Cascade Management Plan (CMP)
SiththanOdai Upper Cascade





Submission
Deputy Project Director Office – CSIAP NP

Contents

Acknowledgements

We would like to express our sincere gratitude and appreciation to all those who have contributed to the development of the SiththanOdai Cascade Management Plan (CMP). Without such efforts and dedication, this cascade profile could not have been successful.

First and foremost, special gratitude is given to Mr. Sarath Wickeramaranae, Consultant at the World Bank, and Mr. D. V. Bandulasena, IDCB Specialist of CSIAP PMU, whose guidance and encouragement helped us develop the CMP. Their leadership and strategic insights have been invaluable in steering the CMP in the right direction. Their ability to navigate complex challenges and provide clear direction has been instrumental in keeping the CMP on track.

Many thanks go to Mr. A. C. G. Babu, DPD CSIAP –NP, who has invested his full effort in guiding the team in preparing this design document. His contributions have undoubtedly enriched the process of CMP development and enhanced the quality of the outcome.

Furthermore, we would like to acknowledge the guidance given by the respective government departments during the transect walk, which has improved the CMP thanks to their comments and advice. Their meticulous attention to detail and innovative thinking have been vital in shaping the CMP into an effective and efficient tool.

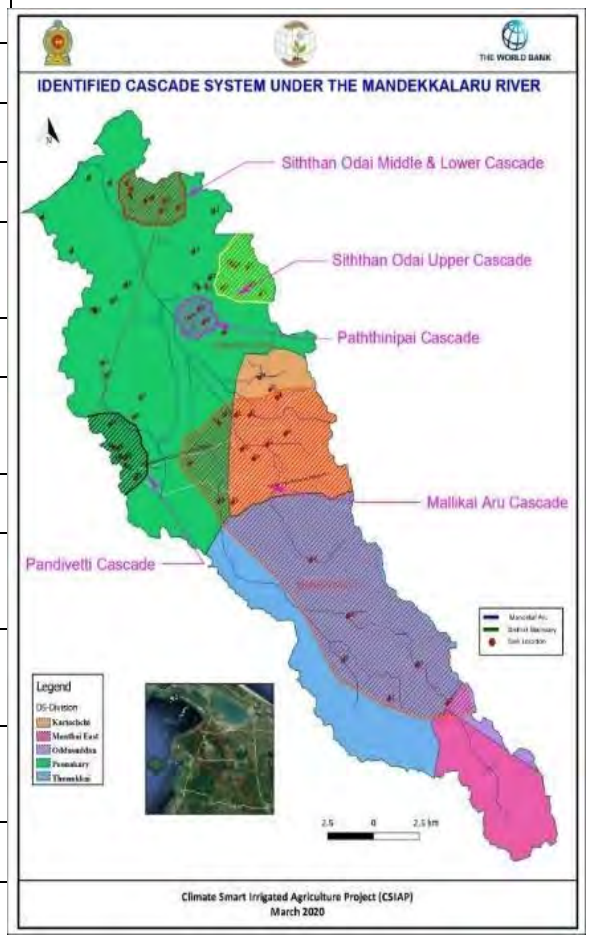
We would also like to thank our team members for their hard work, expertise, and collaborative spirit in achieving the goal of the design phase. Each team member has played a crucial role in understanding the context during the design stage. Their commitment has been truly commendable. The collective knowledge and skills brought to the table have made this assessment a success.

In brief, we extend our heartfelt thanks to everyone involved in the development of the CMP. Everyone's unwavering commitment, dedication, and expertise have made this achievement possible. We are truly grateful for the contributions and look forward to continuing throughout the implementation stage, which is the most challenging.

1. General Information

1.1 Profile Summary

Information	Details
Name of the River Basin	Mandekkalaru
Name of the Cascade	SiththanOdai Upper
Name of the District	Kilinochchi
Name of the Divisional Secretariat/s	Poonakary
Name of the ADC	Poonakary
Name/s of GramaNiladari Division/s	Pallikuda&Neradampan
Extent of the cascade (ha)	1494
Command area in the cascade (ha)	130
Number of Total tanks in cascade	6
Number of tanks used for agriculture	6
Number of families	60



1.2 Particulars of the tanks

#	Polygon	Tank's name	Tank ID Name	GND	Existing Capacity (Ac. ft)	Command Area (ac)	No of farming families
1	1	Arasapuram	25/6/P/W/091	Pallikuda	367.553	70	31
2		Eriyanarai	25/6/P/W/130	Neradampan	181.855	20	14
3		Murukkanoddu	25/6/P/A/174	Neradampan	6.907	10	05
4	2	Kovilkoduthavil	25/6/P/A/088	Pallikuda	54.97	30	10
5		Nadu koduthavil	25/6/P/A/089	Pallikuda	63.385		
6		Moolaikoduthavil	25/6/P/A/090	Pallikuda	47.979		
		Total			722.649	130	60

Table 1- Tank Detail

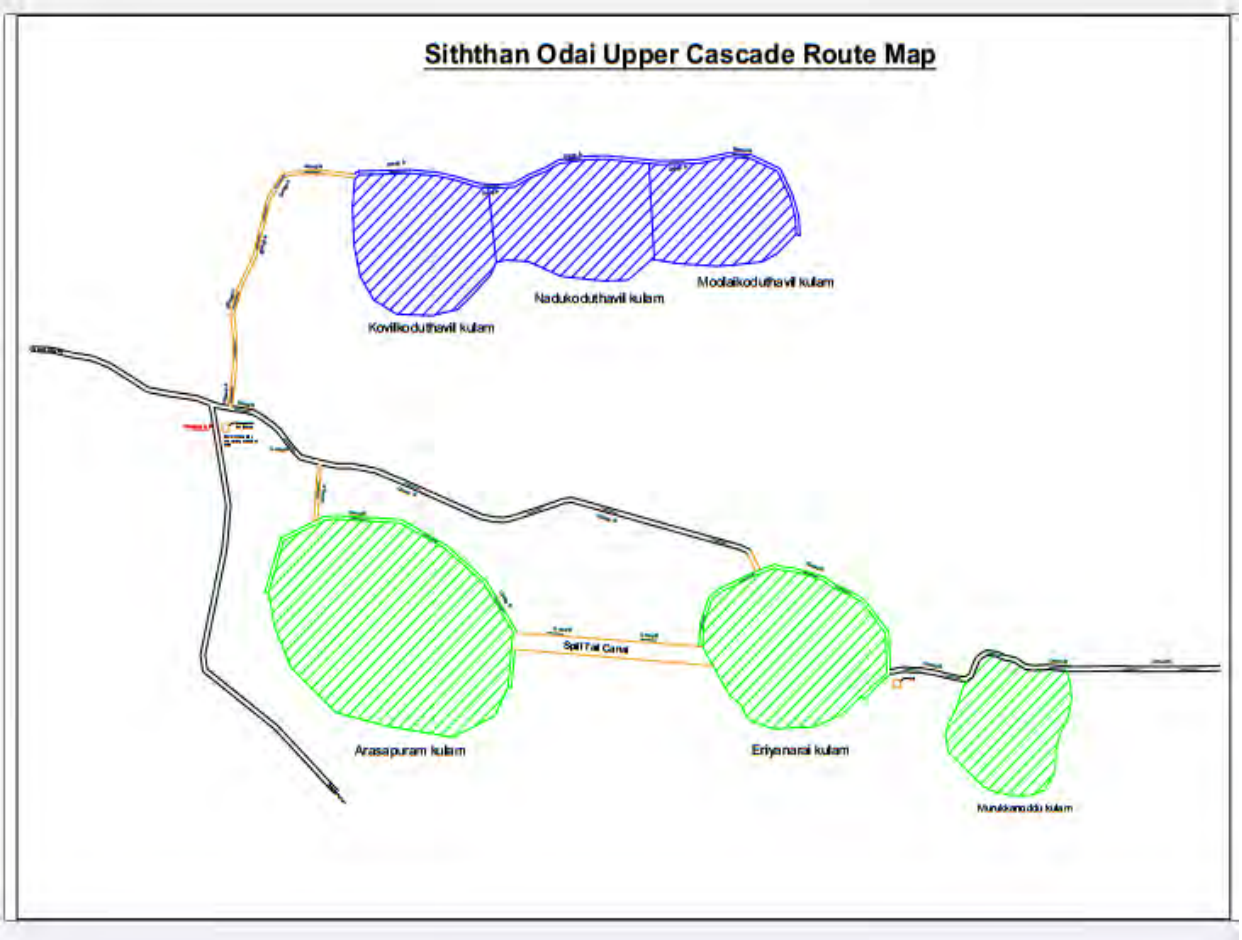


Figure 1: Route map of Transect Walk – SiththanOdai upper Cascade
Source: Climate Smart Irrigated Agriculture Project

1.3Topography of Cascade

The topography of the cascade is almost flat with a slight slope, with elevations ranging from 0-10 meters above mean sea level (MSL). However, the elevation of the majority of the cascade area is less than 4 meters MSL. Theimpact area of proposed program is tropical and semi-arid. Additionally, this area is vulnerable to disaster such as frequent drought, flood and prolonged rainfall shortages.The disaster reduce the groundwater levels.

Based on a combination of climate, soil, and topographic relief characteristics, most of the cascade area lies within the agro-ecological region of the Low Country Dry Zone Flat to Slightly Undulating (DL3). The Low Country Dry Zone Flat (DL4) is also found in some areas. Limestone, a sedimentary rock made of calcium carbonate (CaCO3), usually in the form of calcite or aragonite, is available in the region.

1.4 Executive Summary

The CSIAP conducted an IEC awareness program in the hotspot area (HSA) and led the process for the preparation of the Cascade Management Plan(CMP). Members of the Cascade Management Committee (CMC), members of Farmers Organizations (FO), and representatives of government organizations participated in this process.The cascade management plan was developed using the profile and technical information.

It is crucial to highlight the need for a well-designed CMP, as it ensures equitable water distribution for all agricultural fields within the cascade. Through the CMP, the natural contours of the land will be enhanced to minimize water wastage and reduce the risk of waterlogging or erosion.

In the CMP, channels and structures will be renovated or constructed at appropriate elevations to ensure the gravity-driven water flow. This approach reduces the need for pumping and energy consumption. Furthermore, the CMP will regulate water flow to ensure a steady water supply during the dry season by storing excess water during periods of high rainfal.

Overall, the SiththanOdai Upper CMP plays a vital role in minimizing losses and promoting Climate-Smart Agricultural Practices in water-scarce areas. It allows for the optimal utilization of available water resources and supports for the farmers, fishermen and livestock breeders for their livelihood in a sustainable manner while minimizing environmental impact.

1.5 Introduction to the Cascade

A cascade system can be defined as a connected series of tanks organized within a micro-catchment of dry zone landscapes for storing, conveying, and utilizing water. These tanks are connected by channels for harvesting floodwater and for distribution. In this network, small tanks are connected with large reservoirs that store rainwater and surface runoff. The cascade refers to a system of interconnected irrigation tanks and downstream water flows that are strategically designed to provide water to agricultural fields and ensure efficient water distribution. This system is often employed in areas where water is scarce and where there is a need to optimize water usage for agricultural purposes.

The main principle behind the Tank Cascade System is recycling and re-using water through a network of small to large-scale tanks. The advantage of the cascade is that excess water flow from

a reservoir is captured by the next downstream reservoir. Thus, the excess or runoff water in the command area of a reservoir is collected in the downslope reservoir. This water is continuously filtered and recycled in subsequent tanks. Tank Cascade Systems buffer the effects of climatic fluctuations and work as a cornerstone in coping with future climate change in the dry zone.

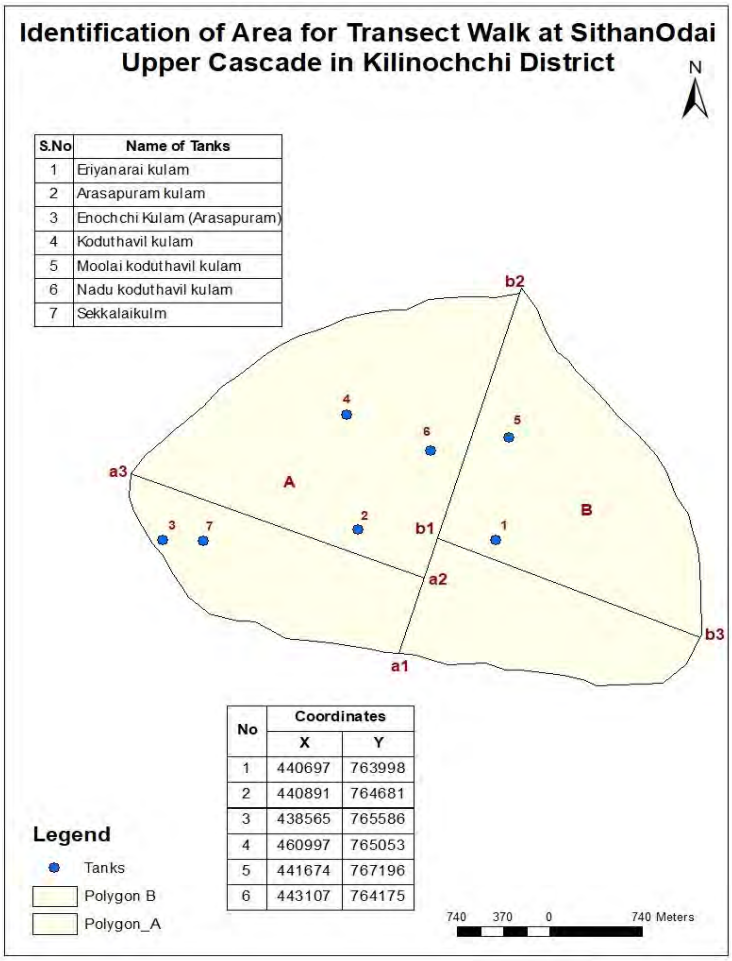
In the past, before climate change, the dry zone of Sri Lanka, particularly the north and east, received rainfall from the northeast monsoon from October to January. Considering this rainfall pattern, small water storages were established to retain water throughout the year. These small water storages are referred to as *"kulam"* (tanks). These tanks serve to collect surface runoff, store, and distribute water for the cultivation of paddy and other field crops (OFC) even during the dry seasons.

Historically, the tanks played major roles in facilitating colonization in the dry zone. The tank cascade system (*wewa-ellangava* in Sinhala or *viluneerkulathodarthokuthi* in Tamil) is evidence of ancient Sri Lankan irrigation infrastructure. Thus, the tanks have characterized the cultural landscape and have become an identity-generating factor for rural culture.

1.6 The Methodology

The participatory assessment process is the basic methodology for developing the Cascade Management Plan. Primary and secondary data collection techniques were used to identify the features of geography, environment, hydrology, socio-economics, and culture of the cascade. Preliminary Investigation Report (PIR), Participatory Rural Appraisal (PRA), Hydrological Studies, Engineering Surveys, Focused Group Discussions, Key Informant Interviews, Matrix Ranking, and Transect Walks were used to collect and validate the data.

People of the hotspot area, members of the Cascade Management Committee (CMC), farmer organizations (FO), and officials of state organizations were grouped into three categories considering their expertise. Safeguard Officers led each group with the support of the Institutional Development and Capacity Building (IDCB) team and specialists from the Climate Smart Irrigated Agriculture Project - Northern Province (CSIAP-NP). Each group walked along the cascade to understand the context. The transect walk helped to identify which resources are overused or exploited and which assets are underused.



The ranking exercise was used to prioritize the critical issues andstrategic interventions were proposed through brainstorming to address the issues. The critical issues and strategic interventions are presented in sections 5.2 and 5.3. Key Performance Indicators (KPIs) were also developed to measure the outcome of the project.

