: 3 *Details of criteria for selection*

No	Criteria	Score	Range and scores			
1	Poverty index (% of poor to population)	10	Above 80%(10)	80 to 50% (7.5)	50to 20%(5)	Below 20% (2.5)
2	% 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(0)		
4	%of small and marginal farmers	10	More than 80%(10)	50to 80%(5)	Less than 50%(3)	
5	Groundwater 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	nonDPAP/DDP Block	Above70% (rejected)
7	Area under rain fed agriculture	15	More than 90%(15)	80to 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 land	15	Lands with low production &where productivity can be significally enhanced with reasonable efforts(15)	Lands with moderate production &where productivity can enhance with reasonable efforts(10)	Lands with high production &where productivity can 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 noncontiguous to previously treated watershed(5)	Neither contiguous to previously treated watershed nor contiguity within the micro watershed 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)	4to6microwatershed (10)	2 to 4 micro water sheds in cluster(5)	
	Cluster approach in the hills(more than one contiguous micro watersheds in the project)		Above 5 micro watersheds in the cluster(15)	3 to 5 micro watersheds in the cluster(10)	2 to 3 micro watersheds in cluster(5)	
	Total	**150**	**150**	**90**	**41**	**2.5**

Four major reasons for selection of these watersheds

- ✓ Dilapidated traditional irrigation system
- ✓ Low productivity of land

- ✓ Poor adaptation to climate change
- ✓ Strong presence of SC/ ST, BPL families and Marginal farmers

2.4. Physiography Relief and Drainage

2.4.1 Physiographic position of the Project area

Kerala is a land highly diversified in its physical features which mainly classify into three types such as High land, mid land and Low land. Even though most part of the study area lies in mid land topography of Kerala, the Northern part of the project area exhibits High land topography. The project area comes under Mahe River Basin. The Western Ghat passes through the study area in the north. High land mainly covers the northern part of the study area namely Kannavam forest enclosing of Kannur and Wayanad Districts. Most part of the project area lies in mid land where as valley tracks come under Low land.

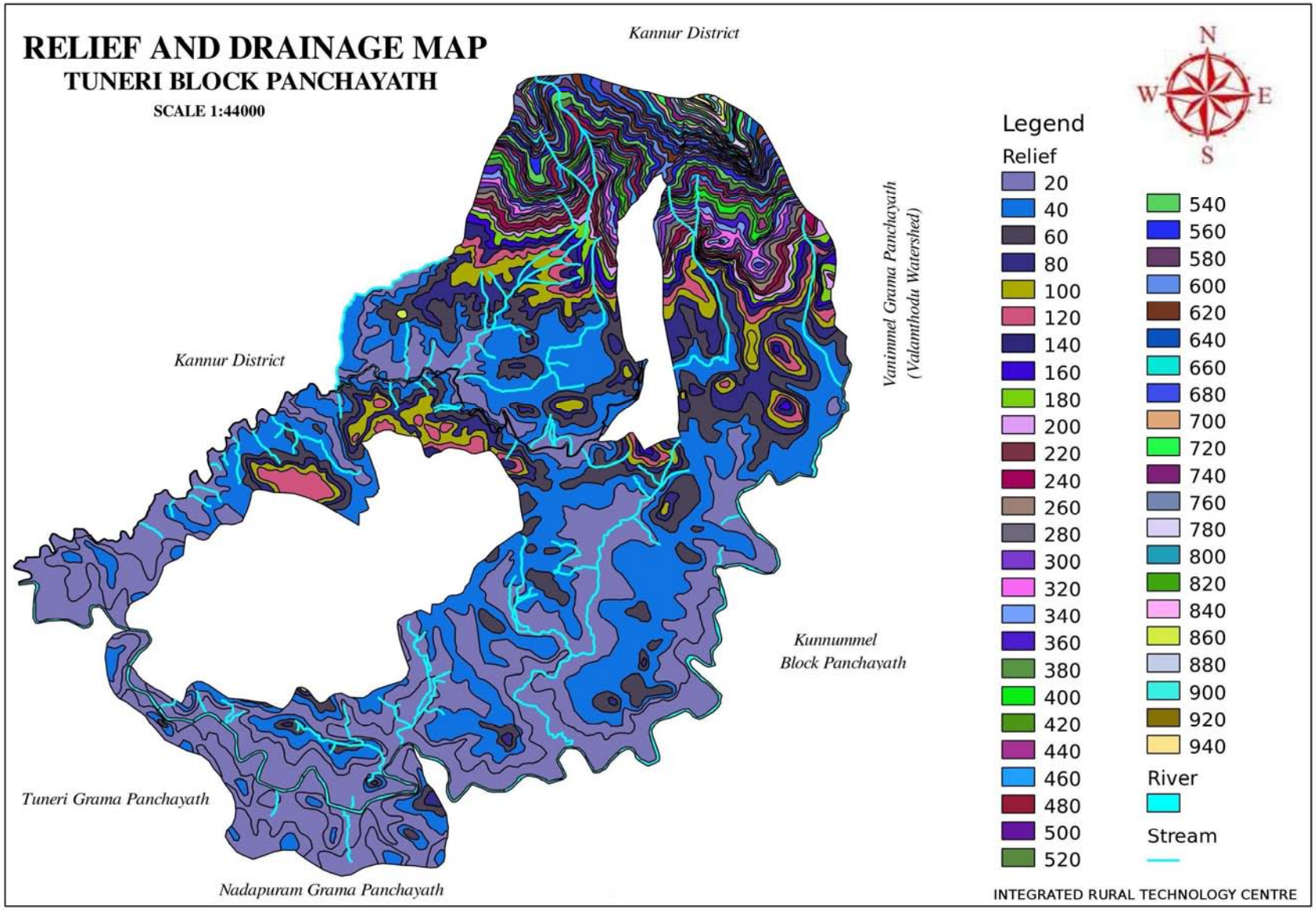
2.4.2 Elevation range

The project area is at an altitude of 20 meter to 940 meter from the Mean Sea Level (MSL).The vested forest area situates along northern part of the study area at an altitude of 600 meter to 940 meter along MSL.

Table No: 4 *Elevation ranges in the project area.*

Sl No.	Elevation Range(in meter)	Area(in Hector)	Percentage (%)
1	20-100	4678.8	81.91
2	120-200	325.1	5.69
3	220-300	172.4	3.02
4	320-400	125.9	2.20
5	420-500	118.3	2.07
6	520-600	146.5	2.56
7	620-700	76	1.33
8	720-800	46.2	0.81
9	820-900	20.3	0.36
10	Above 900	2.5	0.04
Total		**5712**	**100.00**

Map 3


RELIEF AND DRAINAGE MAP
TUNERI BLOCK PANCHAYATH
SCALE 1:44000
Kannur District
Kannur District
Vanimmel Grama Panchayath
(Valamthodu Watershed)
Kunnummel
Block Panchayath
Tuneri Grama Panchayath
Nadapuram Grama Panchayath
N
W
E
S
Legend
Relief
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
360
380
400
420
440
460
480
500
520
540
560
580
600
620
640
660
680
700
720
740
760
780
800
820
840
860
880
900
920
940
River
Stream
INTEGRATED RURAL TECHNOLOGY CENTRE

2.4.3 Slope Range

Slope is the inclination or steepness of a surface. Slope has a scale connotation. It refers to the ground surface configuration for scale that exceeds about 10 m and ranges upward to the landscape as a whole. i.e. Percentage or degree change in elevation over a distance is slope. Slope has gradient, complexity; length and aspect. Distribution of various slope classes identified in the project area and their area are given table No: 5

Generally slope of the project area is from north east to south west. Slope of the project area can be classified into six categories such as S1, S2, S3, S4, Hill Crest, Ridge Crest and Valley according to percentage of slope.

Table No: 5 *Slope classes in the project area.*

1	2	3	4	5
Sl No.	Slope	Slope (in percentage)	Area (in Hector)	Percentage (%)
1	Valley	< 3	273	4.78
2	S1	3 -5	2909.3	50.93
3	S2	5 - 15	718.6	12.58
4	S3	15 - 30	419.2	7.34
5	S4	>30	1193	20.89
6	Hill Crest		49.4	0.86
7	Ridge Crest		149.5	2.62
TOTAL			**5712**	**100.00**

The major portion of the project area is under the slope class between 3%-5% (S1) at **2909.3 ha** (50.63%)., Valley (<3) of the project area is covering under **273 ha** (4.78%)and **718.6 ha** (12.58%) included in the class of S3 (5-15%), and **1193 ha** (20.89%)included in S4 (<30%), at last Hill Crest and Ridge Crest included in the area **49.4 ha** (0.86%) and **149.5 ha** (2.62%) respectively.

Map 4

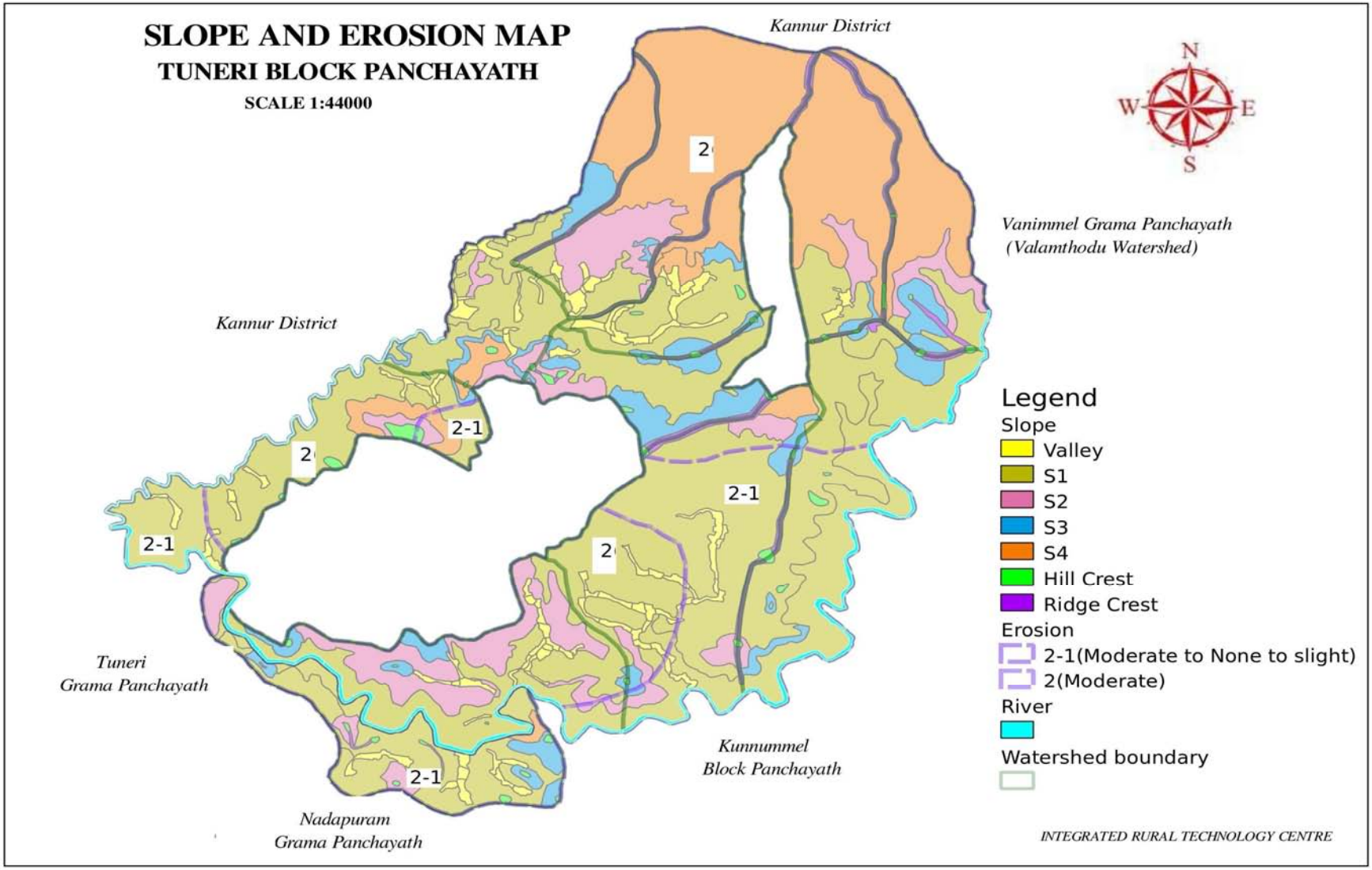
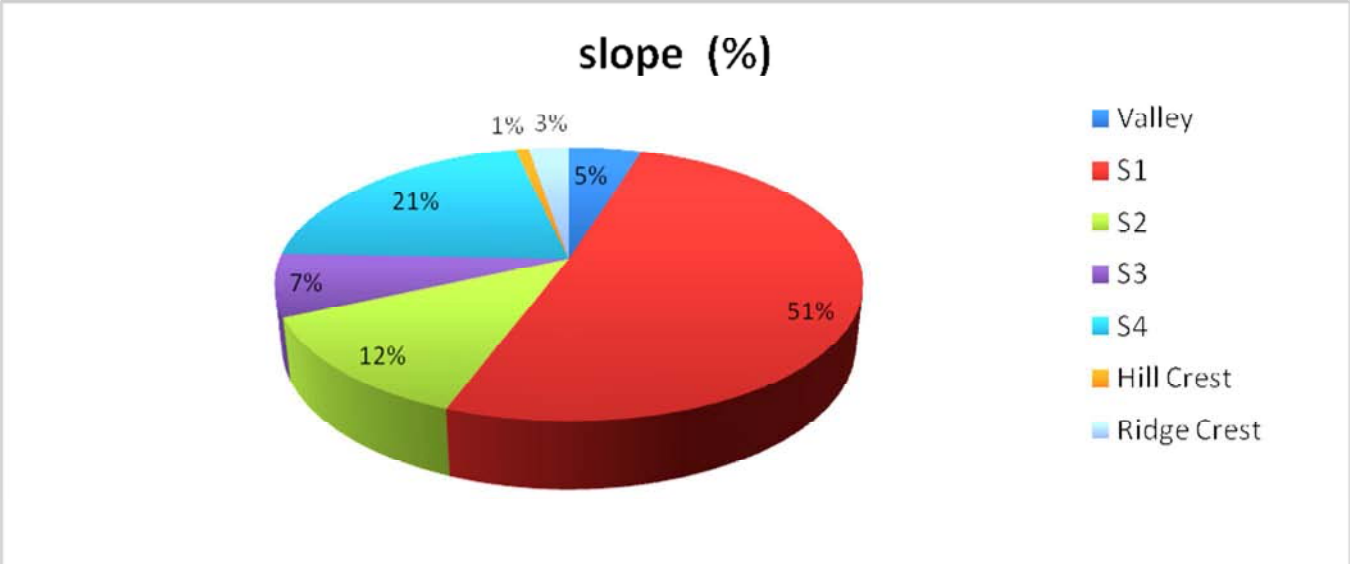

SLOPE AND EROSION MAP
TUNERI BLOCK PANCHAYATH
SCALE 1:44000
Kannur District
Vanimmel Grama Panchayath
(Valamthodu Watershed)
Kannur District
Tuneri
Grama Panchayath
Kunnummel
Block Panchayath
Nadapuram
Grama Panchayath
2
2-1
N
W
E
S
Legend
Slope
Valley
S1
S2
S3
S4
Hill Crest
Ridge Crest
Erosion
2-1(Moderate to None to slight)
2(Moderate)
River
Watershed boundary
INTEGRATED RURAL TECHNOLOGY CENTRE

Figure No: 2. *Distribution of Slope Classes*



2.4.4 Major Drains

The major river of the project area is Mahe River which originates from the forests of Wayanad and enter into the project area at Chelathodu Watershed and flows towards south west direction through Chelathodu, Puthukayam- Mannolthodu, Mankavilthodu, Jathiyeri, Vishnumangalam and Kayalottuthazhe watersheds.Chelathode, Pachapalam thodu, Payyerikkavu thodu, Kalikolumb thodu, Kayalottuthazhe thodu, Kanjirol thodu are the major tributaries of the Mahe river. The drainage density of the treatable area is 37.4 km^2.

2.5 CLIMATE

Kerala is a region blessed with rain. It is estimated that Kerala gets an average rain fall of 3000 mm annually which comes to thrice the total rain fall of India. In Kerala rainfall is available in phases. 60% of rainfall is obtained during south west monsoon, 25% during north east monsoon of October, November months and rest 15% of rainfall from December to May. However due to very steep terrine and occurrence of heavy rainfall within a short span of time rain water force into the sea without retaining of land. There for rainwater that is obtained from this heavy rain could not recharge the underground water. Occurrence of the heavy rainfall within a short period followed by summer season resulted in flooding and drought in Kerala. For the last 10 years maximum temperature recorded in Kozhikode is 32.8^oC and minimum temperature is22.7^oC.

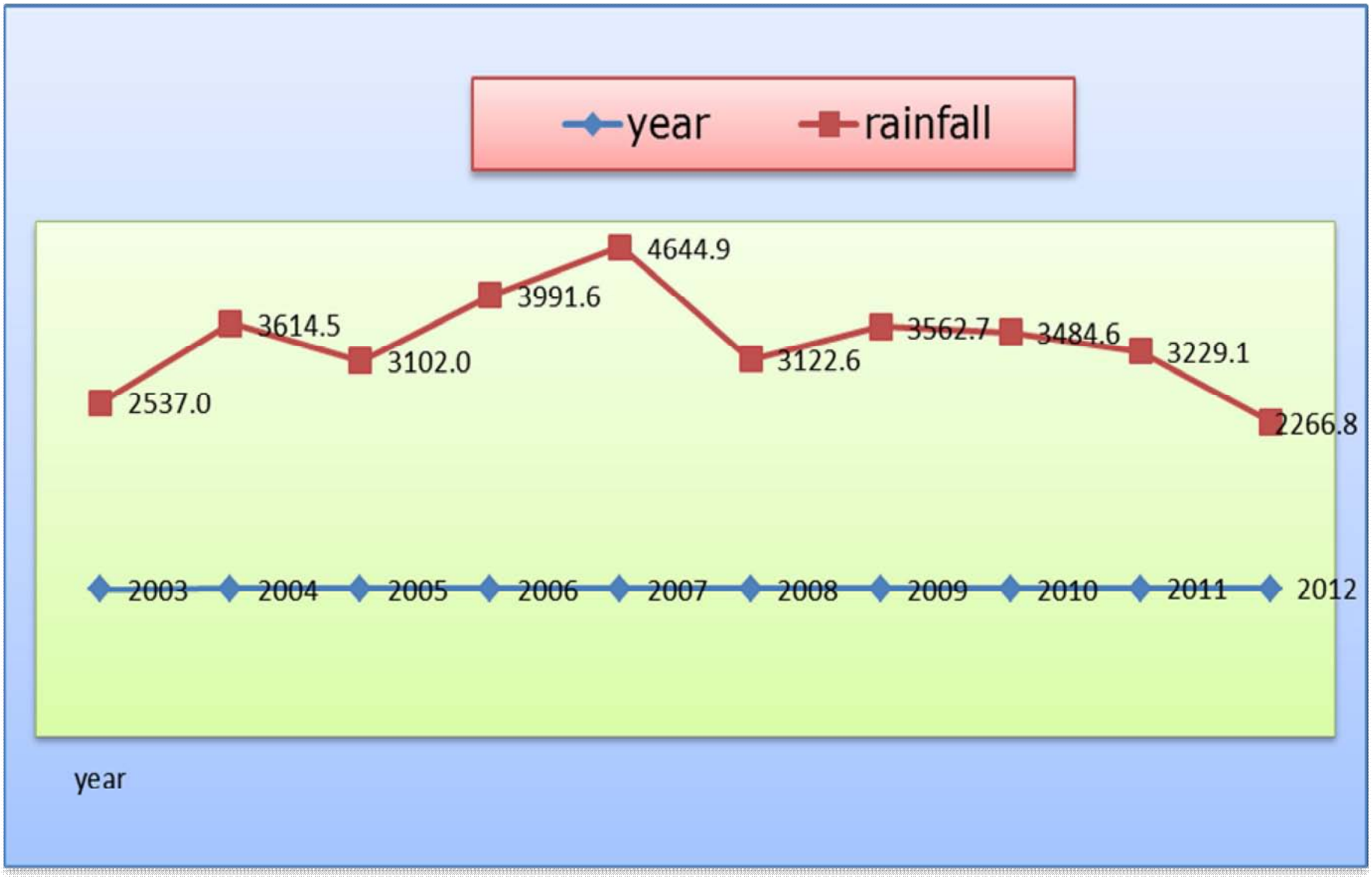
2.5.1 Rain fall

The Thuneri Block is getting rainfall as in other part of the state. Rain is getting on two occasions, South-west Monsoon from June to August and North-East Monsoon from September to November. Average Rainfall, in the project area from 2003 to 2012 is given below.

MONTHWISE AND YEARWISE RAINFALL FOR MINIMUM PERIOD OF LAST 10 YRS												
Rainfall measured at CWDM center Kozhikode (unit mm / days)												
Sl No	YEARS / MONTHS	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Av
1	January	0.0	4.6	8.8	0	0.4	0	0.0	2.4	3.4	0	1.96
2	February	8.8	0.0	6.8	0	0.0	3.8	0.0	0.0	0.0	0.2	1.94
3	March	22.4	0.2	0.0	48.6	0.0	164.8	17.0	0.0	0.0	0	25.30
4	April	73	111	158.8	48.8	155.6	88.4	78.5	71.4	127.0	145	91.25
5	May	118.8	603.4	95.2	662.4	334.2	72	259.6	138.6	107.0	11.4	239.12
6	June	849.8	1190.8	857.6	1006.6	936.9	827.8	558.2	1014.2	989.8	566.2	823.17
7	July	664.4	405.2	897.4	632.6	1383.2	594.2	1390.0	764.0	682.7	409.8	741.37
8	August	229.2	440.0	210.2	483.6	712.0	294.6	236.0	324.6	564.0	546.2	349.42
9	September	192.0	221.2	419.6	680.2	711.6	441.2	305.8	297.6	448.4	260.8	371.76
10	October	191.8	370.0	216.2	281.4	332.4	579.8	302.6	430.6	150.0	213.8	285.48
11	November	185.4	268.1	178.6	147.4	78.2	38.0	369.8	414.2	156.8	113.4	183.65
12	December	1.4	0.0	52.8	0.0	0.4	18.0	45.2	27.0	0.0	0	14.48
	Total	2537.0	3614.5	3102.0	3991.6	4644.9	3122.6	3562.7	3484.6	3229.1	2266.8	3128.90

The project areas receives an average rain fall of 3128.9mm .Out of which 1913 .96 mm is received during the South-west Monsoon (June to August) and average rain fall was received in 2012 (2266.8 mm) and the highest rain fall received in 2004 .More over there is a trend in decreasing the average rain fall receives840.89mm is received during the North west monsoon (September to November). The Table reveals that the lowest

Figure No: 3: Distributions of Rainfall Data

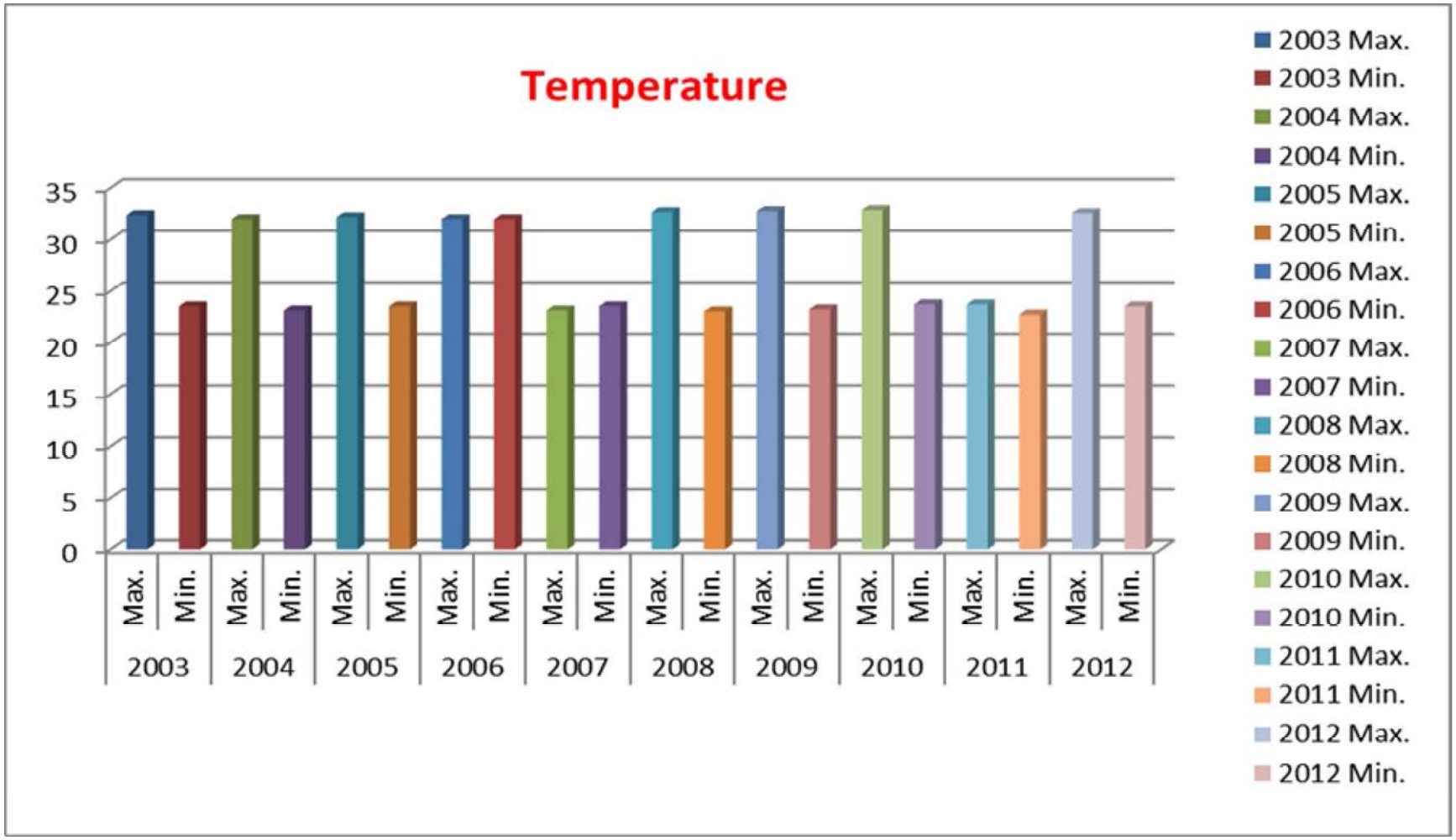


2.5.2 Temperature

Following details are taken from CWRDM Campus, Kottamparamba which explains the details of month wise and year wise average temperature for minimum period of last 10 years (2003-2012) is given below.

MONTHWISE AND YEARWISE AVERAGE TEMPERATURE FOR LAST 10 YRS																					
Maximum/Minimum Temperature-Unit degree Centigrade (oC)- Name of station :CWRDM Campus, Kottamparamba																					
Sl No	YEARS/ MONTHS	2003		2004		2005		2006		2007		2008		2009		2010		2011		2012	
		Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	January	33	21	33	20	33	22	33	21	33	20	33	20	34	20	34	22	34	21	34	21
2	February	34	24	34	22	34	22	34	20	24	23	34	22	34	22	35	22	34	20	35	23
3	March	34	25	35	25	35	24	34	24	34	25	33	23	35	24	36	26	35	23	35	25
4	April	34	25	35	25	34	25	34	26	35	25	35	25	36	26	36	26	35	24	35	25
5	May	33	26	31	24	35	26	33	24	34	25	34	24	34	24	36	26	35	25	34	26
6	June	31	24	30	23	31	24	32	24	32	25	31	23	31	24	31	24	30	23	31	24
7	July	31	23	30	24	29	23	30	23	29	24	31	24	29	23	30	22	30	23	30	24
8	August	31	24	29	24	30	24	30	24	30	24	30	23	31	23	30	24	30	23	29	24
9	September	32	24	31	24	30	24	30	24	30	24	32	23	31	23	30	24	31	23	30	24
10	October	31	24	31	24	31	23	31	24	31	24	33	23	32	24	31	24	33	24	32	24
11	November	33	23	33	23	32	23	32	24	34	22	34	24	33	23	32	24	33	23	32	23
12	December	33	20	33	20	32	22	33	20	34	21	34	22	34	23	33	22	34	21	33	21
13	Average Temperature	**33**	**24**	**32**	**23**	**32**	**24**	**32**	**23**	**32**	**24**	**33**	**23**	**33**	**23**	**33**	**24**	**33**	**23**	**33**	**24**

Figure No: 4: Temperature details



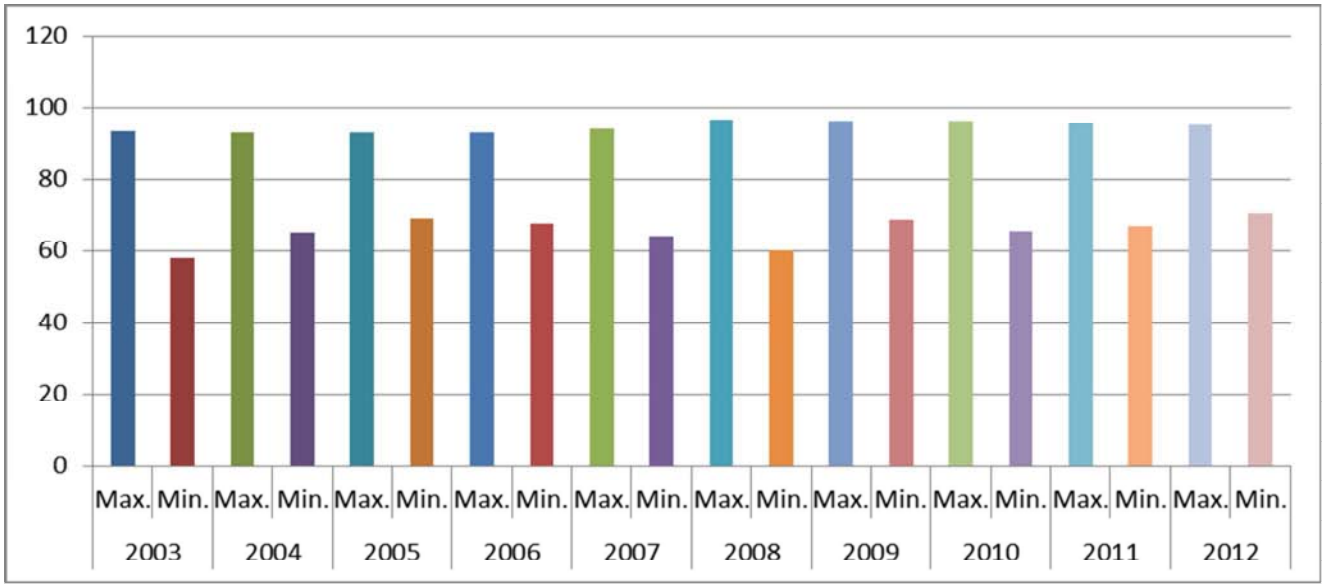
The maximum and minimum average temperature of the project area is 32.8oC and 22.7oC respectively. The maximum temperature is experienced during the month of March and minimum during the month of December

2.5.3 Humidity

Following details are taken from CWRDM Campus, Kottamparamba which explains the details of month wise and year wise average Relative humidity for last 10 years (2003-2012) is given below.

Maximum/Minimum relative Humidity in (%) last 10 yaers Name of Station: CWRDM Campus, Kottamparamba																					
Sl No	YEARS/ MONTHS	2003		2004		2005		2006		2007		2008		2009		2010		2011		2012	
		Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	January	93	47	92	50	92	55	93	53	93	52	96	41	98	52	98	59	98	55	95	57
2	February	93	54	91	47	92	53	92	46	92	49	95	47	96	54	97	53	97	49	93	58
3	March	93	53	92	53	92	55	92	54	93	55	96	50	94	58	93	55	94	53	92	60
4	April	93	57	92	57	92	65	91	62	92	60	94	56	90	62	92	60	93	59	93	64
5	May	94	65	94	78	92	62	93	64	93	64	96	57	92	68	93	64	91	60	92	66
6	June	95	67	95	81	94	86	96	86	97	83	97	75	96	76	97	83	98	85	96	81
7	July	93	55	94	81	94	79	94	80	95	75	96	76	98	90	98	85	98	86	97	83
8	August	92	60	94	79	94	80	94	75	95	79	96	75	98	76	96	75	97	86	97	86
9	September	94	61	93	71	94	81	95	84	95	74	97	66	97	79	97	66	96	80	97	79
10	October	93	66	93	71	94	76	94	79	95	65	97	67	97	73	97	67	95	65	97	75
11	November	92	60	92	61	93	73	93	74	93	60	98	59	97	72	98	59	95	64	97	72
12	December	93	51	93	51	92	59	93	54	96	50	99	56	97	64	96	59	95	61	96	64
	Average Total	**93**	**58**	**93**	**65**	**93**	**69**	**93**	**68**	**94**	**64**	**96**	**60**	**96**	**69**	**96**	**66**	**96**	**67**	**95**	**70**

Figure No: 5: *Distribution of Humidity details*



The maximum and minimum average Relative Humidity of the project area is 93.22 % and 65.55 % respectively.

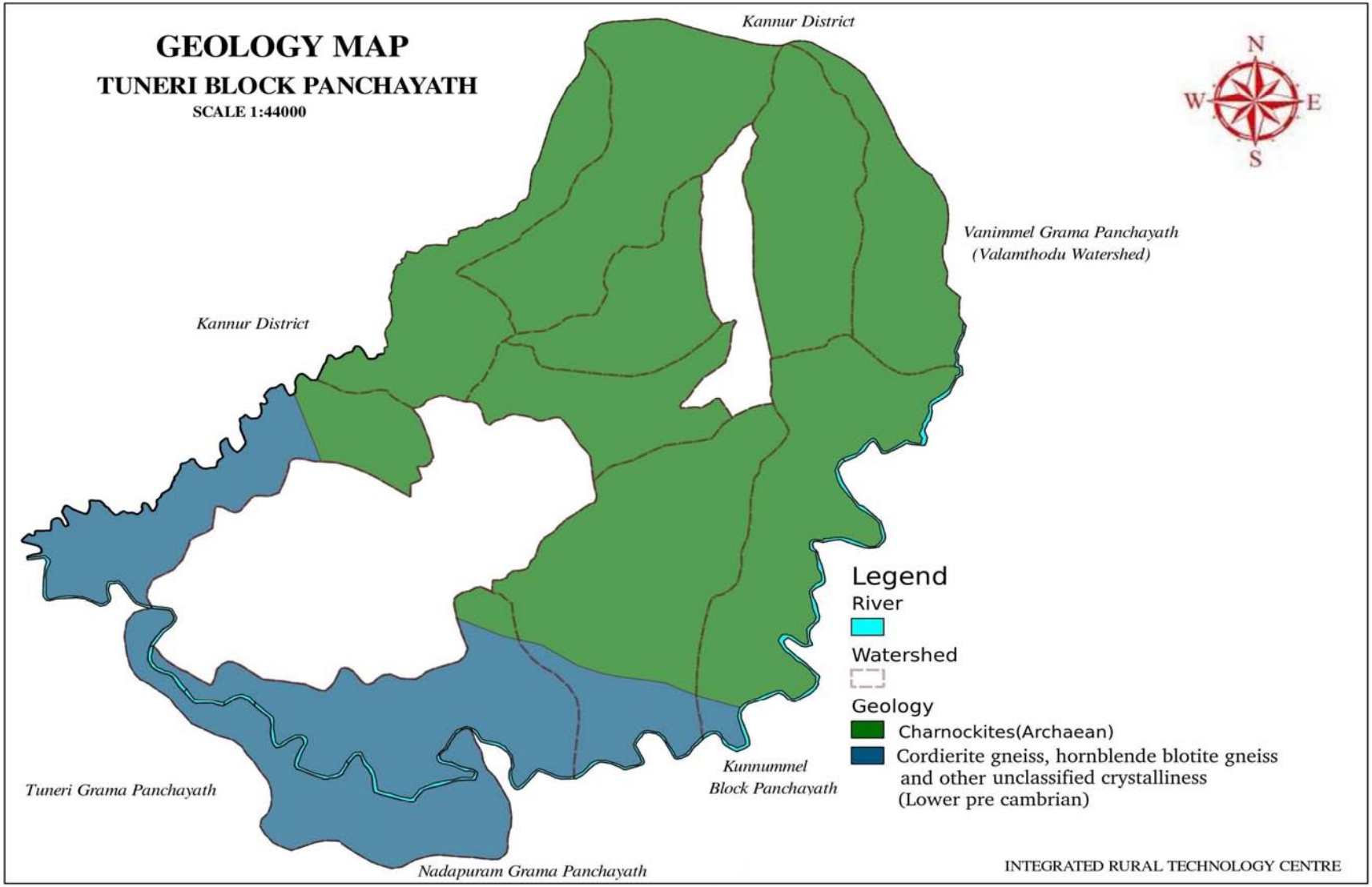
2.6. GEOLOGY

The project areas fall in the geological division viz. Lower Pre Cambrian and Archaean. The Lower pre Cambrian (crystalline rock) comprises of Dharwar (Meta volcanic, Meta sediments) Khondalites, charnockites. The Khondalites include a group of light coloured fine to medium grained, foliated or granulitic rocks comprising granite –sillimanitegreiss with or without graphite, granite-biotitegneiss, and garnet – quartzofplspathice gneiss or granulites and quartzite. The charnockites are characterized by the presence of a rhombic pyroxene, hypersthenes. The Archaean crystalline rocks comprises cordierite gneisses hornblende biotitic gneiss and other unclassified crystalline. In Tuneri Block Panchayath Crystalline rocks seen in Chelathodu, Kundilavalappil, Kalikolumb, Koodalaipuncha, Payyerikkavu, Puthukayam Mannolthodu, and Mankavilthodu. The Archaean covering parts are Kayalottuthazhe, Aroonda II, Vishnumangalam, and Jathiyeri.

