

# Progress Report and Action Plan 2021 – 2022

## 4<sup>th</sup> State Level Steering Committee Meeting 27 Jan 2021

# Water Security and Climate Adaptation in Rural India (WASCA) - Tamil Nadu



Implemented by  
**giz** Deutsche Gesellschaft  
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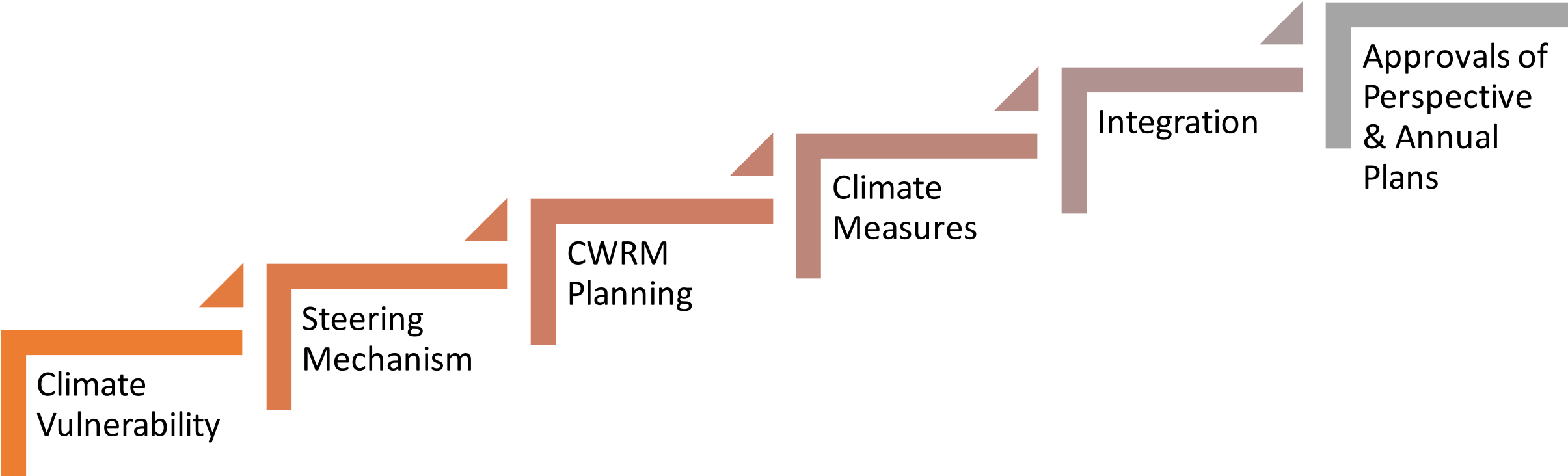
Ministry of Rural Development  
Government of India



Ministry of Jal Shakti  
Government of India



# WASCA – TN : Progress So far



## Water Security & Climate Adaptation: Tamil Nadu: Climate Vulnerability & Key Water Actions

S NO	Vulnerability Area	WASCA Vulnerability Indicators	S NO	Vulnerability Area	WASCA Vulnerability Indicators
1	<b>Climate Vulnerability</b>	changes in maxT	11	<b>Agriculture vulnerability</b>	Rainfed area
2		changes in minT	12		Cropping intensity
3		changes in RF	13		Soil moisture
4		Excess rainfall years	14		Evapotranspiration
5	<b>Water resource vulnerability</b>	Deficient rainfall years	15	<b>Socio-economic vulnerability</b>	Rural proportion
6		Ground water extraction	16		Multidimensional poverty index
7		Ground water Recharge	17		source of drinking water within premises in rural
8		surface water availability	18		marginal farmer_ landholdings
9		water gap			
10		% of contamination			

Water Action 1: Development of Public & Common Lands

Water Action 2: Development of Agriculture & Allied Activities

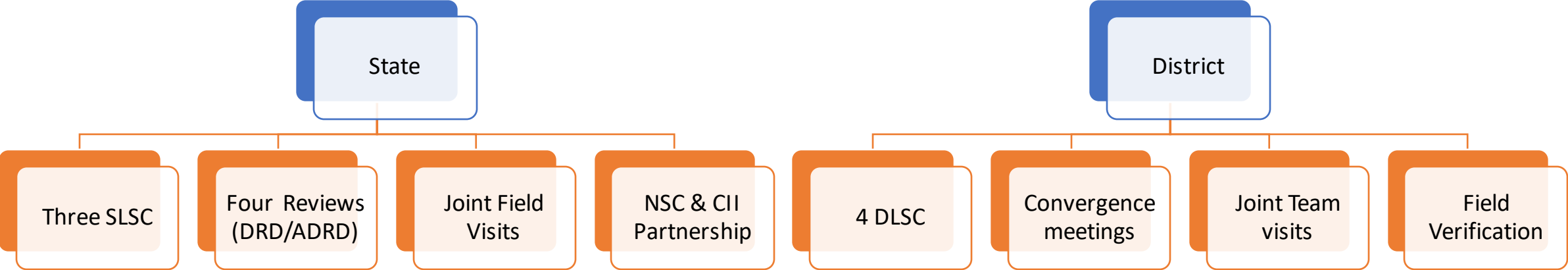
Water Action 3: Development of Rural Water Management

Water Action 4: Climate Resilience Measures

# Overview : Climate Vulnerability Indicators: Ramanathapuram and Thiruvannamalai

	Ramanathapuram	Thiruvannamalai
Exposure in climate extremities is very high during 1951-2015	<ul style="list-style-type: none"> <li>Increase in day time temp. is very high (1.4°C)</li> <li>Rainfall variability is very high</li> <li>Deficient rainfall years (&lt; 59%) are highest among all districts (18 years)14</li> </ul>	<ul style="list-style-type: none"> <li>Increase in day time temperature is high (1.2°C)</li> <li>Minimum temperature increase is high (0.5°C)</li> <li>Excess rainfall are more (15 years)</li> <li>Deficient rainfall years (15)</li> </ul>
Water resource vulnerability	<ul style="list-style-type: none"> <li>Low surface water availability</li> <li>Supply and Demand gap</li> <li>Saline/poor quality of water – firkas are more</li> </ul>	<ul style="list-style-type: none"> <li>Nearly 71 per cent of the blocks are overexploited</li> <li>Out of 52 firkas, 37 are OE, 7 are critical, 8 are semi-critical and there is no safe firka</li> <li>Ground water recharge is low</li> <li>Low surface water availability</li> <li>Demand supply gap is more and</li> <li>Fluoride and Nitrate contamination</li> </ul>
Agriculture vulnerability is very high among all districts	<ul style="list-style-type: none"> <li>Rain fed area (66.28 %)</li> <li>Cropping intensity is very low</li> <li>Evapotranspiration is more</li> <li>Soil moisture is very less</li> </ul>	<p>Soil moisture is less Evaporation is more</p>
Socio-economic vulnerability	<ul style="list-style-type: none"> <li>Poverty index is more (0.63)</li> <li>Source of drinking water within premises in rural area is very low (5.6 %)</li> <li>Marginal farmers are more (93 %)</li> <li>High rural proportion (69.7 %)</li> </ul>	<ul style="list-style-type: none"> <li>Poverty index (0.53)</li> <li>Source of drinking water within premises in rural is 18.8 per cent</li> <li>Marginal farmers are very high (94.7 per cent)</li> <li>Rural proportion is 79.9 per cent</li> </ul>