The findings of the assessment and the proposed interventions were compiled in a report and shared among the team members of the transect walk. The draft report on the Cascade Management Plan was developed based on the insights from the transect walk. The report is submitted to the Project Management Unit (PMU).

2.Logical Information

2.1 Need for Cascade Management Project

Preparing a profile is essential as it provides a comprehensive overview of the design components and operational parameters of the cascade. The Cascade Management Plan serves as a valuable reference for all stakeholders who are responsible for renovating, maintaining, and managing the system. By detailing factors such as tank specifications, interconnections, control mechanisms, safety features, critical issues, and fluid transfer dynamics, the profile enables a clear understanding of how the cascade system functions and how it fits within the entire command and catchment areas. Ultimately, the CMP facilitates effective decision-making, troubleshooting, and optimization. The following list shows the necessities for preparing the profile:

- Ensure the sustainability of the environment, ecosystem, and cascade system.
- Avoid or minimize water loss, flooding, frequent repairs of structures, and waterborne diseases.
- Optimize the contributions not only from farmers but also from other users for the maintenance of the irrigation system.
- Ensure the active involvement of all stakeholders in the cascade management.
- Educate stakeholders on the responsible usage of resources.

2.2 Goal

The goal of the CMP is to reduce vulnerability of climatic changes through efficient water management and to ensure the sustainability of the cascade and the water productivity of the cascade. On other hand prevent illegal activities and facilitate to solve the issues that affect the cascade negatively.

2.3 Objectives of the Cascade Management Project

By end of 2025 cascade management will improve the living standard of the communities living around cascade through the restoration and improvement of the irrigation system. The project will

- address the water scarcity and provide improved and reliable water accessibility for farming, drinking, livestock breeding and domestic purposes.

- enhance the restoration of the watershed of the system in order to conserve biodiversity (flora & fauna, wild animals, etc.) and the associated natural resources through integrated management.
- improve the knowledge on water management techniques, irrigation scheduling, operation and maintenance of cascade area, tank bed, feeder canals, and drainage networks and manage water.

2.4 Targets

- To promote crop zoning programmes and facilitate marketing
- To facilitate the access for transportation and marketing.
- To solve land related issues.
- To facilitate cattle raring during the cropping time
- To establish a legally empowered entity to safeguard the cascade
- Increase the productivity

2.5 Composition of a Cascade Management Committee (CMC) at Divisional Level

Strengthening the institutional framework in the cascade is identified as one of the key requirements for managing the cascade system. Hence, at the national level it was decided that CMCs are to be formed with the representation of Farmers Organizations and regional or district level officials.

The district level and regional level committees are described in the circular # 06 of 2023 published by Department of Agrarian Development regarding “CMC Establishment and Continuity” which was released on 2023.08.03 having reference number 7/3/9/CMC/2023.

As per the circular the regional level committee consists of the following bureaucrats from the respective divisional secretarial jurisdiction.

- Divisional Secretary (DS) serving as Chairman
- Divisional Officer of the Department of Agrarian Development (DAD) - Secretary

- Agriculture Instructors (AIs) in the cascade
- Engineer/Technical Officer – Department of Irrigation
- Engineer/ Technical Officer representing Provincial Irrigation Department
- Regional Engineer/ Technical Officer representing Department of Agrarian Development
- Agricultural Research and Production Assistant
- Representative of the Department of Wildlife Conservation (DoWC)
- Representative of the Department of Forest Conservation (DoFC)
- Representative of Fisheries Unit
- Representative of Central Environment Authority
- Representative of the Department of Animal Production and Health
- Representative of the Agricultural and Agrarian Insurance Board
- Representative of the Geological Survey and Mines Bureau (GS & MB)
- Representative of the National Water Supply & Drainage Board (NWSDB)
- Representative of the Local Government Authority (Pradheshiya Saba)
- Representative of the Department of Land Use & Policy Planning
- Representative of National Aquaculture Development Authority (NAQDA)
- Representative of the Environmental Division of Police
- Representative of the Department of Archaeology
- Representative of the Department of Civil Defense
- GramaNiladhari
- Samurdhi Development Officer
- Economic Development Officer
- President or Secretary of each Farmers Organization and Women Farmers Organizations
- Representative of a Community Water Organization
- One representative from each organization representing other community organizations and environmental organizations

The meeting shall be convened by the Secretary as per the instructions of the Chairman of the Committee. The committee has re-intervened all the stakeholders.

2.6Structure of CMC

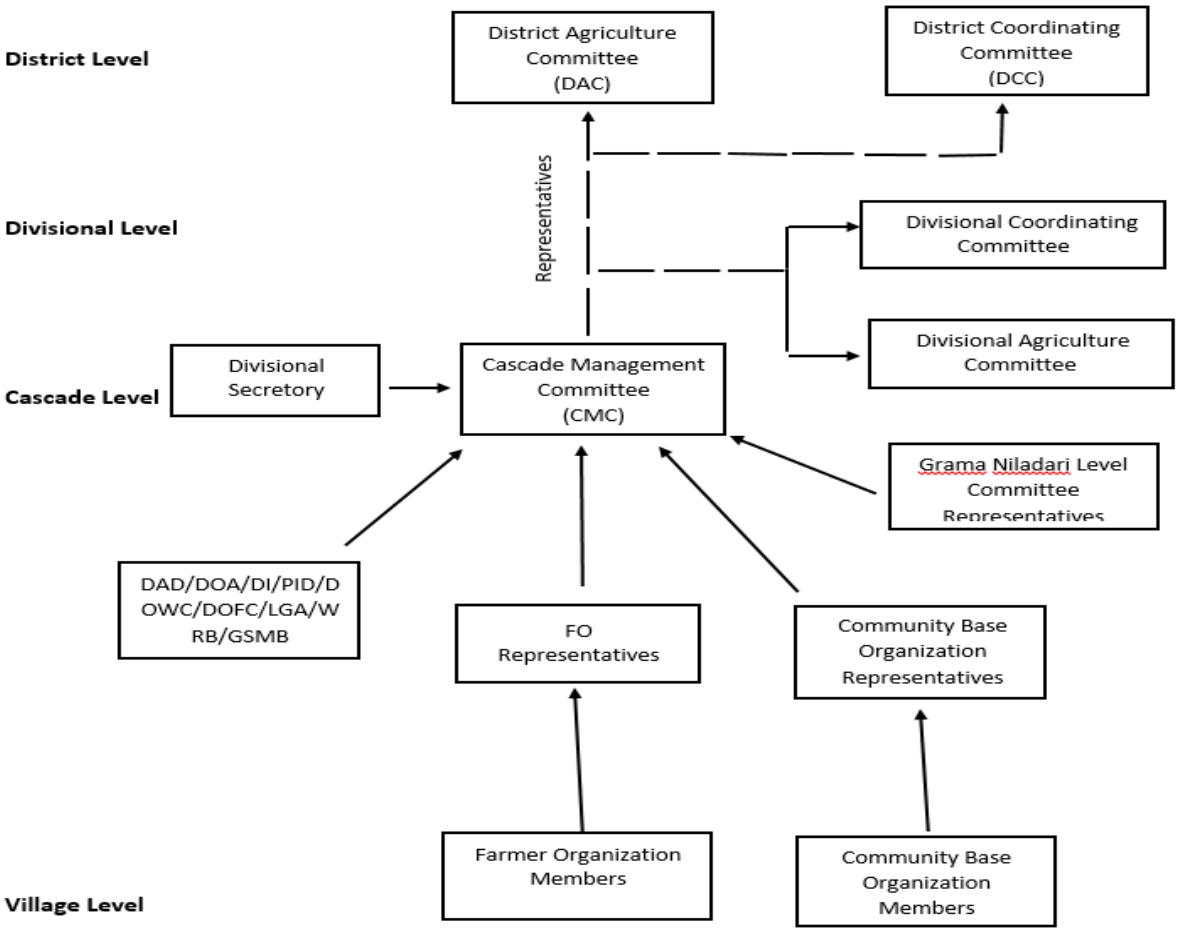


Figure 3:Major stakeholder agencies currently involve for managing the affairs of the SiththanOdai Upper Cascade system.

2.7The Key Roles and Responsibilities of the CMC

The Committee bears the overall responsibility in managing water and associated resources (including ecosystems) in the cascade. The above circular defines the roles and responsibilities of the CMC as follows:

- Plan, Implement and Monitor the Cascade System

  Prepare/ update an integrated agriculture development plan for the water hotspot area of the cascade. The committee make necessary decisions to manage the resources of the cascade through a joint approach of relevant Government Institutions and beneficiaries of the cascade, implement those decisions and monitor the progress and process.

- Establish a formal system for optimal management to conserve the ecosystem.
- Provide support to enforce enacted laws related to ecosystems.
- Manage water resources to minimize natural disasters and discuss the maintenance works.
- Plan cultivation, input supply, training programmes, and other production activities and facilitate market access.
- The committee should discuss the outcomes of cultivation committee meetings. Providing solutions to the problems that can be solved at the cascade level. If not refer the unsolved problems to the Regional/ District level Agriculture.
- Educate the farming community to understand the weather pattern and agriculture advisories.
- Exchange the knowledge and resources among water users.
- Facilitate to implement climate-friendly strategic plans appropriate to the currentclimate and forecast changes. And promote climate-smart agriculture practices and technologies.
- Encourage participatory approach in carrying out activities of the development programs at the cascade level.
- Establish efficient information communication system among water users.
- Submit reports related to the management of cascade to the Regional / District Agriculture Committee time to time.

3. Physical Geography of SiththanOdai Upper

3.1 Biogeography

This cascade exhibits a remarkable biodiversity. There are several species of flora & fauna observed in and around the cascade during the transect walk. Forest area of this cascade is enriched with different herbal plants which are used in traditional medicine.

a. Flora

The forest cover in Kilinochchi district is 31042 ha (23% of district), and the type of forest is tropical thorn, which is primarily influenced by monsoon rains. The vegetation around the cascade system is diverse and includes both terrestrial and aquatic plant species. Mangroves, grasses, reeds, water lilies and various types of aquatic vegetation are common plant species. These plants provide habitats for a wide range of wildlife.

b. Fauna

The tank cascade system supports a diverse array of fauna, including both terrestrial and aquatic species. The tanks and the surrounding areas attract numerous animals like elephant, monkey, deer, sambur, rabbit, and wild boar. Both terrestrial and aquatic plant species provide shelter for birds such as herons, egrets, woodpecker, jungle fowl, peacock, and waterfowl and is making an excellent spot for bird watching. Other common fauna in the region includes fish, amphibians, small mammals and reptiles like crocodiles, snakes, and lizards as well.

c. Aquatic Life

The tanks within the cascade system are home to various fish species. These fish serve as a food source for local communities and contribute to the overall ecological balance of the tanks. Some of the common fish species found in these tanks include Tilapia, Catfish, and Gourami.

3.2 Hydrology

A deep confined aquifer occurs within the sedimentary limestone. The groundwater quality of this area mainly depends on the height of the water table (availability of water in the tanks). The level of Total Dissolved Solids (TDS) in the groundwater is higher than the permissible level of drinking water quality according to WHO standards.

The SiththanOdaiupper cascade system is characterized by its unique hydrological features. The interconnected tanks create a natural water flow system, where water from one tank flows into the next, allowing for effective water management and irrigation. This system is designed to capture and store rainfall during the wet season and release water gradually during the dry season.

a. Command Area & Capacity

There are six tanks located under this cascade. While all six tanks are intended to be used for recharging groundwater, some of them are also utilized to ensure the steady supply for agriculture.Mullaikoduththavil" tank, "Nadukoduththavil" tank and "Kovilkoduththavil" tank isadjoining tanks and there are 30ac of command area The command area and the capacity are shown on the tables.

Table 2: Command area of the Cascade

Tank Name	**Purpose of Usage**
Eriyanarai Tank	Agricultural production (Paddy,OFC),Bathing, washing clothes, bathing domestic pets and farm animals, and drinking purposes of livestock
Arasapuram Tank	Agriculture (Paddy and OFC) ,Bathing, washing clothes, bathing domestic pets and farm animals, and drinking purposes of livestock
Koduthavil Tank	Agriculture (Paddy and OFC) Bathing domestic pets and farm animals, and drinking purposes of livestock
Nadu Koduthavil Tank	Agriculture (Paddy and OFC) ,Bathing domestic pets and farm animals, and drinking purposes of livestock
MoolaiKoduthavil Tank	Agriculture (Paddy and OFC) ,Bathing domestic pets and farm animals, and drinking purposes of livestock
MurukkanodduKulam	Agriculture (Paddy and OFC) , Bathing domestic pets and farm animals, and drinking purposes of livestock

Table 3: Brief Details of Area Capacity of Tanks in the Cascade

1. Arasapuramkulam

Contour level (m)	Area (Ac)	Mean Area (Ac)	Volume (Ac.ft)	Capacity (Ac.ft)
-0.30	0.065	0.033	0.033	0.033
0.00	0.390	0.227	0.227	0.260
0.30	4.412	2.401	2.401	2.661
0.60	23.608	14.010	14.010	16.670
0.90	35.935	29.771	29.771	46.442
1.20	43.844	39.889	39.889	86.331
1.50	49.882	46.863	46.863	133.194
1.80	54.605	52.243	52.243	185.437
2.10	58.370	56.487	56.487	241.925
2.40	62.491	60.431	60.431	302.355
2.70	67.906	65.198	65.198	367.553

3.00	78.066	72.986	72.986	440.539
3.30	90.806	84.436	84.436	524.975
3.60	114.722	102.764	102.764	627.739
3.90	131.082	122.902	122.902	750.641
4.20	146.550	138.816	138.816	889.457
4.50	164.375	155.462	155.462	1044.919
4.80	174.449	169.412	169.412	1214.331
5.10	179.033	176.741	176.741	1391.072
5.40	179.902	179.468	179.468	1570.539
5.70	180.396	180.149	180.149	1750.689
6.00	180.557	180.477	180.477	1931.165
6.30	180.635	180.596	180.596	2111.762
6.60	180.696	180.665	180.665	2292.427
6.90	180.735	180.715	180.715	2473.142
7.20	180.773	180.754	180.754	2653.897
7.50	180.785	180.779	180.779	2834.676
7.80	180.788	180.786	180.786	3015.462

2. Eriyanaraikulam

Contour level (m)	Area (Ac)	Mean Area (Ac)	Volume (Ac.ft)	Capacity (Ac.ft)
0.60	0.191	0.095	0.095	0.095
0.90	2.009	1.100	1.100	1.195
1.20	7.734	4.871	4.871	6.067
1.50	10.658	9.196	9.196	15.263
1.80	13.884	12.271	12.271	27.534
2.10	17.602	15.743	15.743	43.276
2.40	25.338	21.470	21.470	64.746
2.70	34.006	29.672	29.672	94.418
3.00	43.247	38.626	38.626	133.044
3.30	54.375	48.811	48.811	181.855
3.60	68.676	61.526	61.526	243.381
3.90	84.426	76.551	76.551	319.932
4.20	99.786	92.106	92.106	412.038
4.50	114.977	107.382	107.382	519.419
4.80	118.125	116.551	116.551	635.970
5.10	118.220	118.172	118.172	754.143
5.40	118.232	118.226	118.226	872.369
5.70	118.240	118.236	118.236	990.605

3. Murukkanoddukulam

Contour level (m)	Area (Ac)	Mean Area (Ac)	Volume (Ac.ft)	Capacity (Ac.ft)
1.50	0.035	0.018	0.017	0.017
1.80	0.309	0.172	0.169	0.187
2.10	3.431	1.870	1.841	2.028
2.40	6.483	4.957	4.879	6.907
2.70	14.531	10.507	10.342	17.248
3.00	23.828	19.180	18.878	36.126
3.30	29.949	26.888	26.465	62.591
3.60	30.240	30.094	29.620	92.211
3.90	30.289	30.265	29.788	121.999

