



Cascade Profile & Basic Development Plan

Karuwile Aaru A

Under
Climate Smart Irrigated Agriculture Project (CSIAP)

In
Per Aaru River Basin
Oddusudan DSD
Mulliththivu District
Northern Province

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1. Introduction

Small water storage is recognized as a key invention that facilitated the colonization of the dry zone of Sri Lanka. These small reservoirs are referred to as “*Kulam*” (tanks). In the dry zone of Sri Lanka, natural or man-made tanks have served for the collection, storage and distribution of rainfall and runoff and provided irrigation water for the cultivation of paddy and Other Field Crops (OFC) for more than 2000 years. During the two main rainy seasons in April - May and September - December, surface runoff is collected and stored in these tanks and subsequently distributed during the dry periods to the fields located in the downslope.

The tanks are arranged in a cascade-like fashion along shallow valley courses. They are connected by canals, natural drains and spillways and build a complex system of floodwater harvesting, water storage and water distribution. The tank cascade system

(*wewa-ellangava* in Sinhala or *viluneer kulathodar* in Tamil) is an ancient Sri Lankan irrigation infrastructure. The system is a network of small tanks draining to large reservoirs that store rainwater and surface runoff for later use.

Besides irrigation, the stored water is used for domestic purposes, dried out tank beds serve as pasture for the cattle and in general deposited sediments are used as raw material for brick production. Thus, the tanks have characterized the cultural landscape and have become an identity-generating factor for the rural culture.

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 such a system is that excess water flowing from a reservoir along with the water used in its command area is captured by the next downstream reservoir and, thus, put to use again in the command area of the second 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 of Sri Lanka.

The management of Tank Cascade Systems is intimately associated with their sociological setting and the evolution of rural settlements. Therefore, the overall objective of cascade management is to enhance the living standards of rural communities and the environment through the restoration and improvement of the system on a sustainable basis.

Declared tank cascade systems did not exist in the Per Aaru River basin until the implementation of CSIAP. Tank cascade systems were identified from the Participatory Rural Appraisal (PRA), Hydrology studies, Engineering Surveys, and Preliminary Investigation Report (PIR) reports during the project period. Accordingly, a cascade consisting of 8 tanks was identified and named as “Karuveli Aaru –A” based on the consultation with all stakeholders, including farmers and officers. Finally, it was declared as a cascade by the Department of Agrarian Development (DAD) & Provincial Department of Irrigation (PID) at the Divisional Agriculture Committee, Oddusuddan.