# Steering Mechanisms: WASCA TN



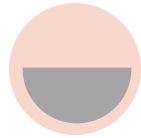
# Stages in CWRMP Planning



1

## Pre Planning

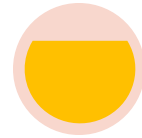
Localizing CWRM  
Categorizing Villages  
Capacity Building & Training  
Setting Targets



2

## Planning

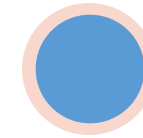
Collection on Non-Spatial Data  
Collection of Spatial data  
Water Budgeting  
Specific studies on ground water & salinity  
Non-NRM works inclusion  
Water Challenges  
Water Actions



3

## Review and Verification

KMZ preparation  
Field Verification  
GP discussion  
Review  
Adopting KMZ to NREGA soft in phases



4

## Integration and Approval

Inclusion into LB  
District Report  
Approval at SLSC / DLSC

# WASCA Tamil Nadu Profile of the Districts

## WASCA TN District Profile

S.N	Item	Ramanathapuram	Tiruvannamalai
1	Population	1353445	2464875
2	SC and ST Population	250520	656283
3	No of Blocks	11	18
4	No of Revenue Villages	380	1038
5	No of Gram Panchayats	439	860
6	No of River Basins	3	3
7	No of River Sub Basins	10	15
8	No of Catchments	3	3
9	No of Watersheds	7	13
	No of Micro Watershed	736	1364

# CWRMP: Parameters Ranking 1: Ramanathapuram

CWRM Parameter	Bogalur	Kadaladi	Kamudi	Mandapam	Mudukulathur	Nairnarkoil	Paramakudi	Rajasingamangalam	Ramanathapuram	Tiruppullani	Tiruvadanai
<b>Geographical Area</b>	11	1	2	10	5	9	6	8	4	7	3
<b>Population</b>	10	1	3	2	7	11	8	6	9	5	4
<b>Livestock population</b>	8	2	1	7	4	11	3	10	9	5	6
<b>Vulnerable popupation</b>	8	2	1	11	4	10	3	6	7	5	9
<b>SC Population</b>	7	2	1	11	4	10	3	6	8	5	9
<b>ST Population</b>	9	6	11	5	7	8	3	4	1	10	2
<b>Active person Job Cards</b>	11	2	1	8	3	10	5	7	9	6	4
<b>% of Clay Soil</b>	2	3	4	5	6	1	7	8	9	10	11
<b>Good Catchment RO</b>	10	2	4	6	7	1	8	9	11	5	3
<b>Average Catchment RO</b>	8	2	9	5	6	1	7	11	4	3	10
<b>Bad Catchment RO</b>	10	2	3	8	5	1	9	6	11	7	4
<b>Length of Natural Drinage Lines</b>	7	2	1	11	3	5	4	9	6	8	10
<b>Number of Micro Watershed</b>	10	2	1	11	3	7	8	4	6	9	5
<b>Length of Canal Network</b>	9	4	3	11	6	8	7	5	2	10	1
<b>Number of Tanks, Ooranis</b>	11	3	4	8	5	9	7	2	10	6	1
<b>Drinking Water Sources</b>	9	5	1	2	8	11	7	10	6	3	4



# CWRMP: Parameters Ranking 1: Ramanathapuram

CWRM Parameter	Bogalur	Kadaladi	Kamudi	Mandapam	Mudukulathur	Nairnarkoil	Paramakudi	Rajasingamangalam	Ramanathapuram	Tiruppullani	Tiruvadanai
% GW for Drinking	6	3	5	2	1	10	7	11	8	4	9
% GW for Agriculture	9	4	2	3	1	10	6	11	5	7	8
% GW for Livestock	7	11	3	6	10	1	5	8	2	4	9
Area Under Forest	4	1	5	6	7	8	9	10	2	11	3
Area under Non-Agricultural Uses	11	1	2	6	9	7	5	10	8	4	3
Barren & Un-cultivable Land Area	6	10	7	9	5	8	3	1	4	11	2
Permanent Pastures and Other Grazing Land Area	2	4	5	8	3	7	9	10	6	11	1
Land Under Miscellaneous Tree Crops etc. Area	7	2	9	5	8	4	6	1	11	3	10
Culturable Waste Land Area	11	1	8	3	5	10	9	2	6	7	4
Fallows Land other than Current Fallows Area	8	1	2	11	6	7	5	9	3	10	4
Current Fallows Area	5	8	1	4	7	6	2	9	3	11	10
Unirrigated Land Area	10	1	2	6	3	7	11	9	5	8	4
Area Irrigated by Source	10	2	6	11	8	9	5	7	1	4	3
Greywater Generation	10	1	3	2	7	11	8	6	9	5	4
% of Area Under Paddy	6	8	11	10	3	9	5	2	4	7	1
Water Demand For Humans	1	2	5	3	7	11	8	9	10	4	6
Water Demand For Agriculture	9	8	7	10	11	3	5	2	6	4	1
Water Demand for Livestock	10	1	4	9	3	11	8	5	7	6	2
Run Off Conserved	9	1	5	2	8	4	10	11	7	6	3
Ground Water Availability	11	8	2	10	4	6	1	3	7	9	5
Ground Water Recharge	11	8	2	10	4	6	1	3	7	9	5
Soil Moisture %	11	1	2	10	5	9	7	6	3	8	4
ET Losses	11	1	2	9	4	8	10	6	7	5	3