2.7 GEOMORPHOLOGY

There are three geomorphology units identified in Tuneri block Panchayath .Extensive cover of laterite occurs all over the midland region, the thickness of which is often controlled by topography and these latarites are derived primarily from the laterisation of charnockites and hornblende gneis

Map 5


GEOLOGY MAP
TUNERI BLOCK PANCHAYATH
SCALE 1:44000
Kannur District
N
W
E
S
Vanimmel Grama Panchayath
(Valamthodu Watershed)
Kannur District
Legend
River
Watershed
Geology
Charnockites(Archaean)
Cordierite gneiss, hornblende blotite gneiss and other unclassified crystalliness (Lower pre cambrian)
Kunnummel
Block Panchayath
Tuneri Grama Panchayath
Nadapuram Grama Panchayath
INTEGRATED RURAL TECHNOLOGY CENTRE

2.8 GROUND WATER

Ground water is one of the major sources of water for agriculture and non-agricultural uses. Status of the groundwater in the project area is comparatively less. Well is the drinking water source and most of the wells dry up during summer season. Average depth of ground water is around 12 meter. There are few ponds in the low lying regions. Most of the people in the northern parts of the project area especially adjoining areas of Kannavam Forest and Hill tracks namely Kalikolumb, Chelathodu, and Kundilavalappil watersheds depend on natural spring for drinking water. Whereas, the people in southern part of the project area adjacent to the Mahe river mainly Vishnumangalam, Jathiyeri, Mankavilthodu, Puthukayam - Mannolthodu and Kayalottuthazhe watersheds depends on wells.

Following are the details taken from Kerala state ground water department, Kozhikode about the water level of the observational bore wells in the project area on the location of Vilangad, Vanimel, Tuneri, and Valayam

Table No: 9 *Details of water level of the observation wells in the project area. (In mtr)*

Location: Vanimel			**Well No:KKDOW 020**						**District: Kozhikode**			
Owner :Panchayath										**Well Type: Bore Well**		
Year	**Jan**	**Feb**	**Mar**	**April**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
2009	12.1	12.6	12.8	13.5	14.3	10.9	5.78	9.28	10	9.94	10.9	10.6
2010	12.5	11.3	12.7	13.2	12.4	12.9	9.33	9.34	8.6		10.2	10.6
2011	11.1	11.8	13.7	13.1	10.9	11.5	9.56	9.79	9.96	7.46	11	11.8
2012	12.7	12.6	14.4	14.2	14.5	9.5	8.34	9.9	10.4	10.3	11	11.3
Location: Tuneri				**Well No:KKDPZ 208**						**District: Kozhikode**		
Owner: KSGWD										**Well Type: Bore Well**		
Year	**Jan**	**Feb**	**Mar**	**April**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
2009	8.36	8.48	8.64	8.87	9.02	8.94	5.92	7.07	7.76	7.84	8.12	8.16
2010	8.33	8.43	8.54	8.77	8.82	8.83	7.9	7.2	7.28		8.03	7.99
2011	8.2	8.38	8.49	8.65	8.73	8.71	7.92	7.47	7.51	7.28	8.03	8.25
2012	8.42	8.54	8.7	8.84	9.01	8.15	8.15	7.96	7.66	8.06	8.21	8.33
Location: Valayam				**Well No:KKDPZ 198**						**District: Kozhikode**		
Owner: KSGWD										**Well Type: Bore Well**		
Year	**Jan**	**Feb**	**Mar**	**April**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
2009	6.42	6.59	6.73	6.94	7.01	6.34	0.91	4.27	5.49	5.56	6.06	6.05
2010	6.22	6.35	6.52	6.66	5.84	6.22	3.78	4.74	4.23		5.83	5.8
2011	6.09	6.33	6.47	6.65	6.33	6.35	5.25	5.24	5.39	4.05	5.96	6.16
2012	6.29	6.51	6.59	6.58	6.9	4.52	4.55	5.41	5.6	5.7	5.97	6.15

(Source KERALA STATE GROUND WATER DEPARTMENT DISTRICT OFFIC KOZHIKODE 2012)

Table No: 9.1 ***Details of water level of the observation wells in the project area.*** *(In mtr)*

OBSERVATION WELL DETAILES November 2012								
Sl.No.	Name of Watersheds	Owner Name	Survey No	Location	Depth of the well (m)	Zone of saturation (m)	Water level (m)	Availability of water
1	(29M9c) Aroonda II	Mukundan	120	Muthangachalil	13	12	1	8
		Nani	10/2d	Andrei	10	8.5	1.5	10
		Muneer	31/1a	Aroonda	7	5	2	12
2	(29M9d) Kalikolumb	T.P Balan	144	Kalikolumb	8	6.75	1.25	9
		mathu	229/1	Kalikolumb	10	8.7	1.3	8
		Kunjikannan	17	Kallunnira	7	5.4	1.6	10
3	(29M9e) Koodalaipuncha	geetha	242	Koodalai	11	9.5	1.5	9
		Kumaran	227	Punja	8	6.3	1.7	10
		Kelappan	117	Punja	7	5	2	11
4	(29M9g) Kundilavalappil	Nanu	188	Kundilavalappil	12	9.5	2.5	9
		Aneesh	168	Nedumparambu	9	7	2	10
		Kalyani	107	Pachapalam	8.5	6	2.5	10
5	(29M9i) Payyerikavu	Asokan	198	Kallunira	11	9.7	1.3	11
		Janu	206	Muthukutti	8.9	7.5	1.4	11
		Rajan	34	Kokri	7	5.5	1.5	12
6	(29M9j) Kayalottuthazhe	Damotharan	52	Kayalottuthazhe	10.5	9	1.5	9
		Kunjabdulla	27/21	Parakadave	9.5	8.4	1.1	10
		Chathukutty	43	Ummathur	8	6.8	1.2	12
7	(29M11a) Jathiyeri	Ayisha	31/2.	Cherumothu	10	9	1	11
		Ammad	44/2	Jathiyeri	8.5	7.2	1.3	11
		Moosa haji	24/2.	Chelmukku	8	6.4	1.6	12
8	(29M12a) Mankavilthodu	K.K Nanu	64/1	Valayam	6	4	2	10
		Ismail	15/1a	Valayam	6.5	5	1.5	11
		Kanaran	90	Vayalpeedika	7.9	5.4	2.5	12
9	(29M13a) Puthukayam - Mannolthodu	Vijeesh	253/a	Karukulam	6	3.5	2.5	10
		M.P Devi	213	Vanimel	5	3.5	1.5	11
		Anil	169	Kolappara	9.5	7.5	2	12
10	(29M14a) Chelathodu	Suku	188	Karukulam	11	9.8	1.2	9
		Mayankutty	245	Paloor	10	8.7	1.3	10
		Kunjami	155	Nalukettumpadi	9	7.2	1.8	11
11	(29M25a) Vishnumangalam	Kumaran	34/3.	Pattani	10	8.5	1.5	11
		Abdullah	99/4	Avadimukku	9.5	8	1.5	11
		Balan	50/3	Avolam	9	7	2	12

(***Source BASE LINE SURVEY IN THE PROJECT AREA 201***

2.9 WATERSUPPLY AND IRRIGATION

The major source of water in the project area consists of wells, ponds and Natural springs. Most of the people used domestic wells for drinking and irrigation facilities.

Table No: 10 ***Details of water sources in the project area.***

Sl no	WS Code	Watershed Name	Ground water depth (in mtr)		Total No		Total No		Total No	
			well	Bore wells	Wells		Ponds		Natural springs	
					Private	Public	Private	Public	Private	Public
1	29M9c	Aroonda II	9	125	168	1	1	0	1	0
2	29M9d	Kalikolumb	11	135	160	2	1	0	9	7
3	29M9e	Koodalaipuncha	8	110	159	2	2	1	4	4
4	29M9g	Kundilavalappil	12	145	140	1	0	0	1	1
5	29M9i	Payyerikavu	7	95	246	3	0	0	0	0
6	29M9j	Kayalottuthazhe	8	105	929	2	1	2	0	1
7	29M11a	Jathiyeri	9	120	1256	5	1	2	0	0
8	29M12a	Mankavilthodu	10	120	2300	9	1	3	0	0
9	29M13a	Puthukayam - Mannolthodu	10	120	900	2	0	0	0	0
10	29M14a	Chelathodu	11	135	521	3	0	0	3	4
11	29M25a	Vishnumangalam	8	110	1106	5	0	1	0	0

(***Source BASE LINE SURVEY IN THE PROJECT AREA 2012)***

The northern part of the project area such as Kalikolumb, Chelathodu and Kundilavalappil are depending on Natural springs and wells. There are 7920 wells in the project area. Out of these 7885 are private and 35 are public. Most of the people living in the upper region of the project area use natural springs for drinking purpose. The people in the middle region are using ponds (16 Nos) for the purpose of irrigation and other uses. Out of these 7 are private and 9 are public. The average depth of the wells and bore wells in the project area is 9.36 m, 120m, respectively. The average depth of the groundwater in the project area is 9 m.

2.10 SOCIO-ECONOMIC DETAILES

. The socio-economic condition of the watershed community is very poor. The livelihood of people inhabiting Watershed area mainly depends upon agriculture. Most of the Residents of the watersheds are Agricultural wage labours; some are engaged in Animal Husbandry and Business. There is no major or even small industry in this area. There are very less job opportunities available and hence people are migrating to other towns/cities for employment

2.10.1 Population

Table No: 11 Population statistics of the project area.

DEMOGRAPHY AND LAND DISTRIBUTION															
1	2	3	4	5									6	7	8
No	WATERSHED NAME	AREA (IN Ha)	Total Families	Population									BPL Families	Literacy (%)	Land holding family (In Ha)
				General		SC		ST		Total male	total female	Total			
				Male	Female	Male	Female	Male	Female						
1	Jathiyeri	670	1934	2779	2830	29	32	2	3	2810	2865	5675	436	88%	0.35
2	Mankavilthodu	1070	3374	7654	7727	189	213	85	98	7928	8038	15966	398	90%	0.32
3	Puthukayam - Mannolthodu	545	1365	2803	2752	58	47	40	43	2901	2842	5743	459	89%	0.40
4	Chelathodu	433	829	531	535	98	90	490	473	1119	1098	2217	295	86%	0.52
5	Vishnumangalam	451	1674	3868	3899	69	83	3	4	3940	3986	7926	303	89%	0.27
6	Aroonda II	266	302	380	420	12	18	16	19	408	457	865	32	91.2%	0.88
7	Kalikolumb	695	411	430	424	54	63	213	246	697	733	1430	186	92%	1.69
8	Koodalai Puncha	363	246	285	328	30	38	21	29	336	395	731	88	93%	1.48
9	Kundilavalappil	360	283	285	321	38	38	85	98	408	457	865	149	90%	1.27
10	Payyerikkavu	238	338	628	675	23	29	15	19	666	723	1389	125	94%	0.70
11	Kayalottuthazhe	621	1230	3025	3180	75	89	43	56	3143	3325	6468	306	87%	0.50
	total	**5712**	**11986**	**22668**	**23091**	**675**	**740**	**1013**	**1088**	**24356**	**24919**	**49275**	**2777**	**90%**	0.76

The majority of population under the project area is marginal farmers and agricultural labourers. The project area has a population of 49275 among 11986 families. The population statistics of the project area reveals that female population (24919) is more than male (24356) population. The BPL Families are 2777.The average literacy rate of the project area are 90 %. Among them 1365 belongs to scheduled caste and 2101 are scheduled tribes. Average land holding is 0.32 to 1.69 ha.

10.2 Education Facilities

Table No:12 Education statistics of the project area.

EDUCATION ISTITUTIONS										
Sl no	Watershed Name	Code No	Schools	Govt	Private	Toilet	Electricity	Staff	Total students	Angan wadies
1	Jathiyeri	29M11a	LP	_	3	Yes	Yes	19	98	3
			UP	_	1	Yes	Yes	5	39	
2	Mankavilthodu	29M12a	LP	2	3	Yes	Yes	_	_	8
			UP	_	1	Yes	Yes	_	_	
			HS	_	1	Yes	Yes	_	_	
3	Puthukayam - Mannolthodu	29M13a	LP	1	_	Yes	Yes	7	58	2
			HSS	1	_	Yes	Yes	69	890	
4	Chelathodu	29M14a	NA							2
5	Vishnumangalam	29M25a	LP	1	_	Yes	Yes	5	48	3
			HSS	_	1	Yes	Yes	79	1932	
6	Aroonda II	29M9c	NA							1
7	Kalikolumb	29M9d	LP	1	_	Yes	Yes	5	18	3
8	Koodalaipuncha	29M9e	NA							2
9	Kundilavalappil	29M9g	LP	1	_	Yes	Yes	5	28	1
10	Payyerikavu	29M9i	NA							2
11	Kayalottuthazhe	29M9j	LP	1	1	Yes	Yes			7
			UP	1	1	Yes	Yes	23		
			HS	_	1	_		45	698	

The education facilities are very less in the project areas. There are only two higher secondary schools, one high school, three UP and twelve LP schools in the project area. And there are some watersheds without any Higher Education facilities, especially Aroonda, Kalikolumb, Kundilavalappil, Payyerikkavu, Koodalai Puncha so that the students from these watershed areas have to travel distance of 5 to 15 km to reach the schools for getting higher education. Thirty four Anganwadies are situated in the project area. All the schools are fully electrified with toilet facilities

2.10.3 Medical facilities

The existing hospitals both in private and public sector play an important role in the health care of the people in this area. Numbers of Allopathic, Ayurvedic and Homeo hospitals are giving great relief to the people in the locality. Even then a conveyance facilities has to be provided for speedy medical attendance.

2.10.4 Credit facility

There are 2 co-operative societies; one nationalized bank and 1 private bank functioning in the project area. Out of these, loans for agricultural purpose are obtained from co-operative and nationalized banks. The farmers have taken short, medium and long term loans from the banks for the agricultural purposes.

2.10.5 Marketing Facilities

Coconut and Areca nut are the major crops in the project area. More over banana is cultivated mainly in the Aroonda and Kalikolumb watersheds. There are mainly four marketing centers such as Valayam, Bhoomivathukkal, Parakkadavu and Kallachi in the project area. Farmers in the Aroonda , Payyerikkavu, Koodalai Punja and Kalikolumb watersheds depends on Valayam market for selling their agricultural goods; Where as farmers in the Jathiyeri watershed depends on Kallachi market. Mankavilthodu, Chelathodu, Kundilavalappil and Puthukayam-Mannolthodu watersheds rely on Bhoomivathukkal market and Vishnumangalam and Kayalottuthazhe watersheds depends on Parakkadavu market for selling their agricultural goods. Even though there are four major marketing centers in the project area, there is no procurement and storage facility for agricultural goods. Besides storage facilities, transportation facilities are comparatively poor, and farmers are unable to sell their agricultural goods in right time.

2.10.6 Land holding size in the project area

The majority of the farmers are small and marginal farmer's .Almost 80 % of the farmers under this category

Table No: 13. ***Land holding pattern in the project area.***

1	2	3	4	5	6	7
No	Name Of Watersheds	AREA (Ha)	Total No of household	Land Holding Pattern		
				SF	MF	LF
1	Aroonda II	266	302	159	132	11
2	Kalikolumb	695	411	133	193	85
3	Koodalaipuncha	363	252	121	96	35
4	Kundilavalappil	360	295	165	104	26
5	Payyerikavu	238	343	229	96	18
6	Kayalottuthazhe	621	1230	1013	207	10
7	Jathiyeri	670	1934	1634	288	12
8	Mankavilthodu	1070	3374	2830	512	32
9	Puthukayam - Mannolthodu	545	1365	1019	325	21
10	Chelathodu	433	829	408	320	101
11	Vishnumangalam	451	1674	1462	207	5
	Total	**5712**	**9176**	**7353**	**1652**	**171**

(Source BASE LINE SURVEY IN THE PROJECT AREA 2012)

The total area of the project is 5712 Ha. About 80% of this is small and marginal farmers, 18% comes under medium category and only 2 % of the farmers hold reasonably vast area of land

2.10.7 Transport and communication

Transport is basic infrastructure, which is a prerequisite for any society to progress. Moreover, these determine the speed of growth and development of place. Following details distributed on the basis of watersheds about the transportation and communication facilities in the project area.

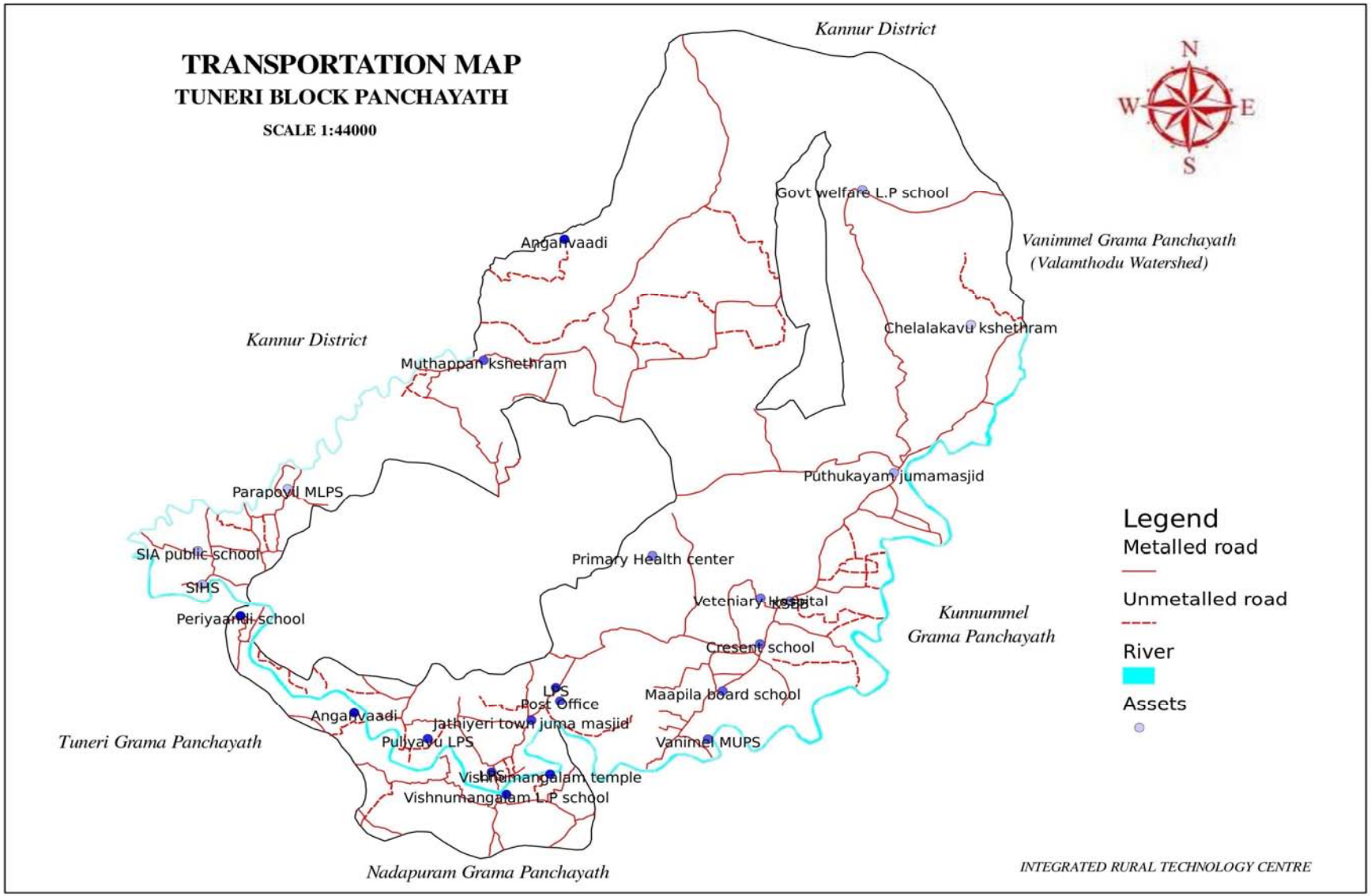
Table No: 14 ***Transportation and Communication facilities in the project area.***

No	WS Code	WATERSHED NAME	State Highway	PWD roads (number)	Panchayath roads (number)	Pucca roads (number)	Katcha roads (number)	Post office (number)
1	29M9c	Aroonda II	NA	1	2	1	NA	NA
2	29M9d	Kalikolumb	NA	0	1	1	2	NA
3	29M9e	Koodalaipuncha	NA	0	3	2	2	NA
4	29M9g	Kundilavalappil	NA	0	2	0	1	NA
5	29M9i	Payyerikavu	NA	0	3	0	1	NA
6	29M9j	Kayalottuthazhe	NA	1	13	2	2	1
7	29M11a	Jathiyeri	NA	1	2	5	NA	1
8	29M12a	Mankavilthodu	NA	1	12	2	NA	1
9	29M13a	Puthukayam - Mannolthodu	NA	1	7	3	2	1
10	29M14a	Chelathodu	NA	1	2	2	NA	NA
11	29M25a	Vishnumangalam	1	2	11	1	NA	NA

(Source BASE LINE SURVEY IN THE PROJECT AREA 2012)

The above table reveals that the State High way passes through the Vishnumangalam watershed. The watershed such as Kalikolumb, Koodalai Puncha, Kundilavalappil and Payyerikkavu has no PWD roads. At present the scheme of Predhan manthri Grameen Suddek Yosgar (PMGSY) is progressing through the Payyerikkavu and Kalikolumb watersheds. The people in the upper region of the project area are depending on Jeep services for their transport facility and the people in the middle region and lower region are depending on Bus, Jeep and Autorikshaws. Mobile, Land phones, and Letters are the major communication facilities in the project area

Map 6


TRANSPORTATION MAP
TUNERI BLOCK PANCHAYATH
SCALE 1:44000
Kannur District
N
W
E
S
Govt welfare L.P school
Anganvaadi
Vanimmel Grama Panchayath
(Valamthodu Watershed)
Kannur District
Chelalakavu kshethram
Muthappan kshethram
Puthukayam jumamasjid
Parapoyil MLPS
SIA public school
SIHS
Periyaandi school
Primary Health center
Veteniary Hospital
KSEB
Kunnummel
Grama Panchayath
Cresent school
LPS
Post Office
Maapila board school
Anganvaadi
Jathiyeri town juma masjid
Tuneri Grama Panchayath
Puliyayu LPS
Vanimel MUPS
LPS
Vishnumangalam temple
Vishnumangalam LP school
Nadapuram Grama Panchayath
Legend
Metalled road
Unmetalled road
River
Assets
INTEGRATED RURAL TECHNOLOGY CENTRE

2.10.8 Recreation facilities

There have a few recreation centers spread over the projected area. There are eleven libraries in the project area, out of which three libraries locate in Mankavilthodu, two libraries in Chelathodu, two libraries in Puthukayam, two libraries in Jathiyeri, one library each in Vishnumangalam and Kayalottuthazhe. In the case of arts and sports club, there are four clubs are generally found in the project area. There are notable recreation centre found in Kundilavalappil and Kalikolumb watershed.

2.11 .AGRICULTURE AND PRESENT LAND USE

The land use of the project area can be broadly classified into agricultural land, building land, vested forest, and waste land. The upper region of the project area consists of vested forest and agricultural land. The middle region is occupied by agricultural and waste lands which are mainly under mixed agricultural / horticultural plantation. The lower region is predominantly occupied by agricultural lands which is mainly under mixed agricultural / horticultural plantation and some area is under paddy converted mixed crops, mixed trees and vegetation. Land use classification of project area is shown in

Table No: 15 ***Details of Land use in the project area***

Sl no	Land use	Total (Ha)
1	**Coconut**	**748.5**
2	**Banana**	**13.9**
3	**Cashew + Coconut**	**4.4**
4	**Cashew**	**76.1**
5	**Built -up land**	**50.4**
6	**Coconut + Arecanut**	**235**
7	**Coconut + Mixed crops**	**1401**

8	Paddy converted to Built -up land	3.4
9	Paddy converted to Mixed crops	89.1
10	Paddy converted to Coconut	112.5
11	Paddy converted to Coconut + Arecanut	29.3
12	Rubber + Mixed crops	6.4
13	Rubber	100.1
14	Mixed crops	2233
15	Paddy converted to waste land	17.6
16	Mixed trees	3
17	Paddy first crop	4.3
18	Mixed crops + Mixed trees	377
19	River	84.4
20	Road	5.4
21	Vested forest	117.2
22	Total	5712

(Source BASE LINE SURVEY IN THE PROJECT AREA 2012)

Map 7

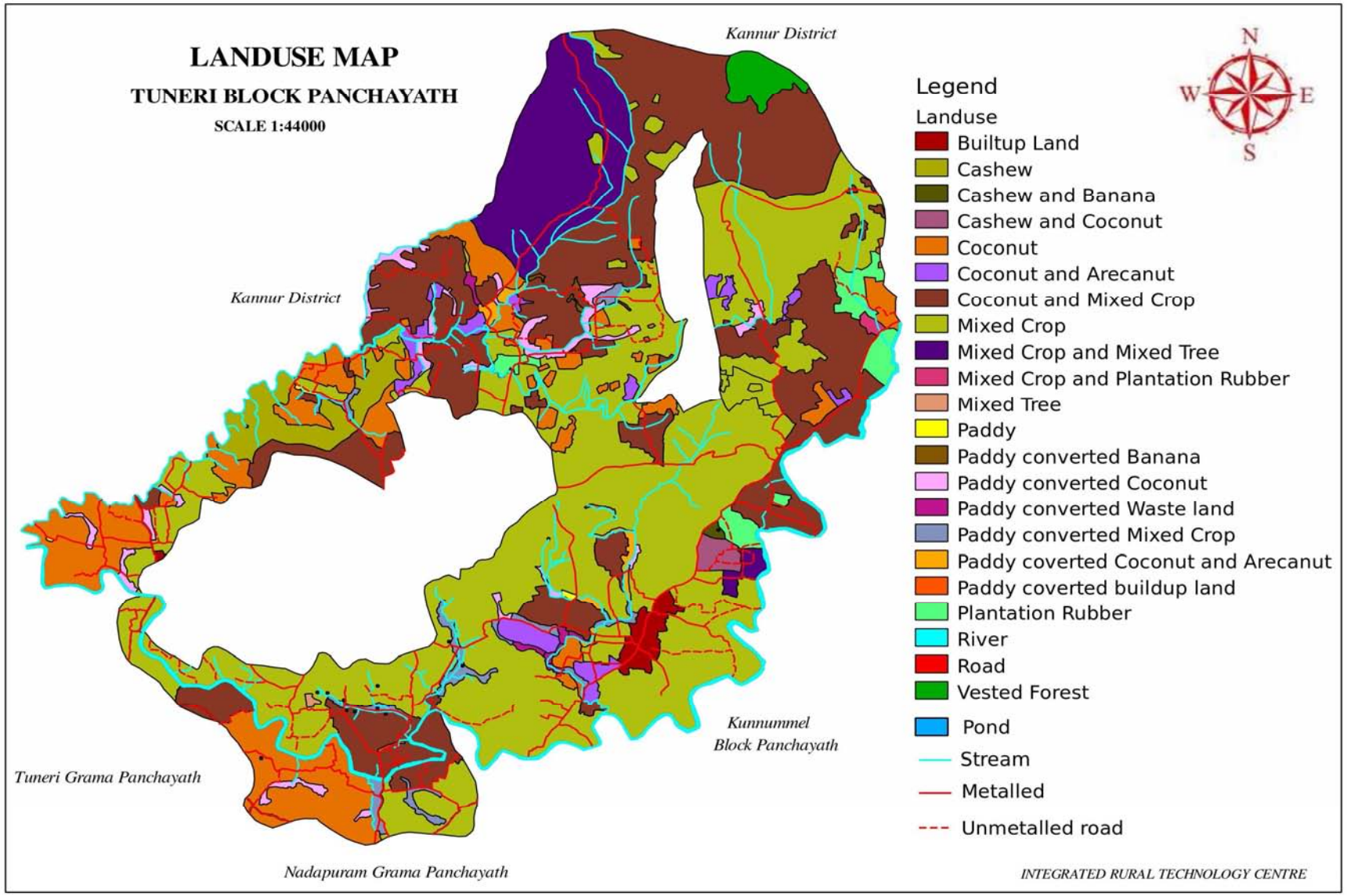
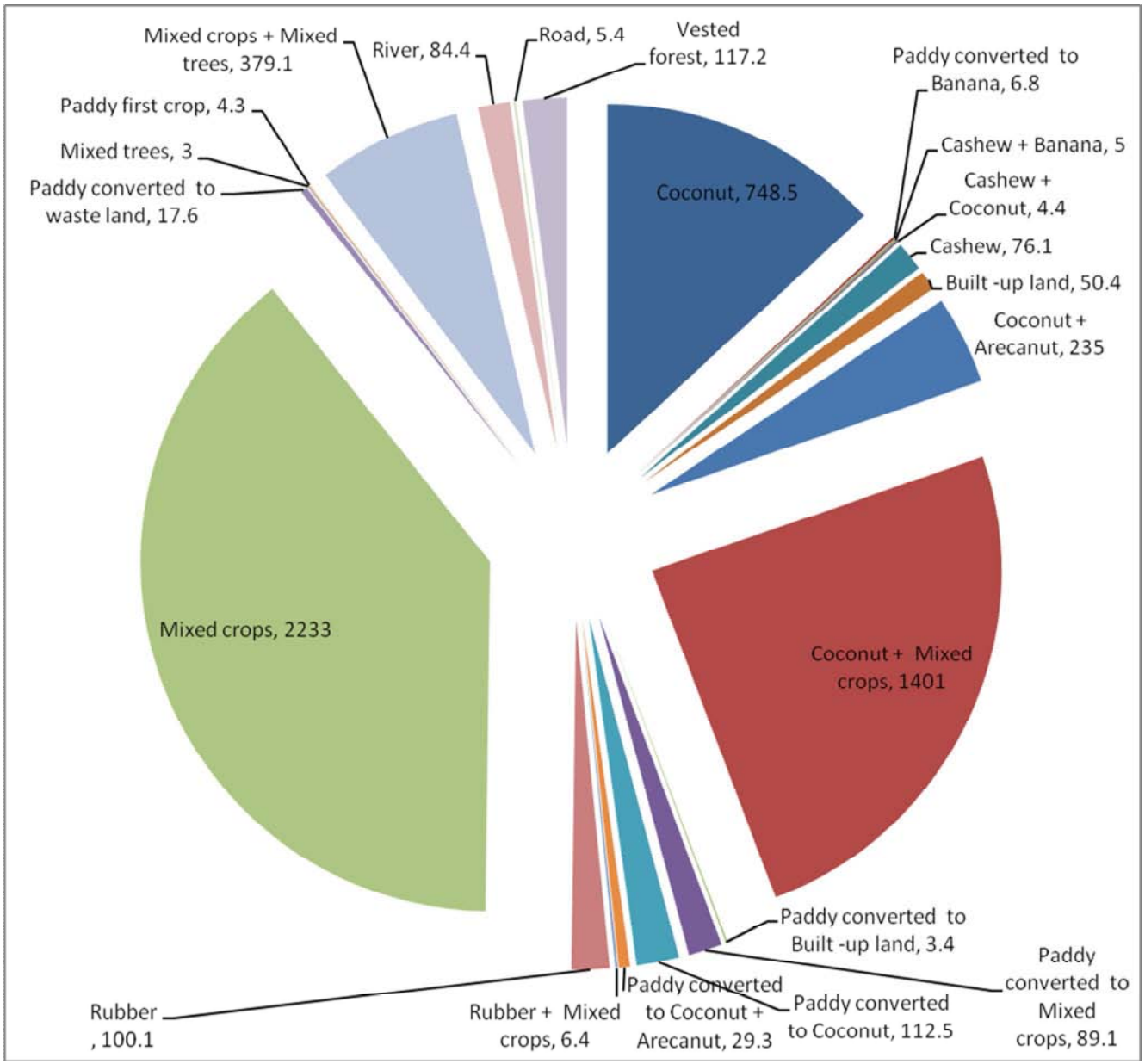

LANDUSE MAP
TUNERI BLOCK PANCHAYATH
SCALE 1:44000
Kannur District
Kannur District
Kunnummel Block Panchayath
Tuneri Grama Panchayath
Nadapuram Grama Panchayath
N
W
E
S
Legend
Landuse
Builtup Land
Cashew
Cashew and Banana
Cashew and Coconut
Coconut
Coconut and Arecanut
Coconut and Mixed Crop
Mixed Crop
Mixed Crop and Mixed Tree
Mixed Crop and Plantation Rubber
Mixed Tree
Paddy
Paddy converted Banana
Paddy converted Coconut
Paddy converted Waste land
Paddy converted Mixed Crop
Paddy coverted Coconut and Arecanut
Paddy coverted buildup land
Plantation Rubber
River
Road
Vested Forest
Pond
Stream
Metalled
Unmetalled road
INTEGRATED RURAL TECHNOLOGY CENTRE

Figure No: 6. ***Distribution of Land Use Details***



Major area under agricultural land is occupied by Mixed crop (2233Ha) which forms 39.09% of total project area .Followed by coconut and Mixed crops which cover an area of 1401Ha (24.53%). 256.2 Ha of Paddy has been converted for other uses (4.48%) out of these, first crop alone is taken in 4.3 Ha and paddy converted to waste land occupy an area of 17.6 Ha. The area occupied by paddy converted to coconut is 112.5 Ha and 29.3 Ha converted to coconut and Arecanut. The area occupied by paddy converted to mixed crop is 89.1 Ha .748.5 ha covers under coconut alone.117 .2Ha is under vested forest. The total area under rubber cultivation is 100.1 Ha

2.12 GROSS DOMESTIC PRODUCT

The major occupations of the people in this area are Agriculture and Agricultural related activities. Nearly 60% of the population in the project area depends upon agriculture. Coconut is the major crop cultivating in the project area. Arecanut, pepper, rubber, cashew, Banana and Tapioca are also cultivated in this area. Since the Agriculture sector became non profitable, people especially agricultural labourers are seen moving towards construction fields.

Many of the people from this region are working in Gulf countries. The influence of Gulf money helped a lot for the economic development of business sector. But it is seen that the major portion of the income from Gulf is utilizing for building purposes. No major industries exist in this project area.

The average wage rate for men in agricultural sector comes around Rs.450/- and for women Rs.375/-.In construction and other fields it comes about Rs.650/-and 450/- respectively.

Local employment is available in agriculture sector, but majority of the labourers are moving towards urban areas for employment.

Scarcity of the labour is experiencing in agricultural sector. But in construction and other fields unskilled labours are almost available and skilled labourers are insufficient.

Self employed people are seen mainly in business areas. Besides some are engaged in Hand loom weaving, Carpentry and Auto-Jeep driving etc

2.13 COMMUNITY ORGANIZATION

User Groups are normally formed to manage an activity or asset created under the programme on a long term basis. The user group collects user charges from their members, oversee the works and manage the benefits. It was decided that each group would formulate certain internal rules and have a feeling of ownership with community spirit.