1.1 General Information about the Cascade

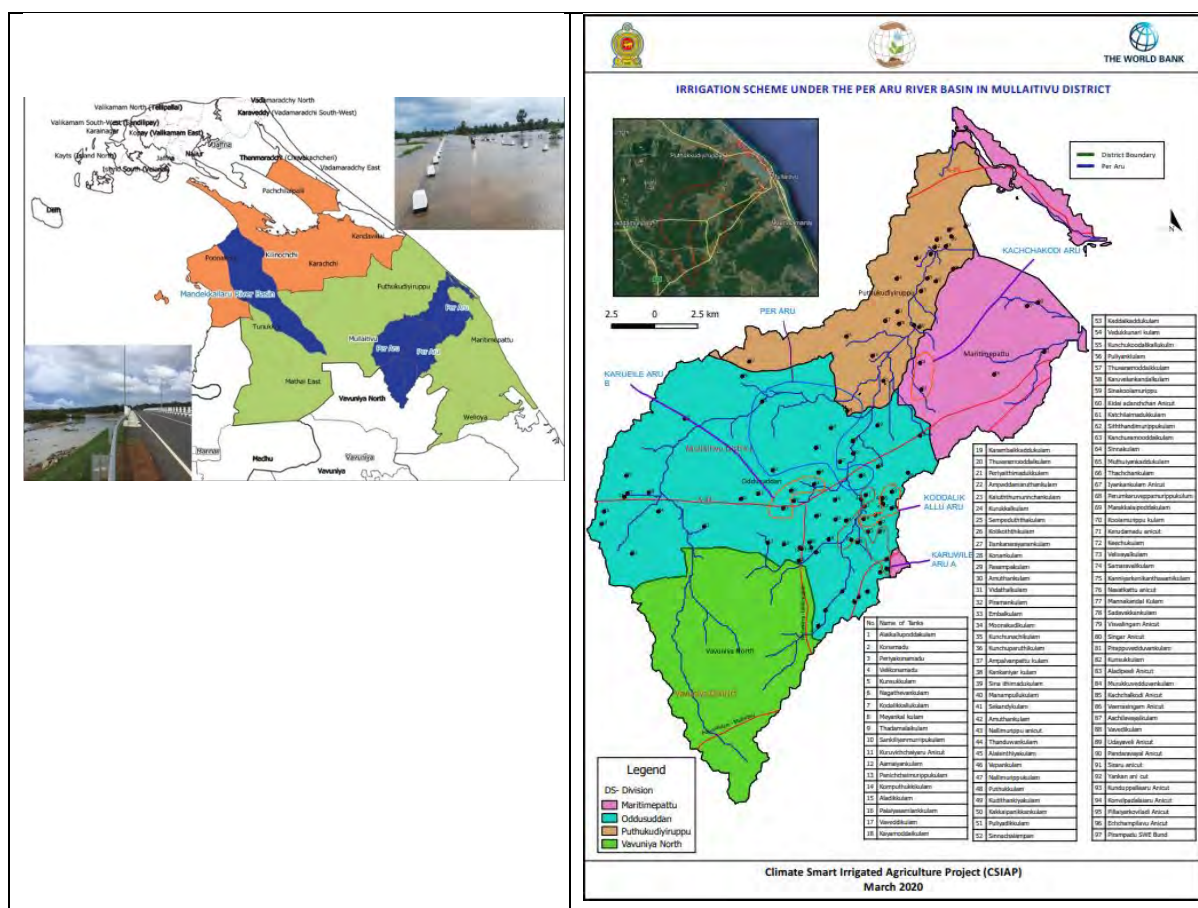
Karuwile Aaru A cascade lies under the Per Aaru river basin in Oddusudan DSD. The general information of the cascade is shown in Table 1.

Table 1: General Information of Karuwile Aaru A Cascade

Information	Details
Name of the District	Mulliththivu
Name of the Divisional Secretariat/s	Oddusudan
Name of the Electorate	Vanni
Name of the River Basin	Per Aaru
Name of the Cascade:	Karuwile Aaru A
Name of the Agrarian Development Center/s.	Oddusudan

Name/s of Grama Niladari Division/s	Oddusudan
The net catchment area	9 km ²
Extent of the Cascade (in hectares)	827
Command area in the cascade (Ac)	683
Gross Designed Capacity	747,501 m ³ (606.2 acft.).
Number of Total tanks & Anicuts in cascade	8
Number tanks & Anicuts used for agriculture	8
Restricted forest areas (ha), if any	-
Number of families living in the command areas of the Cascade	176
Number of tanks located within the forest	0