4. KovilKoduthavilkulam

Contour level (m)	Area (Ac)	Mean Area (Ac)	Volume (Ac.ft)	Capacity (Ac.ft)
0.00	0.202	0.101	0.101	0.101
0.30	1.471	0.836	0.836	0.937
0.60	8.292	4.881	4.881	5.819
0.90	13.659	10.976	10.976	16.794
1.20	18.945	16.302	16.302	33.096
1.50	24.804	21.874	21.874	54.970
1.80	29.479	27.141	27.141	82.112
2.10	35.091	32.285	32.285	114.397
2.40	48.202	41.646	41.646	156.043
2.70	59.447	53.824	53.824	209.868
3.00	65.818	62.632	62.632	272.500
3.30	75.024	70.421	70.421	342.921
3.60	78.216	76.620	76.620	419.541
3.90	78.352	78.284	78.284	497.825
4.20	78.424	78.388	78.388	576.213
4.50	78.466	78.455	78.455	654.657
4.80	78.503	78.484	78.484	733.142
5.10	78.524	78.514	78.514	811.656
5.40	78.529	78.526	78.526	890.182

5. Nadu Koduthavilkulam

Contour level (m)	Area (Ac)	Mean Area (Ac)	Volume (Ac.ft)	Capacity (Ac.ft)
0.30	0.678	0.339	0.339	0.339
0.60	8.464	4.571	4.571	4.910
0.90	16.560	12.512	12.512	17.422
1.20	23.233	19.987	19.987	37.319
1.50	28.899	26.066	26.066	63.385
1.80	35.593	32.246	32.246	95.631
2.10	41.858	38.725	38.725	134.356
2.40	47.976	44.917	44.917	179.273
2.70	56.653	52.314	52.314	231.587
3.00	68.287	62.470	62.470	294.058
3.30	85.382	76.835	76.835	370.892
3.60	87.673	86.527	86.527	457.420
3.90	87.755	87.714	87.714	545.133

6. MoolaiKoduthavilkulam

Contour level (m)	Area (Ac)	Mean Area (Ac)	Volume (Ac.ft)	Capacity (Ac.ft)
0.00	0.006	0.003	0.003	0.003
0.30	0.571	0.288	0.288	0.291
0.60	6.408	3.489	3.489	3.781
0.90	12.252	9.330	9.330	13.111
1.20	17.484	14.868	14.868	27.979
1.50	22.517	20.000	20.000	47.979
1.80	29.225	25.871	25.871	73.850
2.10	39.195	34.210	34.210	108.061
2.40	53.907	46.551	46.551	154.612
2.70	68.016	60.961	60.961	215.573
3.00	74.945	71.481	71.481	287.054
3.30	80.291	77.618	77.618	364.672
3.60	86.077	83.184	83.184	447.855
3.90	86.203	86.140	86.140	533.995

b. Parameters of Tank

The surface water storage capacity of the cascade will be greatly enhanced through renovating the head works of these tanks as indicated in the below table.

No	Name of Tank	Existing Capacity (Ac.ft)	Designed Capacity (Ac.ft)	Coordinate

1	Arasapuram	367.553	367.553	440370.297	765104.145
2	Eriyanarai	181.855	181.855	441467.540	765019.439
3	Murukkanoddu	6.907	36.126	9.39237	80.24592
4	KovilKoduthavil	82.11	114.397	440278.386	766099.576
5	Nadu Koduthavil	95.63	134.356	440950.406	765785.828
6	MoolaiKoduthavil	73.85	108.061	441576.661	765898.434
		807.905	**942.348**		

Table 4: Details of Existing and Designed Capacity

The Full Supply Level (FSL) has not been raised for bothArasapuram and Eriyanaaari tanks during the ongoing development works initiated by CSIAP. A spill structure has been proposed for the Murrukknoddu tank in the new design for Phase 2 of CSIAP. A new common spill structure has been constructed for the other three tanks in this cascade. The details are shown in Table 5.

Table 5: Details of Existing and Designed Full Supply Level.

No	Name of Tank	Existing FSL (m MSL)	Designed FSL (m MSL)	Spill raised by (m)
1	Arasapuram	2.7	2.7	0.0
2	Eriyanarai	3.3	3.3	0.0
3	Murukkanoddu	2.4 (natural)	3.0	0.60
4	Kovilkoduthavil	1.8 (natural)	2.1	0.30
5	Nadu koduthavil			
6	Moolaikoduthavil			

4 tanks (Murukkanoddu, Kovilkoduthavil, Nadu koduthavil and Moolaikoduthavil) in this cascade do not have spill structures or spill pathways, causing them to become breached. However, as part of the CSIAP Project, spill and irrigation structures were constructed according to the topography as outlined in Table 6.

Table 6: Existing and Designed spill Length (based on Design Afflux)

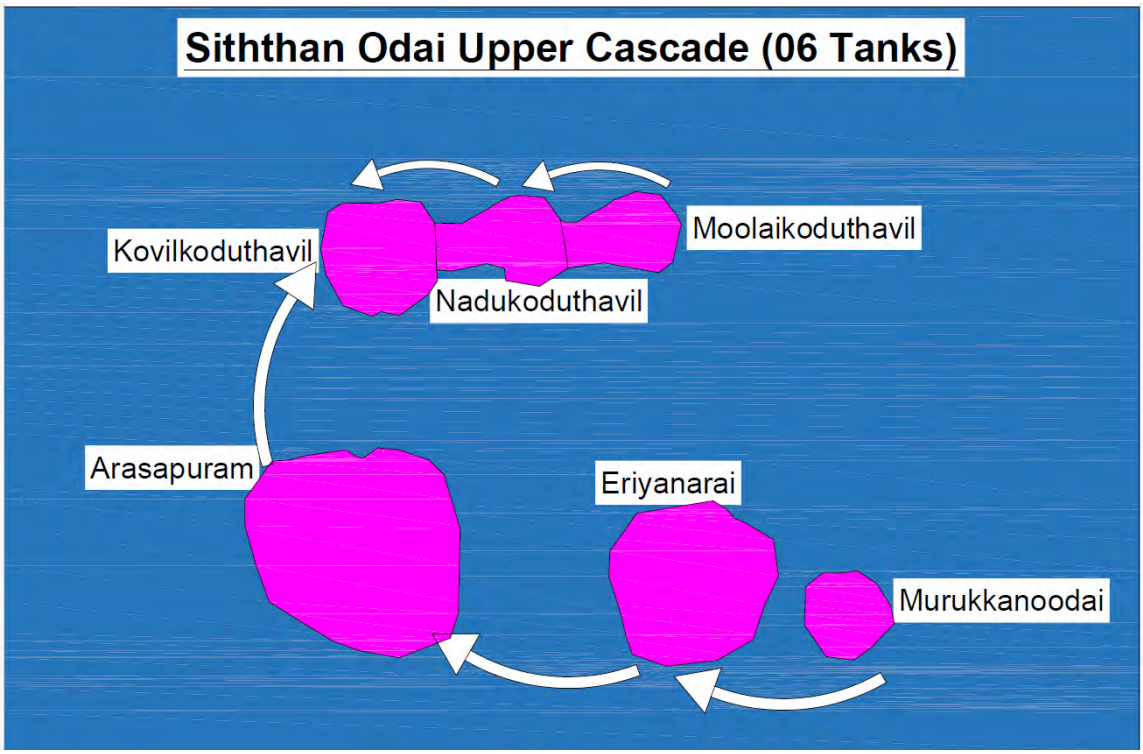
No	Name of tank	Design Peak flow (m3/s)	Existing Spill Length (m)	Designed Afflux (m)	Design Spill length (m)
1	Arasapuram	45.6	20	0.6	20

2	Eriyanarai	43.0	12	0.6	12
3	Murukkanoddu	58.14	No	0.6	48.40
4	Kovilkoduthavil	109.328	No	0.6	130.0
5	Nadu koduthavil				
6	Moolaikoduthavil				

Table 7: Bund Top Level

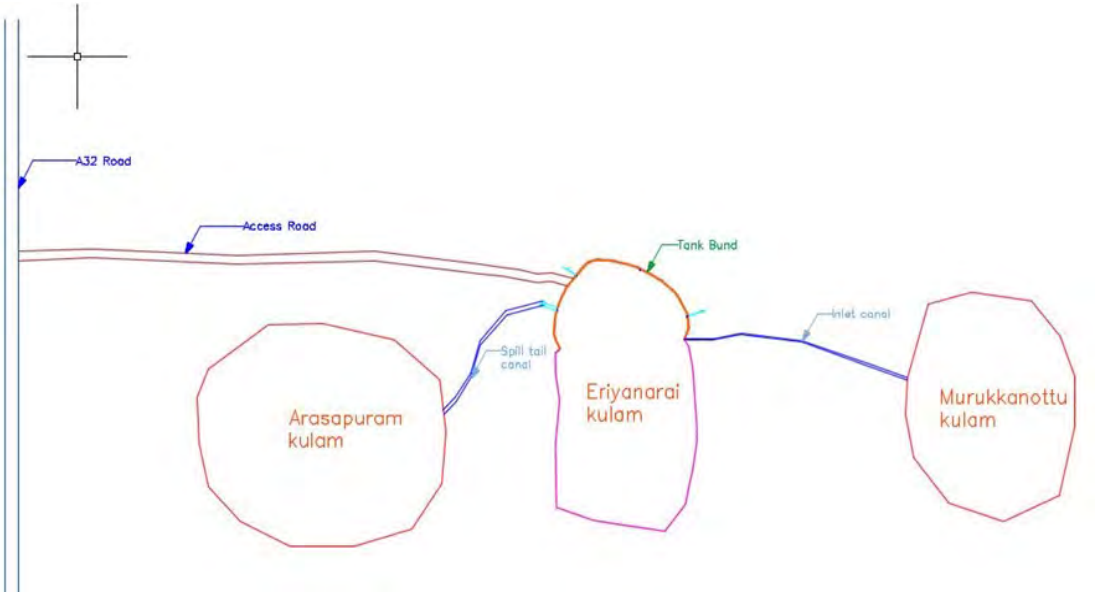
No.	Name of Tank	Existing BTL (MSL)	Designed BTL (MSL)
1	Arasapuram	3.90	4.60
2	Eriyanarai	3.90	4.50
3	Murukkanoddu	No	4.50
4	Kovilkoduthavil	No	3.10
5	Nadu koduthavil	No	
6	Moolaikoduthavil	2.40	

Figure 2 map of Sithan Odai Upper Cascade



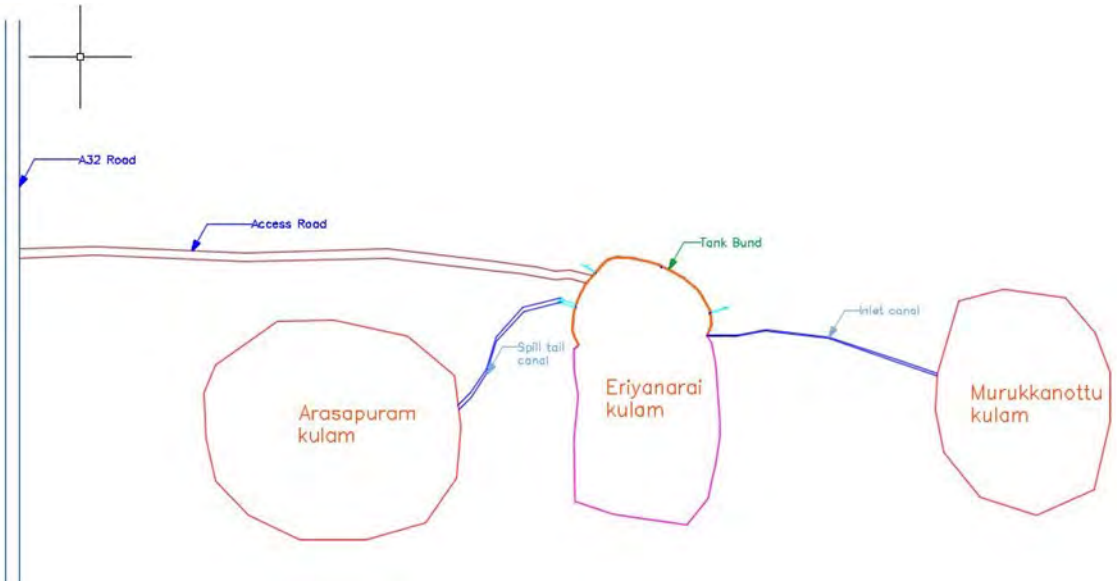
c. Tanks Layouts

Figure 3: Layout of MurukkanodduKulam



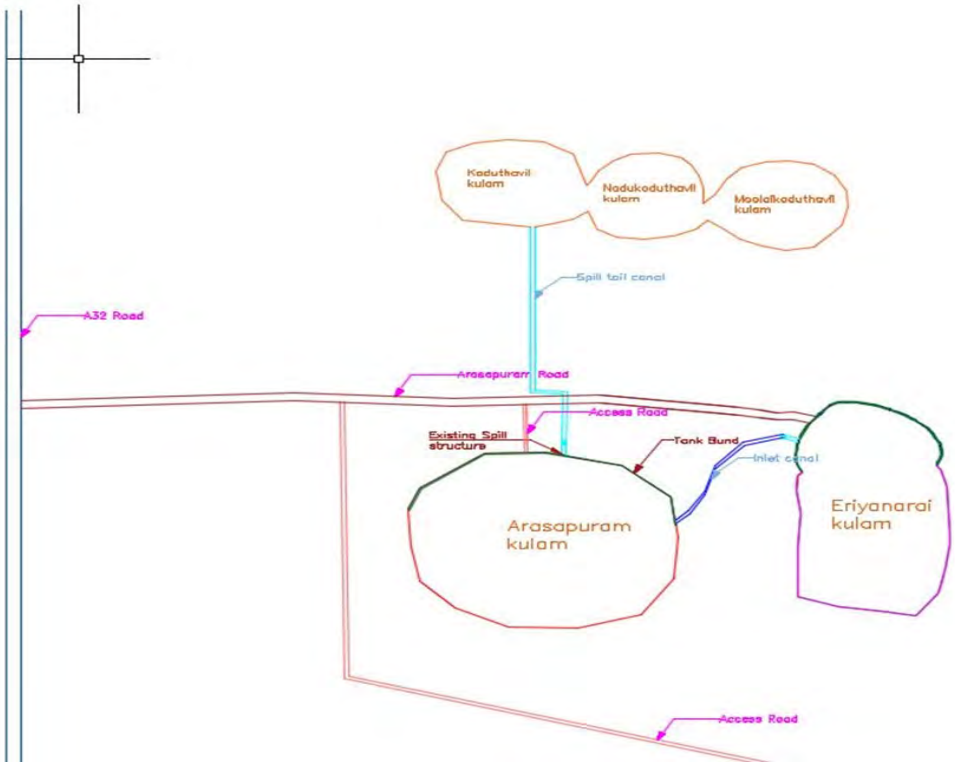
MurrukanodduKulam is an upper tank in this cascade system that receives water from its own catchment area. The earth bund of the tank stretches for 925 meters and a spill structure was constructed. During a transect walk, the farmers mentioned that they expect to cultivate 10 acres in the season as the results of the rehabilitation of tanks.