Table No: 16 ***Details of Community Organization in the project area***

People registered under MGNREGS	No. of SHGs		Self Employment venture
	Male	Female	
3860	41	452	15

The formation of SHGs in all watershed is underway. It is proposed to form at least 6 SHGs in each watershed. Each SHG will consist of 10/15 members. The members would be mainly from landless, SCs and women, small and marginal farmers. Few groups exclusively of unemployed youth have also

been identified. These groups will be homogeneous having common goal for increasing their income by establishing micro enterprise. Under the Project, each SHG would be given a revolving fund of Rs.20000/25000 each after 6 months from the date of formation (subject to qualifying the 1st grading and meeting the laid down norms). The Income Generating Activities are also being identified. After having made discussions, watershed community evinced interest their Income Generation Activities.

2.14 ANIMAL HUSBANDARY AND DAIRYING

Animal Husbandry and Dairying plays an important role for economic structure growth. We connot think about a food menu without egg, milk, meat etc. As 94% of cattle wealth has been centered upon rural areas, advances in the sector will have an impetus upon strengthening national economic status. Majority of cattle farmers are small scale manual farmers and agriculture workers.

Table No: 17. ***Detail s of Animal population in the project area.***

Sl no	Animal Husbandry	No	Availability of milk (litre) /annum	Milk Marketing Societies
1	Cow	1370	414300 Litre	4
2	Goat	1635	46956 Litre	
3	Buffaloes	3		
4	Poultry	7831	NA	
5	Duck	205		
6	Pig	5		
7	Rabbit	68		
8	Others	57		

(Source BASE LINE SURVEY IN THE PROJECT AREA 2012)

2.15 SOILS

2.15.1 Soil types

Kerala is endowed with a variety of soils due to the climate, topography, and vegetation characteristics. Laterite and loams form the major soil types of Kerala. Laterite soil, Riverine alluvial soil, Brown Hydromorphic soil are the major soil types of the watershed area.

2.15.1. (A) Laterite soil:

Majority of area comprises this type of soil. Laterite soil of Kerala is typical kaolinitic weathering products of gneissic and granitic rocks developed under humid tropical conditions. Heavy rainfall and

high temperature prevalent in the State are conductive to the process of laterisation. The surface soil, which is reddish brown to yellowish red, is mostly gravelly loam to gravelly clay loam in texture. The profiles have well-developed B-horizon with abundant ferruginous and quartz gravels. The plinthite is characterized by a compact vesicular mass below the B-horizon, composed essentially of a mixture of hydrated oxides of iron and aluminum. The plinthite includes quarriable type that breaks into blocks and also non-quarriable type that breaks into irregular lumps. Laterites are in general poor in available nitrogen, phosphorus and potassium and are low in the bases. They have poor water-holding capacity, CEC and high P fixing capacity with low organic matter content. They are generally acidic with pH ranging from 4.5 to 6.2

2.15.1 (B) Riverine alluvial soil:

They show wide variation in their physico-chemical properties depending obviously on the nature of alluvium that is deposited and the characteristics of the catchment area through which the river flows. Horizon differentiation is not well expressed. They are very deep soils which surface texture ranging from sandy loam to clay loam. They are moderately supplied with organic matter, nitrogen and potassium. They are acidic and poor in phosphorus and lim.

2.15.1 (C) Brown Hydromorphic soil:

Hydromorphic soils, as a group, occur extensively in the State. These soils are mostly confined to valley bottoms of undulating topography in the midland and to low lying areas of coastal strip. They have been formed as a result of transportation and sedimentation of material from adjacent hill slopes and also through deposition by rivers. They exhibit wide variation in physico-chemical properties and morphological features. The development of the soil profiles has occurred under impeded drainage conditions. These soils, therefore, exhibit characteristic Hydromorphic features like grey horizons, mottling streaks, hard pans, organic matter depositions, iron and manganese concretion, etc. Drainage is the major problem. They are moderately supplied with organic matter, nitrogen and potassium and are deficient in lime and phosphorus. Acidity is a problem in some areas

Map 8

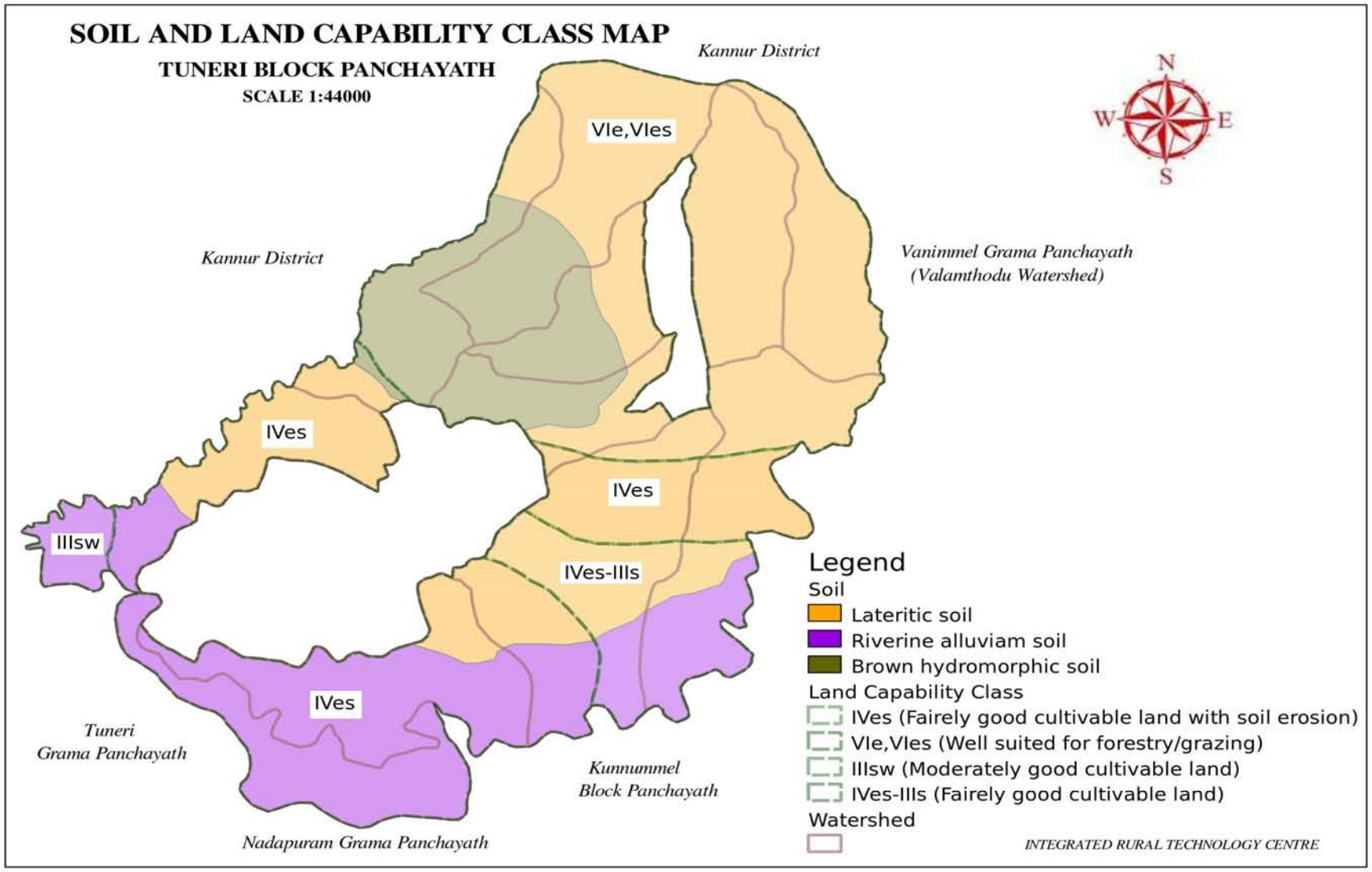

SOIL AND LAND CAPABILITY CLASS MAP
TUNERI BLOCK PANCHAYATH
SCALE 1:44000
Kannur District
Kannur District
Vanimmel Grama Panchayath
(Valamthodu Watershed)
Tuneri
Grama Panchayath
Kunnummel
Block Panchayath
Nadapuram Grama Panchayath
VIe,VIes
IVes
IVes
IIIsw
IVes-IIIs
IVes
N
W
E
S
Legend
Soil
Lateritic soil
Riverine alluviam soil
Brown hydromorphic soil
Land Capability Class
IVes (Fairely good cultivable land with soil erosion)
VIe,VIes (Well suited for forestry/grazing)
IIIsw (Moderately good cultivable land)
IVes-IIIs (Fairely good cultivable land)
Watershed
INTEGRATED RURAL TECHNOLOGY CENTRE

Table No: 18 ***Details regarding soil types***

1	2	3	4	5	6	7
Sl No	WS Code	Name Of Watersheds	Major soil types			
			Brown Hydromorphic soil	Lateritic soil	Riverine Alluvium	Total Ha
1	29M9c	Aroonda II	44	222	0	266
2	29M9d	Kalikolumb	0	695	0	695
3	29M9e	Koodalaipuncha	0	363	0	363
4	29M9g	Kundilavalappil	0	360	0	360
5	29M9i	Payyerikavu	0	238	0	238
6	29M9j	Kayalottuthazhe	50	461	110	621
7	29M11a	Jathiyeri	0	58	612	670
8	29M12a	Mankavilthodu	0	210	860	1070
9	29M13a	Puthukayam - Mannolthodu	0	51	494	545
10	29M14a	Chelathodu	0	433	0	433
11	29M25a	Vishnumangalam	0	0	451	451
	Total		**94**	**3091**	**2527**	**5712**

(Source PPR IWMP TUNRI BLOCK)

2.15.2 Soil depth

The Northern part of the block Panchayath has deep soil with 100-150 centimeter depth. Whereas soils in the southern part of project areas adjacent to the river Mahe includes is very deep, having more than 150 centimeters depth. Soils in the central part of the project area have moderate deep to moderate shallow soil with 50-100cm depth.

2.15.3 Soil erosion:

Soil erosion is one of the most serious environmental problems in the project area, because it seriously threatens the agriculture and the natural environment. Generally, slope of the project area is from North-East to South-West. S1, S2, S3, S4, Hill crest, Ridge crest and Valleys are the slopes seen in the project area. The problems due to soil erosion are loss of fertile topsoil, acidity and reduction of crop productivity.

Table No: 19 ***Details of soil erosion in the project area***

1	2	3
Cause	**Type of erosion**	**Area affected**
	Water erosion	
a	Severe	2355
b	Moderate	2066
c	Slight	1291
	Total	5712

2.15.4 Land Capability Classification

The Land capability classification groups the soils into different classes according to its capability for agricultural production. This will also provide adequate information about soil erosion or other kind of degradation. Every soil can be used based on its potentiality and limitations. The factors deciding the land capabilities are the inherent physical and chemical properties of the soil. Generally Land capability classes I to IV are suited for agriculture, V to VII are suited for grass land and class VIII is suited for wild life.

Table No: 20 ***Details of Land capability in the project area***

SL NO	Land Capability Sub class Association	Area	
		In Ha	Percentage
1	IIIsw	110	1.93
2	IVes -IIIs	533	9.33
3	IVes	2236	39.15
4	VIe -VIes	2833	49.60
	Total	**5712**	**100**

Class IIIsw -Moderately good cultivable lands subject to soil wetness/drainage

Class IIIs -Moderately good cultivable lands subject to soil

Class IVe -Fairly good cultivable lands subject to erosion and runoff

Class IVes -Fairly good cultivable lands subject to soil erosion and runoff

Class VIe -Well suited for forestry or grazing subject erosion and runoff

Class VIes -Well suited for forestry or grazing subject soil erosion and runoff

The land capability of the present project area can be classified in to 3 classes on the basis of suitability of soil for field crop.

Land Irrigability Classification

The project area can be broadly classified in to three Irrigability classes such as 6, 4s-2s and 3st degree of limitations for sustained use under irrigation, on physical and socio-economic factors.

Table No: 21 ***Details of Land Irrigability in the project area***

SL NO	Land Irrigability Sub class Association	Area	
		In Ha	Percentage
1	3st	547	9.58
2	4s - 2s	740	12.96
3	6	4425	77.47
	Total	**5712**	**100**

Class 2s -Moderate limitations soil for sustain under irrigation
Class 3st -severe limitations for sustain use under irrigation with soil and topographic limitations
Class 4s -Marginal lands have limitation of soil for sustained use under irrigation
Class 6 -Not suitable for sustained use under irrigation

The land Irrigability sub class 4s- 2s spread over the Puthukayam- Mannolthodu and Mankavilthodu watershed partially .sub class 3s are found in Vishnumangalam watershed completely and Kayalottuthazhe watershed partially

2.6 PROBLEMS

The problems and suggestions that are detailed below in relation to various sections such as soil, Crop Production, Marketing, Labour, Social, Cultural, Animal Husbandry, Dairying etc are drawn on the basis of findings from the field survey conducted with the peoples participation and held in neighborhood groups and watershed gramasabhas

2.16.1 Problems related to Soil:

- Soil erosion is one of the most serious problems in the watershed.
- Low soil fertility in the watershed area

Suggestions:

Execute soil and water conservation activities such as Gully Plugging and Check Dams as part of drainage treatment and contour bunds, contour terracing, rain pits and fencing as part of area treatment.

2.16.2 Problems related to Crop Production

- Paddy fields are being used for cultivation of other crops since rice cultivation is not being profitable.
- Coconut and Banana cultivated in the uplands is not being irrigated. Coconut also faces the problem of mite attack.
- Coconut cultivation faces the problem of price fall and hence profit obtained is less.
- Erosion of fertilized soil.
- Lack of financial sustainability.
- Unscientific farming practices.
- Infestations of wild animals
- Pest infestation
- Scarcity in the availability of quality seeds and farming materials.
- Lack of facilities for preventing the disease of crops.
- Lack of availability of agricultural labourers.

Suggestions:

- Encourage rice cultivation with use of modern machineries.
- Deepen water sources and construct gullies and check dams in the uplands.
- Village level marketing facility and storage facility should be provided for agricultural products.
- Construction of fence, contour bunds, gully plugging and rain pit for preventing soil erosion.
- Provide awareness among farmers about scientific farming practices.
- Make hybrid variety of seeds available.
- Encourage use of bio fertilizers like vermin compost.
- Make use of trenches and fencing.
- Make availability of MGNREGS Project in agriculture.
- Formation of labour groups in agricultural sector.

2.16.3 Problems related to Marketing

- Lack of transportation facilities.
- Low price for agriculture products.

- Fluctuation in price.
- Poor facilities of market.
- Unavailability of storage house.
- Lack of co-operative stores.
- Farmers mainly depend on private markets more than public market.
- Problem of intermediates.

Suggestions:

- Establish sub centers for collecting the agricultural products.
- Establish marketing facility and storage facility in village level.
- Constitute co operative societies.
- Strengthening activities of VFPCK.

2.16.4 Problems related to Labour:

- Lack of interest to work in agricultural sector.
- Unavailability of labour.
- Difference between the wage rate of agriculture sector and agriculture allied sector.
- Lack of transportation facilities.

Suggestions:

- Encourage young people to make up agriculture as way of living.
- Mechanization and training in modern machineries.

2.16.4 Social problems

. A good majority of the people in Tuneri block panchayath area are depending on Gulf countries for employment and income. The influence of foreign money is reflected either directly or indirectly in the living standards of one third of the population in this area. It also affects the socio cultural aspects of the people. Crores of rupees are seen spending either for house building or for modification of houses. Since the agricultural sector became non profitable, the agricultural labourers have turned towards construction fields. This became a great relief for the agricultural labourers. If immediate effective interventions are not done in the agriculture sector, the production from this sector will go down considerably.

People are seen migrating to other areas especially from the Kalikolumb and Kundilavalappil watersheds which were laying in the upper region of the block panchayath areas. The reasons for this are the nonprofit able agriculture sector, lack of facility for education and conveyance etc. Besides,

people are unaware about other skilled job other than agriculture. Migration to gulf countries for job seeking is also quite common in this block panchayath area.

2.16.5 Cultural problems

Arts and sports clubs and other reading rooms are very less in this region. The function of the existing few clubs are also not in a satisfactory. Majority of the population are participating in all the communal festival occasions in this region. But people are showing less interest in other common functions. The participation of the people in keralolsavam festivals is good. But participation in arts item is seen very less.

2.16.6 Problems related to Animal Husbandry and dairying

- Lack of scientific knowledge about animal husbandry.
- Unavailability of Veterinary hospitals.
- Lack of fodder grass.
- Inadequacy of high yielding livestock.
- Diseases affecting the cattle.
- Poor quality of cattle shelter.
- Reduction in milk price.
- Lack of milk societies.
- Lack of transportation facilities.
- Sterility and mastitis in milk cows.
- Higher expenses and low income from animal rearing.

Suggestions:

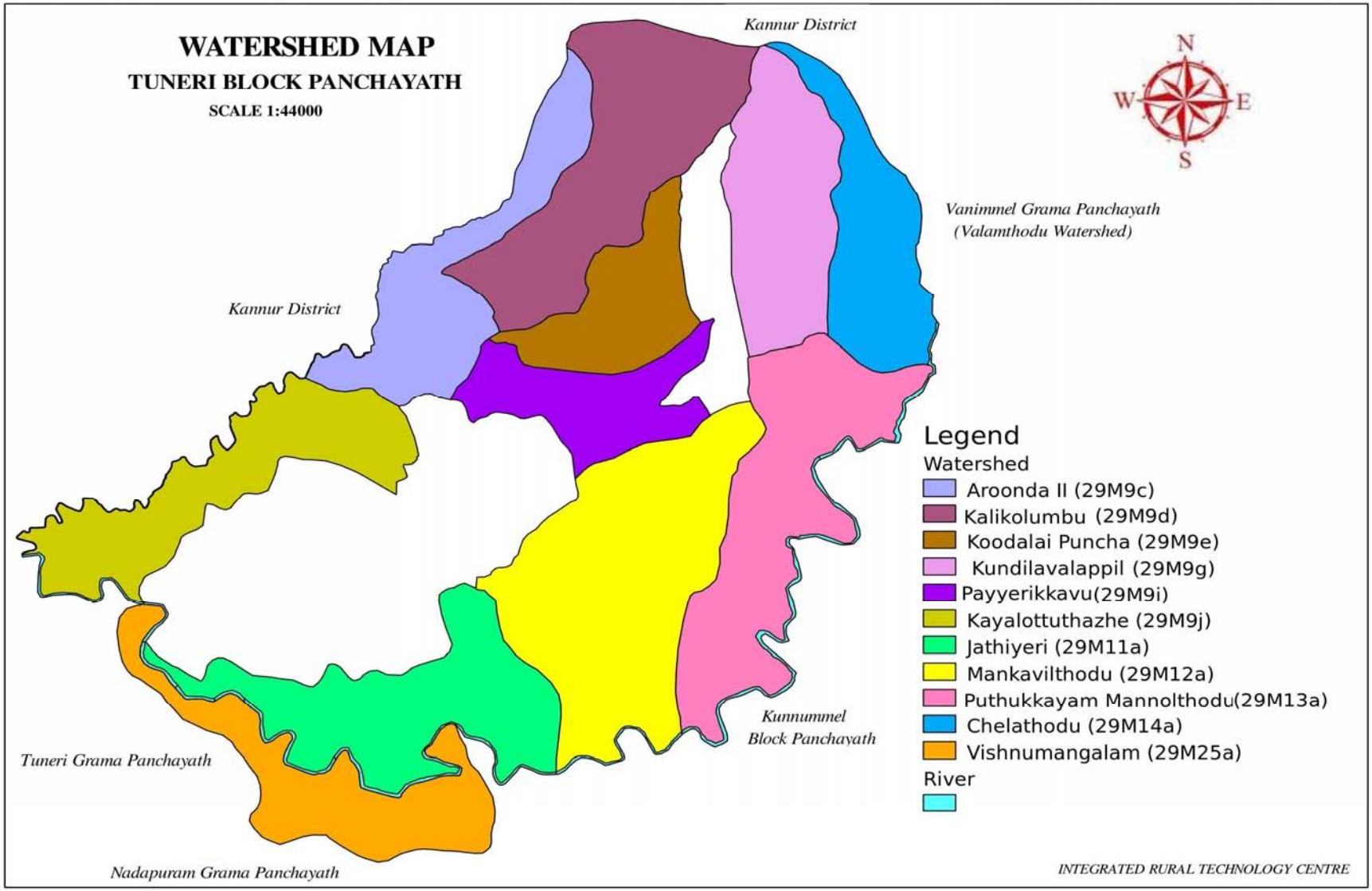
- Provide scientific and technical training for agricultural farmers.
- The farmers may be encouraged for planting fodder in waste land and other areas.
- Make cross breed cattle available which are suitable for the climate.
- Set up milk product unit and improve marketing facilities.
- Conduct awareness classes for dairying farmers.
- Give financial help for rearing cow, goat, hen etc.
- Develop animal husbandry as a livelihood option.

2.17 DETAILS OF WATERSHEDS

Table No: 22 ***Details of Watersheds in the project area***

1	2	3	4	5	6	7
No.	**Name Of Catchments**	**WS Code**	**Name Of Watersheds**	**Total Area**	**Treatable Area**	**Area Under Forest**
1	MAHE River Basin	29M9c	Aroonda II	266	235	0
2	MAHE River Basin	29M9d	Kalikolumb	695	590	0
3	MAHE River Basin	29M9e	Koodalaipuncha	363	319	0
4	MAHE River Basin	29M9g	Kundilavalappil	360	265	86
5	MAHE River Basin	29M9i	Payyerikavu	238	201	0
6	MAHE River Basin	29M9j	Kayalottuthazhe	621	590	0
7	MAHE River Basin	29M11a	Jathiyeri	670	590	0
8	MAHE River Basin	29M12a	Mankavilthodu	1070	980	0
9	MAHE River Basin	29M13a	Puthukayam - Mannolthodu	545	490	0
10	MAHE River Basin	29M14a	Chelathodu	433	369	61
11	MAHE River Basin	29M25a	Vishnumangalam	451	413	0
			Total	**5712**	**5042**	**147**

Map 9


WATERSHED MAP
TUNERI BLOCK PANCHAYATH
SCALE 1:44000
Kannur District
N
W
E
S
Vanimmel Grama Panchayath
(Valamthodu Watershed)
Kannur District
Legend
Watershed
Aroonda II (29M9c)
Kalikolumbu (29M9d)
Koodalai Puncha (29M9e)
Kundilavalappil (29M9g)
Payyerikkavu(29M9i)
Kayalottuthazhe (29M9j)
Jathiyeri (29M11a)
Mankavilthodu (29M12a)
Puthukkayam Mannolthodu(29M13a)
Chelathodu (29M14a)
Vishnumangalam (29M25a)
River
Kunnummel
Block Panchayath
Tuneri Grama Panchayath
Nadapuram Grama Panchayath
INTEGRATED RURAL TECHNOLOGY CENTRE

3. INSTITUTION BUILDING AND PROJECT MANAGEMENT

3.1 Watershed committee details:

The process of formation of Watershed Committees in all 11 sub watersheds is underway and likely to be completed very soon. These committees would submit applications to authorities concerned for registration. The representations to these committees are members from SCs, Landless, women and members from SHGs & UGs. These Committees would be imparted Training for smooth management of the activities related to Watershed

3.2 User Groups:

User Groups are also being formed in Project areas. The members of this group would be those persons who would 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 activities smoothly.

4. CAPACITY BUILDING

Capacity Building is the process of assisting the group or individuals to identify and address issues and gain the insights, knowledge and experience needed to solve problems and implement change. There is a realization in the development sector that there is a need to appraise the success of development interventions by going beyond the conventional development targets and measures of success (e.g. in the form of commodities, goods and services) to take into account improvements to human potential. Capacity building of stakeholders is also increasingly viewed as an important factor in developmental projects that involve participation of stakeholders at all levels for effective implementation of projects.

- Scientific technique of Soil and Moisture conservation
- Improved and Scientific agriculture practices
- To generate feeling of owners before starting any enterprise
- To become aware about the market needs
- Fodder & Dairy development and management
- Rural craft
- Income Generation Activities
- Stitching

- Food Processing
- Post Harvest management practices

One of the key features of the watershed developments the capacity building support. It is a crucial component to achieve the desired results from watershed Development projects. Five percent of the total project cost (Rs. 42.84 Lakhs) has been earmarked for institution and capacity building. The funds available for different micro watersheds as per the IWMP guidelines are as follows:

Table No: 23 ***Distribution of amount in capacity building***

Sl No	WS code	Name of watershed	Amount In Capacity Building (Rs)
			5%
1	29M9c	Aroonda II	199500
2	29M9d	Kalikolumb	521250
3	29M9e	Koodalaipuncha	272250
4	29M9g	Kundilavalappil	270000
5	29M9i	Payyerikkavu	178500
6	29M9j	Kayalottuthazhe	465750
7	29M11a	Jathiyeri	502500
8	29M12a	Mankavilthodu	802500
9	29M13a	Puthukayam	408750
10	29M14a	Chelathodu	324750
11	29M25a	Vishnumangalam	338250
	Total		**4284000**

A. CAPACITY BUILDING AT COMMUNITY LEVEL (This programme will be implemented by PIA by the help of TSO)		
1.	Title of the training programme	Awareness programme of IWMP
2.	Rationale	The community must be made aware of the programme, its concepts, the need of the hour, motivate them to become part of the programme
3.	Objectives	►To familiarize the concept of IWMP ►To familiarize the basics of watershed ►The scope of watershed development in their area ►Various activities proposed under NRM,PS&M and LSS. ►To ensure their participation for the success of the project
4.	Target Group	Watershed Community
5.	Duration	1 Day
6.	No. of participants	50-60
7.	No of batches	10
8.	Expected Outcomes	Community awareness and ensure peoples participation

1.	Title of the training programme	Awareness programme on production system and Micro enterprises (PS&M) and Livelihood Support System (LSS)
2.	Rationale	The watershed community must be made aware of various PS&M and LSS programme envisaged in the project, group formation, credit support through banks, Accounting procedures etc.
3.	Objectives	►To motivate the community to initiate various PS&M. ►To generate additional income from such activities. ►To attain self sustainability. ►To ensure women empowerment.
4.	Target Group	SHGs: rearing cattle, Fodder cultivation, Pisciculture, Apiculture, Horticulture, Mushroom cultivation, Food processing etc
5.	Duration	1Day
6.	No. of participants	10-25
7.	No of batches	For each of the above group one batch (10 batch or more)
8.	Expected Outcomes	Increase the standard of living through increase in percapita income, attain self sustainability etc.

1.	Title of the training programme	Planning and implementation of projects related to creation of common assets.
2.	Rationale	Creating awareness among UGs regarding the mode of creation of common assets
3.	Objectives	► Make aware the UGs regarding their responsibility ►The need for establishing common assets ►The mode of operation in establishing common assets ►Financial procedures include
4.	Target Group	UGs
5.	Duration	1Day
6.	No. of participants	2-3 persons from each UG
7.	No of batches	One per watershed
8.	Expected Outcomes	Empower the UGs to take up the responsibility of creating common assets as well as their future maintenance

1.	Title of the training programme	Concept of watershed management, Roles and responsibilities
2.	Rationale	Impart awareness among the watershed committees regarding the concept of watershed management, roles and responsibilities, operational guidelines, financial management etc.
3.	Objectives	►To create awareness among the WCs regarding the concept of watershed management ►To define the role and responsibilities of WC ►Financial Management of the project ►Management of WDF
4.	Target Group	WCs
5.	Duration	1Day
6.	No. of participants	30 per batch
7.	No of batches	2
8.	Expected Outcomes	Empowerment for effective implementation of the project and proper maintenance of commonly created assets

1	Title of the training programme	Empowering people representatives for IWMP
2.	Rationale	The need for watershed based development programs, concepts involved in watershed development, IWMP-its objectives, steps involved in the implementation of the program, financial management etc
3.	Objectives	►To create awareness among the peoples representatives regarding the need for watershed based development programs ►Concept of IWMP ►Project involved in the programs ►Scope of the project ►Role and responsibilities ►Financial management
4.	Target Group	District, Block and Grama panchayath members
5.	Duration	2 Days
6.	No. of participants	200
7.	No of batches	5 Batch
8.	Expected Outcomes	Ensure smooth implementation of the project, interfere with issues if any while implementation, financial transparency, ensure peoples participation etc

B. CAPACITY BUILDING AT INSTITUTIONAL LEVEL
(This will be implemented by SLNA)

1.	Title of the training programme	MIS training
2.	Rationale	Physical achievement as well as financial transactions involved in the IWMP project has to be registered in the MIS as and when it occurs.
3.	Objectives	►The need of MIS and how it is done ►To organize a set of human resources for MIS at SLNA, all WCDC s and PIAs ►Ensure proper and timely MIS
4.	Target Group	MIS/ Data entry operators at all levels
5.	Duration	2 Days
6.	No. of participants	25
7.	No of batches	5 Batch
8.	Expected Outcomes	Periodical and proper MIS updation

1.	Title of the training programme	Watershed; its concepts, planning and implementation
2.	Rationale	Watershed development is the need of the hour, for the success of any watershed project, a thorough knowledge of its concepts, methodology, planning, implementation etc. Are needed.
3.	Objectives	►To empower the PIA as well as the officials engaged in the program about the concept of watershed development ►To familiarize the basics of watershed development and its methodology ►The process of preparation of a plan for the holistic development of the watershed ►To know about the financial management ►Role and responsibilities at each level ►EPA activities ►Familiarize various Production System and Micro enterprises and livelihood activities ►Scope of convergence & cooperation between departments ►Post project management
4.	Target Group	SLNA, WCDCs, PIAs, WDTs etc.
5.	Duration	3-5 days
6.	No. of participants	25 per batch
7.	No of batches	As per need
8.	Expected Outcomes	Smooth implementation of the project, can overcome hurdles and ensure full professional support from line departments

1.	Title of the training programme	DPR preparation, RS and GIS and its application in watershed management
2.	Rationale	DPR preparation is a crucial activity in watershed development programme. Maps have to be prepared in GIS platform. Various data should be compiled for the preparation of DPR
3.	Objectives	►To prepare a DPR that is technically sound, economically feasible and socially acceptable. ►To prepare various thematic maps on GIS platform. ►The relevance of PRA in watershed management. ►Preparation of action plan based on the PRA. ►Preparation of convergence plan for integration. ►To develop proper exit protocol.
4.	Target Group	TSOs,PIAs and WDTs
5.	Duration	2Day
6.	No. of participants	50 per batch
7.	No of batches	2
8.	Expected Outcomes	Development a Pucca DPR which is technically sound, economically feasible and socially acceptable.

1.	Title of the training programme	IWMP –interventions a new approach
2.	Rationale	Interventions are mainly grouped under three headings: NRM, PS&M and LSS. A diversified group of activities can be under taken in watershed management.
3.	Objectives	►To familiarize various interventions under each group that can be undertaken in watershed management. ►To prepare a DPR with location specific and need based intervention. ►To select interventions suited to the environment. ►To satisfy different class of community and select interventions according to their taste and satisfaction.
4.	Target Group	TSOs,PIAs and WDTs
5.	Duration	1 Day
6.	No. of participants	50 per batch
7.	No of batches	2
8.	Expected Outcomes	Development puca DPR which is technically sound, economically feasible and socially acceptable.

1.	Title of the training programme	IWMP- its concepts, Strategy and convergence.
2.	Rationale	Since IWMP is an integrated programme line departments must know about the project, its concepts, strategy etc. So that they can define their role themselves.
3.	Objectives	►To familiarize the concept and strategy of IWMP. ►To establish the need for integration. ►To define the role themselves. ►To establish a strategy of convergence. ►To prepare a Pucca DPR satisfying all the sections of ►the community. ►To develop a strategy for future maintenance of the assets created
4.	Target Group	Officials of line departments, WDT members, PIA and TSOs
5.	Duration	2 Day
6.	No. of participants	50
7.	No of batches	2
8.	Expected Outcomes	Clarity in convergence and can achieve proper integration.

1.	Title of the training programme	Preparation of process and Technical Manual
2.	Rationale	Technical as well as process manual without any defects is necessary for the proper and successful implementation of the project.
3.	Objectives	►To rectify the defects noted in the existing process manual. ►To incorporate additional points those are not included in the existing manual. ►To familiarize the process manual among the officials.
4.	Target Group	SLNA, WCDC and PDs
5.	Duration	1 Day
6.	No. of participants	10
7.	No of batches	2-3 sittings
8.	Expected Outcomes	A Pucca technical and process manual devoid of all drawbacks.

1.	Title of the training programme	Develop action plan for PS&M and LSS
2.	Rationale	More than 50% of the communities are often landless Agri-labours. For attain self sustainability LSS is the main option.
3.	Objectives	►To familiarize various LSS activities envisaged in the project. ►To get acquainted with the various LSS activities needed by the community ►To develop an action for each watershed depending upon their sustainability.
4.	Target Group	PIAs, Members of District, Block and Grama panchayath members, TSOs etc.
5.	Duration	1 Day
6.	No. of participants	10
7.	No of batches	
8.	Expected Outcomes	A need based, Location specific, Economically feasible and communally acceptable action plan.

1.	Title of the training programme	Training of Trainers (ToT) in IWMP
2.	Rationale	Trainers are necessary for imparting training
3.	Objectives	►To build a team of faculties for Imparting training ►To create awareness among the community as well as institutional level with the help of trainers ►To assist in DPR preparation ►Also assist in monitoring and evaluation
4.	Target Group	Officials from various departments and extension faculty members
5.	Duration	2 Day

6.	No. of participants	10 each
7.	No of batches	3
8.	Expected Outcomes	A well trained faculty team who are capable of disseminating the concept of watershed and other activities related to watershed management.

Training Plan for Project period	
First Year	Awareness programme of IWMP
	Watershed; its concepts, planning and implementation
	DPR preparation, RS and GIS and its application in watershed management
	Empowering people representatives for IWMP
	Training of Trainers (T o T) in IWMP
	IWMP –interventions a new approach
Second Year	Concept of watershed management, Roles and responsibilities
	Develop action plan for PS&M and LSS
	Preparation of process and Technical Manual
	IWMP- its concepts, Strategy and convergence
	MIS training
	Awareness programme on production system and Micro enterprises (PS&M) and Livelihood Support System (LSS)
Third Year	Planning and implementation of projects related to creation of common assets.
	Exposure visit on any successful completed watershed
	Need and purpose of Evaluation
Fourth Year	WDF management
	Use of WDF
	Training on preparation on case studies

. Scope of convergence to MGNREGS, agriculture department, NHM Animal Husbandry, Dairy department

Convergence is the interlinking of development programmes of different line departments so that all developmental works can be implemented successfully in a watershed area for maximum benefit of the people. As the resource availability under IWMP is limited and the requirement of the community is much more it is required to fill the gap through resources available by other departments through their different schemes. Convergence of the programme can enhance the ultimate output under watershed development, which leads to sustainable economic development of the entire watershed community. Convergence has been suggested with different scheme like MGNREGS to give an integrated shape of the programme. Development works on priority basis mostly common benefiting items accepted by the village community find place in the watershed treatment plan. Thus, there are lots of other important items of works which have not been included in the action plan, due to paucity of funds. It is suggested that under convergence of the programme.