# CWRMP: Parameters 1: Tiruvannamalai

CWRM Parameter	Anakavoor	Arni	Chengam	Chetpet	Cheygar	Jawathu hills	Kalasapakkam	Keelpennathur	Pernamallur	Polur	Pudupalayam	Thandarampet	Theellar	Thiruvannamalai	Thurinapuram	Vandavasi	Vembakkam	West Arni
Total Geographical Area	9	15	4	13	12	18	14	11	10	8	16	1	5	7	3	6	2	17
Total Population	17	11	3	12	15	18	7	9	16	4	13	1	10	2	5	8	6	14
Total Livestock population	2	9	4	17	3	18	6	15	7	5	13	14	12	11	16	8	1	10
Vulnerable pupuation	9	15	2	18	14	3	7	10	16	13	12	1	8	4	11	5	6	17
SC Population	14	13	1	17	12	18	6	10	15	11	8	3	7	2	9	4	5	16
ST Population	3	15	6	17	12	1	16	5	11	14	13	2	7	4	9	8	10	18
Active person Job Cards	17	11	2	12	15	18	3	13	14	6	8	1	9	4	5	10	7	16
% of Clay Soil	7	14	1	8	13	15	16	11	10	17	3	2	12	6	4	9	5	18
Good Catchment RO	11	1	6	14	16	10	15	9	8	3	18	2	4	5	7	12	13	17
Average Catchment RO	11	17	10	9	4	7	13	18	6	1	15	5	8	12	14	2	3	16
Bad Catchment RO	12	17	3	13	10	18	14	8	11	9	15	1	6	2	4	7	5	16
Length of Natural Drainage Lines	15	13	3	14	18	1	5	9	17	4	7	2	10	8	6	11	12	16
Number of Micro Watershed	16	18	3	10	17	1	6	7	15	4	11	2	12	14	5	13	8	9
Length of Canal Network	11	8	16	1	7	18	12	4	14	5	17	2	6	9	15	10	3	13
Number of Tanks, Ooranis	4	16	10	12	9	18	13	5	3	17	14	15	2	8	7	6	1	11
Drinking Water Sources	17	12	3	11	14	18	7	10	15	4	16	1	9	2	5	8	6	13

# CWRMP: Parameters 1: Tiruvannamalai

CWRM Parameter	Anakavoor	Arni	Chengam	Chetpet	Cheyyar	Jawathu hills	Kalasapakkam	Keelpennathur	Pernamallur	Polur	Pudupalayam	Thandarampet	Thellar	Thiruvannamalai	Thurinapuram	Vandavasi	Vembakkam	West Arni
% GW for Drinking	5	8	11	17	15	1	14	13	3	16	18	10	2	9	12	6	4	7
% GW for Agriculture	18	10	11	1	15	9	8	6	16	3	2	5	14	7	4	13	17	12
% GW for Livestock	1	9	5	18	3	11	10	14	4	12	15	16	7	13	17	6	2	8
Area Under Forest	1	8	9	7	10	2	11	12	13	4	14	3	5	15	6	16	17	18
Area under Non-Agricultural Uses	1	16	17	8	6	18	11	14	4	9	13	5	7	12	10	3	2	15
Barren & Uncultivable Land Area	17	1	3	10	16	6	8	7	12	5	18	2	9	4	14	11	13	15
Permanent Pastures and Other Grazing Land Area	5	13	17	1	7	14	9	16	6	11	18	15	4	8	12	2	3	10
Land Under Miscellaneous Tree Crops etc. Area	2	16	17	8	1	18	6	10	5	11	13	15	7	9	14	4	3	12
Culturable Waste Land Area	17	13	4	15	10	3	14	18	8	1	12	2	7	9	11	5	6	16
Fallows Land other than Current Fallows Area	8	14	4	10	3	5	11	18	12	15	7	1	6	17	13	9	2	16
Current Fallows Area	5	14	2	13	6	18	16	7	12	15	11	17	4	3	9	8	1	10
Total Unirrigated Land Area	9	16	15	8	7	2	17	5	6	12	18	14	3	10	1	4	13	11
Area Irrigated by Source	14	16	5	7	15	18	4	10	12	3	8	1	9	2	6	11	13	17
Grewater Generation	17	11	3	12	15	18	7	9	16	4	13	1	10	2	5	8	6	14
% of Area Under Paddy	2	8	13	5	9	17	4	18	11	3	6	14	10	16	15	12	1	7
Water Demand For Humans	17	11	3	12	15	18	7	9	16	4	13	1	10	2	5	8	6	14
Water Demand For Agriculture	16	13	6	3	10	18	7	9	17	1	4	2	15	5	8	11	12	14
Water Demand for Livestock	2	9	4	17	3	18	6	15	7	5	13	14	12	11	16	8	1	10
Run Off Conserved	7	12	6	13	11	18	15	14	10	8	16	1	5	4	9	3	2	17
Ground Water Availability	12	16	8	10	13	9	17	11	14	5	18	1	7	6	4	2	3	15
Ground Water Recharge	12	16	8	10	13	9	17	11	14	5	18	1	7	6	4	2	3	15
Soil Moisture %	12	15	2	13	10	18	14	9	11	8	16	1	6	3	5	7	4	17
ET Losses	12	18	9	10	13	16	8	7	11	4	14	1	5	3	2	6	15	17
Ground Water Stuat	2	2	4	2	2	3	4	4	4	4	4	4	4	4	4	4	3	3

# CWRM Findings: Water Challenges

Parameter	Ramanathapuram	Tiruvannamalai
Total Surface Run Off Generated	690 MCM	1080.66 MCM
Total Surface Run off currently stored/ recharged	235.33 MCM	42574ha.m
Ground Water Availability	519.63 MCM	1047 MCM
Ground Water Recharge (annual)	577.36 MCM	1163 MCM
Estimated Soil Moisture	17%	23%
Estimated Evapotransmission losses	1095.59 MCM	1065.4MCM
No of Over exploited Firkhas	/0	38
No of Critical Firkas / Blocks	/1	3
No of Semi Critical Firkas / Blocks	/2	8
No of Safe Firkas / Blocks	/8	3
No of Micro water sheds	910	1849
No of Coastal Micro Watersheds	253	0
No of River Sub basins	11	15

# Catchment Area (Strange Method): Ramanathapuram

S. No	Block	Area in Ha			
		Good Catchment Area	Average Catchment Area	Bad Catchment Area	Total
1	2	3	4	5	6
1	Bogalur	3555.84	1425.49	12709.54	17690.87
2	Kadaladi	28967	11642.95	80102.67	120712.62
3	Kamudi	8982.23	1001.39	45978.71	55962.33
4	Mandapam	6554.4	2658.22	13924.52	23137.14
5	Mudukulathur	6026.02	1794.54	24425.32	32245.88
6	Nainarkoil	6209.47	2226.34	17905.5	26341.31
7	Paramakkudi	7858.48	2234.78	19082.05	29175.31
8	R.S.Mangalam	6273.64	692.88	30669.32	37635.84
9	Ramanathapuram	6622.2	8839.21	12573.98	28035.39
10	Tiruppullani	7897.01	6098	14434.12	28429.13
11	Tiruvadanai	10080.17	1102.63	28554.39	39737.19
	Total	99026.46	39716.43	300360.12	439103.01