Figure 4: Layout of Eriyanaraikulam



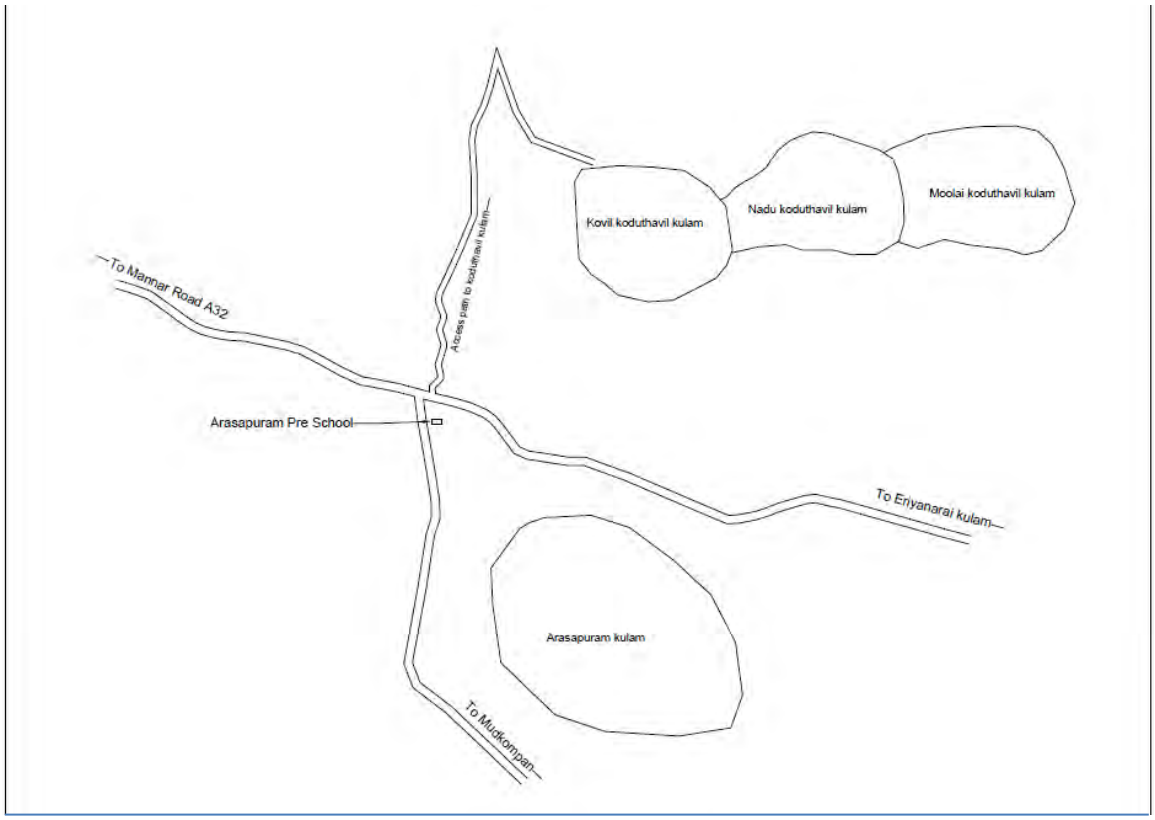
The length of EriyanaariKulam bund is a total of 900 meters. This tank receives water from its own catchment area as well as from the MurrukanodduKulam. A feeder canal has been constructed to connect MurukkanoduKulam withEriyanaari. Additionally, there is a spill tail canal that connects to Arasapuram tank.

Figure 5: Layout of ArasapuramKulam



The Arasapuram tank is situated in the middle of a cascade. It receives water from the EriyanaariKulam, which spills water, and it also has its own catchment. Total length of the arasapuram tank bund is 1025 m. A 20-meter-long CO Spill was constructed at ArasapuramKulam. Farmers practice lift irrigation to irrigate their land.

Figure 6: Layout of KovilkoduthavilKulam, Nau koduthavilkulam, Moolaikoduthavilkulam



All three tanks are interconnected and built as a single structure under the CSIAP. It includes a 140m CO Spill Structure and an inlet control structure. The water is sourced from its own catchment and the KovilKoduthavil tank also receives water from the Arasapuram tank. Additionally, the KovilKoduthavil tank facilitates 30 acres of OFC cultivation using lift irrigation techniques

3. 3 Climate (Rainfall & Temperature)

It is found from the Annual Resource Profile and Statistics of Poonakary DSD that the mean annual rainfall in Poonahary is 1,286 mm, and 75% of the rainfall received during the period starting from September to December by North–East monsoon. But a huge variation was observed in the monthly rainfall pattern compared with the last decade due to global warming and the disturbance of atmospheric circulation. Most of the rain fed cultivations such as paddy, black gram, and OFC were severely affected due to both unexpected drought and heavy rainfall. But the annual temperature varies from 25 C to 35 C.

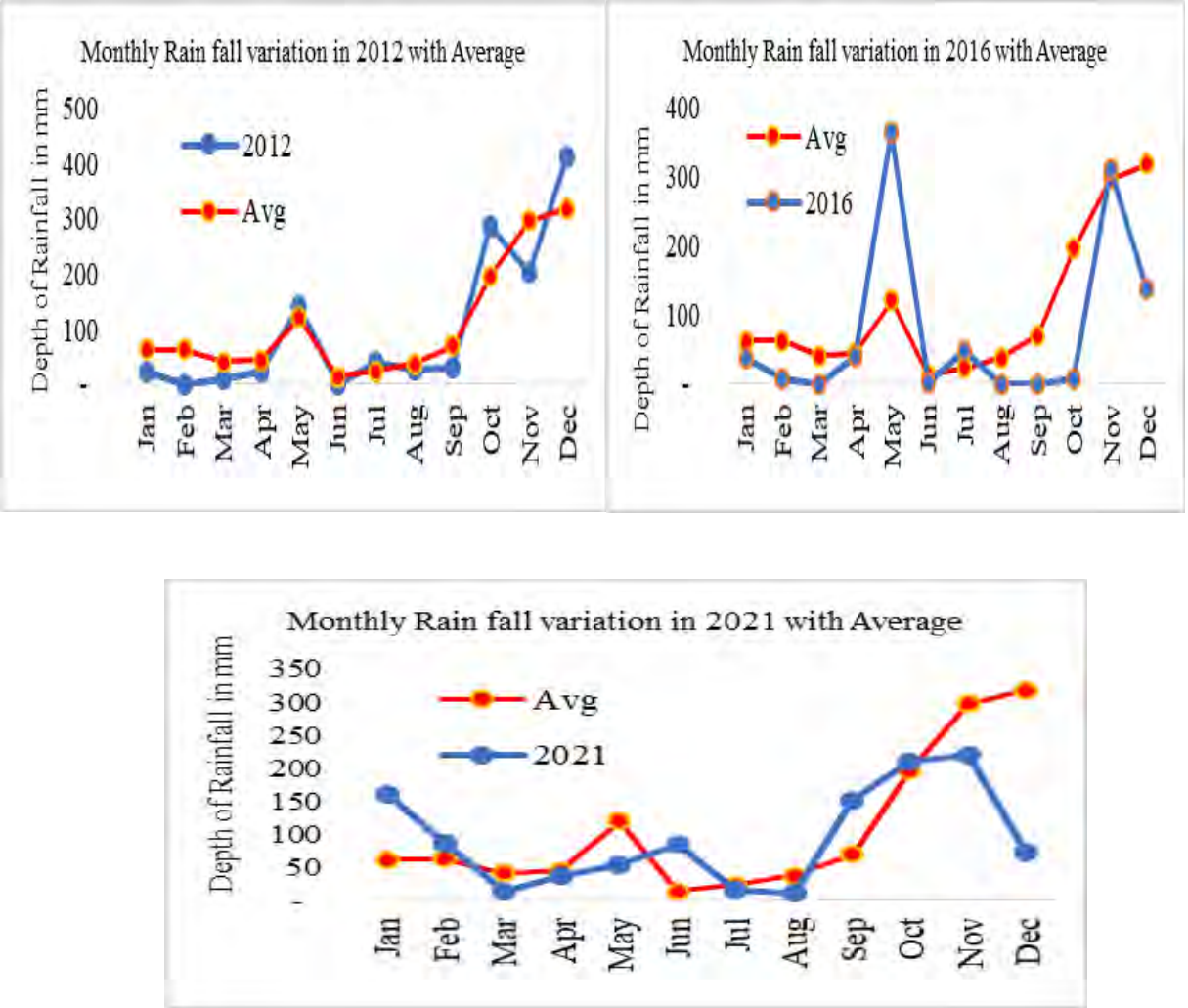


Figure 7: Temporal rainfall variation in the cascade

(The source: Annual Resource Profile and Statistics of Poonakary DSD from 2012 to 2021)

4 Human Geography of SiththanOdai Upper

4.1 Details of the Socio-Economic Aspect

Table 08: Demographic detail of SithanOdai Upper Cascade

Tank Name	Total Population	Total Families	Vulnerable Family			
			Women Headed	Disable	Elders	Samurdhi
Eriyanarai Tank	82	20	02	02	05	25
Arasapuram Tank	127	31	11	05	06	31
Koduthavil,NaduKoduthavil&MoolaiKoduthavil Tank	134	35	12	06	15	32
MurukkanodduKulam	21	05	-	-	-	-
Total	364	91	25	13	26	88

4.2 Details of Livelihood Activities

This cascade plays a crucial role in supporting various livelihood activities for the local populace, ranging from agriculture to forest-related work. The livelihood activities in these polygons are diverse, encompassing various sectors such as agriculture, fisheries, forestry, and small-scale businesses. This diversification of livelihoods helps mitigate risks associated with dependence on a single source of income, contributing to the resilience of the local economy. The descriptive analysis of the livelihood activities in thepolygons is given below.

Agriculture: The primary source of livelihood in the cascade is agriculture (75 families). Other field crops (OFC) is the prominent crop in this cascade. Paddy and vegetables are also primarily being cultivated. Arasapuram farmers possess paddy land outside of the village and cultivated them in Maha season as rain fed cultivation.

Coconut cultivation: This is prominent in this region. Coconuts are valuable commodities used for cooking, oil extraction and production of coconut-based products. Coconut cultivation provides a good income during this scarcity for the coconuts. The cultivation of coconuts also provides a sustainable source of income for the local farmers and contributes significantly to the economy.

Inland Fishing: The tanks facilitate inland fishing activities. Fishermen engage in fishingand get required protein and income also.Inland fishing not only supports the livelihoods of fishermen but also contributes to the food security of the region.

Livestock rearing: The farmers of Arasapuram area involve in the cattle rearing and others involve goats and poultry rearing. An advocacy activity is proposed in the Patghinipai CMP to convince the Minister of Fisheries to submit the concept paper for the establishment of pasture land. These farmers also need to be mobilized to strengthen advocacy initiative.

Forest-related Work: Generation to generation the people of this cascade also engages in hunting, collecting honey from natural beehives, medicinal herbs and fire wood. Pallai bears edible fruit for a season. The residents pluck and sell it. These activities provide supplementary income to the local population.

Employment Opportunities: The people of this cascade are working for salary (03 in government jobs, 11 in private sector and daily wage labor as well). These employment avenues provide additional sources of income and contribute to the overall socio-economic development of the cascade.

Small-Scale Businesses: 07 small shop ownersare doing their business in retail shops, transportation services and other businesses catering to the local community's needs.

In summary, the Siththanodai upper cascade region sustains a diverse range of livelihood activities that are crucial for the well-being and prosperity of the local population. These activities not only provide sustenance but also contribute to the cultural heritage and economic vitality of the area.

4.3Details of Crop & Land Use Pattern within the Cascade System

54 farmers possess land in the range between 2 and 4 ac. The farmers often practice crop rotation and diversification in order to sustain the soil fertility and control the pest and disease. After the paddy harvest, vegetables [chilli(5ac), pumpkin (0.25ac), tomato, red onion, egg plant (0.25ac)and long beans(0.25ac)], grains [groundnut (30ac), black gram (25ac) green gram (5ac), cowpea (5ac) and sesame (5ac)] are cultivatedas high land crop. They buy the seeds [chilli, Brinjal and Groundnut) either from Agriculture Instructor or Private vendors. This pattern ensures the stable food and the source for income to the farmers. This practice helps to maximize land productivity and to diversify the cropping index.

OFC is cultivated around 54ac with the supplementary irrigation especially in Yala season or immediately after Maha season. Further, the fruits (cashew (4ac), mango & guava) are being cultivated in the dwelling places also. Farmers receive yield 500kg of groundnut and 4000Kg of chilliper acre. They bring the product to markets in Poonagaryor in Jaffna district.But theaccess to Kilinochchi market requires transition via Mutkompan.

Farmers cultivate in three seasons and types of crops are also varying for the season. There are much possibilities for introducing long bean and it will cater the vegetable requirement of the village. The total cultivable land extent in Siththanodai upper cascade is around 172ac in Maha and 54ac in Yala season. The detail is shown in Table 09.

Table 09: Details of crop pattern under the small tanks within the cascade

No	Name of Tank	Cultivable Extent (ac)			
		Yala		Maha	
		Paddy	OFC	Paddy	OFC

1	Eriyanarai Tank	0	16.0	20	0
2	Murukkanottu Tank	0	25.0	10	0
3	Arasapuram Tank	0	0	0	0
4	Mullaikoduththavil Tank	0	1	0	1
5	Nadukoduththavil Tank	0		0	
6	Kovilkoduththavil Tank	0		0	
	Total	**-**	**41.0**	**30**	**1**

4.4 Cultural Diversity

Siththanodai upper cascade system reflects a rich tapestry of cultural diversity. Within this system lies a profound narrative encapsulated in the book "PATHTHATHI," which delves into the unique methods employed by the Tamil community to steward their water resources. Through spiritual practices such as rural god worship, known as 'kiramiyavazhipaadu,' and ancient songs, the community has fostered a harmonious relationship with their environment, particularly in managing their cascade system and utilizing well water resources.

The book sheds light on the nuanced interactions between individuals and social groups, illustrating the collective effort required to maintain the delicate balance of their water management practices. With literature refinement, the narrative paints a vivid picture of a community deeply rooted in tradition yet adaptive in its approach to sustainable resource management. The community has concern to conserve the Alliranikunru as it is.

4.5 Management of Irrigation

Based on the water availability Farmers Organization decides the extent of cultivation and carefully manage the water level in each tanks. Farmers used removable wooden plank structure in order to stagnate more storm water for the irrigation purpose in Arasapuram tank. The farmers plant chilli, groundnut and egg plant before tank water level goes down.

A few farmers dug wells (tube wells or open wells) in their farm premises and used they get the water from them for their domestic and cultivation purpose even though the water quality is not fit for the irrigation. 90% of farmers extract water from Arasapuram tank by using kerosene water pump and convey them to their farm land which located 500m to 800m far away from the tank.

Due to the restoration of tank, water level raised further 4 feet and farmers expect that they could extend the cultivation throughout the year.

5. Human Interventions

5.1 Government's Developments Project

The Road Development Authority, Road Development Department and Department of Local Government have undertaken road development projects to improve connectivity and accessibility within the Cascade area. Also, the housing projects supported to rebuild the homes and sanitation facilities in the proposed cascade area. The Ceylon Electricity Board also facilitated the connections to the domestic houses and other community buildings in last decade. Other Government Departments have undertaken activities of agricultural development, education and skill development and health facilities in SiththanOdai Upper cascade. Arasapuramtank was completely restored by the International Labour Organization in 2019 as labour intensive work with the participation of the villagers.

5.2 Ongoing Livelihood Activities

Restoration of "Murukkanottu" tank is proposed in the second phase of CSIAP but farmers getting afraid that CSIAP will initiate restoration soon. There is 05acre of cultivable land and once the renovation is over the land will be cultivated.

The CSIAP is conducting training programs for SAC and workshops to educate farmers about the benefits of sustainable irrigation practices, including water-saving methods, which can enhance their awareness and understanding under the Eriyanarai"tank, "Arasapuram" tank, "Mullaikoduththavil" Tank, "Nadukoduththavil" Tank and "Kovilkoduththavil" Tank rehabilitation program.

5.3 Planned Construction Activities within the Cascade System

Renovation of 2 tanks of the cascade is being restored under CSIAP. The proposed restoration works for "Eriyanarai" and "Arasapuram" tank were curtailed and "Murukkanottu" tank will not be renovated in the first phase and will be restored in the second phase.