6. ACTIVITIES PROPOSED

6.1 ENTRY POINT ACTIVITIES

EPA activities are taken up under watershed projects to build a rapport with the watershed community at the beginning of the project; generally, certain important works which are in urgent demand of the local community are taken up. A group discussion was conducted with Block co-ordination Committee regarding the EPA activity, it was conveyed to the WC that an amount of Rs. 34.00 Lakh was allotted for EPA activity for the eleven micro watersheds, which was 4 per cent of total allocated budget. The watershed people discussed various activities which they felt is important but after a brief discussion it was conveyed to them that only those activities can be taken, which revive the common natural resources. It was also taken into priority that there should be an instrument of convergence which will result in sustainability of activities

INTERGRATED WATERSHED MANAGEMENT PROGRAMME – TUNERI (IWMP- II)

TUNERI BLOCK PANCHAYATH, KOZHIKODE

ENTRY POINT ACTIVITIES

1	2	3	4	5	6	7
SL No	Name Of Watersheds	Work Name	Amount	Convergence/ Beneficiary contributions	Total	Survey No.
1	(29M9c) Aroonda II	Gully plugging Keeriya parambu	48000	13000	61000	
		Gully plugging Pullath	56500	4600	61100	34/2
		Gully plugging Kayalott thazhe	48000	5400	53400	17
2	(29M9d) Kalikolumb	Gully plugging Kalikolumb	59000	2500	61500	114
		Gully plugging Kalikolumb	70500	8500	79000	114
		Gully plugging Kalikolumb	44000	8000	52000	114
		Banana cultivation	50000	12000	62000	114
		Banana cultivation	50000	12000	62000	114
		Banana cultivation	50000	12000	62000	114
3	(29M9e) Koodalaipuncha	Puncha Well construction	235000	35000	270000	232
4	(29M9g) Kundilavalappil	Kuttiyaram Well Repair & Restoration	105000	50000	155000	187a1/a1
		Kundilavalappil Gully plugging	16000	2500	18500	187a1/a1
		Kundilavalappil Gully plugging	8500	2500	11000	187a1/a1
		Gravity Scheme	35000	5700	40700	187a1/a1
		Vegetable & Tuber crop cultivation	50000	12000	62000	187a1/a1
5	(29M9i) Payyerikavu	Well construction Payyerikkavu	235000	35000	270000	34

6	(29M9j) Kayalottuthazhe	Well construction Anthiyeri	235000	35000	270000	
		Bamboo cultivation	136500	17500	154000	
7	(29M11a) Jathiyeri	Well construction Vevam	225000	20000	245000	
		Gully plugging Koroth	26000	7500	33500	20/3
		Gully plugging Koroth	44500	8500	53000	20/3
		Vegetable & Tuber crop cultivation	50000	12000	62000	
		Tree planting (agro forestry)	49600	15000	64600	
		Gully plugging Koroth	9500	2500	12000	20/3
8	(29M12a) Mankavilthodu	Thanda ayathil Check dam repairing	50000	4500	54500	
		RWH Parappupaa P.H.C	150000	35000	185000	
		Parappoyil pond renovation	180000	50000	230000	32/1
		Chathankandi well renovation	90000	12000	102000	
		Organic farming	170000	26000	196000	
9	(29M13a) Puthukayam - Mannolthodu	RWH Velliyodu G.H.S.S	100000	25000	125000	
		Payikundu well construction	220000	32000	252000	34
10	(29M14a) Chelathodu	Muchakkayam Gully plugging	40000	5000	45000	188/1a1
		Chelelakkavu Gully plugging	45000	5000	50000	
		Muchakkayam Gully plugging	30000	5000	35000	188/1a1
		Muchakkayam Gully plugging	32000	5000	37000	188/1a1
		Banana cultivation	68000	12500	80500	188/1a1
		Upland paddy	45000	10000	55000	188/1a1
11	(29M25a) Vishnumangalam	Banana cultivation & Plantation	75000	18000	93000	18-J1
		Vegetable & Tuber crop cultivation	50000	15000	65000	182/3
		Rain water harvesting tank 20,000 ltr GHSS Perode	100000.	20000	120000	
		Bamboo cultivation	45600	20000	65600	
		TOTAL	**3427200**	**638700**	**4065900**	

6.2 NRM (Natural Resource Management)

The physical treatments are to be carried on during the watershed development work phase. While implementing the project, it is necessary that the treatments are carried out starting form ridge and progressing towards the valley. This approach is followed with the following objectives:

a) Protect the upper reaches to avoid erosion and reduce runoff

b) Avoid siltation of structures in the middle and lower catchments.

c) Ensure the cost effectiveness of structures in the valley and

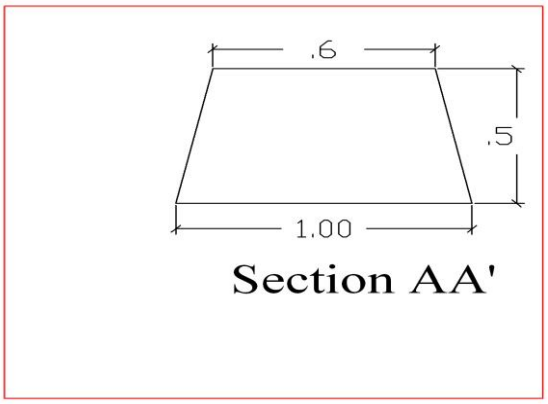
d) Improve overall efficacy of the measures.

6.2.1Earthen Contour Bund

The earthen bund is a small barrier put across the slope along contour in the arable lands with slopes ranging from 5 to 10 %. These bunds are effective barriers to minimize the slope of arable lands, thus by reducing the velocity of runoff. These bunds help in retaining soil moisture & conservation of soil & water in situ.

Earth work for earthen contour bund =1.00X$\underline{1.00+0.50X}$ 0.60=0.45m^3

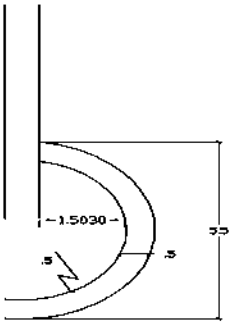
2



6.2.2Centripetal Terracing:

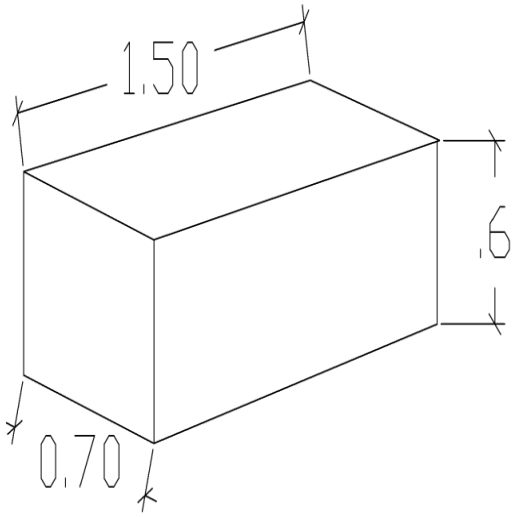
Coconut is an important crop in this watershed. Coconut basins with coconut husk mulching are traditionally practiced in Kerala. Here basins are taken around the coconut palm at a radius of 1.5m to 2m with 0.5meter depth, 0.5m width and arch length of 5.5meter. The farmers are persuaded to do the mulching with coconut husk in these basins; Nearly 150 Nos to 200 Nos husks can be laid in this basin, which can store 150 to 200 liters of water. This water will be used by tree during the period of water stress.

Earth work for centripetal terracing =1.00X5.50X 0.50X0.50=1.375m^3



6.2.3 Rain pit:

In areas, when contour building is not possible water absorption trenches are made to harvest runoff water and soil. The size of this pit is 1.5m x 0.75mx 0.6m.



6.2.4 Pond renovation:

There are nearly 20 ponds Tuneri Block Panchayath. Now most of these ponds are in dilapidated condition. Renovations of these ponds are one of the most important activities for water conservation in this watershed. Along with renovation it is proposed to create Water User Association (WUAs) managing each pond. WUAs consist of pond owners, all those people taking water from these

ponds and some landless people. Landless people can use their share of water for leased land cultivation or they can sell their share of water.

6.2.5 Argo Forestry

Development experts advise to give water and trees to the hands of the poor to fight poverty. Those with very poor quality land can also get good income by adopting agro-forestry systems. Here it is proposed to grow Teak, Mahogany, Venga, Vatta, njaval etc.

6.2.6 Horticulture

There is good potential for growing fruit trees like jack, sappota, Indian gooseberry, guava, mango etc in the watershed area as inter crop. This will help in assuring nutrients to growing children and will fetch a side income to the farmers.

6.2.7 Well recharging

About 26% of the wells dry up in summer. These wells are mainly located along the ridge of the watershed. Because of this the people residing in this area has to depend on public taps installed as part of KWA drinking water scheme. These wells can be made perennial by recharging with roof water. The roof water is brought to a nearby pit filled with stones, pebbles and sand. This water will improve the ground water situation

The specific objectives of the programme are

(i) Recharge ground water

(ii) Improved drinking water availability across the year

(iii) Significantly reduce the impact of drought and consequent public spending on Supply of drinking Water in tankers to the water stressed regions

(iv) Improved agricultural production and productivity. The programme would also envisage strengthening of the decentralization Programme and the PRIs; in discharging their basic mandate in water sector through Community efforts those are cost effective and sustainable.

6.2.8 Gully plugging

Gullies are a symptom of functional disorder of the land, improper land use and are the most visible result of severe soil erosion. They are small drainage channels, which cannot be easily crossed by agricultural equipment. The gully plugging measures include vegetative plantings and brushwood check dams, boulder bunds, brick masonry and earthen bunds or a combination of both, sand bag plugs etc. The specifications for gully plugs are given in Table

Table

Slope of Gully Bed %	Width of Gully Bed (m)	Location	Type of Gully Plug	Vertical Interval
0-5	4.5	Gully bed	Brush wood	3
	4.5-10.5	Gully bed	Earthen	2.25-3.0
	7.5-15.0	At the confluence of two gullies	Sand bag	
	7.5-15.0	At the confluence of all branches of a compound gully	Brick masonry	
5-10.	4.5	Gully bed	Brush wood	3
	4.5-6.0	Gully bed and side branch	Earthen	1.5-3.0

For gullies in which no significant runoff is expected from upstream, earthen gully plugs of 1.1 m cross-section with a grassed ramp of 22.5 cm below the top level are provided at 45-60 m intervals. For gullies in which excessive runoff from the top is expected, an earthen gully plug of 2.2 m cross-section is provided with a pipe outlet. The diameter of the R.C.C. spun pipe is 15 cm for a discharge of 0.03 to 0.09 cumecs coming from a catchment area of up to 1.6 ha. A composite check dam of earth and brick masonry is necessary for catchment areas larger than 1.6 ha. The first structure is located at the confluence of two or more gullies. For long gullies, more such structures are built either at 1.2 m vertical interval or 120 m horizontal interval.

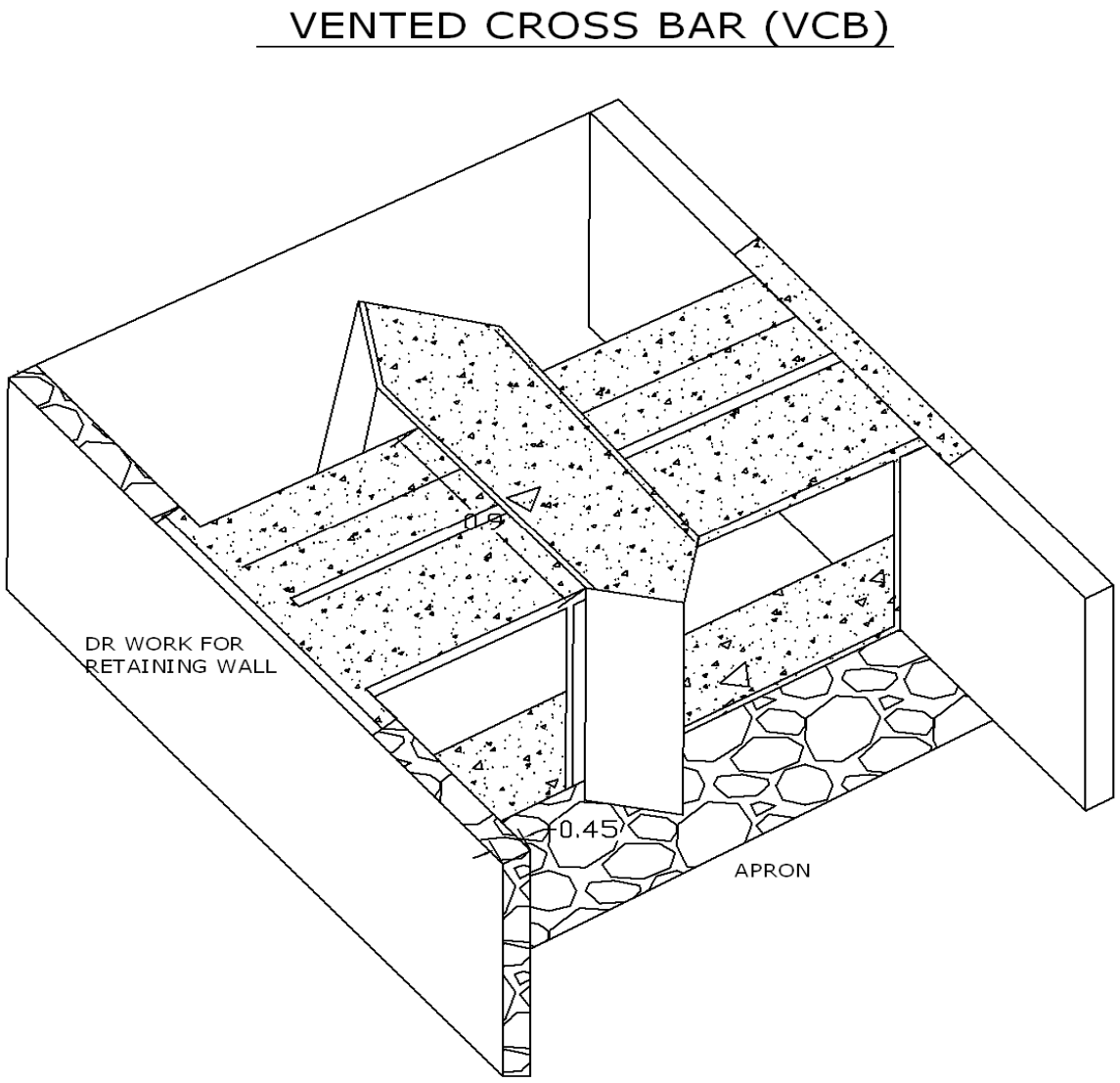
6.2.9 Check Dams

A check dam is generally constructed on small streams and long gullies formed by the erosive activity of water. Ideally a check dam can be constructed in a stream with high banks. The main advantage of check dam is that it cuts off the runoff velocity and reduces erosive activity and the water stored improves soil moisture of the adjoining areas allows percolation to recharge the aquifers

6.2.10. VCB

Vented cross Bars are generally designed in discharge areas of the Mahe river basins of the Mankavilthodu watershed where paddy, banana and vegetables are cultivated in alluvial and low level laterite formations. In general, such lands are located 1 to 1.5 m above the bed level of the streams which are passing in between or on the periphery of the paddy field, making direct irrigation not feasible from the streams. Vented Cross Bars are constructed across the steams with re-in forced cement concrete with an average height of 2.5 m above bed level, a minimum of2 vents and provision of wooden shutters to discharge the flood water and silt load carried during the monsoon seasons. Earthen canals for distribution of the raised up water behind the VCB flowing by gravity to the fields, are often found to get

damaged, resulting in deposition of large quantities of sand and silt in the paddy fields. Hence protection works upstream of the VCB and along the canals are also provided. The cost of these structures vary depending on the width of the streams, bed profile and length of protection works and canals. The average command area is around 40Ha



Budget

The distribution of budget under the natural resources management activities for different micro watersheds as per IWMP guidelines is given below Fifty six percent of the total project cost (Rs. 4.79

Cr.) has been earmarked for NRM activity. The funds available for different micro watersheds as per the IWMP guidelines are as follows:

Table No: 24 ***Distribution of NRM amount in each watershed***

(Amount in Rupees)

Sl No	WS code	Name of watershed	NRM Amount in Rs.
1	29M9c	Aroonda II	2234400
2	29M9d	Kalikolumb	5838000
3	29M9e	Koodalaipuncha	3049200
4	29M9g	Kundilavalappil	3024000
5	29M9i	Payyerikkavu	1999200
6	29M9j	Kayalottuthazhe	5216400
7	29M11a	Jathiyeri	5628000
8	29M12a	Mankavilthodu	8988000
9	29M13a	Puthukayam	4578000
10	29M14a	Chelathodu	3637200
11	29M25a	Vishnumangalam	3788400
Total			**47980800**

Major interventions suggested

The major interventions suggested under the watershed development works are the following:

Table No: 25 ***Details of major interventions in the project area***

1	**Stone pitched Bund**
2	**Restoration Stone Bund**
3	**Centripetal terracing with husk trenching and mulching**
4	**Terracing**
5	**Rain pit**
6	**Well recharge**
7	**Live fencing**
8	**Rain (roof) water harvesting**
9	**Agro forestry**
10	**Biogas plant**
11	**Gully Plugging**
12	**Check dam**
13	**Vented cross bar**
14	**Public Well construction**
15	**Fodder cultivation**
16	**Side protection with Bamboo**

6.3 PRODUCTION SYSTEM AND MICRO ENTERPRISES

6.3.1 Fodder grass cultivation

To promote animal husbandry availability of good quality fodder is very important. Earlier because of the large extent of paddy fields exist here; there was no shortage of fodder. Since the wide spread use of harvesting machines became prevalent availability of hay reduced drastically. This forces many people to do away with their cattle. Promoting fodder grass is the need of the hour here to increase the milk production. Since some of the landless families are also likely to get in2to animal husbandry through this project, they will also need fodder. Landless people's group through this project will do fodder cultivation in leased land.

Expenditure for 100 cents

Fodder slips 9000nos@RS.1/slip = 9000	9000.00
Land preparation	1600.00
Labour charge @Rs.400/man*2nos	800.00
Organic manure	3000.00
Harvesting	600.00
Total	**15000.00**

6.3.2 Vegetable seeds to interested households

To increase the local production and consumption of organically grown vegetables, kits containing selected variety of vegetables are given to interested farmers along with the orientation for organic cultivation.

6.3.3. Green House (Precision farming)

The green house protects the plants from adverse climatic condition and provides an appropriate amount of light, temperature, humidity, carbon dioxide etc. to achieve optimum yield with excellent quality. The reason for building a greenhouse is to get faster growth by raising humidity and controlling temperatures. Labour, energy and capital are the major three cost factors in a typical modern greenhouse production system. Greenhouse technology is highly relevant under Indian conditions due to variant agro- climate conditions of the country

Advantages of Green House

- Provides favorable micro climatic conditions for the plants
- Cultivation in all season is possible
- Higher yield with better quality per unit area
- Conserves moisture thus needs less irrigation
- More suitable for cultivating high value / off- season crops
- Helps to control and diseases
- Helps in gardening of tissue cultured plants
- Helps in raising early nurseries
- Round the year propagation of planting material possible
- Protect the crops from wind ,rain , snow , bird, hail etc

6.3.4. Setting up of agricultural nursery:-

Good quality planting material is always in shortage in Kalikolumb watershed area. The farmers are purchasing Horticultural plans from far away nurseries. To overcome this VWC decided to set up an Agricultural nursery in Kalikolumb watershed area with the financial help of IWMP.

Objectives:-

1. To make available good quality planting materials
2. To enhance rural employment

Requirements for the nursery:-

1. Enough land with adequate sunlight, irrigation facilities, road accessibilities.
2. Necessary potting sheds, Green house, Office set up etc
3. Availability of seed materials
4. Availability of expert in nursery management
5. Defecated labour force

Implementation:-

UG will select beneficiaries (7 Nos) and will form a beneficiary group for the implementation .It is the duty of the beneficiaries to find out location and other infrastructures with the supervision of WDC and expert.

Budget

Investment	IWMP	Contribution/ WDF	Total
1.Irrigation implements (Well, pump set, Sprinkler etc)	25000	0	25000
2.Fencing potting shed , green house)	12000	0	12000
3.Potting mixture ,polythene covers, etc)	15000	0	15000
4.Nursery implements	10000	10000	20000
5.Purchase of planting materials	25000	10000	35000
6.Labour and management input for one year	30000	13000	43000
7.Transportation	0	0	0
Total	**117000**	**33000**	**150000**

6.3.5 .Vermi compost units :-

Organic manure is indispensable component for soil fertility improvement. This will help to improve soil productivity as well as physical condition of the soil. At present due to continues use of chemical fertilizers, pesticides etc. the soil condition is in a declining trend. Environmental problems also exist due to this. Utilizing the agricultural and farm waste good quality Vermi compost can be produced which can be used as good manure for crops this will help waste management, generation of additional employment etc.

The soil test result of all watershed area shows that humus contends of the soil is very low. Vermi compost is excellent organic manure which is rich in nutrients necessary for plant growth. Farmers can produce Vermi compost in their field itself using simple technologies.

Objectives

1. To produce good organic manure for crops.
2. Farm and kitchen waste management.
3. To produce 2000Kg of Vermi compost/year/unit.
4. To earn around Rs16000/year/unit.
5. To keep premises clean and hygienic.

Beneficiaries

Selected farmer's from the watershed area.

Implementation

Beneficiaries are selected by WDC from the Grama Sabha. Necessary training will be given prior to implementation. Assistance will be given on the basis of stages of implementation.

Budget

Sl no	Anticipated Expenditure	Amount
1	Tank with roof (2.5m x 1.5mx 0.9m)	Rs 6000/unit
2	Worms and other inputs	Rs 1100/unit
3	Labour	Rs 1900/unit
4	**Total**	**Rs 9000/unit**
	b) IWMP	Rs 8100/unit
	c) Beneficiary contribution by way labour	Rs 900/unit

6.3.6. Coconut Crown Cleaning

At present the average production of coconut per palm is 30 per year. This is very low yield and economically not viable. One of the main reason for the low yield is various pests and diseases affecting on inflorescence and immature nuts (mites, rodent, rhinoceros beetle, red palm weevil, carried bug, bud rot, fruit rot etc). The pest and decease attack can be effectively controlled by Crown cleaning of the palms. Minimum 35 percent increase of yield is observed if crown cleaning is done at least once in a year.

Method of Implementation:-

The treatment will be carried out under the supervision of User group by labourers registered in WDC. The agronomist of WDT and supervisors appointed by WDC will give technical support.

Advantages:-

a) Can increase production at least by 35%.

b) Can control major pets and diseases.

c) Can create at least …..... man days.

d) The farmer's income will be improved.

e) Can improve the soil fertility and water holding capacity by re cycling palm waste by way of mulching.

Beneficiaries:

The selected farmers from the watersheds area.

Cost of labour for crown cleaning Rs. 40/- per palm

In this programme the pesticides etc. if required has to be met by the farmer

6.3.7. Planting of Coconut trees (HYBRID SIZE)

The project aimed to familiarize new variety of coconut plants in the watershed area. Most of the coconut plants in the watershed are local variety and very low productive. Hence the project introduces hybrid variety of coconut plants to increase the productivity.

Financial Analysis

1	Coconut pit (1*0.7*0.7)	Rs.120
2	Coconut plant	Rs.130
3	Organic Manure	Rs.150
	Total	**Rs.400**

6.3.8 .BANANA CULTIVATION

Banana is invasively cultivated due to high returns from the crop due to lack of labour the cultivation is coming down in odder to protect the cultivation support scheme is proposed VWC can select the beneficiaries and the beneficiaries can successfully implement the program.

Beneficiaries:

Economically backward cultivation/labourers of the watershed area having interest in the programme, definite prior experience in Agricultural practices, beneficiaries should give an undertaking in this regard.

Budget

Sl No	Item	Amount
1	Cost of Seed 60*5	Rs 300
2	Organic Manure	Rs200
	TOTAL	**Rs 500**

Vegetable cultivation in Terrace

Vegetable consumption is very poor in market available vegetable rate is very high .Vegetable are required in day to day life but villagers are not bringing the vegetables in common market .Vegetable like Bitter guard ,snake guard , Bindi, Brinjol ,Coupe a , Amaranths , Pumpkin , Ashgoard , Cucumber

Aim

Vegetable production increasing for two times in a year all watershed area

Budget

The distribution of budget under the Production and productivity activities for the small farmer's marginal farmers, large farmers and for different micro watersheds as per IWMP guidelines is given below:

Table No: 26 ***Distribution of Production system and microenterprises amount in each watershed***

Sl No	WS code	Name of watershed	Production and productivity amount in (RS)
			10 %
1	29M9c	Aroonda II	399000
2	29M9d	Kalikolumb	1042500
3	29M9e	Koodalaipuncha	544500
4	29M9g	Kundilavalappil	540000
5	29M9i	Payyerikkavu	357000
6	29M9j	Kayalottuthazhe	931500
7	29M11a	Jathiyeri	1005000
8	29M12a	Mankavilthodu	1605000
9	29M13a	Puthukayam	817500
10	29M14a	Chelathodu	649500
11	29M25a	Vishnumangalam	676500
	Total		**8568000**

6.4 LIVELIHOOD PROGRAMMES

6.4.1 Pickle unit

There is enough of scope for pickle manufacturing unit in the area. Such units are not manufacturing in and around. If is small-scale unit been started marketing will not the much difficult in the area. The raw material like mango, goose burry, arinelli, irimpuli, fishes etc are available in the area.

Objects

a, A pure livelihood supporting project

b, Co-operation unemployment

c, Income generating activities

Beneficiaries:

Landless women and marginal farmers are interested in this project

Budget

Sl No	Item	Amount (Rs)
1	Furniture and table	2500
2	Knife 6 no X 50	300
3	Vessels 4noX 500	2000
4	Bottle 1 kg 1000X 5 no	5000
5	Raw material like mango, Goose burry etc	20000
6	Transportation	2000
7	Room rent	6000
8	Labour Charge	6000
9	Ingredients	6200
	Total Amount	***50000***

6.4.2 Calf Rearing

Majority of agricultural workers in this sector are engaged in cattle rearing .Calf rearing is the important project of the livelihood project. The project on calf rearing aims at bringing the crossbred calves to maturity within 18 months by providing good care and protection .Expense for concentrate feed, medicine and insurance are included in the plan fund.

6.4.3 .Backyard Poultry

Backyard poultry requiring hardly any infrastructure set-up is a potent tool for enlistment of the poorest of the poor. Besides income generation, rural backyard poultry provides nutrition supplementation in the form of valuable animal protein and empowers women. Thus there is a need to

take up specific rural poultry production programs, to meet the requirements of the rural consumers while constituting a source of subsistence income as a subsidiary occupation by taking up colored bird units ranging from 5 to 10 birds per family in their backyards. Such units require very little hand feeding and can give a fairly handsome return with bare minimum night shelter.

6.4.4. Tailoring &Embroidery Unit

Tailoring is an income generating activity of some women in the Watershed. Even though they have got technical expertise, because of the lack of necessary machines they go for employment to distant places. A large portion of this income is spent for travel expenses. If they are provided with sewing machines, that can help them to become entrepreneurs. Along with this by providing them training in the production of high end value added embroidery products, their income can be considerably increases

Budget for one unit

Sl.No	items	Expenses Rs.
1	Sewing machine 10 nos with motor	Rs 50000.00
2	Training Expenses 10 persons (Rs.1000*10)	Rs 10000.00
3	Miscellaneous (5%)	Rs 5000.00
	Working Capital	
1	Cloths	Rs 10000.00
2	Salary 3000*5 No	Rs 15000.00
	Total	**Rs 90000**

6.4.5. Bee Keeping

True honeybees belong to the family Apidae subfamily Apinae and geniuses Apis.They are social insects living in colonies. A colony consists of a queen, several thousand workers and a few hundred drones. There is division of labour and specialization in the performance of various functions. They build nests (combs) with wax, which is secreted from the wax glands of worker bees. The bees use their cells to rear thin brood and store food. Indian bee (Apes carina indicia)

This is the domesticated hive bee in Kerala. A colony consists of a queen, 20,000to 30,000 workers and a few drones. This species is with gentle temperament and responds to smoking. Lack of flora leads to absconding and also has a strong tendency for swarming. It yields 8-10 kg of honey per colony per year.

Unit cost

Sl. No.	Item of investment	Amount (Rs.)
1	Cost of bee colony (1000 x 4)	5,000.00
2	Cost of empty bee box (12 x 400)	5,800.00
3	Extractor, bee knife, etc.	1,200.00
	Total cost	**12,000.00**

6.4.6. LABOUR BANK

This is one of the incomes generating activity in the Watershed area. Some landless and marginal farmers have skill and efficiency in operating mini agricultural machines like grass cutter, coconut climber etc. Even though they have got technical experience, because of lack of necessary machines and instrument they go for employment to distant places. They are provided necessary machines &tools that can help them to earn income for their livelihood.

Beneficiaries:

Economically backward and landless household of the watershed area having interest in the programme, definite prior experience in concerned activity, and having facilities should be followed without any compromise ;beneficiaries should give an undertaking in this regard.

Implementation:

WDC selected the beneficiaries according to their facilities and willingness. The selected beneficiaries purchase the machines and implement the programme. WDC monitors and given direction to the beneficiaries.

Monitoring:

Watershed Committee will do the monitoring of the programme.

Budget

Cost of farm machines &Tools

(Grass cutter, coconut climber, Driller, Grinder, and Cutter etc.) RS 300000.00

Total RS 300000.00

IWMP RS 210000.00

Beneficiary Contribution Rs 90000.00

6.4.7. Mushroom Cultivation

Species of pleurotus commonly known as oyster mushrooms grow saprophytiacally under natural conditions on trees dead wood, stumps and branches .Today several species of pleurotus are commercially grown in many parts of the world .Kerala enjoying typical tropical climate is found to be the most suitable place for mushroom cultivation. Specious of pleurotus and volvariella can be

successfully cultivated in the state all around the year variety of agro wastes like saw dust ,vegetable and paper waste , oil palm per carp waste and straw . But the best suitable substrate is found to be paddy straw. Many farmers are adopted mushrooms as additional source of income .Nominal capital investment and moderate income, medicinal value local market etc

Budget

Cost of shed and material cost

(Spawn, straw, plastics, etc) : **Rs 10000.00**

6.4.8. Goat rearing programme

Good quality goats are disappearing fast, but there is good demand for goat meat .To meet this demand it is intended to support goat rearing among people of the watershed area. To achieve high quality goats of below one year age is purchase from goat farms and given for rearing along with training in scientific goat rearing practices to the beneficiaries. Each unit consists of 4 goats

6.4.9 .Jack Fruit Unit

In Kerala Jackfruit is now a honey stream fruits for birds and insects. It is grown extensively in Kerala without anybodies caring. It is very popular all over India also and is believed to be of Indian origin. Fully ripe jackfruit is sweetie and has an exotic flavor. The bulbs (the edible flesh) contain 7.5% sugar on dry weight basis and a fair amount of Vitamin A. The seeds are rich in Carbohydrates are used for culinary purposes. Ripe fruits utilized in the preparation of packaged fruits, nectar and jams. Unripe fruits also used for preparations of food supplements. In olden days villagers especially farmers and farm labors considered it a good combination with porridge for satisfying their hunger. Jack fruit processing has improved during the last few years The Krishi Vijnhan Kendra's and KVK Thrissur has developed technologies for processing and preserving it., which has made it possible to produce a marketable product which can easily be handled, packaged in attractive packing, transported and stored before sale. The proposal is to establish an export import unit for exporting processed and packaged Jackfruits to Middle East countries in season and to import dates from Middle East in off-season of Jackfruit.

MARKET & DEMAND ASPECTS

There is a prospective market for these products in Kerala as well as outside the Kerala. It is also learn that there is a good export market potential for these items especially in Middle East countries. In view of the above, it is envisaged that there is good scope for setting up jackfruit processing units in jack growing areas. This wills not only help the farmers to utilize the perishable raw material but also

generate more employment opportunities in rural areas. There are about twenty to twenty five units engaged in un-organized sector manufacturing jack chips and jackfruits preserve.

Budget Jack fruit Unit

Sl No	Product	Qty	Rate Rs.	Value (Rs)
1	Jack fruits	7000 Kg	10/kg	70000
2	Sugar, Citric acid	600 kg	30/kg	18000
3	Packing Materials	LS	LS	12000
4	Machineries			25000

MAN POWER REQUIREMENT				
Sl No	Category	No	Monthly salary	Amount
1	Skilled Workers	1	6000	6000
2	Unskilled Workers	4	4750	19000

Total Amount = Rs 150000 /-

PROCESSING CAPACITY			
Sl No	Product	Qty	Value (Rs)
1	Processed Jack fruits packs/ tin/container (425 gm pack)	3500 No	157500

Table No: 27 ***Distribution of Livelihood amount in each watershed***

(Amount in Rupees)

Sl No	WS code	Name of watershed	Liv 9%
1	29M9c	Aroonda II	359100
2	29M9d	Kalikolumb	938250
3	29M9e	Koodalaipuncha	490050
4	29M9g	Kundilavalappil	486000
5	29M9i	Payyerikkavu	321300
6	29M9j	Kayalottuthazhe	838350
7	29M11a	Jathiyeri	904500
8	29M12a	Mankavilthodu	1444500
9	29M13a	Puthukayam	735750
10	29M14a	Chelathodu	584550
11	29M25a	Vishnumangalam	608850
Total			**7711200**

Table No: *28* ***Distribution of FUNDING PATTERN - Master Plan for 4 Years***

INTEGRATED WATERSHED MANAGEMENT PROGRAMME - TUNERI (IWMP- II)

TUNERI BLOCK PANCHAYATH, KOZHIKODE

FUNDING PATTERN - Master Plan for 4 Years (Amount in Rupees)

Year	Administration	Monitoring	Evaluation	Entry point Activity	Capacity Building	DPR Preparation	Natural Resource Management	Livelihood	Production and productivity	Conclusion	Total IWMP project Fund
1st	2142000	257040	128520	3427200	1713600	856800	6897240	856800	856800	0	17136000
%	3	0.3	0.15	4	2	1	8	1	1	0	20
2 nd	2142000	257040	128520		1713600		17136000	2570400	3427200		27374760
%	3	0.3	0.15		2		20	3	4		32
3rd	2142000	214200	214200		856800		16279200	3427200	3427200		26560800
%	3	0.25	0.25		1		19	4	4		31
4 th	2142000	128520	385560				7668360	856800	856800	2570400	14608440
%	3	0.15	0.45				9	1	1	3	17
Total	**8568000**	**856800**	**856800**	**3427200**	**4284000**	**856800**	**47980800**	**7711200**	**8568000**	**2570400**	**85680000**
%	**10**	**1**	**1**	**4**	**5**	**1**	**56**	**9**	**10**	**3**	**100**

Table No 28

INTERGRATED WATERSHED MANAGEMENT PROGRAMME - TUNERI (IWMP- II)
TUNERI BLOCK PANCHAYATH, KOZHIKODE
FUNDING PATTERN FOR ENTRY POINT ACTIVITIES

Sl. No	Name of Watershed	IWMP Fund	Convergence/ Beneficiary contributions	Total *(Amount in Rupees)*
1	(29M9c) Aroonda II	152500.00	23000.00	175500.00
2	(29M9d) Kalikolumb	323500.00	55000.00	378500.00
3	(29M9e) Koodalaipuncha	235000.00	35000.00	270000.00
4	(29M9g) Kundilavalappil	214500.00	72700.00	287200.00
5	(29M9i) Payyerikavu	235000.00	35000.00	270000.00
6	(29M9j) Kayalottuthazhe	371500.00	52500.00	424000.00
7	(29M11a) Jathiyeri	404600.00	65500.00	470100.00
8	(29M12a) Mankavilthodu	640000.00	127500.00	767500.00
9	(29M13a) Puthukayam - Mannolthodu	320000.00	57000.00	377000.00
10	(29M14a) Chelathodu	260000.00	42500.00	302500.00
11	(29M25a) Vishnumangalam	270600.00	73000.00	343600.00
	Total	3427200.00	638700.00	4065900.00

INTERGRATED WATERSHED MANAGEMENT PROGRAMME - TUNERI (IWMP- II)
TUNERI BLOCK PANCHAYATH, KOZHIKODE
NATURAL RESOURCE MANAGEMENT ACTIVITIES - Master Plan for 4 Years *(Amount in Rupees)*

Sl No	Name of watershed	Year	IWMP Fund	Convergence	WDF	Total
1	(29M9c) Aroonda II	First year	321195.00	48805.00	41109.20	411109.20
		Second Year	798000.00	67250.00	96140.00	961390.00
		Third Year	758100.00	66400.00	91612.00	916112.00
		Fourth year	357105.00	59100.00	46246.00	462451.00
2	(29M9d) Kalikolumb	First year	839212.50	4750.00	93780.00	937742.50
		Second Year	2085000.00	158905.00	126698.38	2370603.38
		Third Year	1980750.00	69000.00	227750.00	2277500.00
		Fourth year	933038.00	36875.00	107767.80	1077680.80
3	(29M9e) Koodalaipuncha	First year	438322.50	90546.96	46335.60	575205.06
		Second Year	1089000.00	85000.00	127667.00	1301667.00
		Third Year	1034550.00	82280.00	121343.61	1238173.61
		Fourth year	487327.50	65800.00	58661.71	611789.21
4	(29M9g) Kundilavalappil	First year	434700.00	109128.00	19607.60	563435.60
		Second Year	1080000.00	116270.00	132900.78	1329170.78
		Third Year	1026000.00	107998.20	125981.68	1259979.88
		Fourth year	483300.00	74490.00	61975.60	619765.60
5	(29M9i) Payyerikavu	First year	287385.00	48825.00	37356.70	373566.70
		Second Year	714000.00	94250.00	89804.00	898054.00
		Third Year	678300.00	51800.00	81122.90	811222.90
		Fourth year	319515.00	46380.00	40655.40	406550.40