# CWRM Findings: Water Challenges

Parameter	Ramanathapuram	Tiruvannamali
Water Demand For Human beings	40.22 MCM	54 MCM
Water Demand for Livestock	4.79 MCM	79.47 MCM
Water Demand for Agriculture	1374.24 MCM	2443.07 MCM
Total Run off generated	690 MCM	1080 MCM
% of Ground Water Utilization for Agriculture (est)	18%	89%
% of Ground Water Utilization for Drinking (est)	40% - 50%	70%-84%
% of estimated Ground Water Utilization for livestock	40%	58%

# Works Identified under WASCA TN through CWRM Planning

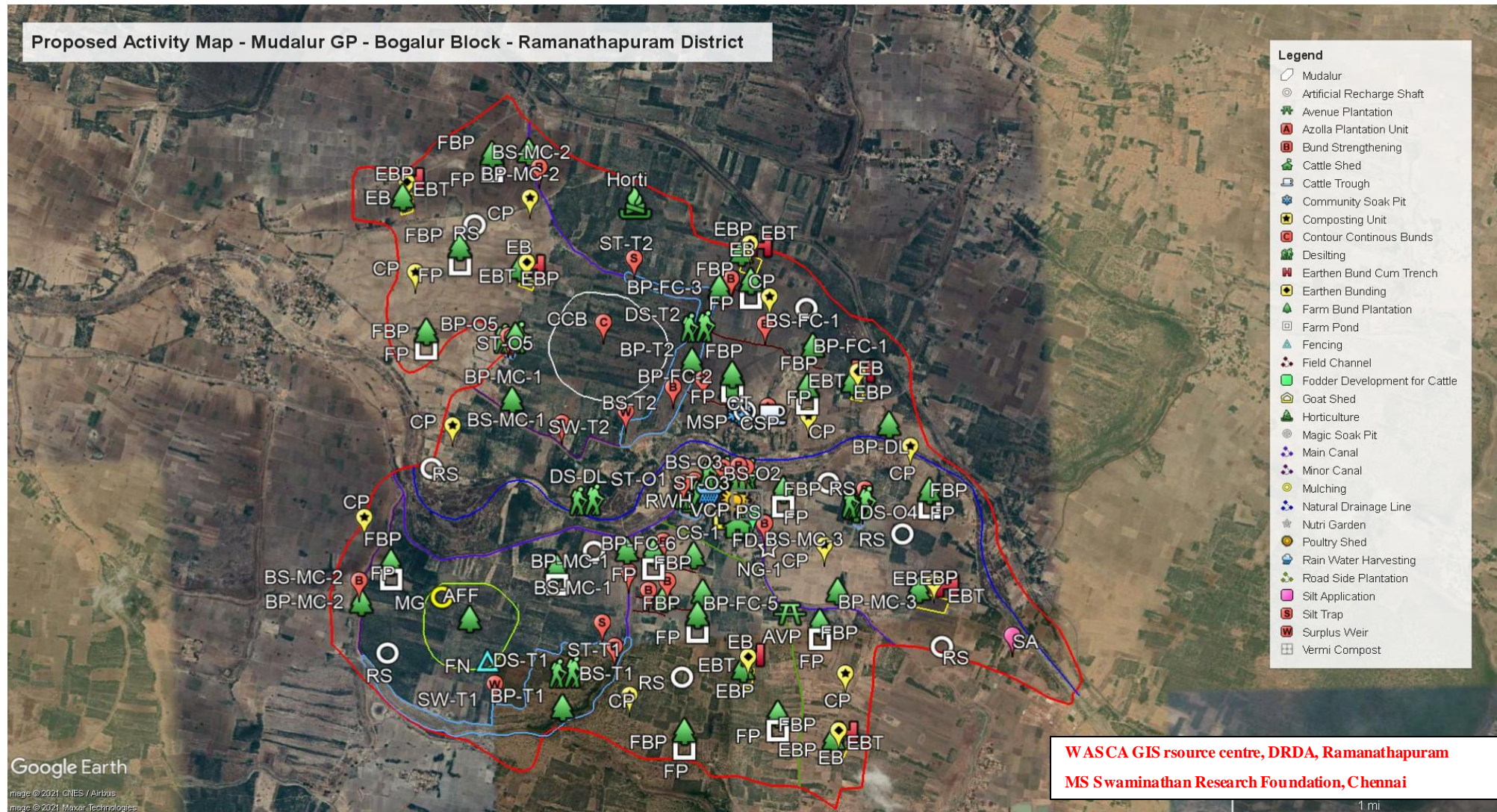
S NO	Item	Ramanathapuram	Tiruvannamalai
1	No of Blocks	11	18
2	No of GPs CWRM Plans completed	429	860
3	No of Works : Development of Public & Common Lands		
4	No of Works: Development of Agricultural and allied Sector		
5	No of Works: Development of Rural Water Management		
6	No of Works Identified Ground Water Aquifer Artificial Recharge Works	54	36
7	No of Works for River Rejuvenation (Large Check Dams and Recharge Shaft)	9	2
8	Total No of Works (3+4+5+6+7)		

# Key Expected Out come of the work by 2022

S NO	Item	Ramanathapuram	Tiruvannamalai
1	Total Area of the district (Ha)	386896.28	459542
2	Total No of Works Proposed	790276	
3	Percentage area targeted under treatment (of total area)	19%	29%
4	Total Run Off Conserved due to treatment	23533.12 Ha.m	40717
5	Total No of Vulnerable population estimated to be benefited	91712	589909
6	% Area brought under afforestation in public lands (non forest)	3%	26.8%
7	% of Fallow lands brought under cultivation	22%	30.7%
8	% of drylands brought under effective water conservation and change in cropping pattern	4%	12%
9	% of natural drainage lines treated	6%	14.7%