No.	Arasapuram Tank	Eriyanarai Tank	Murukkanottu Tank
1	Improvement of tank bund (Existing) – 2125 m	Improvement of tank bund (Existing) – 1265 m	Improvements of tank bund (SWB) – 1025 m
2	Existing spill structure is recently restored	Construction of spill structure - 20 m	Construction of concrete spill structure (SWB) – 10 m
3	Construction of spill tail canal -967 m	Construction of spill tail canal - 1200 m	Construction of spill structure (SWB) – 170 m

4	600mm dia double row H/P inlet was constructedfor4.8 m long.	600 mm dialong double row H/P inlet structure was constructedfor 4.8 m long9.6m.	Improvement of road work
5	Construction of 600 mm Dia double row culvert for 4.8 m long	Construction of 600 mm dia single row H/P inlet structure for 4.8 m9.60 mLong	Construction of Causeway
6	Construction of depth gauge	Construction of depth gauge	Construction of outlet structure

Farmers of this cascade will get more benefit when Mandakallaru Barrage construction is done.

6. Major Challenges in the Cascade

6.1 Extent of Environmental Issues

- **Deforestation:** Smugglers cut trees like satin, oronpalai and muthirai trees in order to make wooden planks and furniture. Based on the verbal information of villagers, unknown people cut the trees. More than 30 numbers of trees were cut down along the area when the team visited. This is common issue along the river basins in Sri Lanka. The success of the CSIAP, at large depends on minimizing the deforestation.

- **Soil Erosion:**There is a high chance for induced soil erosion due to the rehabilitation of this cascade system. Clearing vegetation, excavation activities, and developing bunds, digging barrow pits, and piling soil are the causes. Water flowing through the cascade system can cause soil erosion, particularly in areas where the sandy type soil. This erosion can lead to loss of fertile topsoil, affecting the long-term productivity of the land.
  Being a flat terrain, there is less chances of getting soil eroded due to agricultural practices. However, if the land preparation is done and exposed to intensive rains occurring during September and October there is more chance for soil erosion as these soils are not much stable. On the other hand, the soil get compacted due to absence of organic manure and tend to generate more runoff leaving soil with low water holding capacity. As a result, the soil soon becomes dry and crops are affected with soil moisture deficit.

- **Fragmentation:**The Siththanodai upper cascade command area is divided into smaller plots to accommodate the flow of water. They use more than 85% of land for high land crop cultivation. This fragmentation challengesthe farmers to manage their crops efficiently inthe mechanized farming practices. This smaller plots cause difficulties in accessing and maintaining the land.

- **Climate Change Impacts:**Erratic rainfall patterns, increased temperatures, and prolonged dry spells affect water availability. Developing climate-resilient irrigation strategies, such as implementing micro-irrigation systems, introducing drought-tolerant crop varieties like pumpkin and long beans and practicing conservation agriculture can mitigate the adverse impacts of climate change and ensure the sustainability of agriculture in the area.
- **Improper Garbage Disposal:**The garbage is being disposed improperly including polyethene, tin and other non-compostable materials. The garbage is burnednearby Koduththavil access road. Strengthening CMC to dialog with Pradesiya Sabha for proper disposal of waste. This scenario is not only for this cascade but also in other cascades. Therefore thisshould be dealt under the Clean Sri Lanka to find suitable waste disposable method.
- **Siltation:** There is significant siltation was observed in this cascade area.The rehabilitation of the cascade system will mitigate these impacts. Natural inflow channels need to be cleared.
- **Sedimentation:** As water moves through the cascade system, it can carry sediment, which may accumulate in lower-lying areas or reservoirs. Sedimentation can reduce the water storage capacity and hinder the effective functioning of the irrigation infrastructure. Regular maintenance and sediment removal are essential to ensure the efficient operation of the cascade system.
- **Sand Mining:** Excavation of sand in the forest area is severe problem and it depleted the forestry resources. People from other villages and natives are mining the sand as illegal business activities and need to enhance the livelihood opportunities for them.

6.2 Health Hazard

Increased hardness of groundwater, fertilizer run-off from farming lands and extensive agricultural practices are associated with incidence of Chronic Kidney Diseases in this area. Studies on groundwater quality indicates that the necessity of prior treatment is required, as most of ground water sources has not met the standard of WHO and contaminated with coli forms and Salmonella.

6.3Critical Issues of the Cascade System and Potential Solutions

- **Outdated or Poor Maintenance of the infrastructure:** Abandonment of Murukkonoddu tankis the top prioritized issue. Due to the abandonment of tank, farmers displaced to ‘Karukkaithivu’. Rehabilitation of Murukkonoddu tank will induce them to come back to the native places and increase the cultivation. The existing bund (400m) of Eriyannarai tank, Neradamapan tank, SinnaPoovazhi and PeriyaPoovazhi tanks also needs rehabilitation.

  Ruined Koduthavil inlet structure, lack of maintenance of inlet structure (0.8KM), no RB end control structure, incomplete LB end bund and poor maintenance of Neradamapan to Murukkonoddu Channel (around 1 Km) are key findings and leading to inundation of cultivation in down-stream while others face water logging and loss of yields. Modernizing

and upgrading the irrigation infrastructure is very essential for the effective function of the cascade.Eriyanarai spill way level to be reduced for water inflow of Arasapuram

- **Intensive irrigation practices**: Over-extraction of either ground water or tank water (surface water) in the dry season cause sea water intrusion towards the village via ground water table and reduce the water quality.The participants of the transect walk ranked the drinking water issue as second. Further the water scarcity affect the crop cultivation in Yala season specially. This requires remedial measures such as groundwater management and land-use planning.
- **Lack of Water Storage Facilities:**During the northeast monsoon a significant amount of water is lost due to inadequate storage capacity. Constructing or rehabilitating small-scale surface water harvesting structures to tanks named Eriyanarai, Arasapuram,Mullaikoduththavil, Nadukoduththavil and Kovilkoduththavilwill help to stagnate and store water for dry periods, ensuring a more consistent water availability throughout the year.
- **Inaccurate Irrigation Scheduling:**This cause over- or under-irrigation, negatively impact on crop productivity and water conservation. Implementing modern irrigation management techniques like Precision Agriculture, which utilizes sensors and data analysis can provide real-time information on soil moisture levels, weather patterns, and water requirements. This data-driven approach enables using water precisely when and where it is needed and minimizing water wastage.
- **Poor irrigation Efficiency:** Most of the layman farmers in the cascade area are lack of knowledge about efficient irrigation practices and water management techniques. They adopt surface / flood irrigation methods for cultivation of OFC, fruit crops and perennial crops. Since farmers traditionally practice this method, water is being wasted. Considering the soil and weather conditions of the cascade, the introduction of micro irrigation can help to optimize water usage and reduce wastage of water by 25 to 35 %.
- **Low Level StakeholdersCollaboration:**The collaboration among the stakeholders is not improved enough to manage irrigation effectively. Engaging all relevant parties in decision-making processes can lead to more inclusive and sustainable water resource management. Additionally, improving governance structures, promoting transparency, and enforcing regulations related to water usage and irrigation practices are essential for efficient and equitable water allocation.
- **Bad Condition of Agricultural Road (2KM):**2Km length of access road in Koduththavil tank, Eriyanarai to Arasapuram canal path andother roads are impassable for access the markets in order to convey agriculture goods. It should be renovated for ease transportation of farmers to convey their inputs and their yield.
- **Aquaculture only for household purpose:** There are few fish species available in the tanks. The villagers catch the fish for their daily consumption but there isn’t any tanks for fingerlings stocked so far. Farmers and villagers use hand hook to catch the fish for their consumption.

There is much potential to stock the fingerlings because the tank water holding capacity is increased and adequate water is in the middle of the tank. Villagers requestedto promote aquaculture and for the skill training on production and process of dry fish and smoke fish.

- **No safe place for water pumps which are being used for lift irrigation**: Farmers operate around 20 water pumps along the tank. There is no any safe place to keep their water pumps. Householders can cultivate home gardens using tube wells they don't have water pumps. Construction of platform for lift irrigation may secure the water pumps and home garden can be promoted through provision of solar pumps.
- **Human wildlife Conflict (HEC):**Elephants and other wild animals (boar, monkey, elephant, dear etc..) also are invading in to the village and farm land, destroy and make economic losses. It is essential to erect the fence along the border of village to mitigate the damage and to protect the crops. When working for getting air gun for the Pathinipai cascade, the need for the air guns for these farmers also has to be taken into consideration.
- **No public Transport**: The public in the cascade face many challenges aseven no any single transport service via these villages. The pregnant ladies, the patients and the school children are suffering a lot. If a person is sick, while the family is spending two thousand for hiring three wheeler or fuel for the motor bike and losing the day wage as the bread winner accompanied with the patients. An activity of "Advocate SLTB and Private Bus Owners Association to extend the service" is proposed in the CMP of Pathinipai. This community also has to be linked with the community of Paththinipay to strengthen negotiation with SLTB and Private Bus Owners Association.
- There is manual inlet structure in the bund of Koduththavil tank has not been assigned to any society. Villagers requested to make arrangement for the proper operation and maintenance of this structure.

The above critical issues were identified and ranked as below in the workshop.The interventions were also proposed for each critical issue with the same participants. .

6.4 Proposed Strategic Interventionswere ranked inorder to identified critical issues

Table 10: Proposed Intervention to overcome the identified issues

S/No.	Identified Critical Issues	Rank	Proposed Strategic Interventions
1	Human Elephant Conflict (HEC)	7	Providing the fence for the identified locations to mitigate the damage and to protect the crops
2	Aquaculture only for household purpose	9	Facilitate the community to stock the fingerlings and promote aquaculture
3	Burning garbage nearby Koduththavil access road	14	Strengthen CMC to dialog with Pradesiya Sabha for safety disposal of waste
4	Bad condition of Agricultural Road (2KM)at Koduththavil	3	Construction of 2 km Agricultural Road atKoduththavil
5	Ruined Koduthavil Inlet Structure	13	Construction of Koduthavil Inlet Structure
6	Deforestation – Palai and Muthirai is being cut for business.	15	Enforce the existing legislation and forest conservationthrough conducting awareness programmes.
7	Lack of Maintenance of 0.8KMlength of inlet structure at Eriyanarai	17	Strengthen CMCto maintain assets of the cascade.
8	Wild beasts (boar, monkey, dear etc..) affect the field specially ground nut cultivation	10	Intervention is merged with the intervention which is proposed to the critical issue of Human Elephant Conflict (HEC)
9	No safe place for water pumps which are being used for lift irrigation	12	Construction of Platform for lift irrigation
10	No RB end Control Structure at Arasapuram Tank	8	Establishment of RB end Control Structure at Arasapuram tank.
11	LB end bund is not completed at Arasapuram Tank	4	Completion of LB end Bund at Arasapuram Tank
12	No water pumps for farming/ home gardening	11	Provision of Solar Pumps

13	Sea water intrusion towards the village via ground water table and reduce the water quality	2	Construction of Mandakallaru Barrage is proposed in the CMP of Pathinipai. However, the CMC must be strengthen for “Effective groundwater management and land-use planning”
14	No any single transport service via these villagesof the cascade area.	5	Engage the people of this cascade with the with Pathinipaicommunity in the advocacy initiatives to extend the transport service
15	Murukkonoddu tank is abandoned	1	Rehabilitation of Murukkonoddu tank
16	Poor maintenance of Neradamapan to Murukkonoddu Channel (around 1 Km)	6	Rehabilitation of 1 km Channel Neradamapan to Murukkonoddu
17	Adampanthalvutank is abandoned	16	Rehabilitation of Adampanthalvu tank
18	Naradamaban tank is also in abandoned for long time.	18	Rehabilitation of Neradamapan Tank
19	Crocodiles in bathing area	19	Construction of bathing steps/ Fence for the bathing area
			Advocate the Department of Forest & Department of Wild life to shift the Crocodiles.
20	Eriyanarai to Arasapuram canal path is not completed	20	Rehabilitation of Eriyanarai tank
21	Eriyannarai tank (rehabilitated) bund is damaged near inlet structure		
22	The Mutkompan hospital is not functioning	21	Top level management of CMP advocate at the national level

6.5 Proposed Activities to Overcome the Identified Issues

Table 11: Proposed activities to achieve the targets / specific objectives

S/No.	Identified critical Issues	Proposed Strategic Interventions	Proposed Activities
1	Murukkonoddu tank is abandoned	Rehabilitation of Murukkonoddu tank	Upstream and downstream development at Murukkonoddu tank
2	Sea water intrusion towards the village via ground water table and reduce the water quality	Construction of Mandakallaru Barrage is proposed in the CMP of Pathinipai. However the CMC must be strengthen for “Effective groundwater management and land-use planning”	Construction of Mandakallaru Barrage
3	Bad condition of Agricultural Road (2KM) at Koduththavil.	Construction of 2 Km Agricultural Road for Koduththavil	Rehabilitation of Agro roads at Koduththavil – 2Km
4	LB end bund is not completed at Arasapuram Tank	Completion of LB end bund at Arasapuram Tank	Renovation of LB channel lining at Arasapuram Tank
5	No any single transport service via these villagesof the cascade area.	Engage the people of this cascade with the Pathinipai community in the advocacy initiatives to extend the transport service	Advocacy initiatives to extend the transport service
6	Poor maintenance of Neradamapan to Murukkonoddu Channel (around 1 Km)	Rehabilitation of 1 km Channel Neradamapan to Murukkonoddu	Channel lining development Neradamapan to Murukkonoddu – 1Km
7	Human Elephant Conflict (HEC)	Providing the fence for the identified locations to mitigate the damage and to protect the crops	Installation of Elephant fence
8	No RB end Control Structure at Arasapuram Tank	Establishment of RB end Control Structure at Arasapuram Tank	Rehabilitation of RB end structure at Arasapuram Tank

9	Aquaculture only for household purpose	Facilitate the NAQDA and community to promote aquaculture	Development of inland fishing in the cascade area.
10	Wild beast (boar, monkey, dear etc..) affect the field specially ground nut cultivation	Intervention is merged with the intervention which is proposed to the critical issue of "Human Elephant Conflict" (HEC)	Facilitate the FOs to equipped with air guns.
11	No water pumps for farming/ home gardening	Provision of Solar Pumps	Providing the solar pumps for promoting agricultural production.
12	No safe place for water pumps which are being used for lift irrigation	Construction of Platform for lift irrigation	Establishment of platform for keeping water pumps.
13	Ruined Koduthavil Inlet Structure	Construction of Koduthavil Inlet Structure	Rehabilitation of inlet structure at Koduthavil
14	Burning garbage nearby Koduththavil access road	Strengthen CMC to dialog with Pradesiya Sabha for safety disposal of waste.	Linking stakeholders under Clean Sri Lanka
15	Deforestation – Palai and Muthirai is being cut for business.	Enforce the existing legislation for forest conservation through conducting awareness programme	Conducting IEC for prevention of deforestation.
16	Adampanthalvu tank is abandoned	Rehabilitation of Adampanthalvu tank	Upstream and downstream development of Adampanthalvu tank
17	Lack of Maintenance of inlet structure (0.8KM) at Eriyanarai	Strengthen CMC for the maintenance of inlet structure at Eriyanarai	Rehabilitation of inlet structure at Eriyanarai
18	Naradamaban tank is also abandoned.	Rehabilitation of Neradamapantank	Upstream and downstream development of Neradamban tank.