6	(29M9j) Kayalottuthazhe	First year	749857.50	9850.00	79185.00	838892.50
		Second Year	1863000.00	222082.65	119273.00	2204355.65
		Third Year	1769850.00	109250.00	208712.00	2087812.00
		Fourth year	833692.50	153420.00	109534.80	1096647.30
7	(29M11a) Jathiyeri	First year	809025.00	4750.00	90375.00	904150.00
		Second Year	2010000.00	110850.00	247450.00	2368300.00
		Third Year	1909500.00	214590.00	229180.90	2353270.90
		Fourth year	899475.00	45665.00	99807.70	1044947.70
8	(29M12a) Mankavilthodu	First year	1292025.00	67750.00	151090.00	1510865.00
		Second Year	3210000.00	187725.00	156506.00	3554231.00
		Third Year	3049500.00	343600.00	377012.50	3770112.50
		Fourth year	1436475.00	137500.00	174884.20	1748859.20
9	(29M13a) Puthukayam - Mannolthodu	First year	658087.50	53120.00	78992.00	790199.50
		Second Year	1635000.00	170160.10	93260.00	1898420.10
		Third Year	1553250.00	109250.00	184711.10	1847211.10
		Fourth year	731662.50	150860.00	97861.40	980383.90
10	(29M14a) Chelathodu	First year	522847.50	51975.00	15890.00	590712.50
		Second Year	1299000.00	146525.00	160625.00	1606150.00
		Third Year	1234050.00	111750.00	149155.00	1494955.00
		Fourth year	581302.50	67500.00	72087.60	720890.10
11	(29M25a) Vishnumangalam	First year	544582.50	76584.00	59600.00	680766.50
		Second Year	1353000.00	153510.00	159067.80	1665577.80
		Third Year	1285350.00	153560.00	153292.40	1592202.40
		Fourth year	605468.20	147500.00	74759.80	827728.00

INTERGRATED WATERSHED MANAGEMENT PROGRAMME - TUNERI (IWMP- II) TUNERI BLOCK PANCHAYATH, KOZHIKODE LIVELIHOODS FOR LANDLESS/ ASSETLESS - Master Plan for 4 Years (Amount in Rupees)					
SL No	Name of watershed	Year	IWMP Fund	Beneficiary contributions	Total
1	(29M9c) Aroonda II	First year	39000.00	16000.00	55000.00
		Second Year	119700.00	47300.00	167000.00
		Third Year	159600.00	68400.00	228000.00
		Fourth year	39900.00	17100.00	57000.00
2	(29M9d) Kalikolumb	First year	104250.00	44501.00	148751.00
		Second Year	312750.00	173001.00	485751.00
		Third Year	417000.00	178988.00	595988.00
		Fourth year	104250.00	45750.00	150000.00
3	(29M9e) Koodalaipuncha	First year	54450.00	18050.00	72500.00
		Second Year	163350.00	70650.00	234000.00
		Third Year	217800.00	92200.00	310000.00
		Fourth year	54450.00	23300.00	77750.00
4	(29M9g) Kundilavalappil	First year	54000.00	23250.00	77250.00
		Second Year	162000.00	69000.00	231000.00
		Third Year	216000.00	88001.00	304001.00
		Fourth year	54000.00	22005.00	76005.00
5	(29M9i) Payyerikavu	First year	35700.00	19300.00	55000.00
		Second Year	107100.00	41900.00	149000.00
		Third Year	142800.00	61200.00	204000.00
		Fourth year	35700.00	15300.00	51000.00
6	(29M9j) Kayalottuthazhe	First year	93150.00	38850.00	132000.00
		Second Year	279450.00	155800.00	435250.00
		Third Year	372600.00	121125.00	493725.00
		Fourth year	93150.00	38880.00	132030.00

7	(29M11a) Jathiyeri	First year	100500.00	42970.00	143470.00
		Second Year	301500.00	168199.75	469699.75
		Third Year	402000.00	166000.00	568000.00
		Fourth year	100500.00	58650.00	159150.00
8	(29M12a) Mankavilthodu	First year	160500.00	69506.00	230006.00
		Second Year	481500.00	309249.00	790749.00
		Third Year	642000.00	332278.00	974278.00
		Fourth year	160500.00	85380.00	245880.00
9	(29M13a) Puthukayam - Mannolthodu	First year	81750.00	35000.00	116750.00
		Second Year	245250.00	146250.00	391500.00
		Third Year	327000.00	84250.00	411250.00
		Fourth year	81750.00	41250.00	123000.00
10	(29M14a) Chelathodu	First year	64950.00	27800.00	92750.00
		Second Year	194850.00	126400.00	321250.00
		Third Year	259800.00	173200.00	433000.00
		Fourth year	64950.00	34050.00	99000.00
11	(29M25a) Vishnumangalam	First year	67650.00	35600.00	103250.00
		Second Year	202950.00	129800.00	332750.00
		Third Year	270600.00	180400.00	451000.00
		Fourth year	67650.00	34350.00	102000.00

INTERGRATED WATERSHED MANAGEMENT PROGRAMME - TUNERI (IWMP- II)
TUNERI BLOCK PANCHAYATH, KOZHIKODE
PRODUCTION SYSTEM & MICRO ENTERPRISES - Master Plan for 4 Years *(Amount in Rupees)*

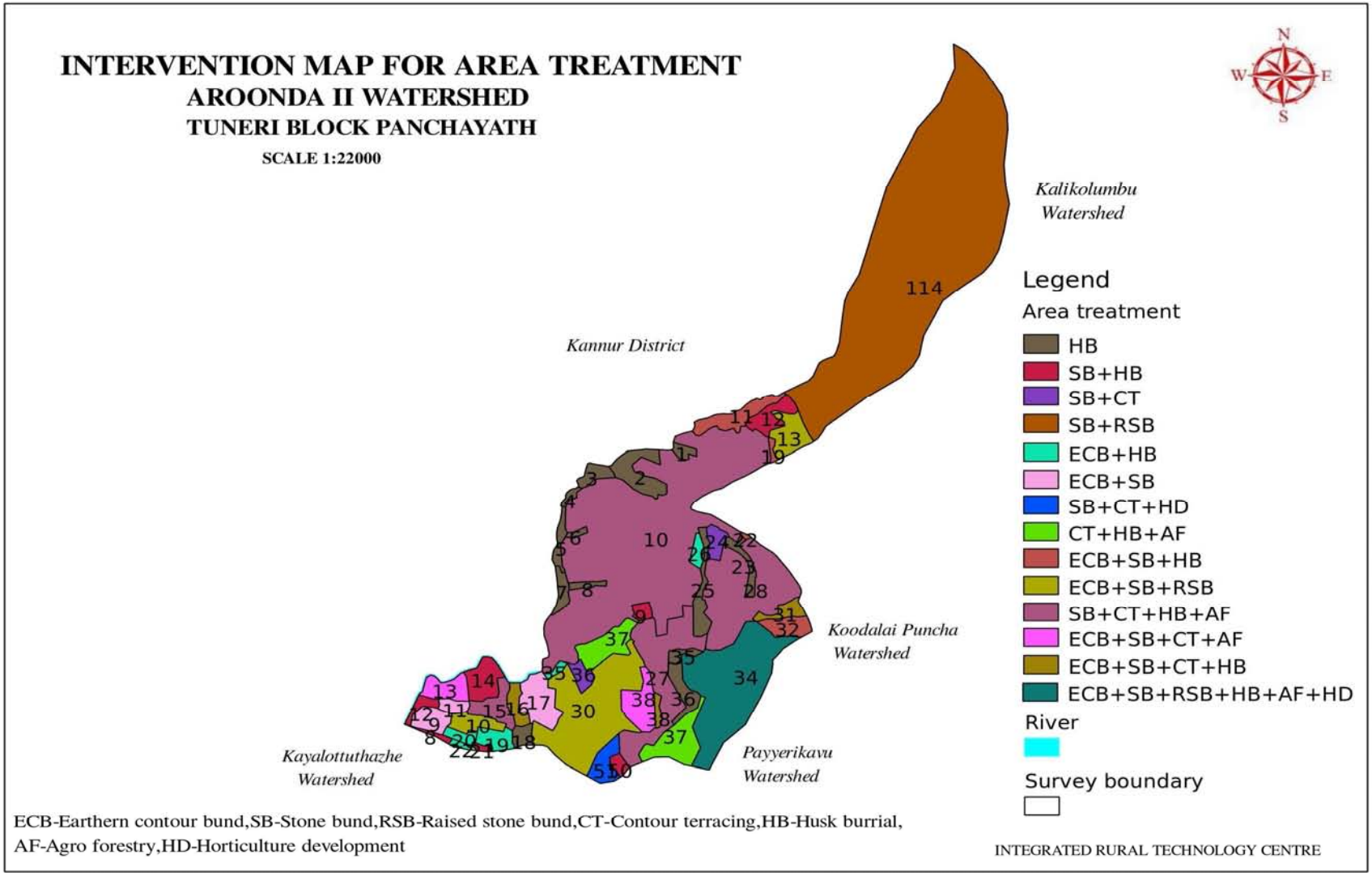
SL No	Name of watershed	Year	IWMP Fund	Convergence	WDF	Total
1	(29M9c) Aroonda II	First year	39900	0	5430	45330
		Second Year	159600	0	21707	181307
		Third Year	159600	9000	22990	191590
		Fourth year	39900	3600	5933	49433
2	(29M9d) Kalikolumb	First year	104250	0	11541	115791
		Second Year	417000	45000	51298	513298
		Third Year	417000	19800	48407	485207
		Fourth year	104250	0	11610	115860
3	(29M9e) Koodalaipuncha	First year	54450	0	6050	60500
		Second Year	217800	0	24100	241900
		Third Year	217800	24960	27040	269800
		Fourth year	54450	0	6030	60480
4	(29M9g) Kundilavalappil	First year	54000	0	6000	60000
		Second Year	216000	13520	25500	255020
		Third Year	216000	21000	30362	267362
		Fourth year	54000	6000	7913	67913
5	(29M9i) Payyerikavu	First year	35700	0	5054	40754
		Second Year	142800	0	19440	162240
		Third Year	142800	7200	20455	170455
		Fourth year	35700	3600	5521	44821
6	(29M9j) Kayalottuthazhe	First year	93150	0	10410	103560
		Second Year	372600	45000	46400	464000
		Third Year	372600	16200	43094	431894
		Fourth year	93150	0	10350	103500

7	(29M11a) Jathiyeri	First year	100500	0	11125	111625
		Second Year	402000	30000	48048	480048
		Third Year	402000	18000	46551	466551
		Fourth year	100500	0	11186	111686
8	(29M12a) Mankavilthodu	First year	160500	0	17783	178283
		Second Year	642000	45000	76293	763293
		Third Year	642000	27000	74159	743159
		Fourth year	160500	0	17864	178364
9	(29M13a) Puthukayam - Mannolthodu	First year	81750	0	9060	90810
		Second Year	327000	27000	39300	393300
		Third Year	327000	16200	38100	381300
		Fourth year	81750	0	9090	90840
10	(29M14a) Chelathodu	First year	64950	0	7180	72130
		Second Year	259800	27000	31950	318750
		Third Year	259800	10800	30060	300660
		Fourth year	64950	0	7230	72180
11	(29M25a) Vishnumangalam	First year	67650	0	7480	75130
		Second Year	270600	27000	40400	338000
		Third Year	270600	10800	25200	306600
		Fourth year	67650	0	7530	75180

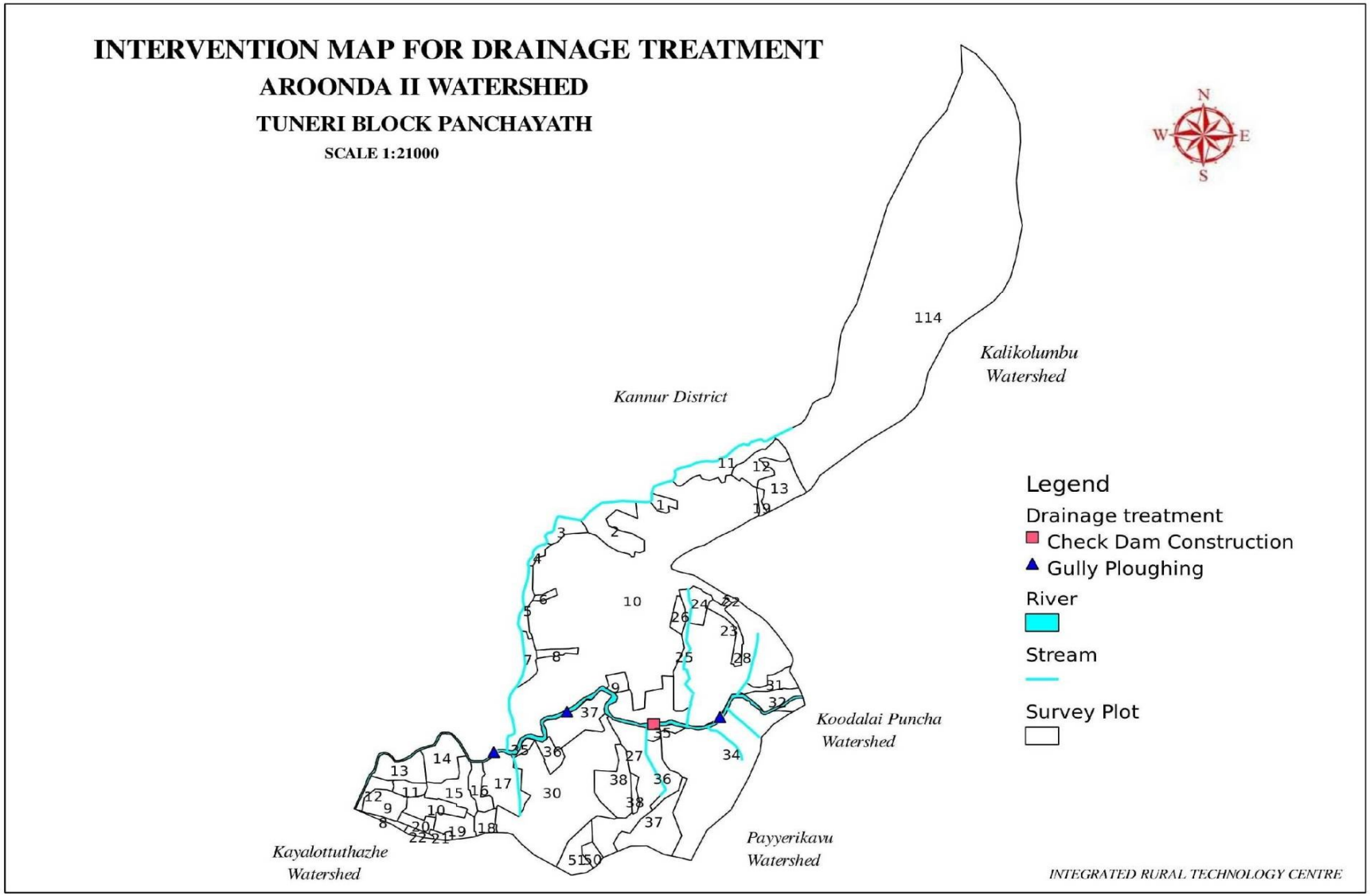
Name Of work :Gully Plugging 1(Sr No -37) AROONDA II WATERSHED scheme of IWMP 2012-13									
item no	Description	No	length	breadth	Depth	Quantity	Unit	Rate	Amount
1)	Earth work excavation in hard soil .For gully plugging within the initial lead and lift	1	6	1.5	0.6	5.4	10 m3	2356	1272.24
2	Rubble masonry using for gully plugging including all cost labour and material								-
	a) Foundation	1	6	1.5	0.6	5.4	m3	710	3834
	b) Super Structure	1	6	1.25	1	7.5	m3	710	5325
	Total					12.9			9159
3)	CC 1:3:6 using 20 mm metal								
	a) Top Belt	1	6	1	0.12	0.72	10dm3	60.77	4375.44
4)	LS for unforeseen								1193
							Total Cost		**16000**
(Rupees sixteen thousand only)									

Name Of work :Gully Plugging 2 (Sr No -25) ARONDA WATERSHED scheme of IWMP 2012-13									
item no	Description	No	length	breadth	Depth	Quantity	Unit	Rate	Amount
1)	Earth work excavation in hard soil For gully plugging within the initial lead and lift	1	7.5	1.5	0.6	6.75	10 m3	2356	1590.3
2	Rubble masonry using for gully plugging including all cost labour and material								
	a) Foundation	1	7.5	1.5	0.6	6.75	m3	710	4792.5
	b) Super Structure	1	7.5	1.25	1	9.375	m3	710	6656.25
	Total					16.125			11448.75
3)	CC 1:3:6 using 20 mm metal								
	a) Top Belt	1	7.5	1	0.12	0.9	10dm3	60.77	5469.3
4)	LS for unforeseen								1492
							Total Cost		20000
	(Rupees twenty thousand only)								

Map 10


INTERVENTION MAP FOR AREA TREATMENT
AROONDA II WATERSHED
TUNERI BLOCK PANCHAYATH
SCALE 1:22000
N
W
E
S
Kalikolumbu Watershed
Kannur District
Koodalai Puncha Watershed
Kayalottuthazhe Watershed
Payyerikavu Watershed
Legend
Area treatment
HB
SB+HB
SB+CT
SB+RSB
ECB+HB
ECB+SB
SB+CT+HD
CT+HB+AF
ECB+SB+HB
ECB+SB+RSB
SB+CT+HB+AF
ECB+SB+CT+AF
ECB+SB+CT+HB
ECB+SB+RSB+HB+AF+HD
River
Survey boundary
ECB-Earthern contour bund,SB-Stone bund,RSB-Raised stone bund,CT-Contour terracing,HB-Husk burrial,
AF-Agro forestry,HD-Horticulture development
INTEGRATED RURAL TECHNOLOGY CENTRE

Map 11


INTERVENTION MAP FOR DRAINAGE TREATMENT
AROONDA II WATERSHED
TUNERI BLOCK PANCHAYATH
SCALE 1:21000
N
W
E
S
Kannur District
Kalikolumbu Watershed
Koodalai Puncha Watershed
Payyerikavu Watershed
Kayalottuthazhe Watershed
Legend
Drainage treatment
Check Dam Construction
Gully Ploughing
River
Stream
Survey Plot
INTEGRATED RURAL TECHNOLOGY CENTRE

Detailed Estimate Check dam

Name Of work :Check dam

Name Of Watershed : Kalikolumb

Sr No : 14

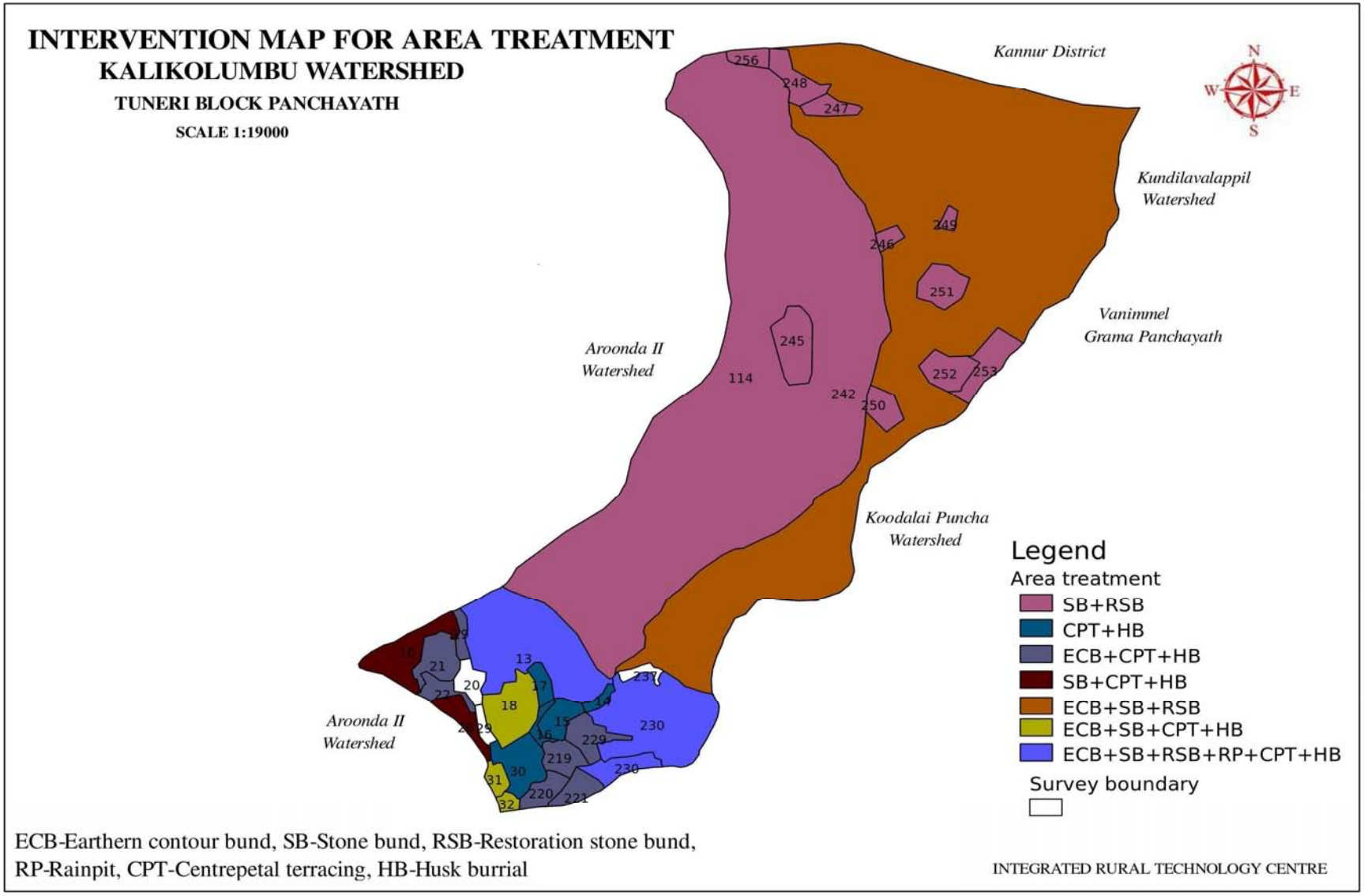
Item no	Description	No	length	breadth	Depth	Quantity	Amount
1)	Earth excavation in hard soil with initial lead up to 50 m and lift up to 1.50 am						
	For cross wall bane	1	11	2.50	0.90	24.75	
	slide revetment bane						
	upstream side	2	25.00	1.20	0.90	54.00 m3	-
	Downstream side	2	25.00	1.20	0.90	54.00 m3	-
	Say 132.75m3 @ Rs. 2356.00/10 m3						**31276**
2)	PCC 1:4:8 using 40 mm						
	metal bed concreting excluding from work						
	for cross wall	1	11	2.50	0.30	8.25 m3	
	for upstream revetment	2	25.00	1.20	3.30	18.00 m3	
	for downstream revetment	2	25.00	1.20	0.30	18.00 m3.	
						44.25 m3.	-
	Say 44.25 m3 @ Rs 4868/m3						**2,15409/-**
3)	Providing cross wall in RCC 1:3:6						
	Using 40 m &20 mm B/S in ratio 6:4						
	excluding form work						
	cross wall basement	1	11	2.50	0.60	16.5 m3	
	cross wall	1	1.00	1.0+0.60	2.50	2.00 m3	
	downstream	2	0.90+0.50		2.50	3.50 m3	
	upstream side		2.00	1.00	2.50	5.00 m3	
						27m3	
4)	Deduction						
	2 went way	2	2.00	0.60	1.50	3.60 m3	
		27 - 3.60				23.40m3	
	Say 23.4 m3 @ Rs 5566/m3						**130244/-**
5)	Re enforcement for RCC retaining wall @ Rs 50 kg /m3						
	40x50 = 2000 kg						
	Say 20 @ Rs. 6339/Qtl						**1,26,780/-**
6	Form work for cross wall above thodu level	1	2.00	10.00	2.50	50	-
	wing walls	1	2.0	1.00	2.50	5	-

			0				
		1	2.00	0.90+0.60	2.50	3.75	-
		1	4.00	0.90+0.60	2.50	7.5	-
				-		66.25 m2	-
	5369/10 m2					say66.25 m2 @ Rs.	**35570/-**
7	DR Masonry for upstream & Downstream of sides of cross walls						
	Say 400.00 m3 @ Rs. 1659/m3 = 6,63,600/-	4	25.00	1.00+0.60	2.50	200 m3	
	Say 200 m3 @ Rs 1659/ m3						**3,31,800/-**
8	Providing PCC 1:3:6 using 20 mm metal above DR masonry	4	25.00	0.60	0.10	6.00 m3	
	60.77/10 dm3					Say 6.00 m3 @ Rs.	**36,462/-**
	Total Cost						**905541/-**

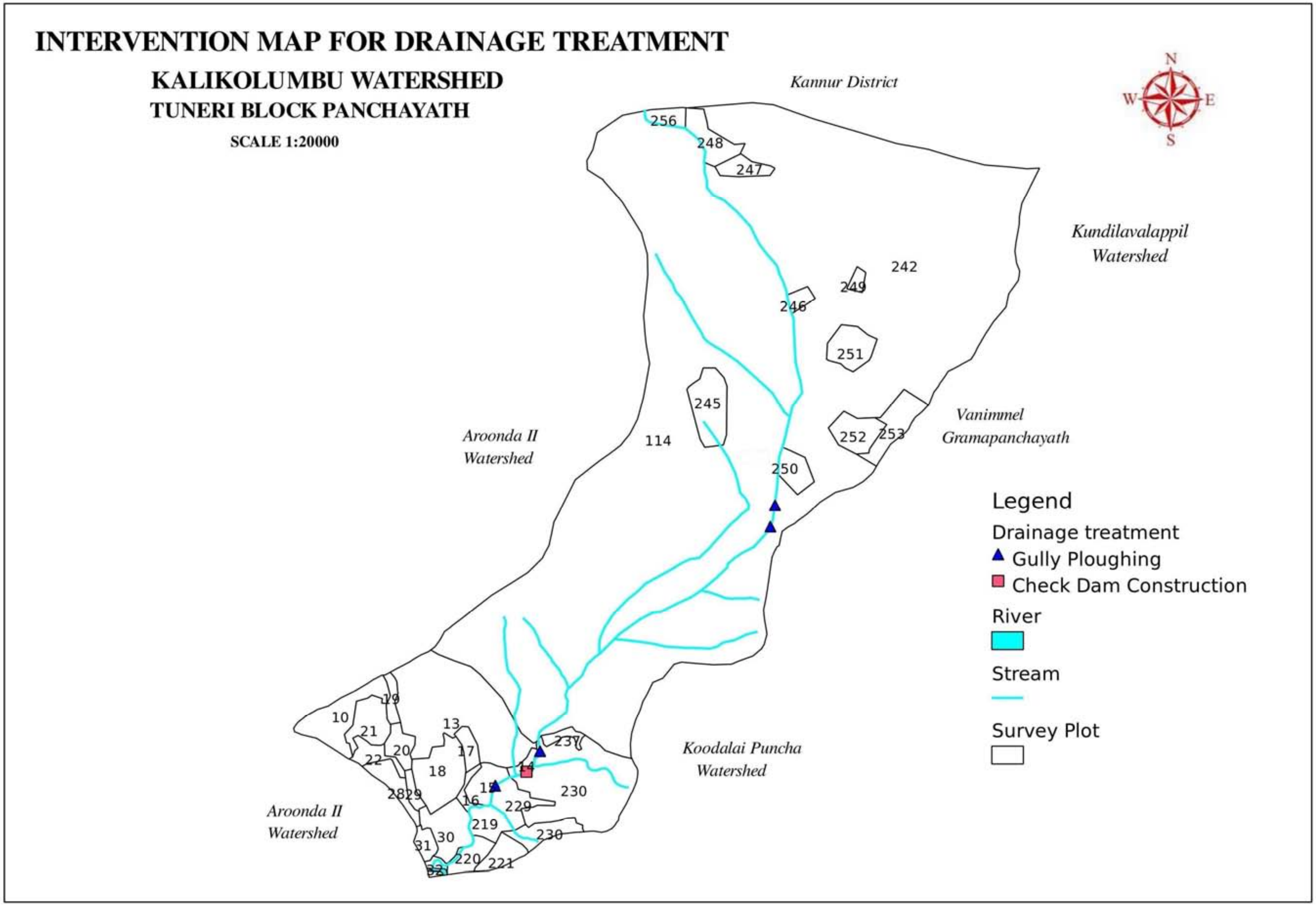
Detailed Estimate for 2 No Gully Plugging in Kalikolumb Watershed

item no	Description	No	length	breadth	Depth	Quantity	Unit	Rate	Amount
1)	Earth work excavation in hard soil For gully plugging within the initial lead and lift	1	8.5	1.5	0.6	7.65	10 m3	2356	1802.34
2	Rubble masonry using for gully plugging including all cost labour and material								-
	a) Foundation	1	8.5	1.5	0.6	7.65	m3	710	5431.5
	b) Super Structure	1	8.5	1.25	1	10.625	m3	710	7543.75
	Total			-		18.275			12975.25
3)	CC 1:3:6 using 20 mm metal								
	a) Top Belt	1	8.5	1	0.12	1.02	10dm3	60.77	6198.54
4)	LS for unforeseen								1024
	Total Cost								22000
	(Rupees twenty two thousand only)								

Map 12

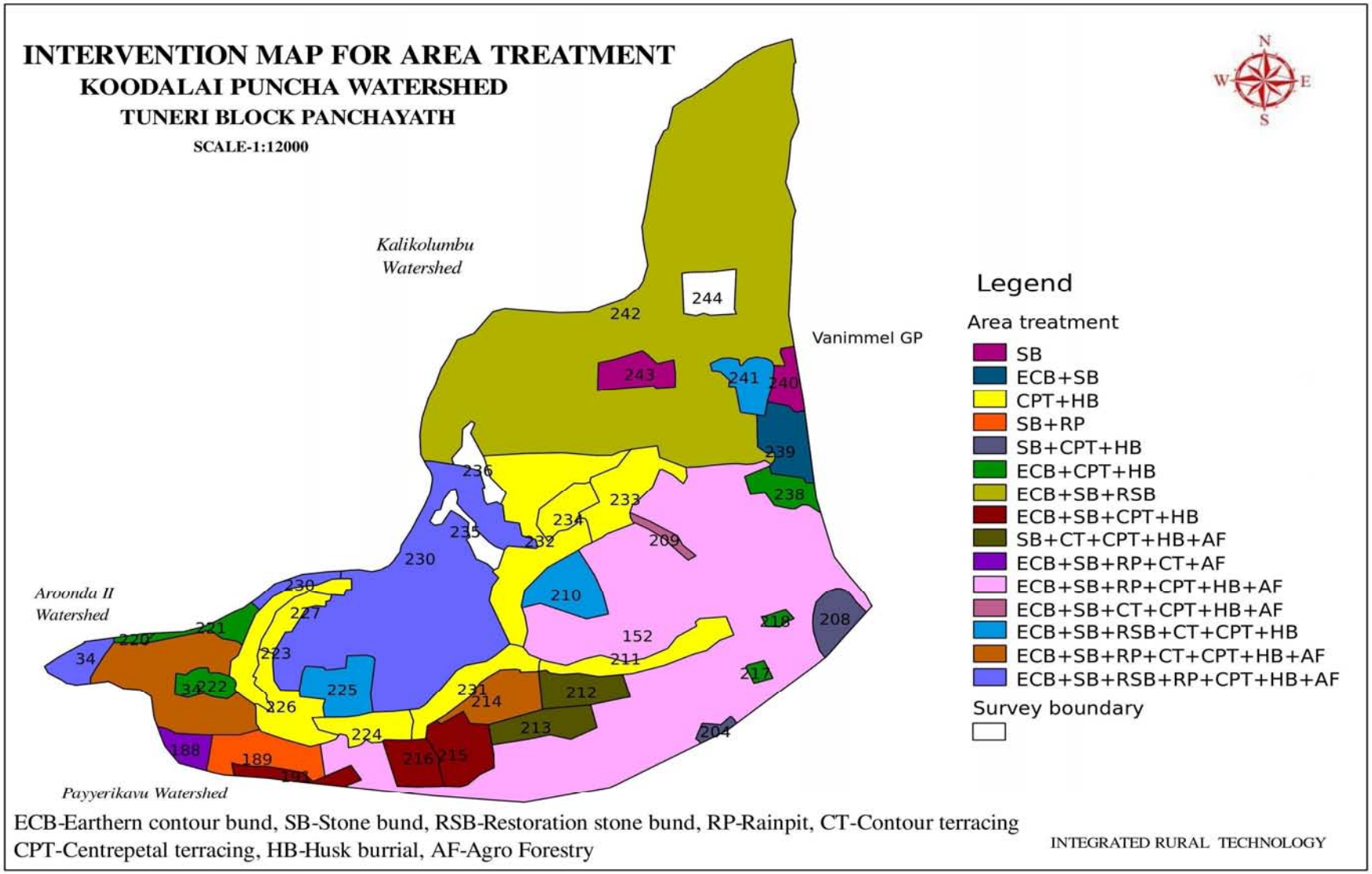

INTERVENTION MAP FOR AREA TREATMENT
KALIKOLUMBU WATERSHED
TUNERI BLOCK PANCHAYATH
SCALE 1:19000
Kannur District
Kundilavalappil Watershed
Vanimmel Grama Panchayath
Aroonda II Watershed
Koodalai Puncha Watershed
Aroonda II Watershed
N
W
E
S
256
248
247
249
246
251
245
114
252
253
242
250
237
230
229
219
220
221
Legend
Area treatment
SB+RSB
CPT+HB
ECB+CPT+HB
SB+CPT+HB
ECB+SB+RSB
ECB+SB+CPT+HB
ECB+SB+RSB+RP+CPT+HB
Survey boundary
ECB-Earthern contour bund, SB-Stone bund, RSB-Restoration stone bund,
RP-Rainpit, CPT-Centrepetal terracing, HB-Husk burrial
INTEGRATED RURAL TECHNOLOGY CENTRE

Map 13

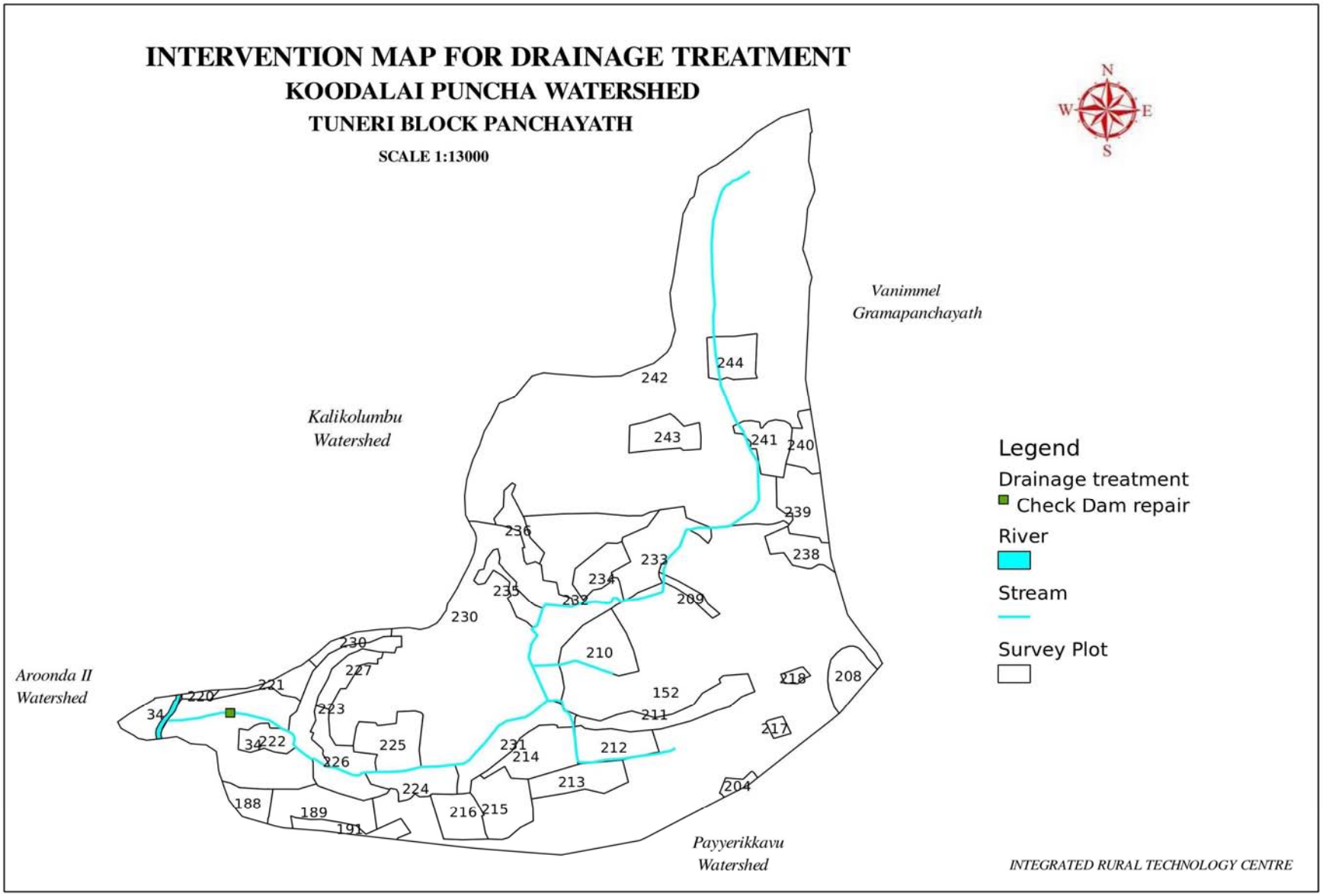

INTERVENTION MAP FOR DRAINAGE TREATMENT
KALIKOLUMBU WATERSHED
TUNERI BLOCK PANCHAYATH
SCALE 1:20000
Kannur District
N
W
E
S
Kundilavalappil Watershed
Vanimmel Gramapanchayath
Aroonda II Watershed
Koodalai Puncha Watershed
Aroonda II Watershed
256
248
247
242
249
246
251
245
114
252
253
250
237
230
229
219
220
221
10
19
21
20
22
13
17
18
2829
16
15
14
30
31
32
Legend
Drainage treatment
Gully Ploughing
Check Dam Construction
River
Stream
Survey Plot