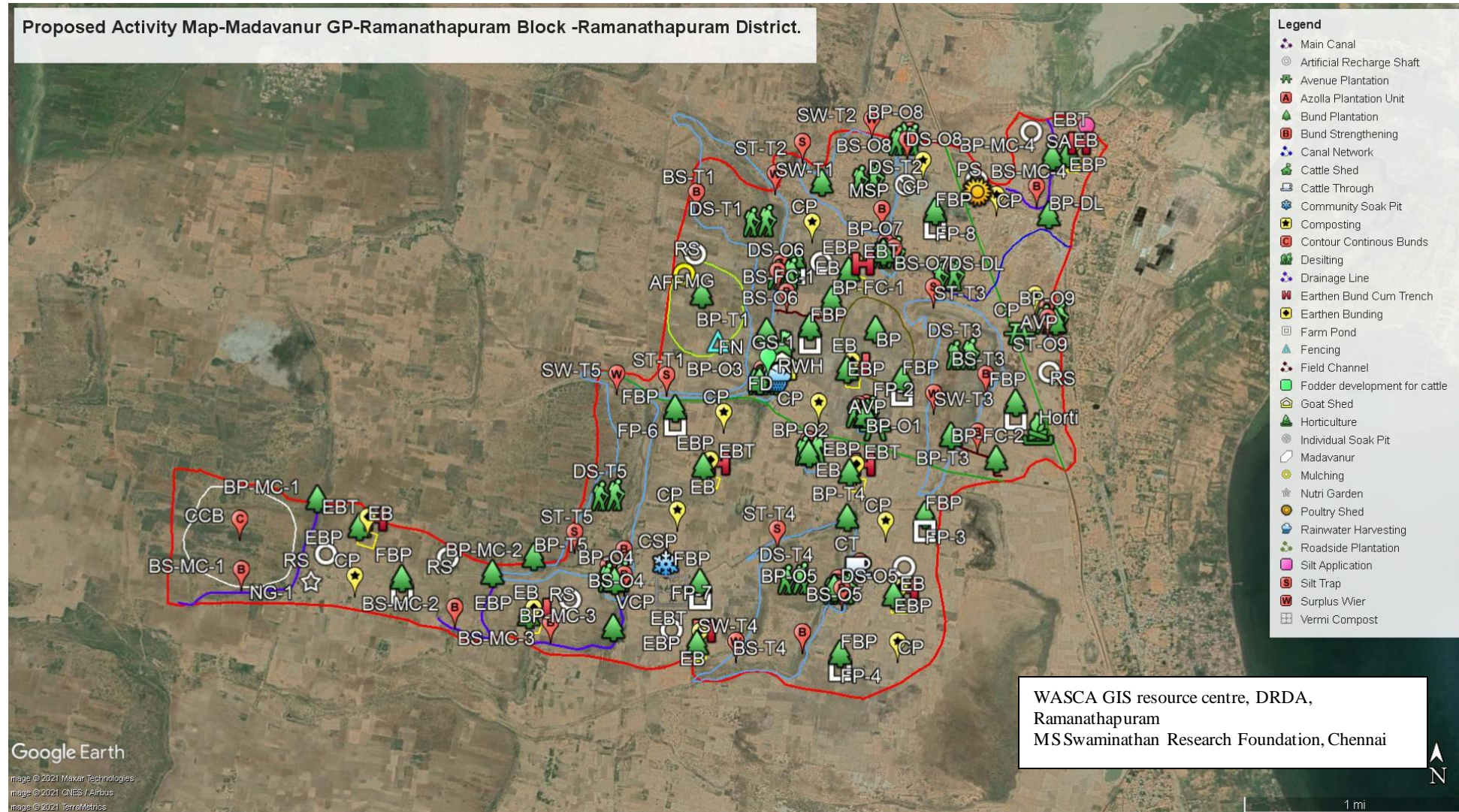


# Mudalur Gram Panchayat – Bogalur block: Ramanathapuram

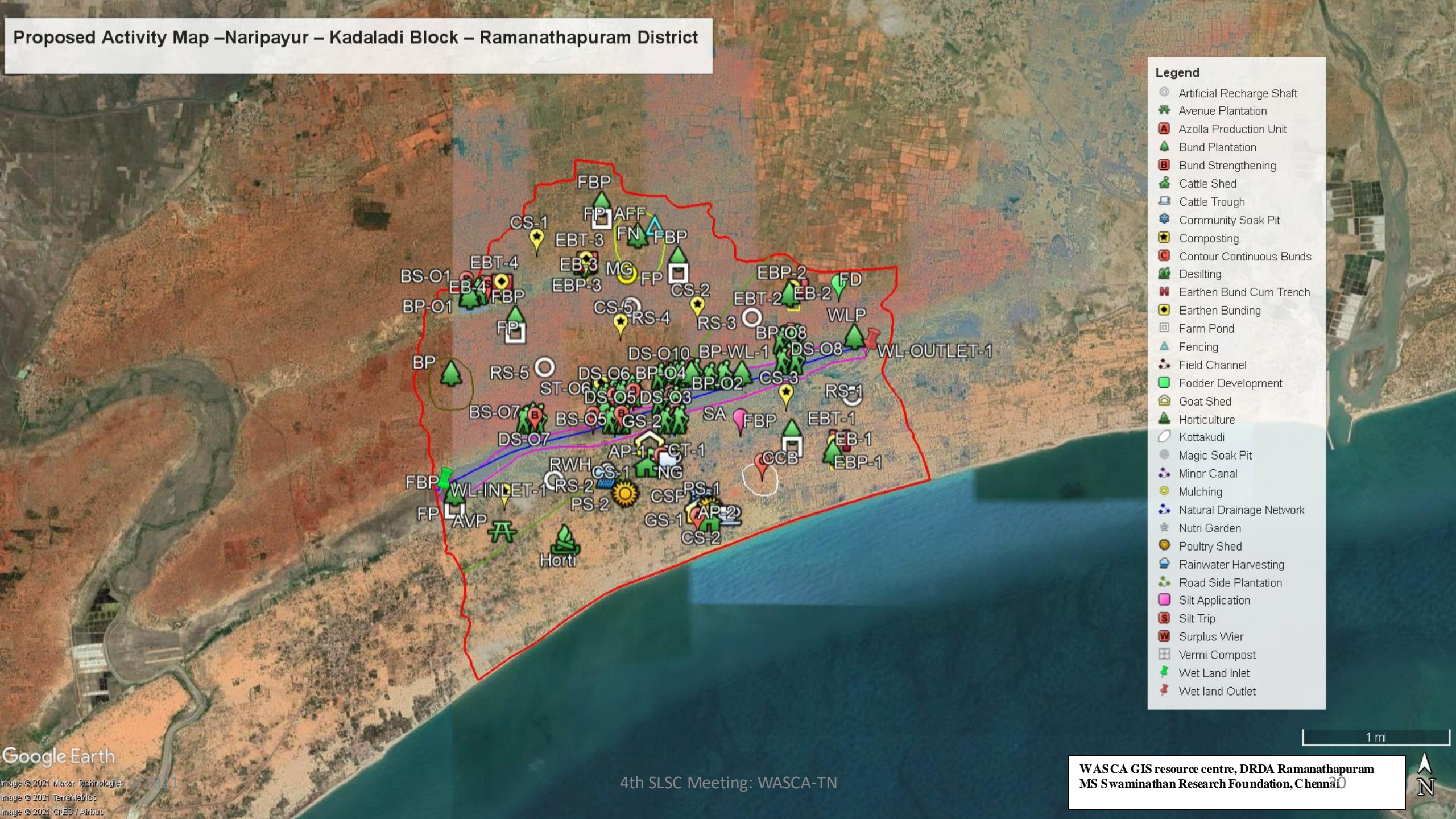