19	Crocodiles in bathing area	Advocate the Department of Forest & Department of Wild life to shift the Crocodiles. Construction of bathing steps/ fence around the bathing area	Construction of bathing steps/ fence around the bathing area
21	Eriyanarai to Arasapuram canal path is not completed	Complete Eriyanarai to Arasapuram canal path	Rehabilitation of Eriyanarai tank
22	Eriyannarai tank (rehabilitated) bund is damaged near inlet structure	Renovate the Eriyannaraitank bund	
23	The Mutkompan hospital is not functioning	Top level management of CMP advocate at the national level	Advocate the Ministry of Health to make Mutkompan hospital operational.

6.6 Total Estimate for Implementing Interventions

Table 12: Gantt Chart for Proposed Activities, tentative budget and Responsible Entities for Implemention

No.	Proposed Activities	Tentative Budget (Rs. Mn.)	Time Frame														Responsibility of Implementation	
			Short Term (Jul - Dec 2024)						Mid Term (Jan - Dec 2025)				Long Term (Jan -Ju c 2026)					
			Jul	Aug	Sep	Oct	Nov	Dec	QI	Q2	Q3	Q4	QI	Q2	Q3	Q4	Major	Others
1	Upstream and downstream development at Murukkonoddu tank	20.0															DAD /CSIAP	FO
2	Construction of Mandakallaru Barrage	500.0															DS / DAD	FO
3	Rehabilitation of agro roads at Koduththavil – 2Km	12.0															DAD /CSIAP	FO
4	Renovation of LB channel lining at Arasapuram tank	10.0															DAD /CSIAP	FO
5	Advocacy initiatives to extend the transport service	50.0															DAD /CSIAP	FO
6	Channel lining development, Neradamapan to Murukkonoddu – 1Km	5.0															DAD /CSIAP	FO
7	Installing Elephant fence	50.0															DAD /CSIAP	FO

8	Rehabilitation of RB end structure at Arasapuram tank	5.0																DAD / CSIAP	FO
9	Development of inland fishing in the cascade area.	1.0																DAD /DF	FO
10	Facilitate the FOs to be equipped with air guns.	1.0																DAD /DWL	FO
11	Providing the solar pumps for promoting agricultural production.	50.0																DAD /CSIAP	FO
12	Establishment of platform for keeping water pumps.	2.0																DAD / DWLC	FO
13	Rehabilitation of inlet structure at Koduthavil																		
14	Linking stakeholders under Clean Sri Lanka	1.0																DAD /PS	FO
15	Conducting IEC for prevention of deforestation.	1.0																DAD /CSIAP	FO
16	Upstream and downstream development of Adampanthalvu Tank	10.0																DAD /CSIAP	FO

17	Rehabilitation of improvement of inlet structure at Eriyanarai	2.0															DAD /CSIAP	FO
18	Upstream and downstream development of Neradamban tank.	10.0															DAD /CSIAP	FO
19	Advocate the Department of Forest & Department of Wild life to shift the Crocodiles to Kadalarichchakulam.	1.0															DAD /DFC	FO
20	Rehabilitation of Eriyanarai Tank																	
21	Advocate the Ministry of Health to make Mutkompan hospital operational.	1.0															CS/MH	FO

6.7 Contribution Expected from the Stakeholder Agencies

Table 13: Proposed Activities with Expected Contribution from Stakeholder Agencies

No.	Proposed Activities	Total Budget (Rs. Mn.)	Expected Budget Contribution in Rs. Mn.			
			Private	Line Agencies	Farmers	Funding Agencies
1	Advocacy initiatives to extend the transport service	50.0		50.0		
2	Development of inland fishing in the cascade area.	1.0		1.0		

3	Facilitate the FOs to be equipped with air guns.	1.0			1.0	
4	Linking stakeholders under Clean Sri Lanka	1.0		1.0		
5	Advocate the Department of Forest & Department of Wild life to shift the Crocodiles to Kadalarichchakulam	1.0		1.0		
6	Advocate the Ministry of Health to make Mutkompan hospital operational.	1.0		1.0		

7. Implementation methodology

7.1 Execution of Cascade Management Plan

Preparing a CMP SiththanOdai Upper cascade system is essential as it provides a comprehensive overview of the system's design, components, and operational parameters. This CMP serves as a valuable reference for engineers, operators, stakeholders and layman farmers involved in the system's installation, maintenance, and management. By detailing factors such as tank specifications, interconnections, control mechanisms, safety features, critical issues and fluid transfer dynamics, the profile enables a clear understanding of how the cascade system functions and how it fits within the entire command and catchment areas. Ultimately, this CMP facilitates effective decision-making, troubleshooting, and optimization, ensuring the tank cascade system operates reliably and efficiently to meet its intended purpose.

By addressing these key issues and implementing sustainable irrigation management practices, the Siththanodai upper cascade area, can enhance water efficiency, increase agricultural productivity and ensure the long-term sustainability of water resources.

7.2 Community’s Responsibilities in the Cascade

The management of the proposed cascade falls under the purview of the farmers’ organization with ownership vested in the DAD. Community responsibility for maintaining these tanks is categorized into organizational settings, self-interest, and collective-oriented responsibility under the social capital framework. Additionally, an ancient book, 'PATHTHATHI,' is preserved by the community of Paththinipai, elucidating their responsibilities in managing cascading tanks, protecting water resources, and addressing water-related emergencies such as floods and droughts. Farmers have undergone awareness training on cascade management systems, cascade development plans, and identifying issues and tasks pertinent to cascade development.

8. Annexures

Annexure 1: Circular No 6 of 2023 issued by the Department of Agrarian Development on 3 rd August 2023 to establish Cascade Management Committees

சுற்றறிக்கைஇலக்கம் – 06/2023
அனைத்துமாவட்டசெயலாளர்களுக்கும்பிரதேசசெயலாளர்களுக்கும்,

குளஅடுக்குத்தொடர்அமைப்புமுகாமைத்துவகுழுஉருவாக்கம்மற்றும்நடாத்திச்செல்லல்ஒழுங்குமுறைகள்
நாட்டின்உள்ளகத்திலிருந்துகடலுக்குவழிந்தோடும்பிரதானஆறுகள்மூன்றாம்நிலைநீர்வழிகள்எனவும், அப்பிரதானஆறுகளைசேரும்கிளைஆறுகள்இரண்டாம்நிலைநீர்வழிகள்எனவும்அக்கிளைஆறுகளுக்குநீர்வழங்கும்சிறியநீர்வழிகள்ஆரம்பநிலைநீர்வழிகள்எனவும்அழைக்கப்படும்.
கிராமியமட்டத்திலானகுளங்களும்நீர்த்தேக்கங்களும்பெரும்பாலும்ஆரம்பநிலைநீர்வழிகளினூடுஅமைக்கப்பட்டுள்ளதோடுபூமியின்மேற்பரப்பில்நீரைத்தேக்கிகீழேவழிந்தோடச்செய்யஅமைக்கப்பட்டிருக்கும்வாவிகளும் இதனுள்அடங்கும்.

- நாட்டின்உள்ளகத்தில்காணப்படும்ஆரம்பநிலைநீர்வழியொன்றுஅல்லதுநீர்வழிவலையமைப்பிலுள்ளநீரியல்ரீதியாகஒன்றிணைந்தசிறுமற்றும்நடுத்தரஅளவிலானவாவிஅமைப்புக்கள்அல்லதுகுளங்கள்மற்றும்நீர்த்தேக்கஅமைப்புக்கள்அல்லதுநீர்த்தேக்கஅமைப்புக்களினாலானநடுத்தரஅளவிலானநீரேந்துபகுதிகுளஅடுக்குத்தொடர்அமைப்புஎனகூறப்படும்.

- இலங்கையில் 1166 குளஅடுக்குத்தொடர்அமைப்புக்கள்கண்டுபிடிக்கப்பட்டுள்ளன. இக்குளஅடுக்குத்தொடர்அமைப்புக்களைமையமாகக்கொண்டுபுவியியல், நீரியல், சூழலியல்மற்றும்சமூகபொருளாதாரமேம்பாடுகுறித்துவளப்பயன்பாட்டினைவினைத்திறனாகவும்நிலையானதாகவும்கொண்டுசெல்வதனைஇலக்காகக்கொண்டு 1968 இலக்கம் 48 நீர்ப்பாசன (திருத்தங்கள்) கட்டளைச்சட்டத்தின்திருத்தியமைக்கப்பட்ட 1946 இலக்கம் 32 நீர்ப்பாசனகட்டளைச்சட்டத்தின் 1(அ) 1,2,3,4 உறுப்புரைகளின்பிரகாரம்கமநலஅபிவிருத்திஆணையாளர்நாயகத்திற்குவழங்கப்பட்டிருக்கும்அதிகாரங்களுக்கமையமேற்குறிப்பிட்டசட்டத்திற்கமையநடாத்தப்படும்மாவட்டவேளாண்மைகுழுவின்போது, நீர்ப்பாசனக்கைத்தொழிலைமையமாகக்கொண்டநெல்உற்பத்திஉள்ளிட்டவேளாண்மையில்தாக்கம்செலுத்தும்அல்லதுஅனைத்துதுணைக்காரணிகள்குறித்துநடவடிக்கைகளைமேற்கொள்ளகுறித்தசட்டத்தினால்உங்களுக்குவழங்கப்பட்டுள்ளஅதிகாரங்களின்பிரகாரம்குளஅடுக்குத்தொடர்அமைப்புமுகாமைத்துவகுழுக்களைஉருவாக்குதல்மற்றும்நடாத்திச்செல்லுதல்ஒழுங்குமுறைகள்தொடர்பாகவேளாண்மைக்குழுவில்கலந்துரையாடுமாறும்அதற்குகீழ்குறிப்பிட்டுள்ளவிடயங்களைவழிகாட்டிகளாகபயன்படுத்துமாறுகனிவுடன்தெரிவிக்கிறேன்.

    - <u>குளஅடுக்குத்தொடர்அமைப்புமுகாமைத்துவகுழுக்களைஉருவாக்குவதற்கானகுறிக்கோள்கள்</u>

        - குளஅடுக்குத்தொடரில்அமைந்துள்ளஅனைத்துஇயற்கைவளங்கள், அதாவதுமண், நீர், வனவளம்,உயிரியல்அமைப்புக்கள், காணிமற்றும்நீர்ப்பாசனகட்டமைப்புக்களைமுகாமைத்துவம்செய்வதற்காகநலன்விரும்பிகள்மற்றும்குறித்தஅரசஅதிகாரிகள்ஒருமித்தஅணுகுமுறையுடன்செயல்படுவதற்கானநிறுவனகட்டமைப்பொன்றினைஅமைத்தல்.
        - நீர்ப்பாசனவேளாண்மை, கால்நடைதொடர்பானநடவடிக்கைகள்மற்றும்நன்னீர்மீன்பிடிக்கைத்தொழிலிற்குநீர்வழங்கல், வனவளம்மற்றும்வனவிலங்குகளின்தேவைப்பாடுகளைசமாந்தரமாகநடாத்திச்செல்லல், நிலத்தடிநீரினைஉகந்தவாறுபேணுதல்வீட்டுத்தோட்டபராமரிப்புஉள்ளிட்டவீட்டுநீர்பாவனையினைமுறையாகமுகாமைத்துவம்செய்தல்.
        - வேளாண்மைநடவடிக்கைகளுக்குநீர்ப்பாவனைசெய்பவர்கள்உள்ளிட்டபடிநிலைஅமைப்பினைபராமரிப்புசெய்வதற்காகவேறுபயனாளிகள்மற்றும்பங்குதாரர்களின்ஒத்துழைப்பினைபெற்றுக்கொள்ளல்.

    - <u>குளஅடுக்குத்தொடர்அமைப்புமுகாமைத்துவகுழுக்களைஉருவாக்குவதற்கானநோக்கங்கள்</u>

        - குளஅடுக்குத்தொடர்அமைப்புமுகாமைத்துவம்மற்றும்நிலையானபேணுகைக்காகசட்டபூர்வஅங்கீகாரத்துடனானநிறுவனகட்டமைப்பொன்றினைஉருவாக்குதல்.

- ஒவ்வொருகுளஅடுக்குத்தொடர்அமைப்புக்களுக்குஏற்பஅதன்செயல்பாட்டிற்கும்நிலையானபாவனைக்கும்தொடர்புடையபிரச்சினைகள்மற்றும்முன்மொழிந்ததீர்வுகளைஒருங்கிணைந்தஅணுகுமுறையுடன்கலந்தாலோசித்துசட்டபூர்வஅங்கீகாரத்துடனானமுறைமைஒன்றினைஉருவாக்குதல்.
- குளஅடுக்குத்தொடரிற்குள்உள்ளவேளாண்மை, நீர்முகாமைத்துவ, சூழலியல்,சமூகபொருளாதாரமற்றும்புவியியல்காரணிஅமைப்பின்செயல்திறனுக்காகதொடர்ச்சியாகவும்வினைத்திறனாகவும்நடாத்திச்செல்வதற்கானமுறைமையொன்றைஏற்படுத்தல்.
- குளஅடுக்குத்தொடர்அமைப்பின்அபிவிருத்திநடவடிக்கைகளில்முழுஅமைப்பிற்கும்இடம்பெறும் சேதங்களைத்தடுத்துதேவைகளைஉறுதிப்படுத்தல்,
நீர்வளத்தினைவினைத்திறனானமுறையில்பாவனைசெய்வதற்காகசாகுபடிஉற்பத்தியினைஅடித்தளமாகக்கொண்டுதிட்டங்களைநிர்மாணித்தல்.
- குளஅடுக்குத்தொடர்அமைப்பிற்குஒருங்கிணைந்தவேளாண்மைஉற்பத்திதிட்டமொன்றினைநிர்மாணித்தல்மற்றும்அத்திட்டத்தின்செயல்திறன்நிலைமையைகண்காணித்தல்.
- குளஅடுக்குத்தொடர்அமைப்பொன்றில்காணப்படவேண்டியகூறுகளைமாற்றுவதற்குதேவையானநடவடிக்கைகளைமேற்கொள்ளல்.
- குளஅடுக்குத்தொடர்அமைப்புடன்தொடர்புடையசமூகபொருளாதாரதொடர்புகளைபேணுதல்மற்றும்அதுதொடர்பிலானபங்குதாரர்களைவிழிப்புணர்த்துதல்.