Name Of work :Check Dam repair Koodalai Puncha Watershed of IWMP 2012-13							
Item no		No	length	breadth	Depth	Quantity	Amount
1)	Earth work excavation in hard soil For foundation initial lead and lift	2	3	0.6	0.6	2.16m3	
	Say 3 m3@ Rs 2356/10 m 3						706.8/-
2)	Random Rubble Masonry Use in 1:6 for foundation and side wall						
	Foundation	2	3	0.6	0.6	2.16 m3	-
	Super Structure	2	3	0.45	1.65	4.45 m 3	-
						6.61 m3	-
	Say 6.61 m3@ Rs 3207/ m 3						21198/-
3)	C C 1:4:8 is using 40 mm metal for bed						
		3	2	2.3	0.15	2.07 m3	
	Say 2.07 m3@ Rs 4868/ m 3						10076/-
4)	Plastering in CM 1:4 ,12 mm thick for wall and bed						
	a) side wall	2	3		1.65	13.20 m2	
	b) bed	3	2		2.30	13.80 m2	-
	c)Bed side	3	10.6		0.15	4.77 m2	-
						31.77 m2	-
	Say 32 m2 @ Rs 1914/10 m 2						6124/-
5)	Shutter providing for check dam	3	2		1.65	9.9	39454
	Total Amount						**77558**

Map 14


INTERVENTION MAP FOR AREA TREATMENT
KOODALAI PUNCHA WATERSHED
TUNERI BLOCK PANCHAYATH
SCALE-1:12000
N
W
E
S
Kalikolumbu Watershed
Vanimmel GP
Aroonda II Watershed
Payyerikavu Watershed
Legend
Area treatment
SB
ECB+SB
CPT+HB
SB+RP
SB+CPT+HB
ECB+CPT+HB
ECB+SB+RSB
ECB+SB+CPT+HB
SB+CT+CPT+HB+AF
ECB+SB+RP+CT+AF
ECB+SB+RP+CPT+HB+AF
ECB+SB+CT+CPT+HB+AF
ECB+SB+RSB+CT+CPT+HB
ECB+SB+RP+CT+CPT+HB+AF
ECB+SB+RSB+RP+CPT+HB+AF
Survey boundary
ECB-Earthern contour bund, SB-Stone bund, RSB-Restoration stone bund, RP-Rainpit, CT-Contour terracing
CPT-Centrepetal terracing, HB-Husk burrial, AF-Agro Forestry
INTEGRATED RURAL TECHNOLOGY

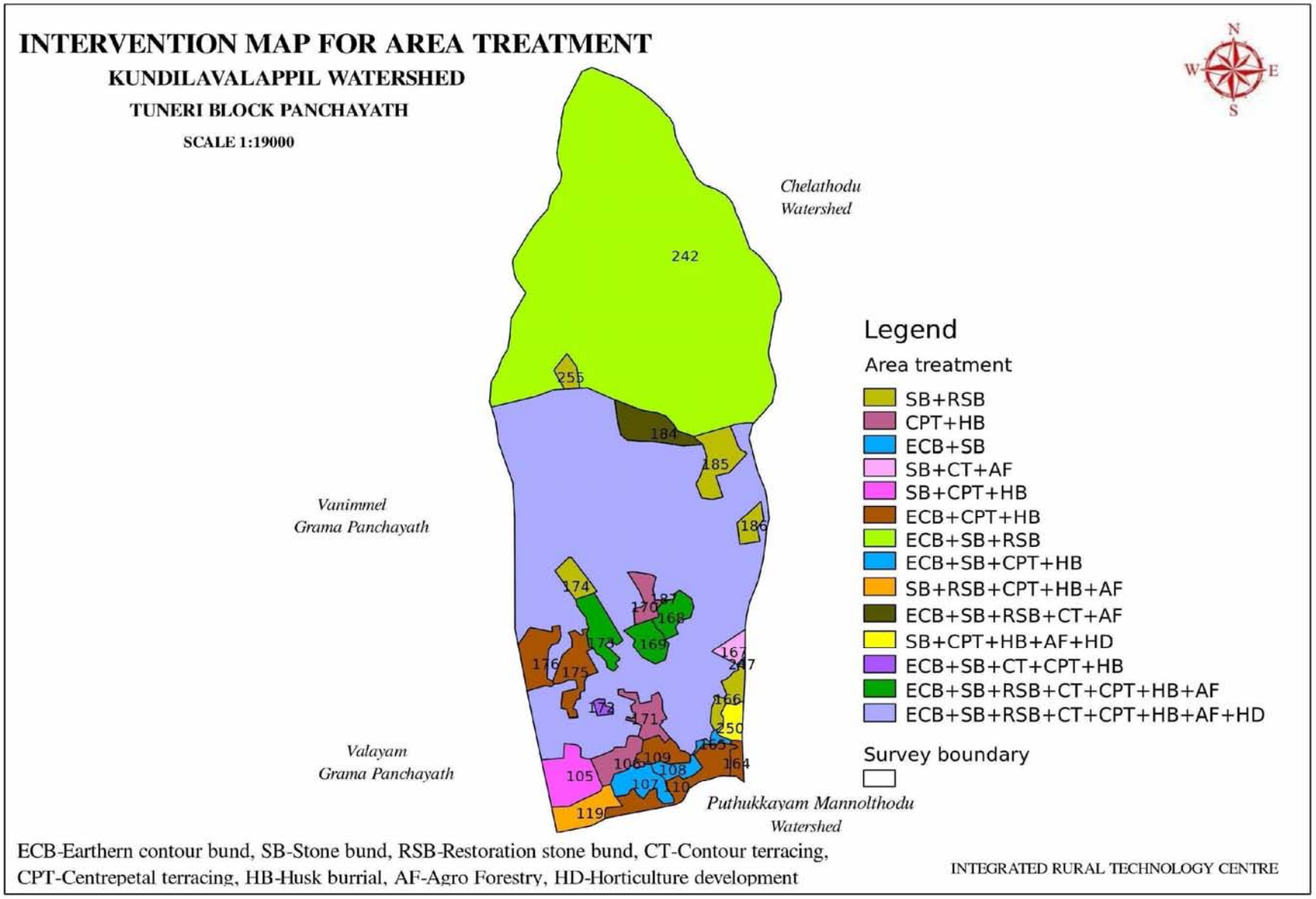
Map 15


INTERVENTION MAP FOR DRAINAGE TREATMENT
KOODALAI PUNCHA WATERSHED
TUNERI BLOCK PANCHAYATH
SCALE 1:13000
N
W
E
S
Vanimmel Gramapanchayath
Kalikolumbu Watershed
Aroonda II Watershed
Payyerikkavu Watershed
Legend
Drainage treatment
Check Dam repair
River
Stream
Survey Plot
INTEGRATED RURAL TECHNOLOGY CENTRE
242
244
243
241
240
239
236
238
233
234
235
232
209
230
230
210
227
221
220
218
208
152
34
223
211
217
34
222
225
231
214
212
226
213
224
204
188
216
215
189
191

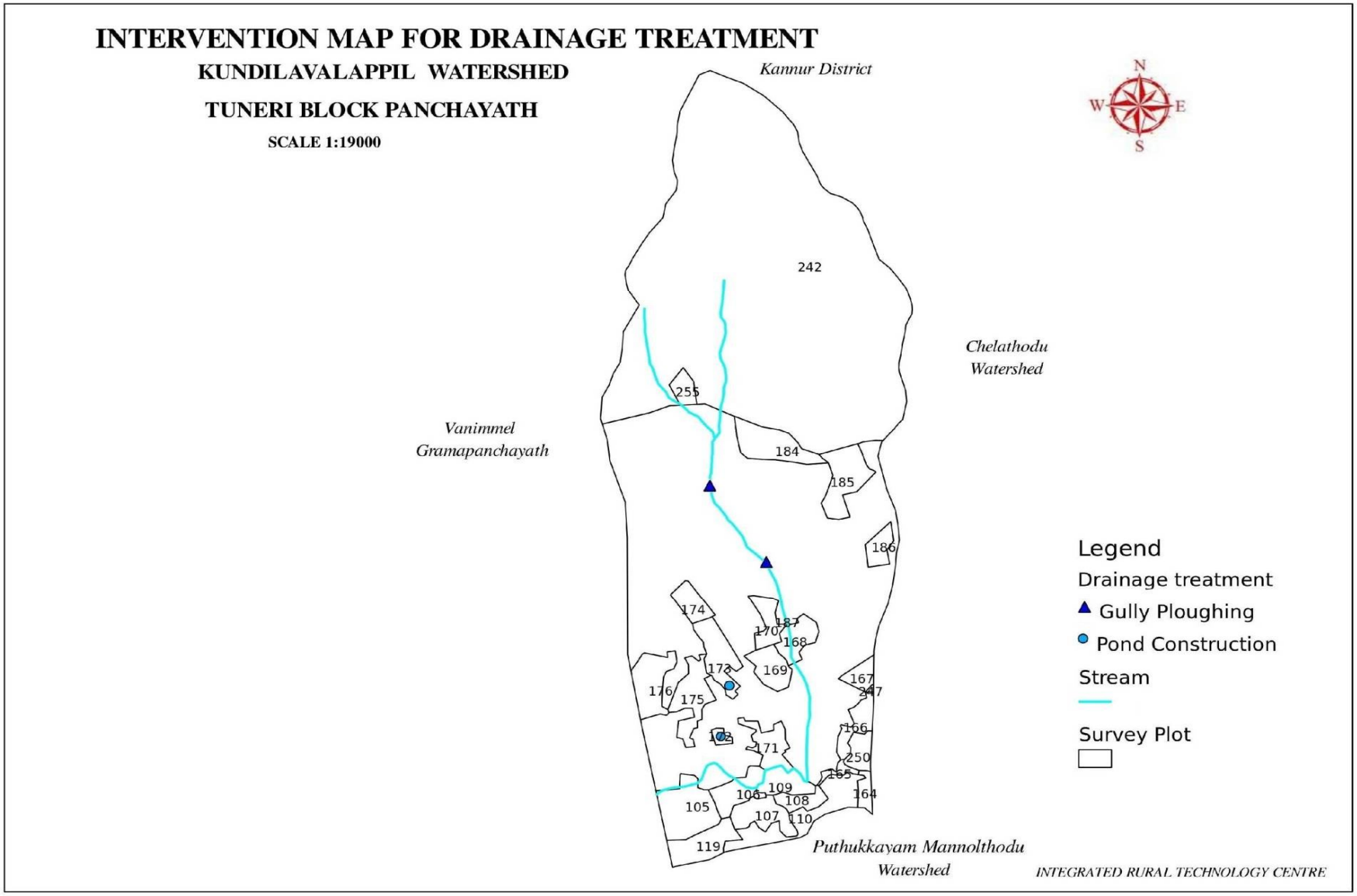
Detailed estimate Pond construction 1								
Sr No :172								
	No	length	width	high	qty	Unit	rate	amount
Clearing the light jungle	1	16	10		160	100m2	377	603.2
Bailing Out Water from the pond for drain								8000
earth work excavation								
I st 1.5 m	1	16	10	1.5	240	m^3	235.6	56544
II nd 0.5 m	1	16	10	0.5	80	m^3	294.5	23560
side bund strengthening	1	52	1	0.75	39	m^3	235.6	9188.4
LS								2104
Total amount								**100000**

Detailed estimate Pond construction 2								
Sr No :173								
	No	length	width	high	qty	Unit	rate	amount
Clearing the light jungle	1	21	15		315	100m2	377	1187.55
Bailing Out Water from the pond for drain								8000
earth work excavation								
Ist 1.5 m	1	21	15	1.5	472.5	m^3	235.6	111321
IInd 1.00 m	1	21	15	1	315	m^3	294.5	92767.5
side bund strengthening	1	72	1	0.75	54	m^3	235.6	12722.4
LS								2002
Total amount								**228000/-**

Map 16


INTERVENTION MAP FOR AREA TREATMENT
KUNDILAVALAPPIL WATERSHED
TUNERI BLOCK PANCHAYATH
SCALE 1:19000
N
W
E
S
Chelathodu
Watershed
Vanimmel
Grama Panchayath
Valayam
Grama Panchayath
Puthukkayam Mannolthodu
Watershed
242
255
184
185
186
174
170
187
168
174
169
176
175
173
171
167
247
166
250
165
109
106
108
107
110
105
164
119
Legend
Area treatment
SB+RSB
CPT+HB
ECB+SB
SB+CT+AF
SB+CPT+HB
ECB+CPT+HB
ECB+SB+RSB
ECB+SB+CPT+HB
SB+RSB+CPT+HB+AF
ECB+SB+RSB+CT+AF
SB+CPT+HB+AF+HD
ECB+SB+CT+CPT+HB
ECB+SB+RSB+CT+CPT+HB+AF
ECB+SB+RSB+CT+CPT+HB+AF+HD
Survey boundary
ECB-Earthern contour bund, SB-Stone bund, RSB-Restoration stone bund, CT-Contour terracing,
CPT-Centrepetal terracing, HB-Husk burrial, AF-Agro Forestry, HD-Horticulture development
INTEGRATED RURAL TECHNOLOGY CENTRE

Map 17


INTERVENTION MAP FOR DRAINAGE TREATMENT
KUNDILAVALAPPIL WATERSHED
TUNERI BLOCK PANCHAYATH
SCALE 1:19000
Kannur District
N
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S
242
Chelathodu
Watershed
255
Vanimmel
Gramapanchayath
184
185
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168
173
169
167
247
176
175
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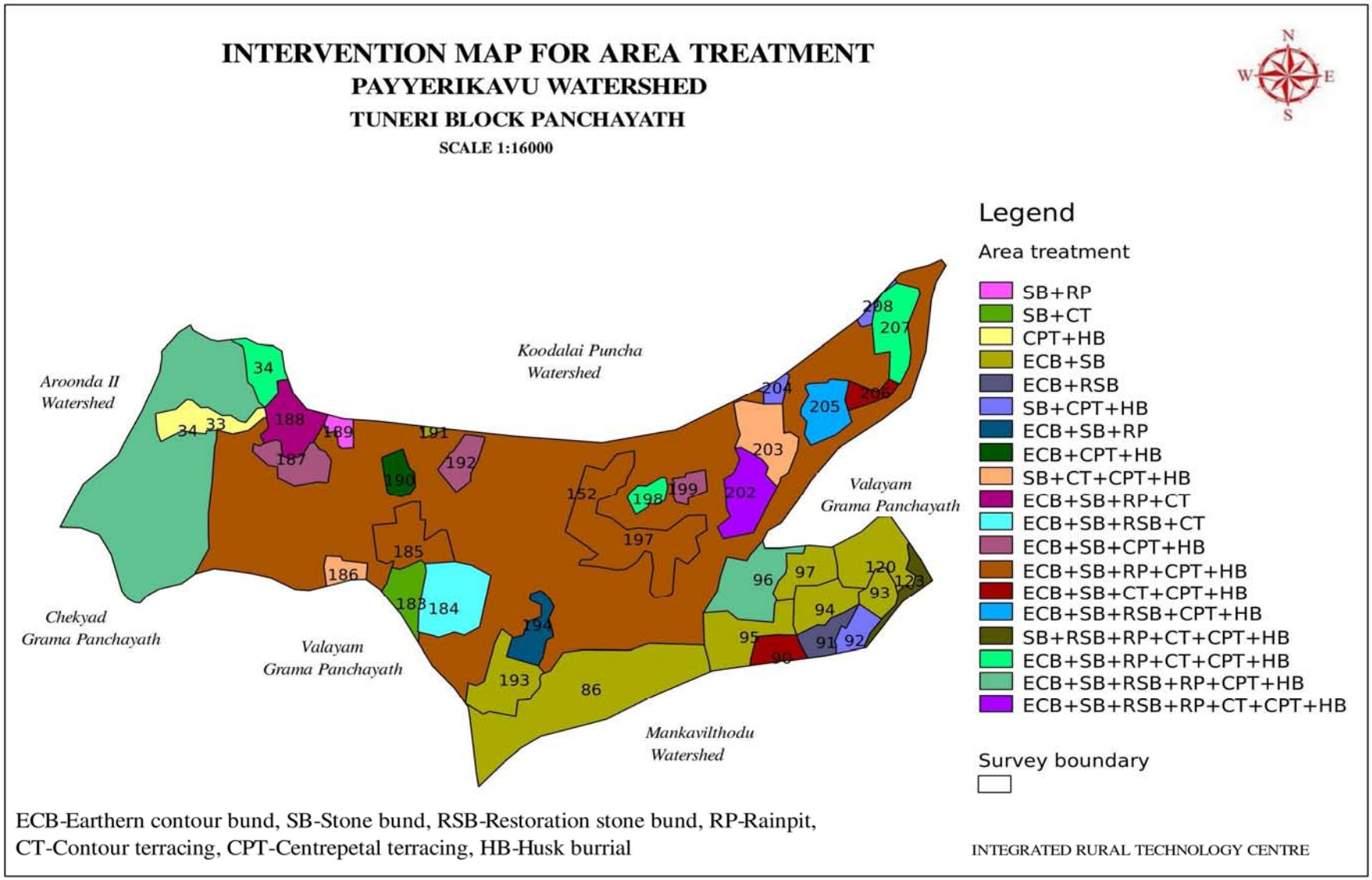
171
250
165
109
105
108
164
105
107
110
119
Puthukkayam Mannolthodu
Watershed
Legend
Drainage treatment
Gully Ploughing
Pond Construction
Stream
Survey Plot
INTEGRATED RURAL TECHNOLOGY CENTRE

Map 18


INTERVENTION MAP FOR AREA TREATMENT
PAYYERIKAVU WATERSHED
TUNERI BLOCK PANCHAYATH
SCALE 1:16000
N
W
E
S
Aroonda II Watershed
Koodalai Puncha Watershed
Valayam Grama Panchayath
Chekyad Grama Panchayath
Valayam Grama Panchayath
Mankavilthodu Watershed
34
33
188
189
191
192
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190
152
198
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202
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204
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208
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86
96
97
120
123
93
94
95
91
92
Legend
Area treatment
SB+RP
SB+CT
CPT+HB
ECB+SB
ECB+RSB
SB+CPT+HB
ECB+SB+RP
ECB+CPT+HB
SB+CT+CPT+HB
ECB+SB+RP+CT
ECB+SB+RSB+CT
ECB+SB+CPT+HB
ECB+SB+RP+CPT+HB
ECB+SB+CT+CPT+HB
ECB+SB+RSB+CPT+HB
SB+RSB+RP+CT+CPT+HB
ECB+SB+RP+CT+CPT+HB
ECB+SB+RSB+RP+CPT+HB
ECB+SB+RSB+RP+CT+CPT+HB
Survey boundary
ECB-Earthern contour bund, SB-Stone bund, RSB-Restoration stone bund, RP-Rainpit,
CT-Contour terracing, CPT-Centrepetal terracing, HB-Husk burrial
INTEGRATED RURAL TECHNOLOGY CENTRE

Scheme of IWMP 2012-13 Survey no :39

Item no	Description	No	length	breadth	Depth	Quantity	Unit	Rate	Amount
1)	Earth work excavation in hard soil For gully plugging within the initial lead and lift	1	7.5	1.5	0.6	6.75	10 m3	2356	1590.3
2	Rubble masonry using for gully plugging including all cost labour and material								-
	a) Foundation	1	7.5	1.5	0.6	6.75	m3	710	4792.5
	b) Super Structure	1	7.5	1.25	1	9.375	m3	710	6656.25
	Total					16.125			11448.8
3)	CC 1:3:6 using 20 mm metal								
	a) Top Belt	1	7.5	1	0.12	0.9	10dm3	60.77	5469.3
4)	LS for unforeseen								1492
	Total Cost								20000/-

(Rupees twenty thousand only)

Name Of work : Gully Plugging Kayalottuthazhe Watershed (Aduvara thodu) scheme of IWMP 2012-13 (S R No8)

Item no	Description	No	length	breadth	Depth	Quantity	Unit	Rate	Amount
1)	Earth work excavation in hard soil For gully plugging within the initial lead and lift	1	8.5	1.5	0.6	7.65	10 m3	2356	1802.34
2	Rubble masonry using for gully plugging including all cost labour and material								-
	a) Foundation	1	8.5	1.5	0.6	7.65	m3	710	5431.5
	b) Super Structure	1	8.5	1.25	1	10.625	m3	710	7543.75
	Total					18.275			12975.3
3)	CC 1:3:6 using 20 mm metal								
	a) Top Belt	1	8.5	1	0.12	1.02	10dm3	60.77	6198.54
4)	LS for unforeseen								1024
							Total Cost		**22000/-**

(Rupees twenty two thousand only)

Name of Work: Open wells (5 No)

Scheme of IWMP 2012 - 13- Kayalottuthazhe Watershed

Item No	Description	No	Length	Breadth	Depth	Quantity	Amount
1)	Earth work excavation in hard soil for digging open well						
	a)Initial depth 0-1.5m	1	d2/4 = 3.14x3.5x3.5/4		1.5	14.42 M3	
	Say 14.421 m3 @ Rs. 2356/ 10 M3						Rs 3397/-
	b)First depth 1.5 -3.00m	1	d2/4 = 3.14x3.5x3.5/4		1.5	14.42 M3	
	Say 14.42m3 @ Rs. 2945/ 10 m3						Rs 4247/-
	c)Second depth 3.00- 4.50	1	d2/4 = 3.14x3.5x3.5/4		1.5	14.42 M3	
	Say 14.42 m3 @ Rs 3416/ 10 M3						Rs 4926/-
	d)Third depth 4.50 - 6.00 m.	1	d2/4 = 3.14x3.5x3.50/4		1.5	14.42 M3	
	Say 14.42 m3 @ Rs. 3651/ 10 M3						Rs 5265/-
2)	Earth work excavation in ordinary soil for digging open well						
	e) Forth depth = 6 to7.50 m	1	d2/4 = 3.14x3.5x3.50/4		1.5	14.42 M3	
	Say 26.01 m3 @ Rs. 1389/ 10 m3						2003/-
	f)Fifth depth 7.50- 9.00 m.	1	d2/4 = 3.14x3.5x3.5/4		1.5	14.42 M3	
	Say 26.01 m3 @ Rs. 1515/ 10 m3						2185/-
3)	Laterite masonry CM 1:6 for steaming including laterite stone						
	a)using laterite steaming bottom	1	3.14x3.15x0.35		1.5	5.19m3	
	b) steaming top	1	3.14x3x0.20		7.5	14.13m3	
	Say 26.8.m3 @ 4087					19.32M3	78961
	Laterite masonry CM 1:6 for steaming including laterite stone						
	a)Parapet	3.14 x 3.0x 0.20			1.2	2.26 m3	

	b)Platform	3.14 x 4.40x 1.20	0.4	6.63 m3.	
	c)pillar = 3x0.35x0.20x1.90			0.399 m3.	
				9.289m3	
	Say 12.00 m3 @ Rs .4087/ m3				37964/-
4)	Providing fixing GI Pipe 40 mm dia				
	GI Pipe= 3x3 = 9 m				
	Say 9 m @ Rs. 185/ 1 m			9 m	1665/-
5)	Plastering in CM 1:4, 12 mm thick over laterite surface				
	a) side	3.14x3.2	1.2	12.06 m2	
	b) Top	3.14 x 3.2	0.2	2.0 m2.	
	c) plat form side	3.14x6.60	0.2	4.1m2	
	d) plat form top surface	3.14x5.60	1.2	21 m2	
	e) Pillar	3x1.10	1.9	6.27m2	
				45.43m3	
	Say 45.43 m2 @ Rs. 1914/ 10M2				8693/-
6	Bailing out Water by using 5 HP Motor 2 nos in 4 Days				
	= 5x2x3x8=320 HP/Hr				
	Say 240 hp motor @ Rs. 33/hour			240 hp	7920/-
7	L S For unforeseen				774
					158000/-
	Total Cost = 1,58,000 Rs. only				
	(Rupees One lakh fifty eight thousand only)				

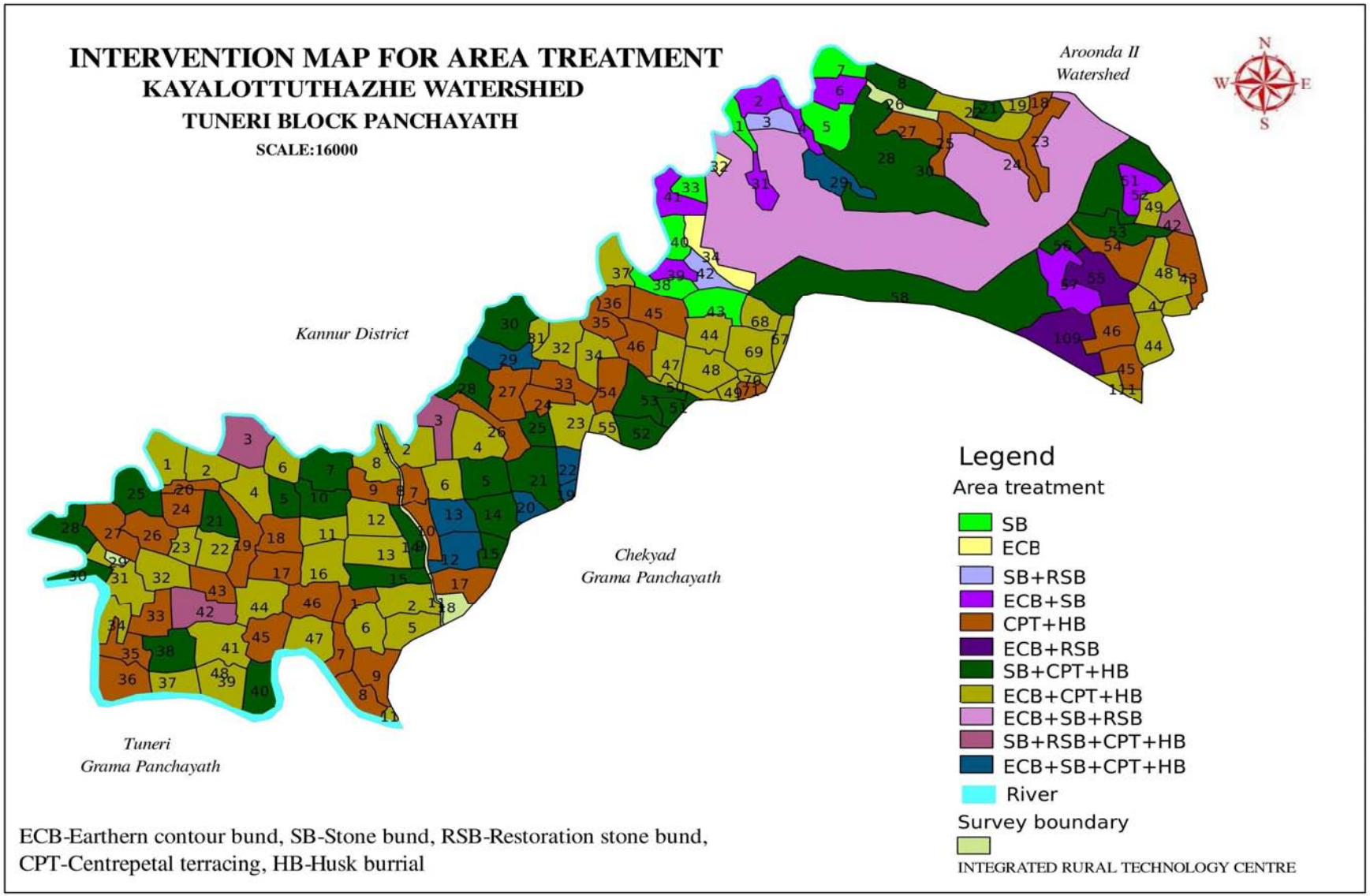
Name Of work :Check dam, Kayalottuthazhe watershed (Survey No:3)

scheme of IWMP 2012-13

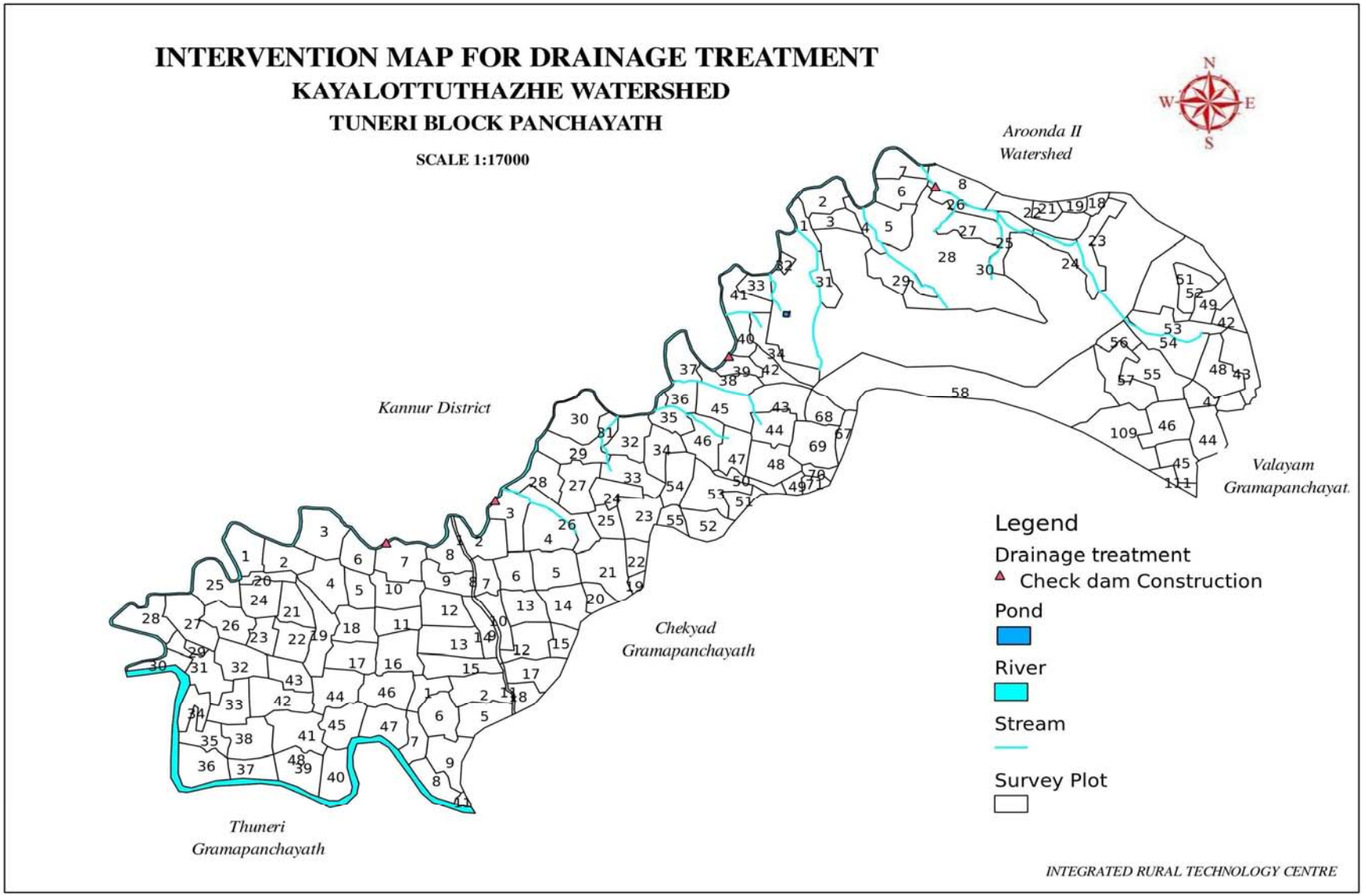
Item no	Description	No	length	breadth	Depth	Quantity	Amount
1)	Earth excavation in hard soil with initial lead up to 50 m and lift up to 1.50 am						
	For cross wall bane	1	8	2.50	0.90	18.00 m3	
	slide revetment bane						
	upstream side	2	25.00	1.20	0.90	54.00 m3	-
	Downstream side	2	25.00	1.20	0.90	54.00 m3	-
					Say 126m3 @ Rs. 2356.00/10 m3		**29686/-**
2)	PCC 1:4:8 using 40 mm metal bed concreting excluding from work						
	for cross wall	1	8	2.50	0.30	6 m3	
	for upstream revetment	2	25.00	1.20	3.30	18.00 m3	
	for downstream revetment	2	25.00	1.20	0.30	18.00 m3.	
						42 m3.	-
	Say 42 m3 @ Rs 4868/m3						**204456/-**
3)	Providing cross wall in RCC 1:3:6 Using 40 m &20 mm B/S in ratio 6:4 excluding form work						
	cross wall basement	1	8	2.50	0.60	12.00 m3	
	cross wall	1	1.00	1.0+0.60	2.50	2.00 m3	
	downstream	2		0.90+0.50	2.50	3.50 m3	
	upstream side		2.00	1.00	2.50	5.00 m3	
						22.50m3	
4)	Deduction						
	2 went way	2	2.00	0.60	1.50	3.60 m3	
				22.50 - 3.60		18.90m3	
					Say 18.90m3 @ Rs 5566/m3		**105197**
5)	Re inforcement for RCC retaining wall @ Rs 50 kg /m3 40x50 = 2000 kg						
					Say 20 @ Rs. 6339/Qtl		**1,26,780/-**

6	Form work for cross wall above thodu level	1	2.00	10.00	2.50	50	-
	wing walls	1	2.00	1.00	2.50	5	-
		1	2.00	0.90+0.60	2.50	3.75	-
		1	4.00	0.90+0.60	2.50	7.5	-
						66.25 m2	-
	5369/10 m2				say66.25 m2 @ Rs.		**35570/-**
7	DR Masonry for upstream & Downstream of sides of cross walls						
	Say 400.00 m3 @ Rs. 1659/m3 = 6,63,600/-	4	25.00	1.00+0.60	2.50	200 m3	
				Say 200			**3,31,800/-**
	m3 @ Rs 1659/ m3						
8	Providing PCC 1:3:6 using 20 mm metal above DR masonry						
		4	25.00	0.60	0.10	6.00 m3	
				Say 6.00			
	m3 @ Rs. 60.77/10 dm3						**36,462/-**
	Total Cost						**869951/-**

Map 19


INTERVENTION MAP FOR AREA TREATMENT
KAYALOTTUTHAZHE WATERSHED
TUNERI BLOCK PANCHAYATH
SCALE:16000
Aroonda II Watershed
Kannur District
Chekyad Grama Panchayath
Tuneri Grama Panchayath
N
W
E
S
Legend
Area treatment
SB
ECB
SB+RSB
ECB+SB
CPT+HB
ECB+RSB
SB+CPT+HB
ECB+CPT+HB
ECB+SB+RSB
SB+RSB+CPT+HB
ECB+SB+CPT+HB
River
Survey boundary
INTEGRATED RURAL TECHNOLOGY CENTRE
ECB-Earthern contour bund, SB-Stone bund, RSB-Restoration stone bund,
CPT-Centrepetal terracing, HB-Husk burrial