# Madavanur Gram Panchayat – Ramnathapuram block



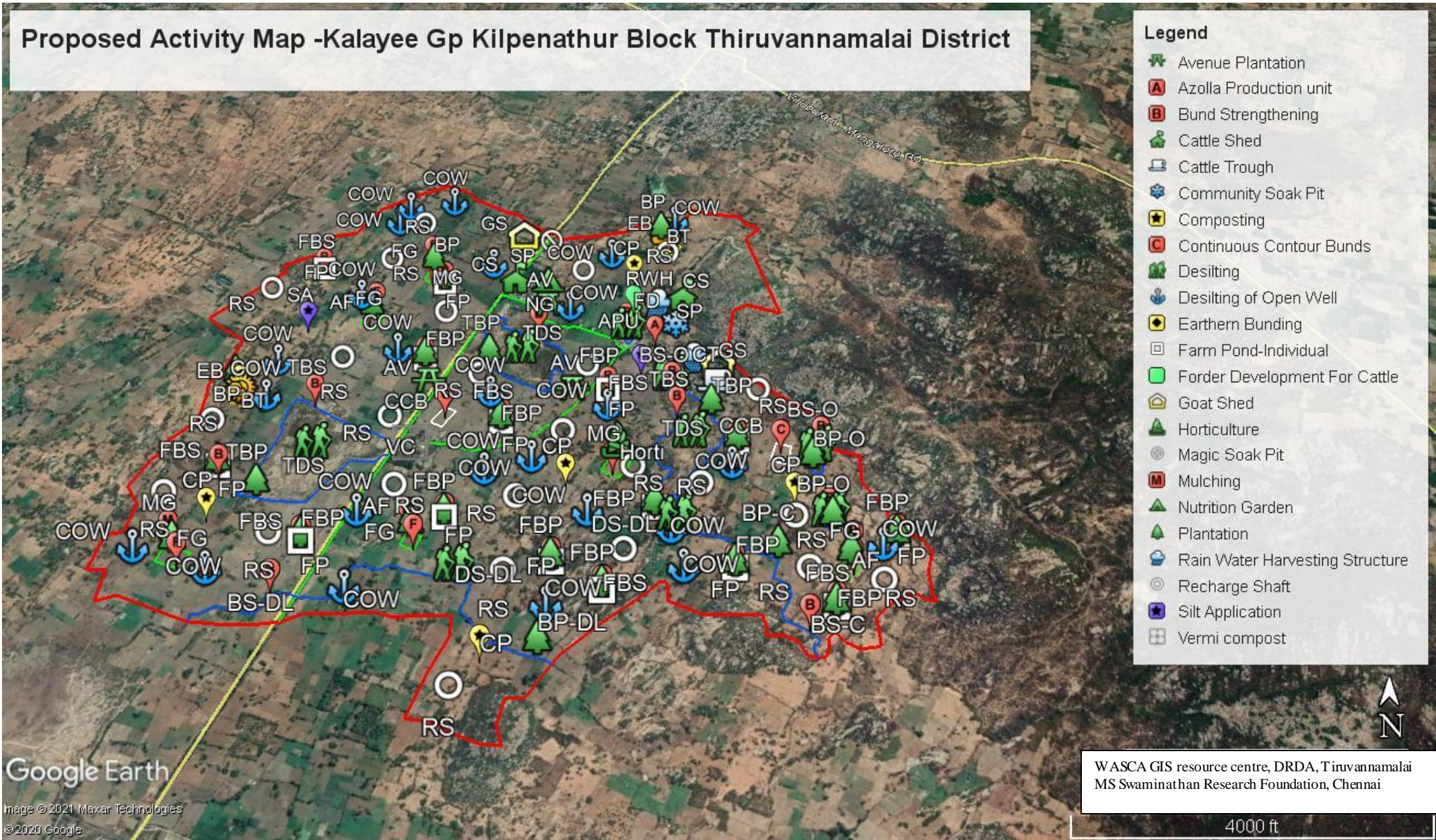
**Proposed Activity Map –Naripayur – Kadaladi Block – Ramanathapuram District**