1.1 The Cascade Maps



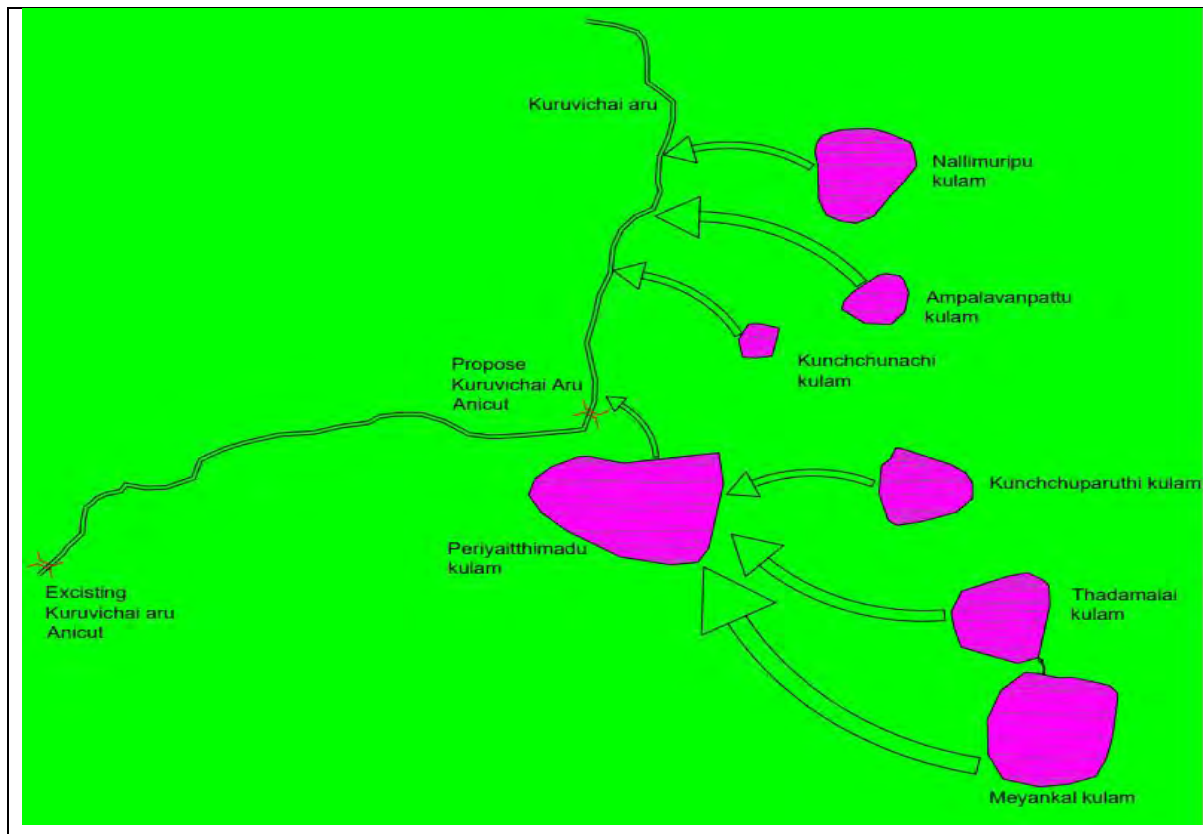


Figure 1: Map of Karuwile Aaru - A Cascade

1.2 Definition of the Cascade and Cascade Management

A cascade system is described as a connected series of tanks organized within a micro-catchment of the dry zone landscape, storing, conveying and utilizing water. It provides water for irrigation, domestic purposes, animals and ecosystems. In a broader sense, the system can be considered as a sustainable ecosystem.

Strengthening the institutional framework in the cascade is identified as one of the key requirements for managing the cascade system. Therefore, CMCs consisting of farmer Organizations and local-level officials are to be formed for resources (water and land) management at the cascade level.

1.3 Need for Cascade Management Committee

- Ensure the sustainability of Cascade Systems.
- Make all stakeholders in a cascade actively involve in the management of the system ensuring their perspectives.
- To ensure the Environmental and ecosystem stability of the cascade.
- To avoid/minimize high tank water losses, frequent repairs of structures, low system productivity, waterborne diseases *etc.*
- Tanks serve multiple purposes, such as irrigation for agriculture, water for livestock, inland fisheries, groundwater recharge, flood control, *etc.*
- Maintain the regional groundwater table in cascade area.
- Other than agriculture water users, there is hardly any contribution from the other users for the maintenance of the irrigation system.

- The resources are used by other users without any limitation.
- Common resources, such as water and the environment, should be managed as common property.