Map 20


INTERVENTION MAP FOR DRAINAGE TREATMENT
KAYALOTTUTHAZHE WATERSHED
TUNERI BLOCK PANCHAYATH
SCALE 1:17000
N
W
E
S
Aroonda II Watershed
Kannur District
Chekyad Gramapanchayath
Valayam Gramapanchayat
Thuneri Gramapanchayath
Legend
Drainage treatment
Check dam Construction
Pond
River
Stream
Survey Plot
INTEGRATED RURAL TECHNOLOGY CENTRE

Name Of work :Check dam

Vanimel Grama Panchayat, Jathiyeri watershed
Scheme of IWMP 2012-13

Name Of work :Check dam
Vanimel Grama Panchayat, Jathiyeri watershed
Scheme of IWMP 2012-13

item no	Description	No	length	breadth	Depth	Quantity	Amount
1)	Earth excavation in hard soil with initial lead up to 50 m and lift up to 1.50 am						
	For cross wall bane	1	13	2.50	0.90	29.25	
	slide revetment bane upstream side	2	25.00	1.20	0.90	54.00 m3	
	Downstream side	2	25.00	1.20	0.90	54.00 m3	
				Say 137.25m3 @ Rs. 2356.00/10 m3			**32336/-**
2)	PCC 1:4:8 using 40 mm metal bed concreting excluding from work						
	for cross wall	1	13	2.50	0.30	9.75 m3	
	for upstream revetment	2	25.00	1.20	3.30	18.00 m3	
	for downstream revetment	2	25.00	1.20	0.30	18.00 m3.	
						45.75 m3.	
				Say 45.75 m3 @ Rs 4868/m3			**222711/-**
3)	Providing cross wall in RCC 1:3:6 Using 40 m &20 mm B/S in ratio 6:4 excluding form work						
	cross wall basement	1	13	2.50	0.60	19.5 m3	
	cross wall	1	1.00	1.0+0.60	2.50	2.00 m3	
	downstream	2		0.90+0.50	2.50	3.50 m3	
	upstream side		2.00	1.00	2.50	5.00 m3	
						30m3	
4)	Deduction						
	2 went way	2	2.00	0.60	1.50	3.60 m3	
			30 - 3.60			26.40m3	
				Say 26.4 m3 @ Rs 5566/m3			**146942/-**
5)	Re inforcement for RCC retaining wall @ Rs 50 kg /m3 40x50 = 2000 kg						
						Say 20 @ Rs. 6339/Qtl	**1,26,780/-**
6	Form work for cross wall above thodu level	1	2.00	10.00	2.50	50	
	wing walls	1	2.00	1.00	2.50	5	
		1	2.00	0.90+0.60	2.50	3.75	
		1	4.00	0.90+0.60	2.50	7.5	
						66.25 m2	

	m2			say66.25 m2 @ Rs. 5369/10			**35570/-**
7	DR Masonry for upstream & Downstream of sides of cross walls Say 400.00 m3 @ Rs. 1659/m3 = 6,63,600/-	4	25.00	1.00+0.60	2.50	200 m3	
				Say 200 m3 @ Rs 1659/ m3			**3,31,800/-**
8	Providing PCC 1:3:6 using 20 mm metal above DR masonry	4	25.00	0.60	0.10	6.00 m3	
				Say 6.00 m3 @ Rs. 60.77/10 dm3			**36,462/-**
				Total Cost			**932601**

Name Of work :Check dam
Vanimel Grama Panchayat, Jathiyeri watershed scheme of IWMP 2012-13

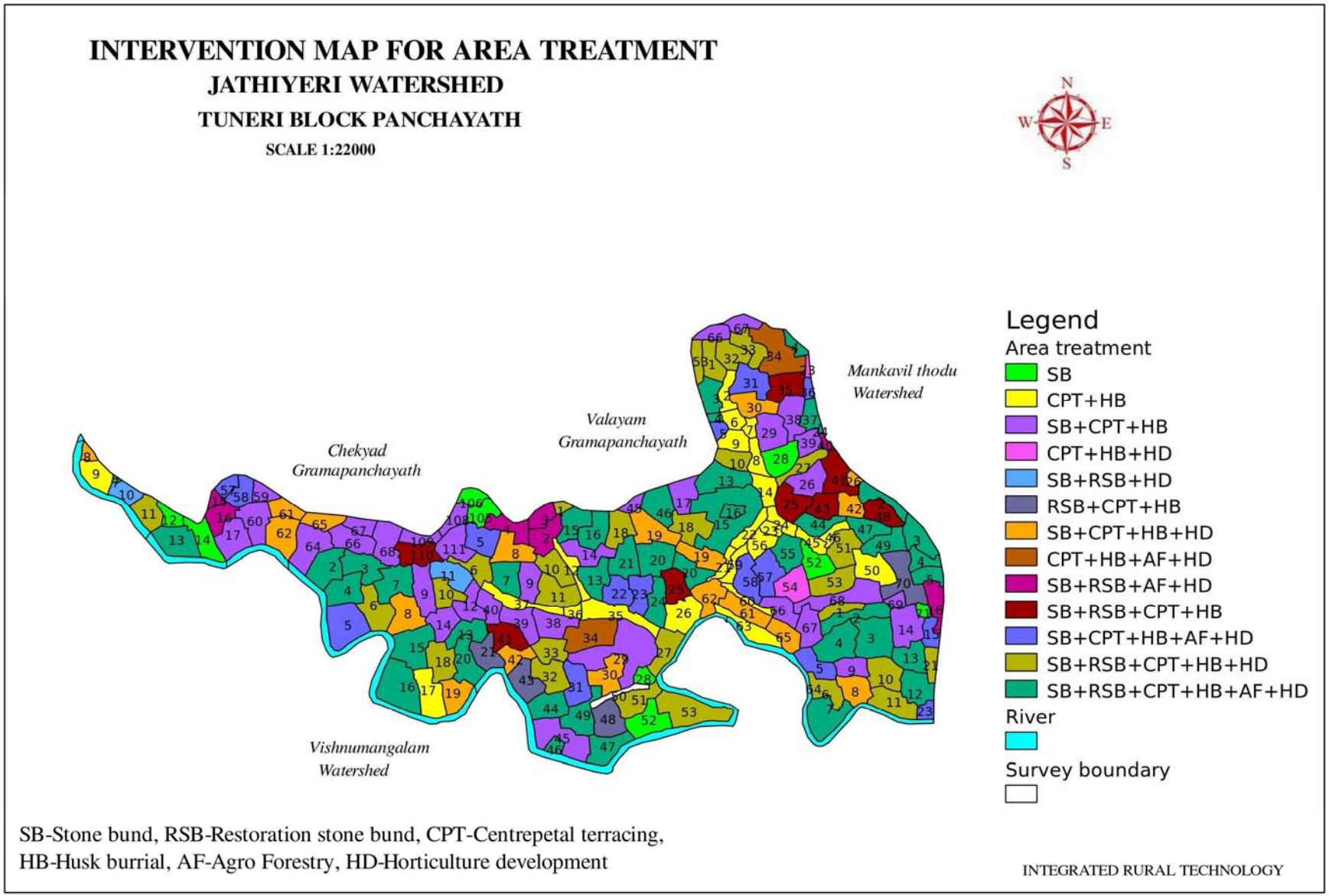
item no	Description	No	length	breadth	Depth	Quantity	Amount
1)	Earth excavation in hard soil with initial lead up to 50 m and lift up to 1.50 am						
	For cross wall bane	1	11	2.50	0.90	24.75	
	slide revetment bane upstream side	2	25.00	1.20	0.90	54.00 m3	-
	Downstream side	2	25.00	1.20	0.90	54.00 m3	-
				Say 132.75m3 @ Rs. 2356.00/10 m3			**31276**
2)	PCC 1:4:8 using 40 mm metal bed concreting excluding from work						
	for cross wall	1	11	2.50	0.30	8.25 m3	
	for upstream revetment	2	25.00	1.20	3.30	18.00 m3	
	for downstream revetment	2	25.00	1.20	0.30	18.00 m3.	
						44.25 m3.	-
				Say 44.25 m3 @ Rs 4868/m3			**2.15409/-**
3)	Providing cross wall in RCC 1:3:6 Using 40 m &20 mm B/S in ratio 6:4 excluding form work						
	cross wall basement	1	11	2.50	0.60	16.5 m3	
	cross wall	1	1.00	1.0+0.60	2.50	2.00 m3	
	downstream	2		0.90+0.50	2.50	3.50 m3	
	upstream side		2.00	1.00	2.50	5.00 m3	

						27m3		
4)	Deduction 2 went way	2	2.00 27 - 3.60	0.60	1.50	3.60 m3 23.40m3		
					Say 23.4 m3 @ Rs 5566/m3			**130244/-**
5)	Re inforcement for RCC retaining wall @ Rs 50 kg /m3 40x50 = 2000 kg							
					Say 20 @ Rs. 6339/Qtl			**1,26,780/-**
6	Form work for cross wall above thodu level wing walls 5369/10 m2	1 1 1 1	2.00 2.00 2.00 4.00	10.00 1.00 0.90+0.60 0.90+0.60	2.50 2.50 2.50 2.50	50 5 3.75 7.5 66.25 m2 say66.25 m2 @ Rs.	-	**35570/-**
7	DR Masonry for upstream & Downstream of sides of cross walls Say 400.00 m3 @ Rs. 1659/m3 = 6,63,600/- m3	4	25.00	1.00+0.60	2.50	200 m3 Say 200 m3 @ Rs 1659/		**3,31,800/-**
8	Providing PCC 1:3:6 using 20 mm metal above DR masonry 60.77/10 dm3	4	25.00	0.60	0.10	6.00 m3 Say 6.00 m3 @ Rs.		**36,462/-**
						Total Cost		**905541/-**

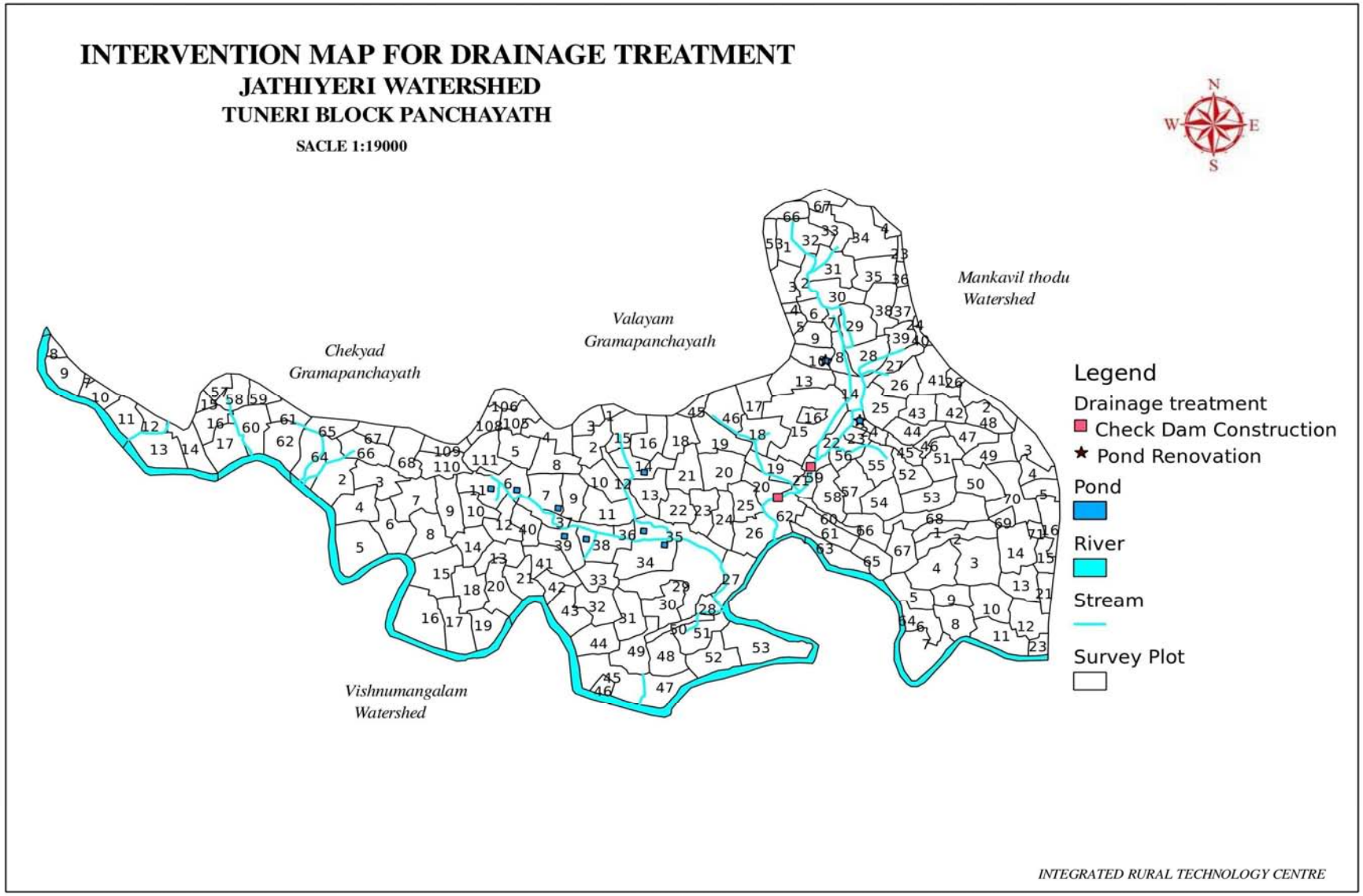
Name of Work
Pond Renovation

Sl No	Item of Work	No	Length	Width	High	qty	unit	rate	amount
1	Clearing the light jungle	1	15	10		150	100m2	377	565.5
2	Bailing Out Water from the pond for drain								8000
3	Earth work excavation								
4	Ist 1.5 m	1	15	10	1	150	m^3	294.5	44175
5	Side bund strengthening	1	72	1	0.75	54	m^3	235.6	12722.4
	LS								1537
	Total Amount								**67000 /-**

Map 21


INTERVENTION MAP FOR AREA TREATMENT
JATHIYERI WATERSHED
TUNERI BLOCK PANCHAYATH
SCALE 1:22000
N
W
E
S
Chekyad Gramapanchayath
Valayam Gramapanchayath
Mankavil thodu Watershed
Vishnumangalam Watershed
Legend
Area treatment
SB
CPT+HB
SB+CPT+HB
CPT+HB+HD
SB+RSB+HD
RSB+CPT+HB
SB+CPT+HB+HD
CPT+HB+AF+HD
SB+RSB+AF+HD
SB+RSB+CPT+HB
SB+CPT+HB+AF+HD
SB+RSB+CPT+HB+HD
SB+RSB+CPT+HB+AF+HD
River
Survey boundary
SB-Stone bund, RSB-Restoration stone bund, CPT-Centrepetal terracing,
HB-Husk burrial, AF-Agro Forestry, HD-Horticulture development
INTEGRATED RURAL TECHNOLOGY

Map 22


INTERVENTION MAP FOR DRAINAGE TREATMENT
JATHIYERI WATERSHED
TUNERI BLOCK PANCHAYATH
SACLE 1:19000
N
W
E
S
Chekyad Gramapanchayath
Valayam Gramapanchayath
Mankavil thodu Watershed
Vishnumangalam Watershed
Legend
Drainage treatment
Check Dam Construction
Pond Renovation
Pond
River
Stream
Survey Plot
INTEGRATED RURAL TECHNOLOGY CENTRE

Name Of work: Check dam (2Nos) Vanimel Grama Panchayat, Mankavilthodu Thodu watershed scheme of IWMP 2012-13

Survey No:25

item no	Description	No	length	breadth	Depth	Quantity	Amount
1)	Earth excavation in hard soil with initial lead up to 50 m and lift up to 1.50 am						
	For crosswalk bane	1	11	2.50	0.90	24.75	
	slide revetment bane						
	upstream side	2	25.00	1.20	0.90	54.00 m3	-
	Downstream side	2	25.00	1.20	0.90	54.00 m3	-
		Say 132.75m3 @ Rs. 2356.00/10 m3					**31276**
2)	PCC 1:4:8 using 40 mm metal bed concreting excluding from work						
	for cross wall	1	11	2.50	0.30	8.25 m3	
	for upstream revetment	2	25.00	1.20	3.30	18.00 m3	
	for downstream revetment	2	25.00	1.20	0.30	18.00 m3.	
						44.25 m3.	-
	Say 44.25 m3 @ Rs 4868/m3						**2,15409/-**
3)	Providing cross wall in RCC 1:3:6						
	Using 40 m &20 mm B/S in ratio 6:4						
	excluding form work						
	crosswalk basement	1	11	2.50	0.60	16.5 m3	
	cross wall	1	1.00	1.0+0.60	2.50	2.00 m3	
	downstream	2	0.90+0.50		2.50	3.50 m3	
	upstream side		2.00	1.00	2.50	5.00 m3	
						27m3	

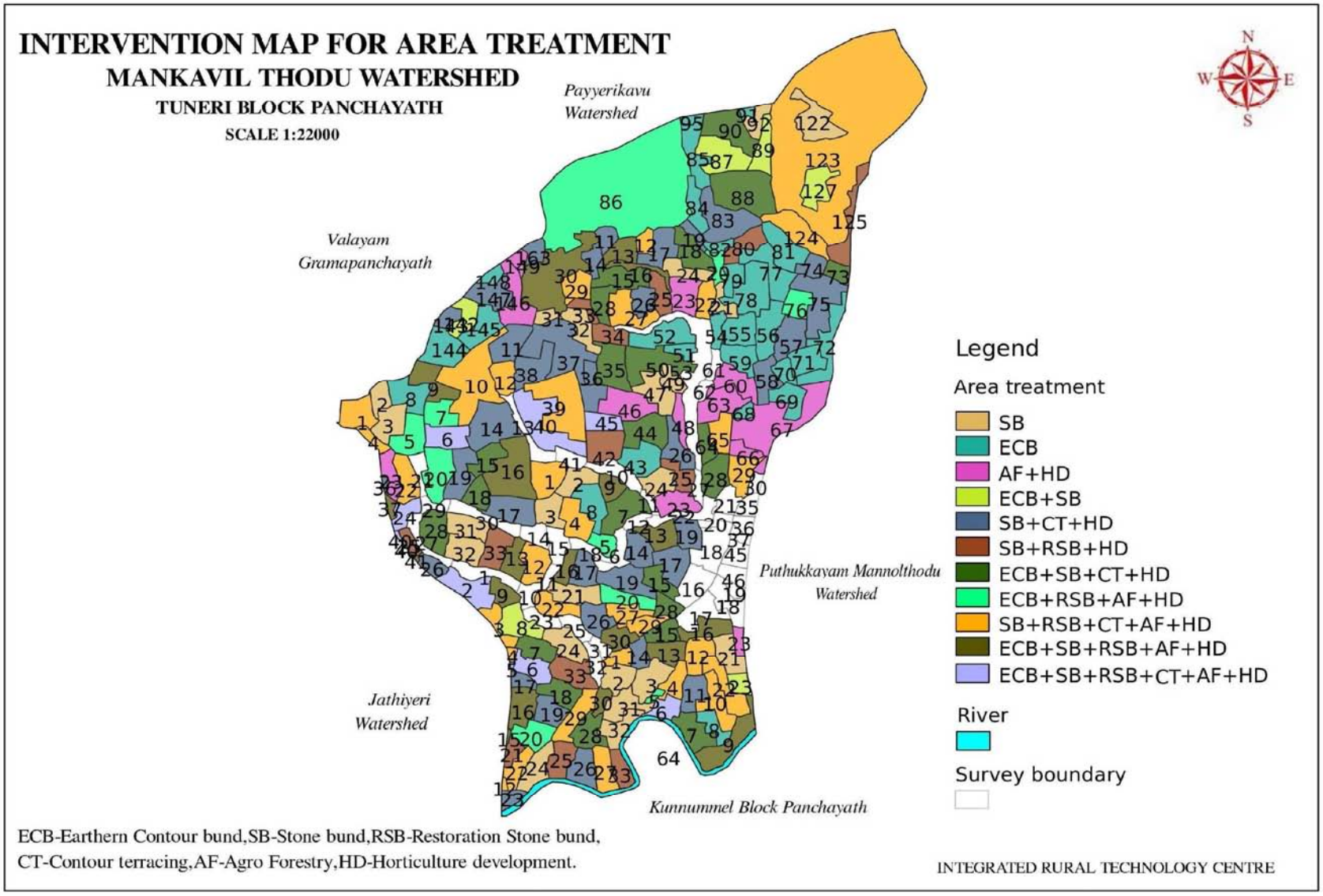
4)	Deduction 2 went way	2	2.00	0.60	1.50	3.60 m3	
				27 - 3.60		23.40m 3	
					Say 23.4 m3 @ Rs 5566/m3		**130244/-**
5)	Re in for cement for RCC retaining wall @ Rs 50 kg /m3 40x50 = 2000 kg Rs. 6339/Qtl				Say 20 @		**1,26,780/-**
6	Form work for cross wall above Thodu level	1	2.00	10.00	2.50	50	-
	wing walls	1	2.00	1.00	2.50	5	-
		1	2.00	0.90+0.60	2.50	3.75	-
		1	4.00	0.90+0.60	2.50	7.5	-
						66.25 m2	-
	Rs. 5369/10 m2				say66.25 m2 @		**35570/-**
7	DR Masonry for upstream & Downstream of sides of cross walls Say 400.00 m3 @ Rs. 1659/m3 = 6,63,600/- Rs 1659/ m3	4	25.00	1.00+0.60	2.50	200 m3	
					Say 200 m3 @		**3,31,800/-**
8	Providing PCC 1:3:6 using 20 mm metal above DR masonry	4	25.00	0.60	0.10	6.00 m3	
					Say 6.00 m3 @ Rs. 60.77/10 dm3		**36,462/-**
	Total Cost						**905541/-**

VCB 1									
Sl no	item of work	No	Length	width	High	Qty	Unit	Rate	Amount
1	site clearance		14	14		196	100m2	240	470.4
	Thodu cleaning		25	14	0.3	105	m3	235.6	24738
	Earth work								
	Foundation	1	14	2	0.8	22.4			
	Apron (3m+2m)	1	5	14	0.3	21			
	Abutment	2	1	1.2	0.6	1.44			
	Retaining wall	2	15	0.6	0.45	8.1			
2	Total					52.9	m3	235.6	**12473**
	DR work					0			
	foundation	1	14	1.5	0.3	6.3			
	Apron	1	4.5	14	0.3	18.9			
3	Retaining wall	2	15	0.6	0.45	8.1			
	Retaining wall superstructure	2	15	0.45	2	27			
						60.3	m3	1659	100038
4	CC 1:4:8 for using top belt	2	15	0.3	0.15	1.35	m3	6077	8203.95
5	DR for Apron	1	5	14	0.3	21	m3	1659	34839
6	CC for foundation	1	14	1.5	0.5	10.5			
	CC for abutment	2	1	0.6	2	2.4			
	CC for slab	1	14	1.5	0.2	4.2			
	CC for Base block	1	14	0.9	0.5	6.3			
	CC for pillar	5	0.9	0.9	1.8	7.29			
						30.7	m3	6077	186503
7	Re inforcement for RCC retaining wall @ Rs 50 kg /m3	30x50 kg				15	qtl	6339	95085
	Plastering cm 1:6, 12 mm thickness								
	Abutment	2	1	1		2			
	base block	1	14	1.9		26.6			
	Pillar	5	3.6	2		36			
	Apron	1	5	14		70			
8						135	M2	120	16152
9	wood work for shuttering	6	1.5	0.05	2	0.9	M3	39454	35508.6
	Total								**514010**
	Five Lakh fourteen thousand and ten rupees								

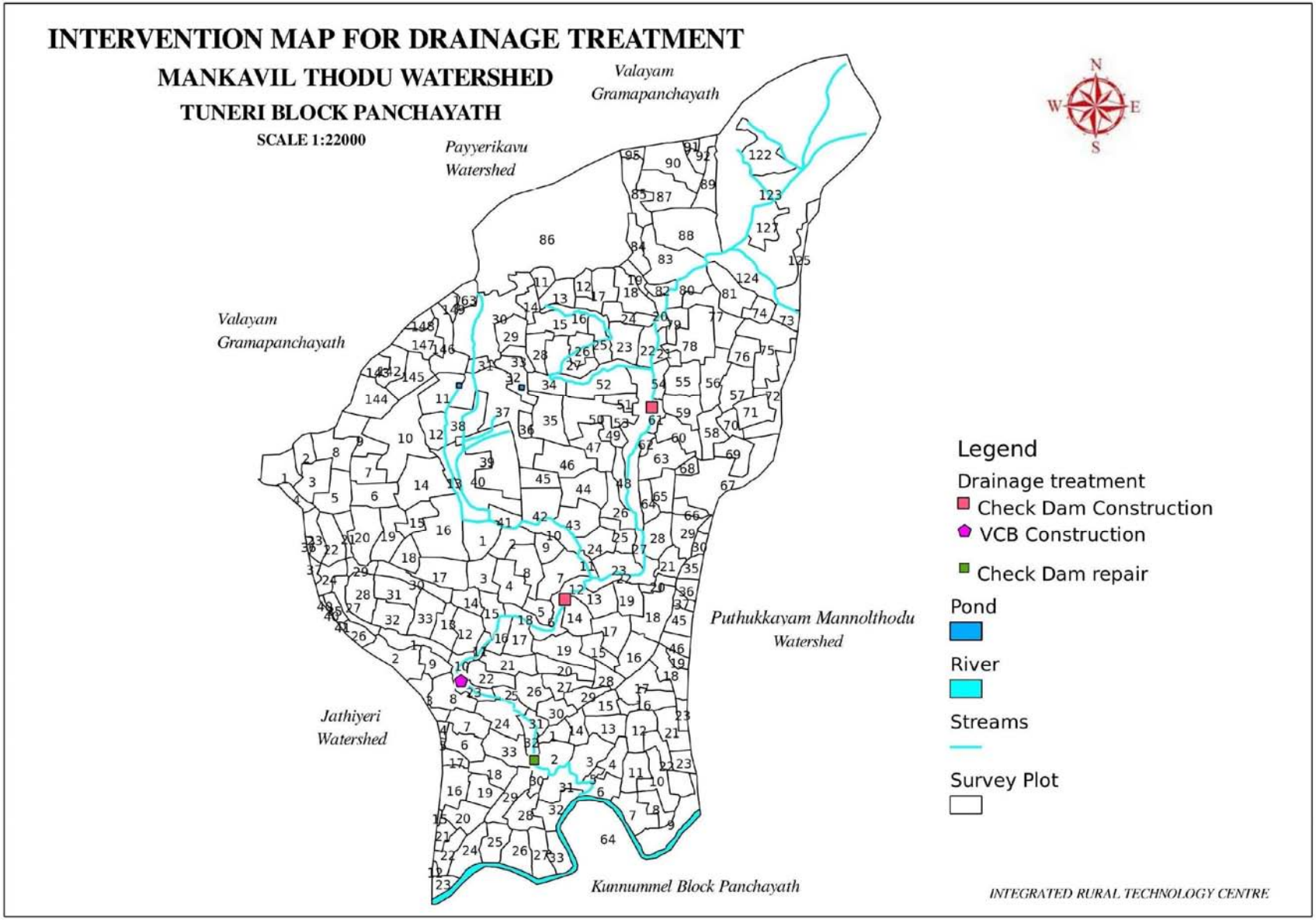
Detailed Estimate for Pond Renovation

Sl no	Pond renovation (survey no 11)								
	item of work	No	length	width	high	qty	unit	rate	amount
	Clearing the light jungle	1	15	10		150	100m2	377	565.5
2	Bailing Out Water from the pond for drain								8000
3	earth work excavation								
	Ist 1.5 m	1	15	10	1	150	m^3	294.5	44175
4	side bund strengthening	1	72	1	0.75	54	m^3	235.6	12722.4
	LS								1537
	Total Amount								67000

Map 23


INTERVENTION MAP FOR AREA TREATMENT
MANKAVIL THODU WATERSHED
TUNERI BLOCK PANCHAYATH
SCALE 1:22000
Payyerikavu Watershed
Valayam Gramapanchayath
Puthukkayam Mannolthodu Watershed
Jathiyeri Watershed
Kunnummel Block Panchayath
N
W
E
S
Legend
Area treatment
SB
ECB
AF+HD
ECB+SB
SB+CT+HD
SB+RSB+HD
ECB+SB+CT+HD
ECB+RSB+AF+HD
SB+RSB+CT+AF+HD
ECB+SB+RSB+AF+HD
ECB+SB+RSB+CT+AF+HD
River
Survey boundary
ECB-Earthern Contour bund,SB-Stone bund,RSB-Restoration Stone bund,
CT-Contour terracing,AF-Agro Forestry,HD-Horticulture development.
INTEGRATED RURAL TECHNOLOGY CENTRE

Map 24


INTERVENTION MAP FOR DRAINAGE TREATMENT
MANKAVIL THODU WATERSHED
TUNERI BLOCK PANCHAYATH
SCALE 1:22000
Valayam Gramapanchayath
Payyerikavu Watershed
Valayam Gramapanchayath
Puthukkayam Mannolthodu Watershed
Jathiyeri Watershed
Kunnummel Block Panchayath
N
W
E
S
Legend
Drainage treatment
Check Dam Construction
VCB Construction
Check Dam repair
Pond
River
Streams
Survey Plot
INTEGRATED RURAL TECHNOLOGY CENTRE

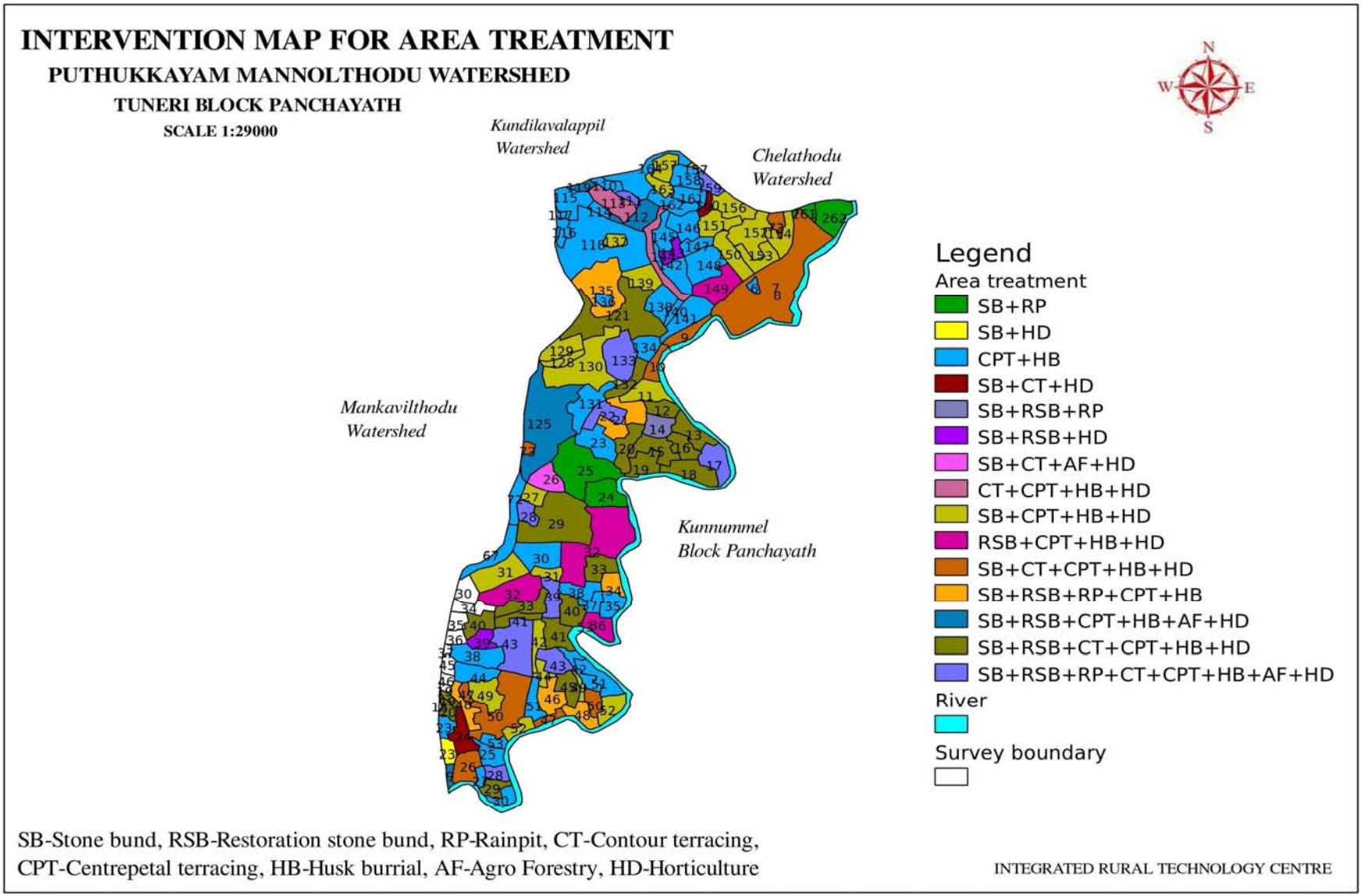
Detailed Estimate for Side protection, Pond renovation, and Side protection with Embankment

Name of watershed : PUTHUKYAM- MANNOLTHODU									
Type of work :Side protection									
Sl No	Stream	Item of work	Survey No	Length	Breadth	High	Quantity	Unit Rate	Total Cost
1	Kodiyura Chal	Earth work	19,20, 15	250	0.75	0.3	56.25	235.6	13252.5
		DR work		250	0.75	1	187.5	1659	311062.5
	Total								324315.00

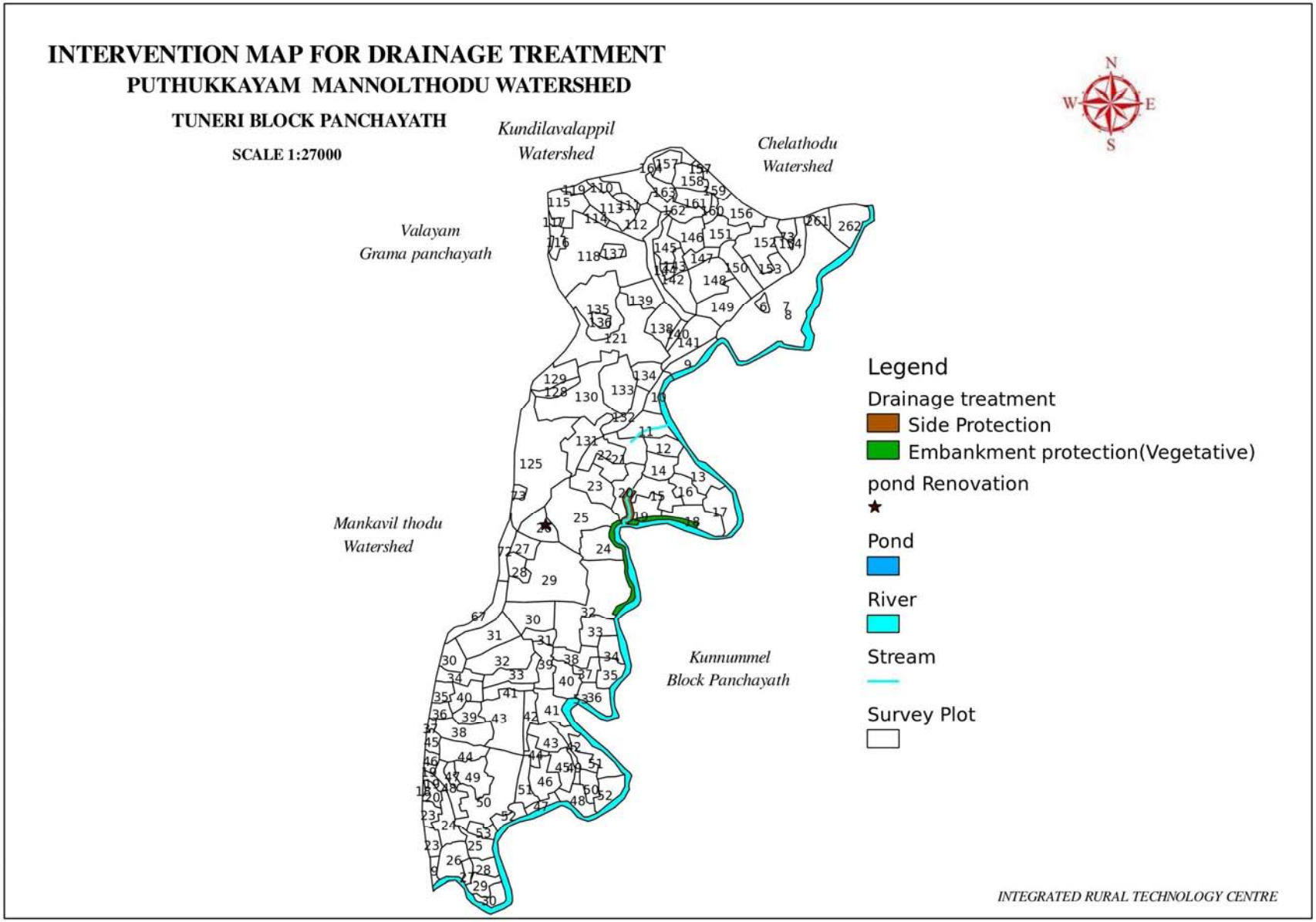
Type of work :Pond renovation								
Survey No :26								
No	length	width	height	qty	unit	rate	amount	
1 Clearing the light jungle	1	25	20		500	100m2	377	1885
2 Bailing Out Water from the pond for drain								15000
3 Earth work excavation Fist 1.5 m	1	25	20	1	500	m^3	294.5	147250
4 Side bund strengthening	1	72	1	0.75	54	m^3	235.6	12722.4
5 LS								1537
		Total						**178394**