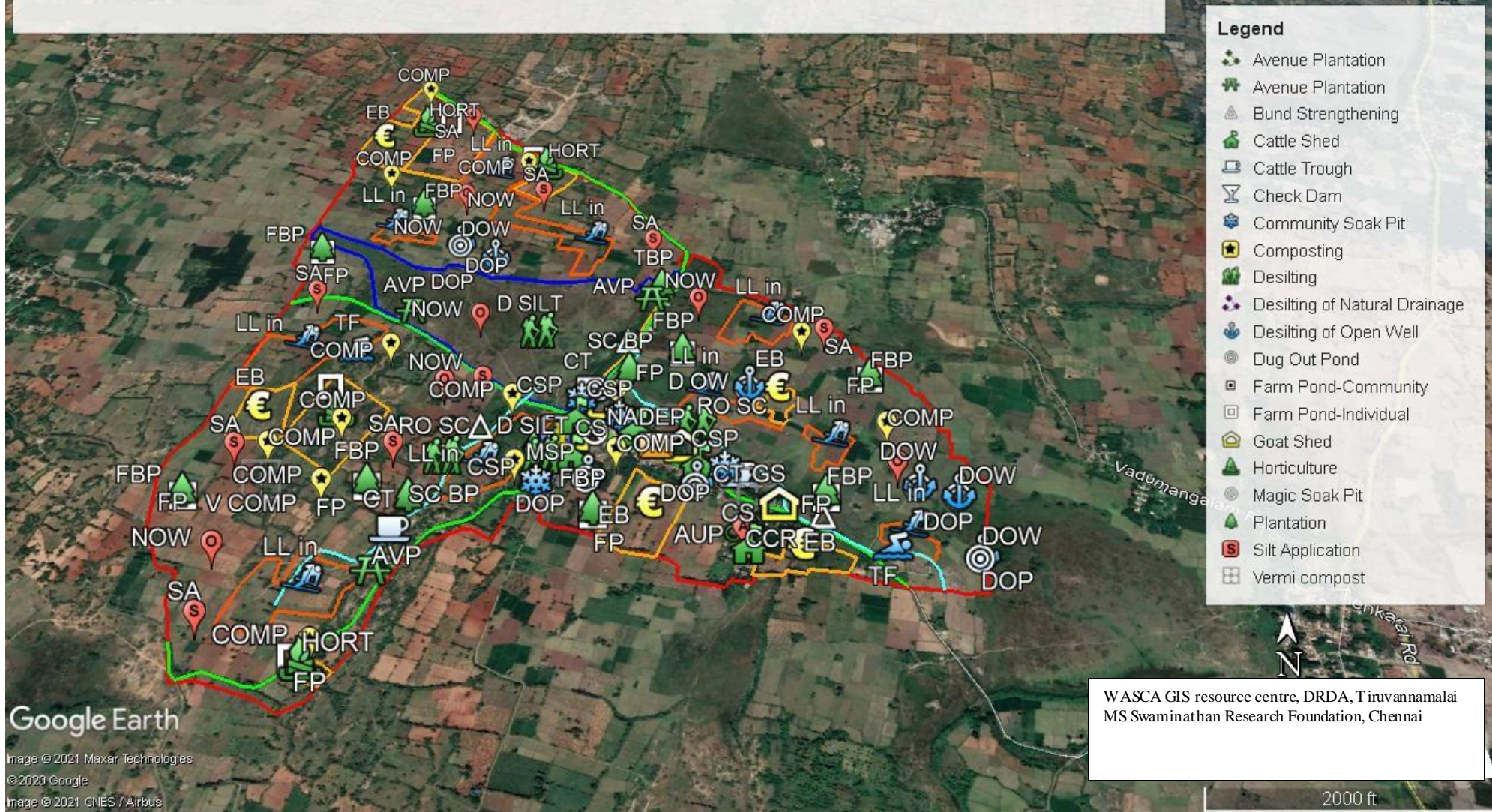
- Legend**
- Artificial Recharge Shaft
  - ✳ Avenue Plantation
  - ▲ Azolla Production Unit
  - ▲ Bund Plantation
  - Bund Strengthening
  - 🏠 Cattle Shed
  - 🐄 Cattle Trough
  - 👤 Community Soak Pit
  - ♻️ Composting
  - 📐 Contour Continuous Bunds
  - 🌱 Desilting
  - 🛞 Earthen Bund Cum Trench
  - 📍 Earthen Bunding
  - 🏠 Farm Pond
  - 🌿 Fencing
  - 🌊 Field Channel
  - 🏠 Fodder Development
  - 🏠 Goat Shed
  - 🌿 Horticulture
  - 🏠 Kottakudi
  - 👤 Magic Soak Pit
  - 🌊 Minor Canal
  - ☀️ Mulching
  - 🌊 Natural Drainage Network
  - 🌱 Nutri Garden
  - 🏠 Poultry Shed
  - 🌊 Rainwater Harvesting
  - 🌿 Road Side Plantation
  - 📍 Silt Application
  - 📍 Silt Trip
  - 🛞 Surplus Wier
  - 🏠 Vermi Compost
  - 🌿 Wet Land Inlet
  - 🛞 Wet land Outlet