- <u>குளஅடுக்குத்தொடர்அமைப்புமுகாமைத்துவகுழுவின்பணிகள்</u>

  - குளஅடுக்குத்தொடர்அமைப்பிற்கானதிட்டங்களைதயாரித்தல்,
நடைமுறைப்படுத்தல்மற்றும்கண்காணித்தல்.
  - குளஅடுக்குத்தொடர்அமைப்புமுகாமைத்துவகுழுஅங்கத்தவர்களால்முன்வைக்கப்படும்பிரச்சினைகள்,
முன்மொழிவுகள்மற்றும்திட்டங்களுக்காகதீர்வுகளைமுன்வைத்தாலும்தீர்வுகாணமுடியாதபிரச்சனைகளைபொருத்தமானபிரதேச/
மாவட்டவேளாண்மைகுழுவிடம்முன்வைத்துதீர்த்துக்கொள்ளல்.
  - குளஅடுக்குத்தொடர்அமைப்புமுகாமைத்துவத்துடன்தொடர்புடையஅறிக்கையினைசந்தர்ப்பத்திற்கேற்றவாறுபிரதேச/மாவட்டவேளாண்மைகுழுவிடம்முன்வைத்தல்.
  - கிராமியகுளஅடுக்குத்தொடர்களில்அமையப்பெற்றிருக்கும்அனைத்துநீர்மூலங்கள்மற்றும்நீர்நுகர்வோர்கள்ஒன்றிணைத்துகுளஅடுக்குத்தொடர்சேர்ந்தமத்தியநீர்பிடிப்புப்பகுதிக்காகஒருங்கிணைந்தவேளாண்மைதிட்டமொன்றினைஉருவாக்கிநடைமுறைப்படுத்தல்.
  - குளஅடுக்குத்தொடர்அமைப்பொன்றினுள்நடவடிக்கைகளில்ஈடுபடும்அனைத்துநீர்நுகர்வோர்களினதும்தேவைப்பாடுகளுக்கேற்பநீர்பிடிப்புப்பிரதேசத்திலுள்ளஇயற்கைவளமுகாமைத்துவம்தொடர்பிலானதீர்மானங்களைமேற்கொள்ளுதல்மற்றும்நடைமுறைப்படுத்துதல்.
  - இயற்கைஅனர்த்தங்கள், அழிவுகள், தீங்குவிளைவிக்கும்மனிதநடவடிக்கைகளைகுறைக்கக்கூடியவகையில்அனைத்துநீர்மூலங்களையும்முகாமைசெய்தல்.
  - குளஅடுக்குத்தொடரிலுள்ளஅனைத்துநீர்மூலங்களையும்மையமாகக்கொண்டநீர்வாடிக்கையாளர்களுக்கிடையேவினைத்திறனானதகவல்தொடர்பாடல்முறையொன்றினைஉருவாக்குதல்.
  - படிநிலையிலுள்ளசுற்றுச்சூழல்அமைப்புக்களுடன்தொடர்புடையஉள்ளீடுகள்மற்றும்வெளியீடுகள்திறனானமுறையில்முகாமைத்துவம்செய்யமுறையானவழிமுறைஒன்றினைஉருவாக்குதல்.
  - தற்போதையமற்றும்எதிர்காலத்தில்நிகழும்எனகணிக்கப்படும்காலநிலைமாற்றங்களுக்குதகுந்தகாலநிலைநட்புஉபாயமுறைதிட்டங்களைநடைமுறைப்படுத்தலும்நீர்நுகர்வோர்களைஅவ்வாறானகாலநிலைமாற்றங்களுக்குபழக்கப்படுத்துதல்.
  - குளஅடுக்குத்தொடர்அமைப்புமுறைமைக்குள்நீர்வாடிக்கையாளர்களிடையேஅறிவு, திறன், மனப்பாங்குமற்றும்வளங்களைவினைத்திறனானமுறையில்பரிமாற்றம்செய்துகொள்ளல்.
  - நீர்நுகர்வோர்களின்காணி,
நீர்மற்றும்சுற்றுச்சூழல்அமைப்புக்களின்வினைத்திறனைமேம்படுத்துவதற்கானநடவடிக்கைகளைமேற்கொள்ளல்.
  - வேளாண்மைக்குமற்றும்நீர்நுகர்விற்கேற்றசுற்றுச்சூழல்அமைப்புக்களுடன்தொடர்புடையபாரம்பரியசட்டங்கள்மற்றும்இயற்றப்பட்டசட்டங்களைஅமுலுக்குகொண்டுவருவதற்குத்தேவையான ஆதரவினைவழங்குதல்.
  - காணிஉரித்துடையவிவசாயிகள்மற்றும்உரிமையாளர்களின்கூட்டத்தினை(சாகுபடிஉற்பத்திக்கூட்டம்)
நடாத்ததேவையானஅடிப்படைதீர்மானங்களைமேற்கொள்ளவிவசாயிகளுக்குஉதவிபுரிதல்,அதனோடுதொடர்புடையஒருங்கிணைப்புநடவடிக்கைகளைமேற்கொள்ளுதல்மற்றும்கண்காணித்தல்.
  - குளஅடுக்குத்தொடர்அமைப்புஅதிகாரப்பிரதேசக்குள்ளானஅனைத்துநீர்மூலங்கள்மற்றும்அதனோடுதொடர்புடையஏனையசுற்றுச்சூழல்அமைப்புக்களின்நிலையானதன்மையினைபேணுவதற்காகுறித்தகுறித்தஅரசநிறுவனங்களின்வழிகாட்டல்கள்மற்றும்அறிவுறுத்தல்களைபின்பற்றி பாதுகாப்பதற்குஉரியநடவடிக்கைகளைமேற்கொள்ளல்.

- குளஅடுக்குத்தொடர்அமைப்பிற்குபாதிப்பினைஉண்டுபண்ணும்பங்குதாரர்களுக்குஎதிராகசட்ட செயற்பாடுகளைமேற்கொள்வதற்குதேவையானநடவடிக்கைகளைமேற்கொள்ளல்.
- குளஅடுக்குத்தொடர்அமைப்பின்அனைத்துஅபிவிருத்திநடவடிக்கைகளிலும்செயன்முறைரீதியாகபங்களிப்பினைவழங்கலும்முன்னேற்றத்தைகலந்தாலோசித்தலும்
- குளஅடுக்குத்தொடர்அமைப்பில்நீர்ப்பாசனகைத்தொழிலில்கூட்டதீர்மானங்களைநடைமுறைபடுத்தும்நிலைமையினைகண்காணித்தல்.

- குளஅடுக்குத்தொடர்அமைப்பின்நீர்ப்பாசனகைத்தொழில்களின்செயல்பாடுகள்மற்றும்பராமரிப்புநிகழ்வுகளைகண்காணித்தல்.

- <u>குளஅடுக்குத்தொடர்அமைப்புமுகாமைத்துவகுழுவின்கலவை</u>

  - <u>பிரதேசமட்டம்</u>

    இக்குழுகுறித்தபிரதேசசெயலகஅதிகாரப்பிரதேசத்தின்கீழுள்ளஅதிகாரிகளினால்உள்ளடக்கியதாகும்.

    - பிரதேசசெயலாளர்
    - கமநலஅபிவிருத்திபிரதேசஅதிகாரி
    - வேளாண்மைஆலோசகர்
    - மாகாணநீர்ப்பாசனதிணைக்களத்தினைபிரதிநிதித்துவப்படுத்துமாறுபொறியியலாளர் / தொழிநுட்பஅதிகாரி
    - கமநலஅபிவிருத்திதிணைக்களத்தினைபிரதிநிதித்துவப்படுத்தும்பிரதேசபொருளியலாளர் / தொழிநுட்பஅதிகாரி
    - வேளாண்மைஆராய்ச்சிமற்றும்உற்பத்திஉதவியாளர்
    - கிராமஅலுவலர்
    - சமுர்திஅபிவிருத்திஉத்தியோகத்தர்
    - பொருளாதாரஅபிவிருத்திஉத்தியோகத்தர்
    - காணிபயன்பாடுமற்றும்கொள்கைஉருவாக்கதிணைக்களத்தின்பிரதிநிதிஒருவர்
    - மாகாணமீன்பிடித்திணைக்களத்தின்பிரதிநிதிஒருவர்
    - நீர்உயிரினவளர்ப்புஅபிவிருத்திஅதிகாரசபையின்பிரதிநிதிஒருவர்
    - சுற்றாடல்அதிகாரசபையின்பிரதிநிதிஒருவர்
    - பொலிஸ்சுற்றாடல்பிரிவின்பிரதிநிதிஒருவர்
    - விலங்குற்பத்திமற்றும்சுகாதாரதிணைக்களத்தின்பிரதிநிதிஒருவர்
    - வேளாண்மைமற்றும்கமநலகாப்புறுதிசபையின்பிரதிநிதிஒருவர்
    - நீர்ப்பாசனபொறியியலாளர் / தொழிநுட்பஅதிகாரி
    - வனசீவராசிகள்பாதுகாப்புத்திணைக்களத்தின்பிரதிநிதிஒருவர்
    - வனப்பாதுகாப்புத்திணைக்களத்தின்பிரதிநிதிஒருவர்
    - புவிச்சரிதவியல்மற்றும்சுரங்கப்பணியகத்தின்பிரதிநிதிஒருவர்
    - தேசியநீர்வழங்கல்மற்றும்வடிகாலமைப்புசபையின்பிரதிநிதிஒருவர்
    - தொல்பொருளியல்திணைக்களத்தின்பிரதிநிதிஒருவர்
    - சிவில்பாதுகாப்புத்திணைக்களத்தின்பிரதிநிதிஒருவர்
    - உள்ளூராட்சிநிறுவனங்களைபிரதிநிதித்துவப்படுத்தும்அதிகாரமுடையஅலுவலர்ஒருவர்
    - விவசாயஅமைப்புக்கள், மாதர்விவசாயஅமைப்புக்கள், உற்பத்திவிவசாயகுழுக்களைபிரதிநிதித்துவப்படுத்திஒவ்வோர்அமைப்புக்களினதும்தலைவர்அல்லதுசெயலாளர்
    - சமுதாயநீர்வழங்கல்அமைப்பொன்றின்பிரதிநிதிஒருவர்
    - வேறுசமூகஅமைப்புக்கள்மற்றும்சுற்றாடல்அமைப்புக்களைபிரதிநிதித்துவப்படுத்திஅமைப்பொன்றின்பிரதிநிதிஒருவர்

  - <u>மாவட்டமட்டம்</u>

    இக்குழுகுறித்தமாவட்டத்தின்கீழுள்ளஅதிகாரிகளைஉள்ளடக்கியது.

    - மாவட்டதலைவர்அல்லதுமாவட்டசெயலாளர்
    - பிரதேசசெயலாளர்
    - கமநலஅபிவிருத்திபிரதி / உதவிஆணையாளர்
    - உள்ளூராட்சிநிறுவனங்களைபிரதிநிதித்துவப்படுத்திஉள்ளூராட்சிஉதவிஆணையாளர்அல்லதுபிரதிநிதிஒருவர்
    - மாவட்டவேளாண்மைபணிப்பாளர்

- மாகாணமற்றும்மாகாணங்களுக்கிடையேயானபிரதிவேளாண்மைபணிப்பாளர்கள்
- நீர்ப்பாசனத்துறைபணிப்பாளர்அல்லதுபிரதானபொறியியலாளர்
- மாகாணநீர்ப்பாசனத்திணைக்களத்தினைபிரதிநிதித்துவப்படுத்திபிரதிபணிப்பாளர்அல்லது பிரதிநிதிஒருவர்
- காணிஉபயோகம்மற்றும்கொள்கைஉருவாக்கதிணைக்களத்தின்உதவிப்பணிப்பாளர்அல்ல துமாவட்டஅதிகாரி
- மாகாணமீன்பிடிதிணைக்களத்தின்பணிப்பாளர்அல்லதுபிரதிநிதிஒருவர்
- நீர்உயிரினவளர்ப்புஅபிவிருத்திஅதிகாரசபையின்உதவிப்பணிப்பாளர்அல்லதுமாவட்டஅதி காரி
- சுற்றாடல்அதிகாரசபையின்மாவட்டஉதவிப்பணிப்பாளர்அல்லதுமாவட்டஅதிகாரி
- விலங்குற்பத்திமற்றும்சுகாதாரதிணைக்களத்தின்பிரதிப்பணிப்பாளர்அல்லதுபிரதிநிதிஒருவ ர்
- வேளாண்மைமற்றும்கமநலகாப்புறுதிசபையின்உதவிப்பணிப்பாளர்அல்லதுபிரதிநிதிஒருவ ர்
- வனசீவராசிகள்பாதுகாப்புத்திணைக்களத்தின்உதவிப்பணிப்பாளர்அல்லதுமாவட்டஅதிகாரி
- வனப்பாதுகாப்புத்திணைக்களத்தின்மாவட்டவனபாதுகாப்புஅதிகாரிஅல்லதுபிரதிநிதிஒருவ ர்
- தேசியநீர்வழங்கல்மற்றும்வடிகாலமைப்புசபையின்மாவட்டஅதிகாரிஅல்லதுபொறியியலா ளர்
- தொல்பொருளியல்திணைக்களத்தின்உதவிப்பணிப்பாளர்அல்லதுமாவட்டஅதிகாரி
- புவிச்சரிதவியல்மற்றும்சுரங்கப்பணியகத்தின்பிரதிநிதிஒருவர்
- கமநலஅபிவிருத்திபிரதேசஅதிகாரி
- பொலிஸ்சுற்றாடல்பிரிவின்நிலையஅதிகாரி
- சிவில்பாதுகாப்புதிணைக்களத்தின்பிரதிநிதிஒருவர்
- மாவட்டவிவசாயஅமைப்புக்களின்கூட்டமைப்பினைபிரதிநிதித்துவப்படுத்திதலைவர் / செயலாளர்அல்லதுபிரதிநிதிஒருவர்
- சமூகநீர்வழங்கல்அமைப்பின்பொறுப்பதிகாரிஅல்லதுமாவட்டபிரதிநிதிஒருவர்
- வேறுசமூகஅமைப்புக்கள்மற்றும்சுற்றாடல்அமைப்புக்களின்மாவட்டமட்டத்தினைபிரதிநிதி த்துவப்படுத்திஒருஅமைப்பிலிருந்துஒருபிரதிநிதி

க:வே :-
குளஅடுக்குத்தொடர்அமைப்புகட்டுப்பாட்டுபிரதேசஎல்லைக்குள்குறித்தநிறுவனத்தில்கட்டுப்பா ட்டுபிரதேசங்கள்ஒன்றைவிடக்கூடுதலாகக்காணப்படும்சந்தர்ப்பத்தில்அவ்வவ்கட்டுப்பாட்டுபிர தேசங்களைபிரதிநிதித்துவப்படுத்திமேலுள்ளவாறுபொறுப்பதிகாரிகள்கலந்துகொள்ளவேண்டும் .

- <u>குளஅடுக்குத்தொடர்அமைப்புமுகாமைத்துவகுழுவொன்றின்அதிகாரிகள்குழாம் – பிரதேசமட்டம்</u>

    - படிநிலைஅமைப்பிற்குபிரதேசசெயலாளர்பிரிவுகள்ஒன்றைவிடக்கூடுதல்காணப்படும்சந்தர் ப்பத்தில்கலந்துகொள்ளும்அனைத்துபிரதேசசெயலாளர்களும்குழுவின்இணைத்தலைவராக உத்தியோகபூர்வமாகசெயல்படவேண்டும்.

    - படிநிலைஅமைப்பிற்கானகமநலசேவைகட்டுப்பாட்டுபிரதேசத்தில்கமநலஅபிவிருத்திபிரதே சஅதிகாரிகுழுவின்செயலாளராகஉத்தியோகபூர்வமாகசெயல்படவேண்டும். படிநிலைஅமைப்பிற்குகமநலசேவைகட்டுப்பாட்டுபிரதேசங்கள்ஒன்றைவிடக்கூடுதல்காண ப்படும்சந்தர்ப்பங்களில்கூடியநீரேந்துஏக்கர்எண்ணிக்கையினைகொண்டகட்டுப்பாட்டுபிர தேசத்தின்கமநலஅபிவிருத்திபிரதேசஅதிகாரிசெயலாளராகசெயல்படவேண்டும்.

    - குழுதலைவரின்அறிவுரைகளுக்கேற்பசெயலாளரால்கூட்டம்ஏற்பாடுசெய்யப்படவேண்டும்.

- <u>குளஅடுக்குத்தொடர்அமைப்புமுகாமைத்துவகுழுவொன்றின்அதிகாரிகள்குழாம் – மாவட்டமட்டம்</u>

    - குளஅடுக்குத்தொடர்அமைப்பிற்குமாவட்டங்கள்ஒன்றைவிடக்கூடுதல்காணப்படும்சந்தர்ப்ப த்தில்கலந்துகொள்ளும்அனைத்துமாவட்டசெயலாளர்களும்குழுவின்இணைத்தலைவராகஉ த்தியோகபூர்வமாகசெயல்படவேண்டும்.

    - குளஅடுக்குத்தொடர்அமைப்பின்மாவட்டபிரதி / உதவிஆணையாளர்கள்குழுவின்செயலாளராகஉத்தியோகபூர்வமாகசெயல்படவேண்டும். குளஅடுக்குத்தொடர்அமைப்பிற்குகமநலசேவைகட்டுப்பாட்டுபிரதேசங்கள்ஒன்றைவிடக்கூ டுதல்காணப்படும்சந்தர்ப்பங்களில்கூடியநீரேந்துஏக்கர்எண்ணிக்கையினைகொண்டமாவட் டபிரதி / உதவிஆணையாளர்கள்செயலாளராகசெயல்படவேண்டும்.