Type of work :Embankment protection (Vegetative)									
name of watershed : Puthukayam- Mannolthodu									
Sl No	Stream	Item of work	Survey No	Length	Breadth	High	Quantity (RM)	Unit Rate	Total Cost
1	Mahe river	Side protection (Embankment)	18,19 ,25,24	1500			1500	100	150000

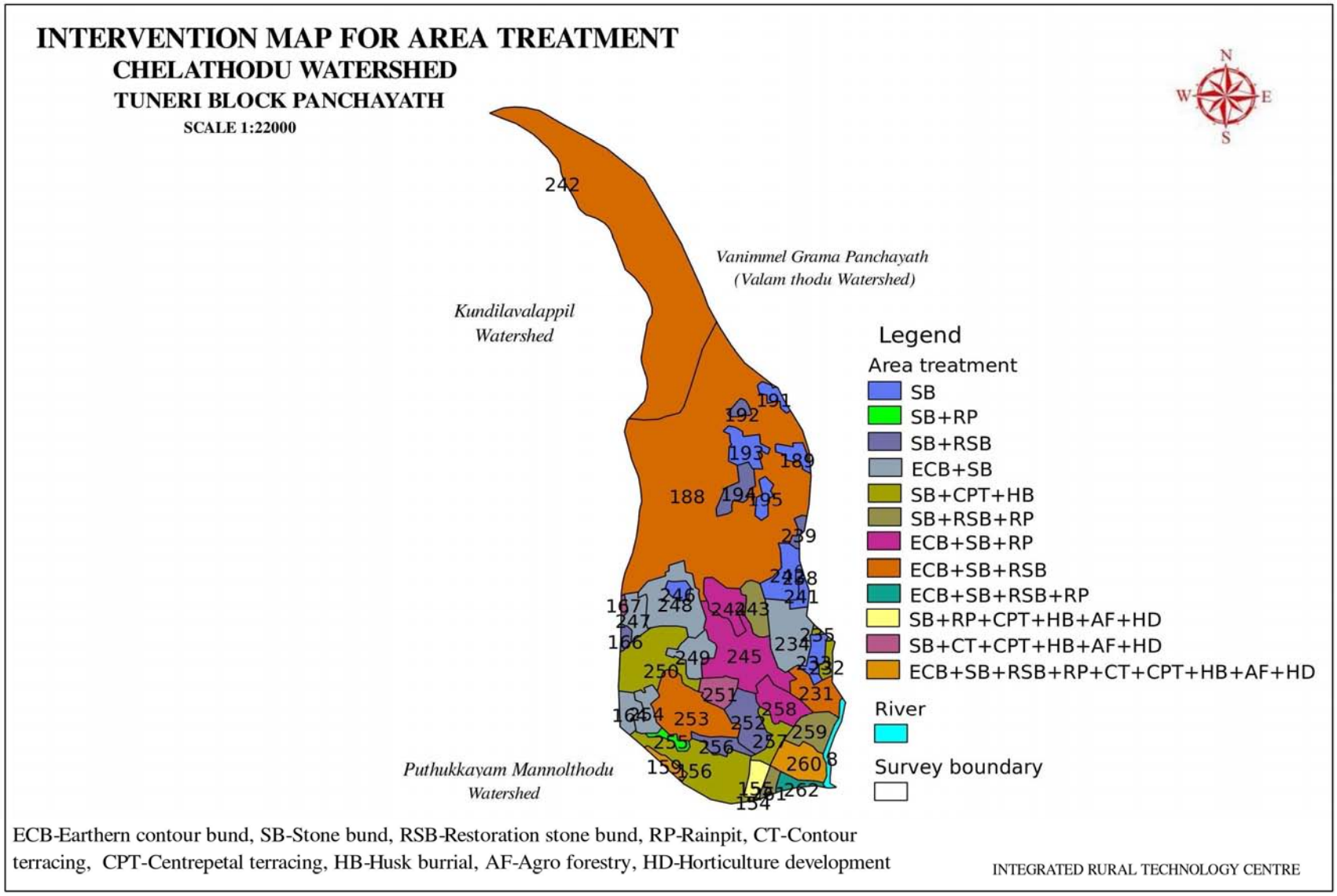
Map 25


INTERVENTION MAP FOR AREA TREATMENT
PUTHUKKAYAM MANNOLTHODU WATERSHED
TUNERI BLOCK PANCHAYATH
SCALE 1:29000
Kundilavalappil Watershed
Chelathodu Watershed
Mankavilthodu Watershed
Kunnummel Block Panchayath
N
W
E
S
Legend
Area treatment
SB+RP
SB+HD
CPT+HB
SB+CT+HD
SB+RSB+RP
SB+RSB+HD
SB+CT+AF+HD
CT+CPT+HB+HD
SB+CPT+HB+HD
RSB+CPT+HB+HD
SB+CT+CPT+HB+HD
SB+RSB+RP+CPT+HB
SB+RSB+CPT+HB+AF+HD
SB+RSB+CT+CPT+HB+HD
SB+RSB+RP+CT+CPT+HB+AF+HD
River
Survey boundary
SB-Stone bund, RSB-Restoration stone bund, RP-Rainpit, CT-Contour terracing,
CPT-Centrepetal terracing, HB-Husk burrial, AF-Agro Forestry, HD-Horticulture
INTEGRATED RURAL TECHNOLOGY CENTRE

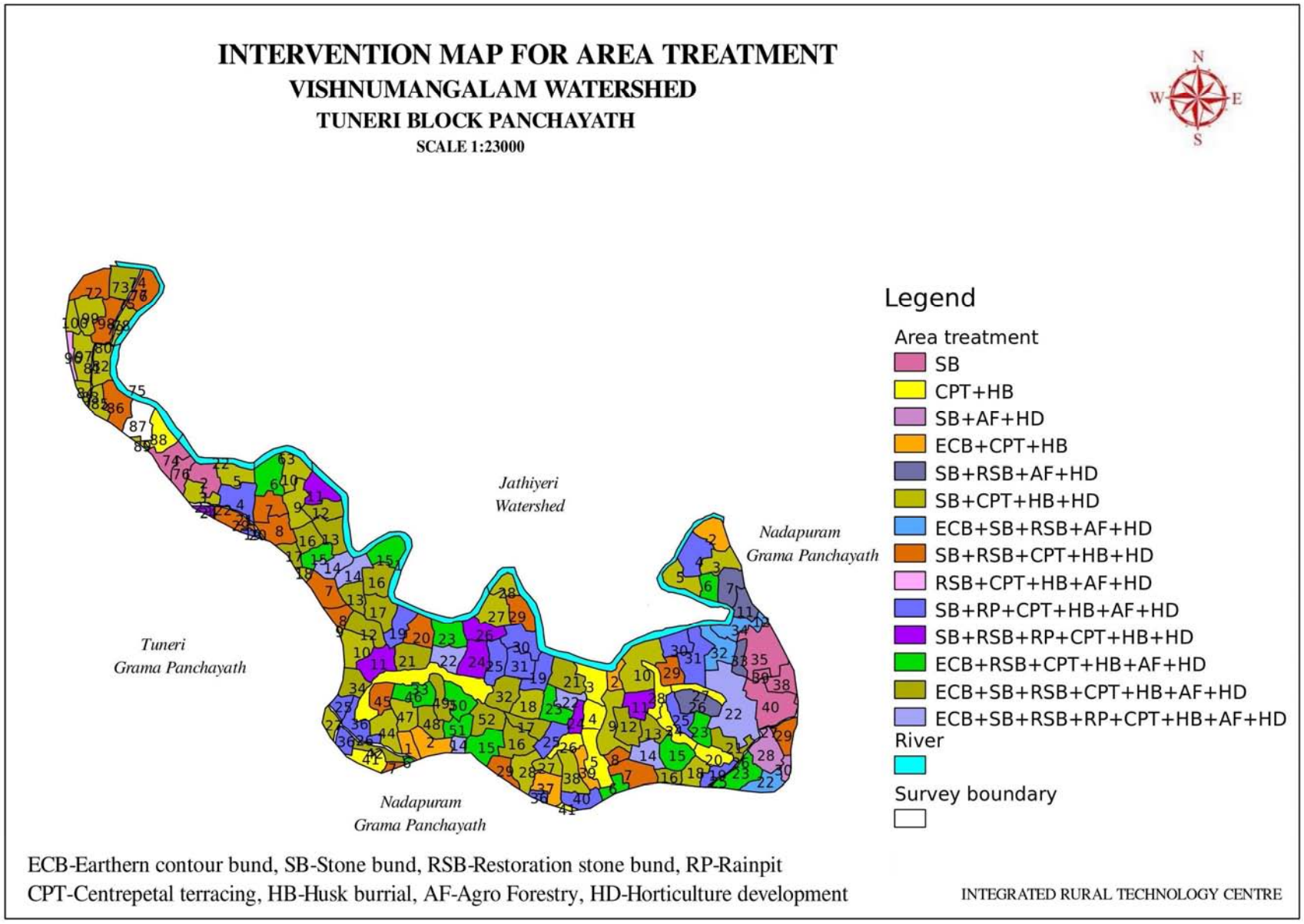
Map 26


INTERVENTION MAP FOR DRAINAGE TREATMENT
PUTHUKKAYAM MANNOLTHODU WATERSHED
TUNERI BLOCK PANCHAYATH
SCALE 1:27000
Kundilavalappil Watershed
Chelathodu Watershed
Valayam Grama panchayath
Mankavil thodu Watershed
Kunnummel Block Panchayath
N
W
E
S
Legend
Drainage treatment
Side Protection
Embankment protection(Vegetative)
pond Renovation
Pond
River
Stream
Survey Plot
INTEGRATED RURAL TECHNOLOGY CENTRE

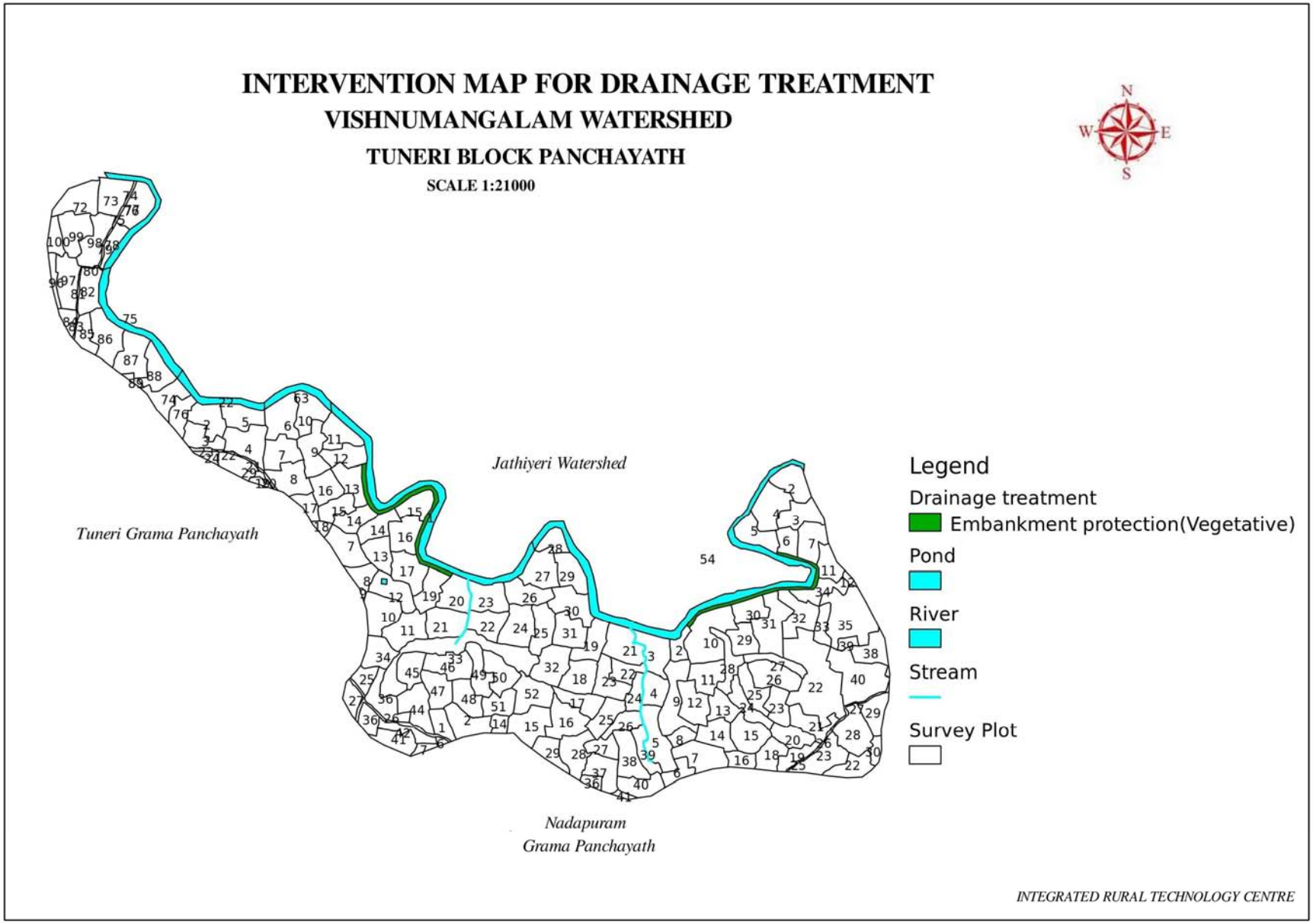
Map 27


INTERVENTION MAP FOR AREA TREATMENT
CHELATHODU WATERSHED
TUNERI BLOCK PANCHAYATH
SCALE 1:22000
N
W
E
S
Vanimmel Grama Panchayath
(Valam thodu Watershed)
Kundilavalappil
Watershed
Puthukkayam Mannolthodu
Watershed
Legend
Area treatment
SB
SB+RP
SB+RSB
ECB+SB
SB+CPT+HB
SB+RSB+RP
ECB+SB+RP
ECB+SB+RSB
ECB+SB+RSB+RP
SB+RP+CPT+HB+AF+HD
SB+CT+CPT+HB+AF+HD
ECB+SB+RSB+RP+CT+CPT+HB+AF+HD
River
Survey boundary
ECB-Earthern contour bund, SB-Stone bund, RSB-Restoration stone bund, RP-Rainpit, CT-Contour terracing, CPT-Centrepetal terracing, HB-Husk burrial, AF-Agro forestry, HD-Horticulture development
INTEGRATED RURAL TECHNOLOGY CENTRE

Map 28


INTERVENTION MAP FOR AREA TREATMENT
VISHNUMANGALAM WATERSHED
TUNERI BLOCK PANCHAYATH
SCALE 1:23000
N
W
E
S
Jathiyeri Watershed
Nadapuram Grama Panchayath
Tuneri Grama Panchayath
Nadapuram Grama Panchayath
Legend
Area treatment
SB
CPT+HB
SB+AF+HD
ECB+CPT+HB
SB+RSB+AF+HD
SB+CPT+HB+HD
ECB+SB+RSB+AF+HD
SB+RSB+CPT+HB+HD
RSB+CPT+HB+AF+HD
SB+RP+CPT+HB+AF+HD
SB+RSB+RP+CPT+HB+HD
ECB+RSB+CPT+HB+AF+HD
ECB+SB+RSB+CPT+HB+AF+HD
ECB+SB+RSB+RP+CPT+HB+AF+HD
River
Survey boundary
ECB-Earthern contour bund, SB-Stone bund, RSB-Restoration stone bund, RP-Rainpit
CPT-Centrepetal terracing, HB-Husk burrial, AF-Agro Forestry, HD-Horticulture development
INTEGRATED RURAL TECHNOLOGY CENTRE

Map 29


INTERVENTION MAP FOR DRAINAGE TREATMENT
VISHNUMANGALAM WATERSHED
TUNERI BLOCK PANCHAYATH
SCALE 1:21000
N
W
E
S
Jathiyeri Watershed
Tuneri Grama Panchayath
Nadapuram
Grama Panchayath
Legend
Drainage treatment
Embankment protection(Vegetative)
Pond
River
Stream
Survey Plot
INTEGRATED RURAL TECHNOLOGY CENTRE

SUSTAINABILITY

The projects under IWMP Scheme aim at sustainability in the long run. This is achieved through the establishment of Watershed Development Fund which takes care of past project maintenance and sustenance. This fund is meant to sustain the maintenance of the assets created during the course of project implementation so that the people in the watershed area continue to reap the benefits even after the completion of the project. Further, the village level institutions such as Watershed Committee remain in position even after the PIA withdraws from the project after its completion. These institutions have intrinsic strength as they are self-constituted and lead by natural leaders in the villages. The institutional arrangements envisaged in the guidelines ensure sustainability and the resources augmented and economic plans developed are made the foundation to create new nature based, sustainable livelihoods and raise productivity levels

a. Consolidation and completion of various works.

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

c. Sustainable management of natural resources

d. Up-scaling of successful experiences regarding farm production systems / off-farm livelihoods

EXPECTED OUTCOME

The expected outcome of the project include the overall increase in the standard of living of the people in the watershed by mitigating the various constraints in the development of the natural resources which will increase the productivity of various activities. The end result will be increase in the employment and income of the farm households and as well as landless households.

Moreover, the intervention will have multiple benefits available to communities in terms of employment, check in migration, improvement in water table, more area under agriculture and horticulture, check in soil loss and decrease in Flood and drought incidences, improvement in crop yield, milk yield, check in degrading of land etc. The benefits thus accrued would be short term and long term.

Employment:

The Project plans for creation of both wage employment and self-employment would be created by engaging people in watershed. Physical works like construction of earthen bunds, gully plugging, horticulture development, plantation, etc. self-employment would be created by providing the people with cash support in the form of direct livelihood activities like agriculture, animal husbandry and enterprises development

Table 84 : Expected employment related outcomes.

Employment generation																
Sl No	Names of Watersheds	Wage employment										Self-Employment				
		No of Man Days					No of Beneficiaries					No of Beneficiaries				
		SC	ST	Others	Women	Total	SC	ST	Others	Women	Total	SC	ST	Others	Women	Total
1	(29M9c) Aroonda II	4	2	452	284	742	4	2	452	284	742	2	1	113	227	343
2	(29M9d) Kalikolumb	7	9	1037	652	1705	7	9	1037	652	1705	4	5	259	522	790
3	(29M9e) Koodalai Puncha	4	4	523	329	860	4	4	523	329	860	2	2	131	263	398
4	(29M9g) Kundilavalappil	2	9	391	247	649	2	9	391	247	649	1	5	98	198	302
5	(29M9i) Payyerikkavu	3	2	370	232	607	3	2	370	232	607	2	1	92	186	281
6	(29M9j) Kayalottuthazhe	8	5	1069	672	1754	8	5	1069	672	1754	5	3	267	537	812
7	(29M11a) Jathiyeri	8	6	1113	699	1826	8	6	1113	699	1826	5	4	278	560	847
8	(29M12a) Mankavilthodu	9	15	1428	899	2351	9	15	1428	899	2351	6	9	357	719	1091
9	(29M13a) Puthukayam - Mannolthodu	3	13	593	374	983	3	13	593	374	983	2	8	148	300	458
10	(29M14a) Chelathodu	2	11	471	297	781	2	11	471	297	781	1	6	118	238	363
11	(29M25a) Vishnumangalam	13	0	1609	1009	2631	13	0	1609	1009	2631	8	0	402	807	1217
	Total	**63**	**76**	**9056**	**5694**	**14889**	**63**	**76**	**9056**	**5694**	**14889**	**38**	**44**	**2263**	**4557**	**6902**

Drinking water:

The people living in the project area are facing scarcity of water in the summer season. But the post project level, people of this watershed, expect has no shortage of drinking water even during summer months.

Ground water table:

In the presence scenario the ground water level of open wells varies from 10meter to 16 meter, from village to village. The groundwater has gone down due to rapid urbanization and maximum ground water harvesting without any sustainable measure. The watershed activities like roof water harvesting, well recharging, rain water harvesting pits, staggered trenches, etc. will help in ground water recharging under this project and it is expected that the ground water level will come up and reach at 8 to 12 meter.

Table No: 85 ***Statues of drinking water***

Sl. No.	Names of the Watersheds	Availability of drinking water (no. of months in a year)		Quality of drinking water	
		Pre-project	Expected Post-project	Pre-project	Expected Post-project
1	(29M9c) Aroonda II	8-10	9-11	Potable	Potable
2	(29M9d) Kalikolumb	7-9	9-10	Potable	Potable
3	(29M9e) Koodalaipuncha	8-12	10-12	Potable	Potable
4	(29M9g) Kundilavalappil	7-11	9-12	Potable	Potable
5	(29M9i) Payyerikavu	8-12	10-12	Potable	Potable
6	(29M9j) Kayalottuthazhe	7-12	10-12	Potable	Potable
7	(29M11a) Jathiyeri	8-12	10-12	Potable	Potable
8	(29M12a) Mankavilthodu	7-12	10-12	Potable	Potable
9	(29M13a) Puthukayam - Mannolthodu	9-12	10-12	Potable	Potable
10	(29M14a) Chelathodu	8-10	9-11	Potable	Potable
11	(29M25a) Vishnumangalam	8-12	10-12	Potable	Potable

Agriculture:

Agriculture primarily depends upon water. The planned earthen bunds would prevent the saline water to mix with sweet water and also help percolate sweet water underground, and preserve some

moisture in the soil. This will help in additional area coming under cultivation and increasing productivity too. The farmers can take more than one season of crop.

Fodder:

Although there are a large number of cattle populations in the village, availability of fodder for them is scarce. The villagers are not aware of quality fodder crops and its benefits for the animals. Initially fodder grass cultivation proposed in the project area.

Table No: 86 ***Increase/ Decrease in area under fodder***

Increase/ Decrease in area under fodder			
Sl. No.	Names of Watershed	Existing area under fodder (ha)	Expected Achievement through IWMP(ha)
1	(29M9c) Aroonda II	0.25	7
2	(29M9d) Kalikolumb	0.65	11
3	(29M9e) Koodalaipuncha	-	-
4	(29M9g) Kundilavalappil	0.25	-
5	(29M9i) Payyerikavu	-	6
6	(29M9j) Kayalottuthazhe	-	9
7	(29M11a) Jathiyeri	-	10
8	(29M12a) Mankavilthodu	0.45	15
9	(29M13a) Puthukayam - Mannolthodu	-	9
10	(29M14a) Chelathodu	-	6
11	(29M25a) Vishnumangalam	-	6

Milk Production:

The villagers are not use to extract milk from their cows due to poor health condition of the cows and for feeding the calf. The households get milk from their cows occasionally. If the cows are feed with quality fodder and proper health facility is provided, these cows can give more milk on a regular basis. Steps are proposed to improve the breeds by artificial insemination so that the milk production can increase in future.

Table No: 87 *Details of Livestock in the project areas*

Sl. No	Name of Watershed	Type of Animals	Pre project				Post Project			
			No.	Unit	Yield	Income (In Rs.)	No.	Unit	Yield	Income (In Rs.)
1	(29M9c) Aroonda II	Cow	112	ltr	27300	955500	130	ltr	42200	1477000
		Goat	86	ltr	1911	47775	103	ltr	3850	96250
		Poultry	420	kg	420	42000	510	kg	510	51000
		Duck	2	kg	3	450	12	kg	18	2700
2	(29M9d) Kalikolumb	Cow	122	ltr	30240	1058400	140	ltr	36750	1286250
		Goat	256	ltr	7462	186550	285	ltr	8662	216550
		Poultry	530	kg	530	53000	610	kg	610	61000
		Duck	2	kg	3	450	8	kg	12	1800
3	(29M9e) Koodalaipuncha	Cow	122	ltr	28980	1014300	141	ltr	33250	1163750
		Goat	202	ltr	4914	122850	237	ltr	5660	141500
		Poultry	689	kg	689	68900	792	kg	792	79200
		Duck	12	kg	18	2700	20	kg	30	4500
4	(29M9g) Kundilavalappil	Cow	162	ltr	37440	1310400	177	ltr	43040	1506400
		Goat	217	ltr	5642	141050	234	ltr	6495	162375
		Poultry	658	kg	658	65800	756	kg	756	75600
		Duck	16	kg	16	2400	22	kg	33	4950
5	(29M9i Payyerikavu	Cow	101	ltr	31200	1092000	122	ltr	35900	1256500
		Goat	60	ltr	1456	36400	82	ltr	6125	153125
		Poultry	178	kg	178	17800	223	kg	223	22300
		Duck	12	kg	18	2700	24	kg	36	5400
6	(29M9j) Kayalottuthazhe	Cow	83	ltr	21840	764400	102	ltr	25100	878500
		Goat	132	ltr	5824	145600	152	ltr	6775	169375
		Poultry	530	kg	530	5300	635	kg	635	63500
		Duck	2	kg	3	450	8	kg	12	1800
7	(29M11a) Jathiyeri	Cow	132	ltr	38880	1360800	156	ltr	42680	1493800
		Goat	232	ltr	6734	168350	277	ltr	7835	195875
		Poultry	630	kg	630	6300	755	kg	755	75500
		Duck	2	kg	3	450	10	kg	15	2250
8	(29M12a) Mankavilthodu	Cow	325	ltr	128640	4502400	348	ltr	141100	4938500
		Goat	238	ltr	6279	156975	274	ltr	7350	183750
		Poultry	2736	kg	2736	273600	3126	kg	3126	312600
		Duck	59	kg	88	13200	72	kg	108	16200
9	(29M13a) Puthukayam - Mannolthodu	Cow	86	ltr	27840	974400	98	ltr	32050	1121750
		Goat	127	ltr	4459	111475	145	ltr	5250	131250
		Poultry	573	kg	573	57300	668	kg	668	66800
		Duck	19	kg	28	4200	28	kg	42	6300
10	(29M14a) Chelathodu	Cow	67	ltr	22260	779100	78	ltr	25650	897750
		Goat	13	ltr	364	9100	26	ltr	455	11375
		Poultry	638	kg	638	63800	735	kg	735	73500
		Duck	60	kg	90	13500	76	kg	114	17100
11	(29M25a) Vishnumangalam	Cow	58	ltr	19680	688800	72	ltr	22760	796600
		Goat	72	ltr	1911	47775	95	ltr	2250	56250
		Poultry	188	kg	188	18800	235	kg	235	23500
		Duck	12	kg	18	2700	20	kg	30	4500

User Group:

Although there are several UGs existing in the village, but they are never involved in any activities for generating income. These groups are identified and proposed to be assisted for taking group activities for their livelihoods. Similarly two more groups can be formed as per the interest of the women community and trained for different activities so that more and more women will be involved in income generation.

Increase in Livelihoods:

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

Migration:

As migration is not a good sign for a developing society , steps are suggested to discourage the migrating families by making labour oriented works available in the village at the migrating time. Migrating young's are proposed to be provided alternate livelihood options for their self employment. Wage employments and better opportunities are common reasons for migration. At present there are very less job opportunities available and hence they migrate to other towns/ cities for the better employment.

Table No: 88. ***Detail of seasonal migration***

Sl No	Watershed	No of person Migrating per Month		No of Days per year of migration	
		Pre-project (Days)	Expected post project (Days)	Pre-project (Days)	Expected post project (Days)
1	(29M9c) Aroonda II	23	18	1341	1155
2	(29M9d) Kalikolumb	52	47	6415	5850
3	(29M9e) Koodalaipuncha	26	16	631	522
4	(29M9g) Kundilavalappil	20	15	1977	1225
5	(29M9i) Payyerikavu	19	16	1096	950
6	(29M9j) Kayalottuthazhe	54	43	6609	5850
7	(29M11a) Jathiyeri	56	45	5595	4750
8	(29M12a) Mankavilthodu	72	65	4241	3850
9	(29M13a) Puthukayam - Mannolthodu	30	18	3684	2821
10	(29M14a) Chelathodu	24	18	571	435
11	(29M25a) Vishnumangalam	81	69	8071	7523
	Total	**457**	**350**	**40231**	**34931**

Formation of UG Federation:

Although numbers of UGs have been formed in the locality very few are involved in some activities. Most of the members are not aware of the concept of UG and their role. But individually most of them are involved in any kind of activities, mostly farmers and labours etc Resource use: Steps will be taken for developing the status of common property resources like forest, pasture and water bodies. Awareness will be created among the villagers for using the resources by every family in a systematic manner so that optimum utilization of these resources can be possible

WATERSHED DEVELOPMENT FUND

A locally acceptable and proper mechanism for utilization of watershed development funds for post project maintenance and its augmentation will be specified by the project. During the project period total expenditure will be Rs. 85680000/- for undertaking different watershed activities for successful completion of the project of accomplishment of the objectives. The details of the activities have been explained in the action plan prepared at the PIA level with the support of the community members and field functionaries. The excepted collection of Watershed Development Fund will be utilized for post project maintenance of the assets.

People's contribution towards the Watershed Development Fund (WDF) plays a vital role for post project maintenance of assets created during the project period. The contributions to WDF shall be a minimum 10% of the cost of NRM works executed on private lands only. However, in case of SC/ST, small and marginal farmers, the minimum contribution shall be 5% of the cost of NRM works executed on their lands. However, for other cost intensive farming system activities such as Aquaculture, Horticulture, Agro-forestry, Animal Husbandry etc on private land directly benefiting the individual farmers, the contribution of farmers will be 20% for General category and 10% for SC & ST beneficiaries and the remaining cost of the activities i.e. 80% for the General and 90% for SC/ST category will come from the project funds subject to a maximum limit of an Amount equal to double of the standard unit cost norm for Watershed Development Project.

These contributions would be acceptable either in cash at the time of execution of works or voluntary labour. A sum equivalent to the monetary value of the voluntary labour would be transferred from the watershed project account to the WDF bank account that will be distinct from the Watershed Committee (WC) bank account. User charges, sales proceeds and disposal amounts of intermediate usufruct rights shall also be deposited in the WDF bank account. Income earned from assets created under the project on common property resources shall also be credited to WDF .The Secretary, Watershed Committee (WC) shall maintain a completely separate account of the income and

expenditure of the WDF. Rules for operation of the fund should be prepared by the Watershed Committee (WC) and ratified by the Gram Sabha. The WDF bank account should be operated by the President of the Gram Panchayath and any member from the SHG nominated by the Gram Sabha. Alternatively, the guidelines for the management and utilization of the WDF may be evolved by the concerned Nodal Ministry .After completion of Phase II, at least 50% of the WDF funds shall be reserved for maintenance of assets created on community land or for common use under the project. Works taken up on private land shall not be eligible for .Repair/maintenance out of this Fund. The remaining money may be used as a revolving fund to advance loans to the villagers of the project area who have contributed to the fund. Individuals as well as charitable institutions should be encouraged to contribute generously to this Fund.

USER CHARGES:

The watershed committee with proper approval from Gram Sabha has finalized a mechanism for collection user's charges. It has also finalized that no charge will be taken from landless, destitute or disabled / widow headed households for work done on private or public land. The user charges collected shall be credited to the WDF for maintenance of assets created during the project life.

EXIT PROTOCOL:

Integrated Watershed Management Programme will be implemented in 7 years in watershed areas with certain objectives and prescribed activities. Starting from selection of the watershed up to evaluation, in each respect people's participation has been accorded foremost priority. It is need less to mention that successful implementation of the project is based on participation of the people in each and every activity. After completion of the project period, the project is except to self sustain in the watershed areas and the key of sustainability lies in the hands of the people. The assets created will be handed over to the Block Panchayath and president of Block Panchayath and User Groups with prior approval of the watershed association will maintain the same.

As decided by the watershed association in exit protocol to be ensured that the secretary, watershed committee (WC) shall maintain a completely separate account of the income and expenditure of the WDF. In this context the rules for operation of the funds is prepared by the watershed committee (WC) and ratified by the Gram Sabha.

After completion of phase II, at least 50% of the WDF funds will be reserved for maintenance of assets created on community land or for common use under the project. Works taken up on private land or individual assets the concerned beneficiaries will do the repair / maintenance. The remaining amount will be used as a revolving fund to advance loans to the groups of the project area who have contributed

to the fund. Regular monitoring of the project will have to be carried out at each stage for contribution to the watershed development fund from watershed level to district level.

All the members of the User Groups and staff such as watershed president, secretary, Treasurer, volunteers and members have been given orientation and training to improve their knowledge and upgrade technical / management and community organizational skills to a level that is appropriate for the successful discharge of their responsibilities

The village community will be organized into several, homogeneous self-help groups for savings and other income generation activities, which would have achieved sufficient commitment from their members and build up financial resources to be self-sustaining. In this regard an agreement has been made between User Groups and Project Implementing Agency for post project management of the assets created and over all development in a sustainable manner.

Project Summary

Integrated Watershed Management Programme is a centrally sponsored programme. Among the Other Block Panchayaths in Kozhikode District the Tuneri lock Panchayath occupied for the project of IWMP IInd phase. The Tuneri Block is located in Vadakara Taluk of Kozhikode District comprising of eight panchayath. The Project area situates in Chekyad, Tuneri, Valayam, Vanimel, and Nadapuram Panchayaths that has an area of 5712 ha covered eleven micro watersheds and the total amount sanctioned for the project is 856.80 Lakhs. Tuneri Block is plays a role of PIA and IRTC provide technique support to the project.

The project area comes under Mahe River Basin and it is situates an altitude of 20 m to 940 m from the Mean Sea Level. Severe and Moderate soil erosion, Ground Water depletion, Low productivity, Low wage rate, Migration are the major problems faced of this project area. Soil and water conservation measures and livelihood activities are the main activities for check the issues in the project area through the mechanism of User Groups V.E.O. is the secretary of User Groups in each watershed.

During the period of project the PIA and User Groups are maintained the Action Plan. After the completion of the project period, the project is except to self sustain in the watershed area and Key of sustainability lies in the hands of the people. The assets created will be handed over to the Block Panchayath and president of Block Panchayath and UGs with prior approval of watershed association will maintain the same.

CONCLUSION

Tuneri Block Panchayath (IWMP II) has been Sanction under the Integrated Watershed Management Programme running under the new Common Guideline 2011. It is located in North East direction of the Vadakara Taluk; Kozhikode district and Kerala state. It consists of five panchayath (Chekyad, Tuneri, Valayam, Vanimel, and Nadapuram). The total Geographical area of the watershed project is about 5712 ha. This covers 11 Micro watersheds and the total amount sanctioned for the project is 856.80 Lakhs. Tuneri Block is plays the role of PIA (Project Facilitating Agency) and IRTC provide the technique support to the project.

With the Several interventions under IWMP project such as Livelihood support, Farm Production System, various types of activities relating to soil conservation measures, protection to field by constructing the structures etc., it is expected that these Watershed area will gain a lot. This intervention will have multiple benefits available to communities in terms of employment, check in migration, improvement in water table, more area under agriculture and horticulture, check in soil loss and decrease in Flood and drought incidences, improvement in crop yield, milk yield, check in degradation of land etc. The benefits thus accrued would be short term and long term. With the judicious use of funds available under IWMP and with convergence from MGNREGA, this project will proves to be very beneficial in improving socio – economic status of people residing in Project area.