# Proposed Activity Map -Kalayee Gp Kilpenathur Block Thiruvannamalai District

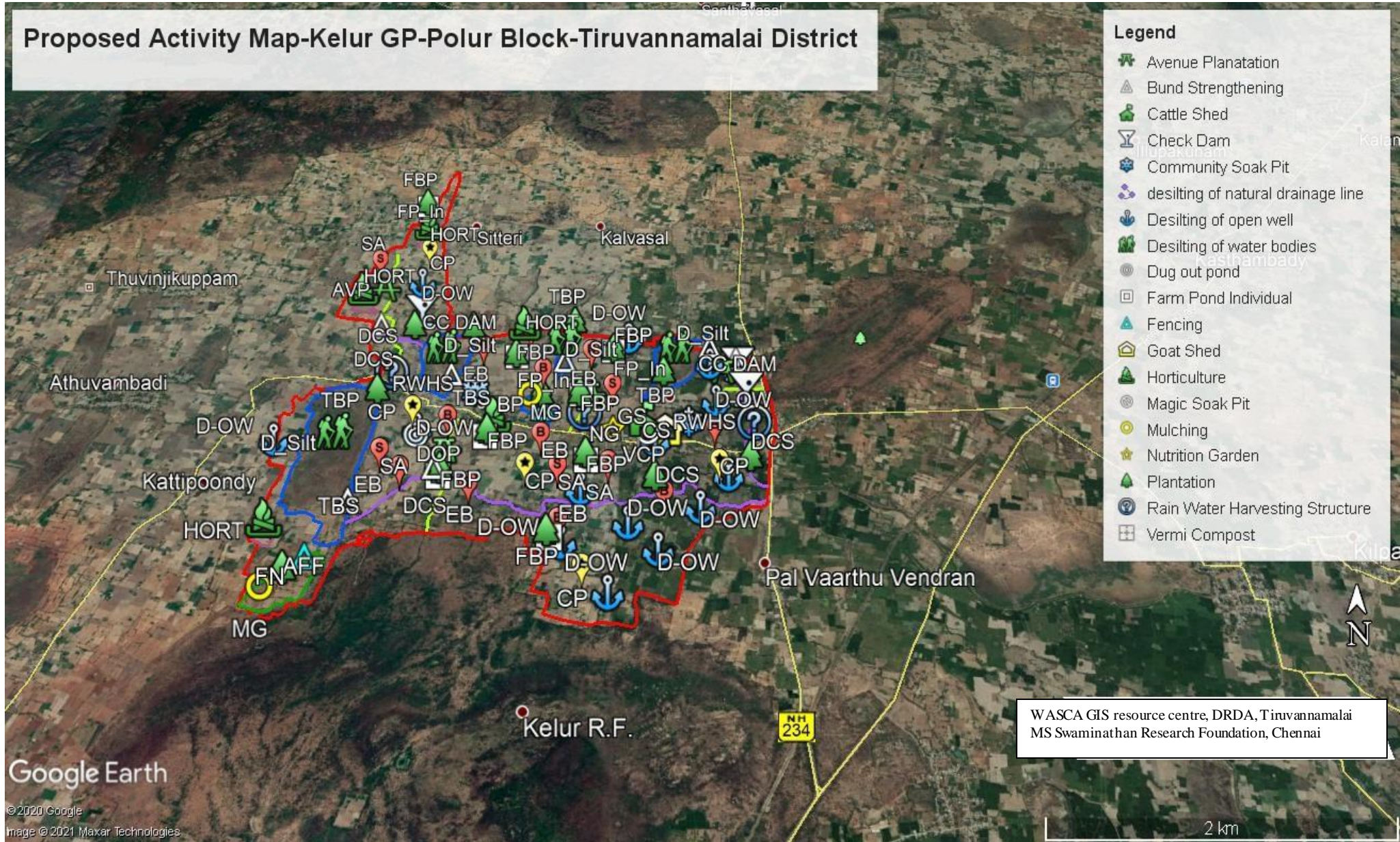


# Proposed Map Activity-Thadinolambai GP-Peranamallur Block-Tiruvannamalai District



# Proposed Activity Map-Kelur GP-Polur Block-Tiruvannamalai District

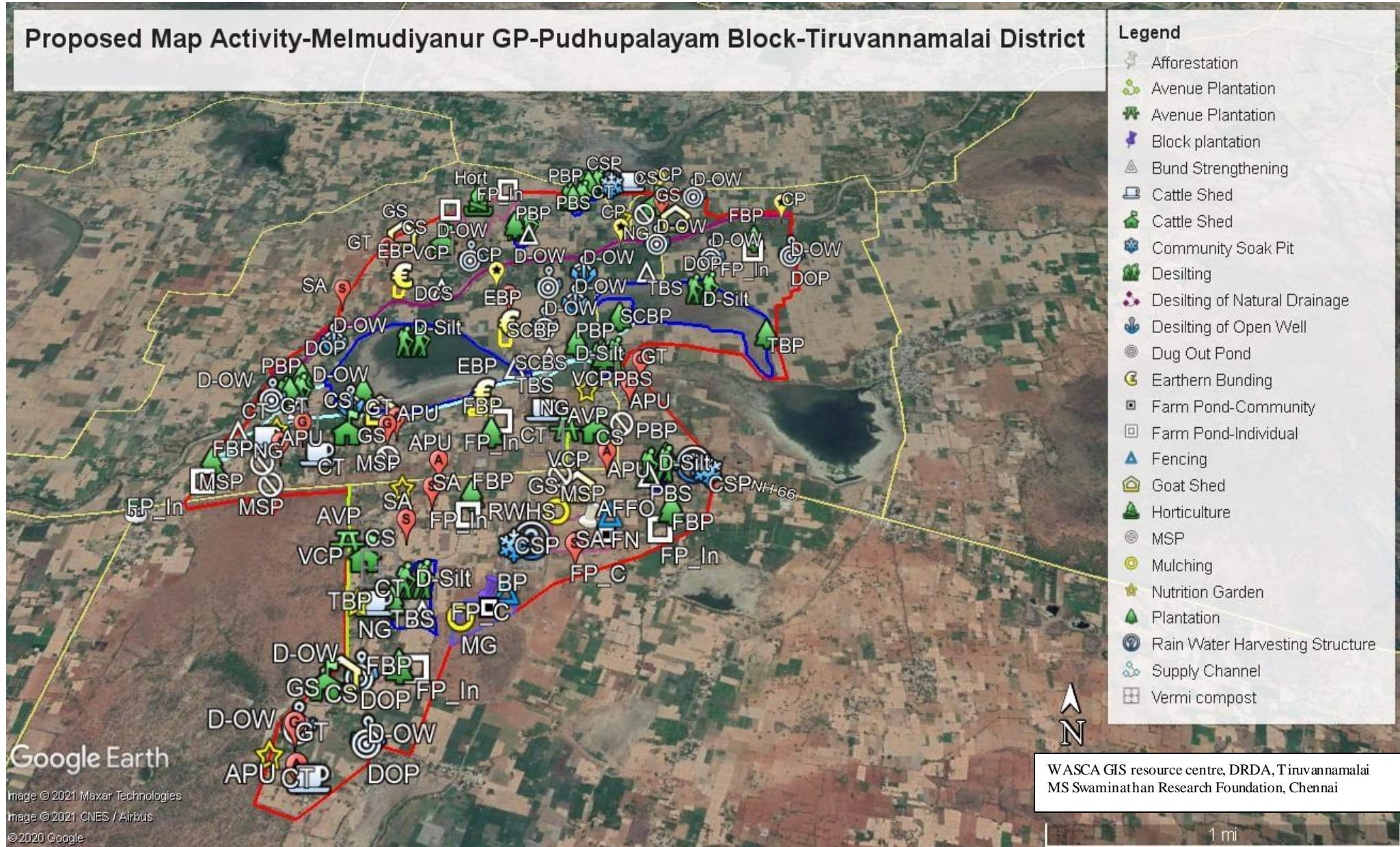
- Legend**
- Avenue Planatation
  - Bund Strengthening
  - Cattle Shed
  - Check Dam
  - Community Soak Pit
  - desilting of natural drainage line
  - Desilting of open well
  - Desilting of water bodies
  - Dug out pond
  - Farm Pond Individual
  - Fencing
  - Goat Shed
  - Horticulture
  - Magic Soak Pit
  - Mulching
  - Nutrition Garden
  - Plantation
  - Rain Water Harvesting Structure
  - Vermi Compost



WASCA GIS resource centre, DRDA, Tiruvannamalai  
MS Swaminathan Research Foundation, Chennai

Google Earth  
© 2020 Google  
Image © 2021 Maxar Technologies

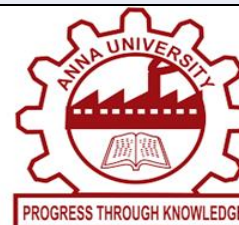
# Proposed Map Activity-Melmudiyanur GP-Pudhupalayam Block-Tiruvannamalai District





# Technical Partners of WASCA

S.No	Institution Name and Responsibilities	Contact Person
1	Centre for Climate Change and Disaster Management, Anna University -Climate Study – Scoping	Dr. K. Palanivelu Director, CCC&DM, Anna University
2	MS Swaminathan Research Foundation (MSSRF) – Lead Technical Partner. Taramani- Lead Technical Agency (20 Experts Engaged)	Dr R. Rengalakshmi, Director, JRD Tata Eco Technology Centre, MSSRF, Chennai.
3	Suganthi Devadason Marine Research Institute (SDMRI), Thoothukudi – Seawater intrusion study (Six Experts Engaged)	Dr. Edward Patterson Director, SDMRI, Thoothukudi
4	Prime Meridian – Ground Water Assessment and Study (Six Experts Engaged)	G. Kumaran, Director



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