1.3.1. Role and Responsibilities of the Cascade Management Committee

- The committee should make necessary decisions to manage the resources of the cascade with a joint approach of all agencies and beneficiaries of the cascade and follow up the implementation of those decisions.
- The committee should discuss the maintenance work to be carried out in the cascade by respective farmer organizations.
- It should organize participatory activities of the development programs at the cascade level
- The committee should discuss the outcomes of cultivation committee meetings and issues that can be solved at the cascade level.
- They should plan cultivation, water issues, input supply, training programmes, and other production activities and make arrangements for the marketing of products.
- They should bear the overall responsibility of the development and production programs within the cascade and the management of water and associated resources (including ecosystems) in the cascade.
- Through integrated management, ensure drinking, agricultural, livestock, and inland fisheries requirements are equitably met.
- Promote climate-smart agriculture practices and technologies.
- Prepare/ update an agriculture development plan for the entire cascade.
- Facilitate market access to the production from the agriculture plan implementation.
- Facilitate the community to access the weather and agriculture advisories.

1.3.2. Composition of a Cascade Management Committee

- i. Representative of the Divisional Secretary (DS) - Chairman
- ii. Divisional officer of the Department of Agrarian Development (DAD) - Secretary
- iii. Agriculture Instructors (AIs) in the cascade
- iv. Representative of the Department of Irrigation (DoI)
- v. Representative of the Department of Wildlife Conservation (DoWC)
- vi. Representative of the Provincial Irrigation Department (PID)
- vii. Representative of the Department of Forest Conservation (DOFC)
- viii. Representative of the Geological Survey and Mines Bureau (GS & MB)
- ix. Representative of the Water Resources Board (WRB)
- x. Representative of the Local Government Authority (Pradheshiya Saba)
- xi. Representatives of the Grama Niladhari level Committee
- xii. Representatives of the Department of Land Use Planning
- xiii. Representatives of NACTA
- xiv. Department of Police
- xv. Representative of Farmer Organizations (FOs)
- xvi. Representative of Community Base Organizations (CBOs) in the cascade

The Co-Chairman of the CMC must be a representative of farmer organizations.