- குழுதலைவரின்அறிவுரைகளுக்கேற்பசெயலாளரால்கூட்டம்ஏற்பாடுசெய்யப்படவேண்டும்.

- இலங்கையின்வேளாண்மைத்துறையின்நிலையானதன்மைதங்கிநிற்கும்பிரதானகாரணியானஉயிரியல் அமைப்புக்களின்முகாமைத்துவத்திற்காககுளஅடுக்குத்தொடர்நீர்ப்பாசனமுகாமைத்துவத்தினைமுறை மையாக்குமுகமாகஉருவாக்கப்படும்குளஅடுக்குத்தொடர்அமைப்புமுகாமைத்துவகுழுக்கள்மூலம்எதிர் பார்க்கப்படும்பணிகளைநிறைவேற்றஒருங்கிணைந்துசெயற்படுவீர்கள்எனஎதிர்பார்க்கின்றேன்.

ஏ.எச்.எம்.எல்.அபேரத்ன
கமநலஅபிவிருத்திஆணையாளர்நாயகம்

பிரதி :-

- செயலாளர், பொதுநிர்வாக, உள்நாட்டலுவல்கள், மாகாணசபைகள்மற்றும்உள்ளூராட்சிஅமைச்சு
- செயலாளர், விவசாயத்திணைக்களம்
- அனைத்துமாகாணபிரதானசெயலாளர்கள்
- கணக்காய்வாளர், தேசியகணக்காய்வுஅலுவலகம்
- பொலிஸ்மாஅதிபர், இலங்கைபொலிஸ்திணைக்களம்
- பணிப்பாளர்நாயகம், விவசாயதிணைக்களம்
- பணிப்பாளர்நாயகம், நீர்ப்பாசனதிணைக்களம்
- பணிப்பாளர்நாயகம், சமூர்திஅபிவிருத்தித்திணைக்களம்
- பணிப்பாளர்நாயகம், வனசீவராசிகள்பாதுகாப்புத்திணைக்களம்
- வனப்பாதுகாப்புநாயகம், வனப்பதுகாப்புத்திணைக்களம்
- பணிப்பாளர்நாயகம், விலங்குற்பத்திமற்றும்சுகாதாரதிணைக்களம்
- பணிப்பாளர்நாயகம், காணிஉபயோககொள்கைதிட்டமிடல்திணைக்களம்
- பணிப்பாளர்நாயகம், தொல்பொருளியல்திணைக்களம்
- பணிப்பாளர்நாயகம், இலங்கைசிவில்பாதுகாப்புதிணைக்களம்
- பணிப்பாளர்நாயகம், நீர்உயிரினவளர்ப்புஅபிவிருத்திஅதிகாரசபை
- பணிப்பாளர்நாயகம், மத்தியசுற்றாடல்அதிகாரசபை
- பணிப்பாளர்நாயகம், புவிச்சரிதவியல்மற்றும்சுரங்கப்பணியகம்
- தலைவர், வேளாண்மைமற்றும்கமநலகாப்புறுதிசபை
- தலைவர் ,தேசியநீர்வழங்கல்மற்றும்வடிகாலமைப்புசபை
- அனைத்துமாகாணசெயலாளர்கள், மாகாணவேளாண்மைதிணைக்களம்
- செயலாளர், மாகாணநீர்ப்பாசனஅமைச்சு
- அனைத்துமாகாணவேளாண்மைபணிப்பாளர்கள், மாகாணவேளாண்மைதிணைக்களம்
- அனைத்துமாகாணவிலங்குற்பத்திமற்றும்சுகாதாரபணிப்பாளர்கள், மாகாணவிலங்குற்பத்திமற்றும்சுகாதாரதிணைக்களம்
- கருத்திட்டபிரதானிகள் – CSIAP / CRIWMP / SARP
- அனைத்துகமநலஅபிவிருத்திபிரதி / உதவிஆணையாளர்கள்

(தகவலறிவதற்காகவும்தேவையானவிவகாரங்களுக்காக)

Annexure 2: Participants of Transect Walk

F – 22
M – 59
81

CSIAP

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Climate Smart Irrigated Agriculture Project (CSIAP), Northern Province.

Attendance of Participations

Province : Northern   DS Division : Poonagari   Venue : Arasapuram

District : Kilinochchi   ASC Division : Poonagari   Date : 20/03/2024

Objectives of the Programme / Awareness : Transect walk for CMP Siththan odai upper

No	Name of the Participant (பெயர்)	Name of the Organization (அமைப்பு)	ID NO (தே[redacted]	[redacted]	M (ஆண்)/ F (பெண்)	Signature
1	P. Thiviya	CSIAP-NP	[redacted]	[redacted]	F	P. Yezi
2	T. Kajanthiny	Jeya Pavan	[redacted]	[redacted]	F	T. Kaja
3	S. Sivakumary.	,,	199784310379.	0763779594	F.	S. Sulmy
4	P. Suganthy.	,,			F	[illegible]
5	T. Tharmarasha.	,,		0767473733.	m.	[illegible]
6	R. Kethuyan	ASC-Mulan	917754544V	0714437721	F	Reeut.
7	J. Urmila	ASC - Mulangavil	927620707V	0779654633	F	J. Ur
8	R. Thusganthan		199609701945	0774655031	M	R. Thusa
9	V. Thilakarany				F	[illegible]
10	A. Yogeshwaran	CSIAP-NP	–	–	M	A. Yogeswaran
11	T. Sajeevan	EDO Kn bg	852674327V	0776760122	m	T. Saj
12	S. Ketheeswaran.	DO Kn/70	860671719V	0775781400	M	S. Keth
13	R. Sriranganathan			0776756391	M	[illegible]
14	T. Thusharath	DOA-NP	952651269V	0777631719	M	[illegible]
15	A. VIMALACHANDRAN		500183552V	0769820735	m	[illegible]

CSIAP

The World Bank

Climate Smart Irrigated Agriculture Project (CSIAP), Northern Province.

Attendance of Participations

Province : Northern | DS Division : | Venue :

District : | ASC Division : | Date :

Objectives of the Programme / Awareness :

No	Name of the Participant (பெயர்)	Name of the Organization (அமைப்பு)	ID NO (தே.அ.அ இல)	Contact no (தொ.பே.இல)	M (ஆண்)/ F (பெண்)	Signature
1	[illegible]	ARV 69	493193880V		M	[illegible]
2	K. Sritharan		821432600V	0772247637	M	[illegible]
3	S. Navageetha		937623879V	0767367587	F	S. Navageetha
4	[illegible]		441062686V	0776583062	[illegible]	[illegible]
5	P. Mithusan	AF Th	961730560V	0779824692	M	Pirithusan
6	N. Sathiya		199735700494 0	0762865574	F	N. Sathiya
7	K. Yogeswaran	Irrigation T.O	832782882V	0771041808	M	[illegible]
8	[illegible]	[illegible]	863184045V	0708773525	M	[illegible]
9	[illegible]	[illegible]	966412763V	0779094452	F	[illegible]
10	[illegible]	[illegible]	971135 29V	0779094452	M	R. Mageevan
11	[illegible]	[illegible]	[illegible]	0771596707	M	[illegible]
12	A. Suthantham	Ado-ASC	890452612V	0776275082	M	A. Suthantham
13	[illegible]	[illegible]	756210047V	0770025845	F	Vadasaku
14	S. Sharangee	CSIAP-AF	957832865V	07775 68653	F	[illegible]
15	S. Pirunthukam	CSIAP-AP	1995 3030 1396	0779415960	M	[illegible]

CSIAP

The World Bank

Climate Smart Irrigated Agriculture Project (CSIAP), Northern Province.

Attendance of Participations

Province : Northern | DS Division : | Venue :

District : | ASC Division : | Date :

Objectives of the Programme / Awareness :

No	Name of the Participant (முழுப்	Name of the Organization (அமைப்பு)	ID NO (அடையாள இல)	Contact no (தொடர்பு இல)	M (ஆண்)/ F (பெண்)	Signature
1	S. Bonnuraj		767595140V	—	F	
2	[illegible]		198505041127	0774401225	F	P. Anitha
3	[illegible]		756505410V	—	F	
4	[illegible]		845629810V	0770534575	F	
5	S. Rajul		853013943V		M	
6	S. Thusiyanthan		752541213V	—	M	
7	Eng. T. [illegible]				M	
8	G. Rupakaran	Internal Auditor	772860884V	0718161134	M	
9	K. Rajendra	PO-NP	0772983791	—	M	
10	H. G. C. Baba	CSIAP-NP			M	
11	S. Nilojan	CSPNP			M	
12						
13						
14						
15						

CSIAP

Climate Smart Irrigated Agriculture Project (CSIAP), Northern Province.

The World Bank

Attendance of Participations

Province : Northern | DS Division : | Venue :

District : | ASC Division : | Date :

Objectives of the Programme / Awareness :

No	Name of the Participant (பெயர்)	Name of the Organization (அமைப்பு)	ID No (ஆ.அ.எ இல)	Contact no (தொ.பே.இல)	M (ஆண்)/ F (பெண்)	Signature
1					M	
2					M	
3					M	
4					M	
5					M	
6					M	
7					M	
8					M	
9					M	
10					M	
11					M	
12					F	
13					F	
14					M	
15					M	

Climate Smart Irrigated Agriculture Project (CSIAP), Northern Province.

Attendance of Participations

Province : Northern | DS Division : | Venue :

District : | ASC Division : | Date :

Objectives of the Programme / Awareness :

No	Name of the Participant (பெயர்)	Name of the Organization (அமைப்பு)	ID NO (தே.அ.அ இல)	Contact no (தொ.பே.இல)	M (ஆண்)/ F (பெண்)	Signature
1	K-Sujeendran	CSIAP	842604320V		M	[signature]
2	P. Manojan	CSIAP	920570302V		m	[signature]
3	K. Rajendra	CSIAP	6522003365V		m	[signature]
4	A.G.C. Balon	CSIAP			M	[signature]
5	S. Vigneswaran		7ab404578V		F	[signature]
6	S Jithy Alex Van	CSIAP			M	[signature]
7	S.J.R. Peries				m	[signature]
8	[illegible]	[illegible]	901835208V		M	[signature]
9	[illegible]				F	[signature]
10	[illegible]				F	[signature]
11	S. Jeya Kanthan		892373159V	0769131735.	M	S. Kanthan.
12	K. Suresh.		912991725.V	0775930084	M	K. [signature]
13	N. Lokeswaran.		913017259V	0774156256	M	[signature]
14	[illegible]			0774878286	M	[signature]
15	[illegible]		563284959V	0771989515	M	N. Vamadevan

Annexure 3: List of Participants for the Preparation and Validation of the Cascade Management Plan

No.	Position	Name	Contact No.	Address
1	Chairman	S. Arudchelvam	077-6478729	ADP, DS Office, Poonakary
2	Co-Chairman	S.Pathmanathan	0773877399	President, FO Arasapuram
3	Secretary	K. Kunaseelan	077-4811472	ADO, Poonakary
4	Members	B. Banushan	077-0439434	AI, Pallikuda
5	Members	T. Tisiyanthan	074-2928217	IE, DOI, Kilinochchi
6	Members	Y. Srirangan	077-3692649	TO, DAD, Kilinochchi
7	Members	P. Thevasajeevan	076-9856494	RO, DWL, Kilinochchi
8	Members	I. G.C.Anura Kumara	077-4199983	Range Forest Office, Poonakary
9	Members	V. Anushiya	0779086270	WRDO
10	Members	N. Sunthareswaran	0778671815	RDS
11	Members	M. Dilakshan	0778948318	FO Arasapuram
12	Members	G. Gobithan	0770216194	FO Koduthavil
13	Members	S. Sivananthan	0766068708	FO Eriyanari
14	Members	B. Mathyvannan		FO Murukkunari

Annexure 4: Guidance for Preparation of Subproject Proposals to Raise Funds to Implement Interventions and Major Activities

1. Administrative Details:

No	Matters	Details
1	Contact details of proposal submitting agency: (postal, e-mail, telephone etc	
2	Contact Details of the implementing agency: (postal, e-mail, telephone etc.)	
3	Contact details with the position of the person responsible for providing information of the proposal (e-mail, telephone – land/mobile:	
4	Sector of the proposal (rehabilitation of tanks/catchment treatment/agriculture practices/ marketing/ institutional development/technology transferring/training/other (specify etc.).	
5	Ref. no of the concurrence of the Divisional Agriculture Committee (DAC).	

2. Sub-Project Details:

2.1. Title of the Sub-Project (Please note that the name may be very similar to that of the project development objective, but not in all time):

……

2.2. Summary of the sub-project (please give a very brief paragraph answering the questions of what it is, why it is, who it is, where it is and when it is implemented? The estimated total cost is also needed).

……

2.3. Project Location (details such as cascade, Agrarian Service Centre, Local Government Ward, GN Division etc. If the project location is considered as a highly vulnerable area to flood or drought, please indicate that too).

……

2.4. Project issue/rational/justification (This is very important and is considered as the main part of the proposal. Therefore, please highlight what the issue, how it is impacted on the farmers, how it was identified and what bad effects would happen, if it is not resolved).

……

2.5. How the critical issue was identified? (through community consultations, requests from farmer organisations, cascade management plan etc.).

……

2.6. Objective of the sub-project (please formulate this in very rational manner since it is important for the monitoring purpose).

……

2.7. Specific Objectives (Specific objectives need to be developed according to SMART form and this is also very important for the monitoring purpose.

1.

2.

2.8. Proposed sub- project activities (This part needs to be described very rationally and what actions the implementing agency proposed to address the critical issue and how it contributes to achieve the project objective?

……

2.9. Expected results (these may be economic, political, social, environment, cultural, nutritional etc.).

1.

2.

2.10. Beneficiaries (The nature of the beneficiaries – In addition to number of male and female, please indicate other characteristics also such as belonging to low-income or indigenous groups, affected by war etc.).

……

2.11. Who of the beneficiaries will participate in implementation?

2.12. How do women get benefited?

……

2.13. Who will be responsible for operation and maintenance (O&M) including estimated cost for O&M?

……

2.14. Potential Risks and strategies propose to minimize the risks

2.15. Does the project fall either under the negative list or prescribed list?

(a) If, Yes, please explain whether IEE or EIA is required.

……

(b) If No, IEER/EIS format will be required.

2.16. Name/names of the proposed farmer organizations or producer organizations that could be got involved in implementing the sub-project (if applicable, details need to be annexed).

……

3. Implementation methodology

3.1. How the project is planned to be implemented and with what stakeholders etc? (describe with adequate details).

……

3.1. Tendering process (explain how it is planned to procure required materials).

3.2. Activity plan (describe the activity plan with the time frame and the responsible agencies/persons in implementation. This need to be describe using a Gantt chart).

4. Subproject Monitoring Mechanism: (This is very important. Therefore, please describe how the monitoring activities are taken place providing adequate details).

.....

5. Subproject Evaluation Mechanism: (please indicate how the implementing agency plans to evaluate the project and at what intervals).

……

6. Reporting arrangement (please describe who will take the responsibility of making both financial and progress reporting and also the expected time period).

7. Estimated Cost:

No	Major Activity	Total estimated cost in LKR	Community Contribution (LKR)	Other sources(specify) (LKR)	Amount expected from donor agency (LKR)
1					
2					

8. Submission

8.1. Authorized person to submit the sub-project proposal on behalf of the Cascade Management Committee (CMC).

8.2. Position, contact details, frank, date of submission

09. Annexes:

Annexure 5: Photos