1.3.3 Existing Institutional Framework Related to Cascade Management.

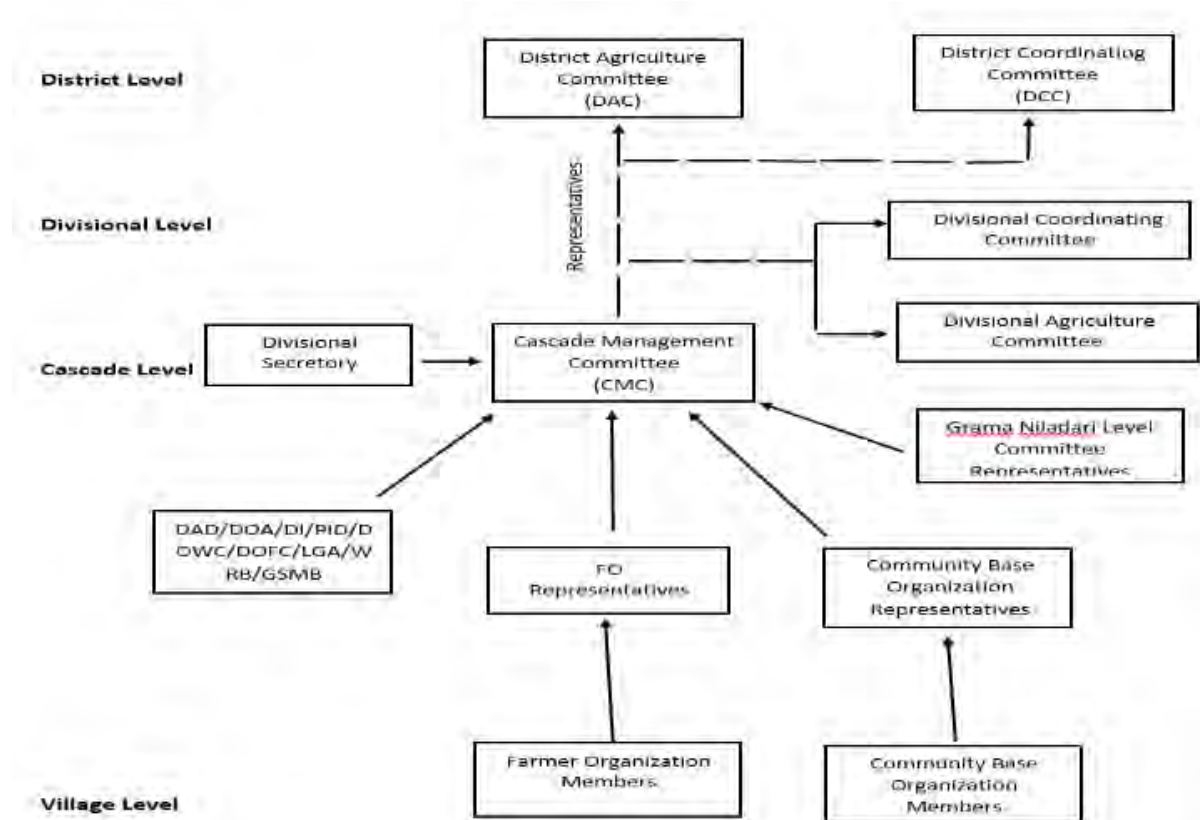


Figure 2: Institutional arrangement for cascade management

1.4 The Methodology

The participatory assessment process is the basic methodology for developing the cascade profile, and appropriate tools were used to identify the bio-physical condition of the cascade area. The primary & secondary data collection techniques were used to develop this CMP. Focused group discussion, key informant interviews, matrix ranking, and transect walk were the main tools. Participants living in the hotspot area and members of Cascade Management Committees (CMCs) have participated in this assessment process.

The objectives of the cascade profile development and how needful data is to be collected and generated during the interactive and iterative process have been conducted in Focus group discussions. The need for tank cascade system was identified through the Participatory Rural Appraisal (PRA), Hydrology studies, Engineering Surveys, and Preliminary Investigation Report (PIR) reports during the project period. The main intervention was identified and ranked during the discussion.

A cascade consisting of 3 tanks was identified and named as “Karuwile Aaru-A” based on the consultation with all stakeholders, including farmers and officers. Finally, it was declared as a cascade by the Department of Agrarian Development (DAD) & Provincial Department of Irrigation (PID) at the Divisional Agriculture Committee, Oddusuddan.

Participants were grouped into three groups based on their knowledge of the area and subject matter, and Safeguard Officers took the leading role in each group as group coordinators with

the support of IDCB and Specialist of CSIAP-NP. Each group conducted the transect walk to cover tanks and the adjoining settlement area.

The gathered data in the transect walk, was validated in the discussion with the members of the cascade. This validated information was compiled as a report and shared among the CSIAP officers who participated in the transect walk of Karuveli Aaru-A cascade. Finally, the report was developed and submitted to PMU for further improvement.

1.5 Particulars of the Tanks under the Cascade

There are 07 tanks & 01 Anicut under the Karuveli Aaru A cascade namely Meyankal kulam, Thadamalaikulam, KunchupAaruthikulam, Periyaithimadukkulam, Ampalvanpattu kulam, Kunchunachikulam Nallimurippukulam and Kuruvichi Aaru Anicut in Oddusudan DSD in Mulliththivu district. All these 7 tanks & 1Anicut are used for irrigation purposes and recharging the groundwater.

Table 2: Particulars of the Tanks

No	Tank's name	Tank ID Name	GND	Existing Capacity (Ac.ft)	Com mand Area (ac)	No of farmer families
1	Meyankal kulam	<u>13/5/T/W/115</u>	Periyaithimadu	3.80	35	12
2	Thadamalai kulam	<u>13/5/T/W/121</u>	Periyaithimadu	136.74	118	14
3	KunchupAaruthi kulam	<u>13/5/T/W/89</u>	Periyaithimadu	22.95	28	12
4	Periyaithimaduk kulam	<u>13/5/T/W/111</u>	Periyaithimadu	298.66	210	63
5	Ampalvanpattu kulam	<u>13/5/T/W/119</u>	Periyaithimadu	38.03	38	12
6	Kunchunachi kulam	<u>13/5/T/W/109</u>	Periyaithimadu	21.54	20	12
7	Nallimurippu kulam	<u>13/5/T/W/116</u>	Periyaithimadu	79.45	18	4
8	Kuruvichi Aaru Anicut	<u>13/5/A/W/81</u>	Kathlaiyarsamal an kulam	4.84	216	47
Total				606.01	683	176

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

1. Meyankal kulam

Contour level (m)	Area (Ac)	Mean Area (Ac)	Volume (Ac.ft)	Capacity (Ac.ft)
44.900	0.877	0.000	0.000	0.000
45.200	2.836	1.856	1.827	1.827

45.500	4.729	3.782	3.723	5.550
45.800	6.462	5.595	5.507	11.057
46.100	8.471	7.466	7.349	18.406
46.400	9.994	9.232	9.0870	27.493
46.700	11.429	10.712	10.543	38.035
47.000	12.792	12.111	11.920	49.956
47.300	13.526	13.159	12.952	62.908

2. Thadamalaikulam

Contour level (m)	Area (Ac)	Mean Area (Ac)	Volume (Ac.ft)	Capacity (Ac.ft)
43.700	0.014	0.000	0.000	0.000
44.000	1.095	0.555	0.546	0.546
44.300	2.951	2.023	1.991	2.537
44.600	5.102	4.026	3.963	6.499
44.900	8.667	6.884	6.776	13.276
45.200	11.711	10.189	10.029	23.304
45.500	13.744	12.727	12.527	35.831
45.800	14.951	14.347	14.121	49.952
46.100	15.976	15.463	15.220	65.172
46.400	17.337	16.656	16.394	81.566
46.700	18.294	17.816	17.535	99.101
47.000	19.126	18.710	18.415	117.516
47.300	19.945	19.535	19.228	136.745
47.600	20.831	20.388	20.067	156.812
47.900	22.088	21.460	21.121	177.933

3. KunchupAaruthikulam

Contour level (m)	Area (Ac)	Mean Area (Ac)	Volume (Ac.ft)	Capacity (Ac.ft)
41.100	0.242	0.000	0.000	0.000
41.400	0.292	0.267	0.263	0.263
41.700	0.589	0.441	0.433	0.697
42.000	1.167	0.878	0.864	1.561
42.300	2.500	1.833	1.805	3.366
42.600	5.113	3.806	3.746	7.112
42.900	8.098	6.606	6.501	13.614
43.200	10.874	9.486	9.337	22.950
43.500	12.587	11.730	11.546	34.496
43.800	15.955	14.271	14.046	48.543

4. Periyaithimadukkulam

Contour level (m)	Area (Ac)	Mean Area (Ac)	Volume (Ac.ft)	Capacity (Ac.ft)
34.500	0.977	0.000	0.000	0.000
34.800	3.930	2.454	2.415	2.415
35.100	10.596	7.263	7.149	9.564

35.400	16.386	13.491	13.278	22.842
35.700	23.004	19.695	19.385	42.227
36.000	30.382	26.693	26.273	68.500
36.300	39.230	34.806	34.258	102.758
36.600	52.795	46.013	45.288	148.046
36.900	63.763	58.279	57.361	205.407
37.200	74.468	69.115	68.027	273.434
37.300	79.363	76.915	25.235	298.669

5. Ampalvanpattu kulam

Contour level (m)	Area (Ac)	Mean Area (Ac)	Volume (Ac.ft)	Capacity (Ac.ft)
36.000	0.028	0.000	0.000	0.000
36.300	0.124	0.076	0.075	0.075
36.600	0.909	0.517	0.509	0.584
36.900	1.121	1.015	1.00	1.583
37.200	1.427	1.274	1.254	2.837
37.500	1.951	1.689	1.662	4.499
37.800	2.913	2.432	2.394	6.892
38.100	4.510	3.712	3.653	10.546
38.400	6.269	5.389	5.304	15.850
38.700	7.927	7.098	6.986	22.836
39.000	10.028	8.978	8.836	31.673
39.300	11.593	10.811	10.640	42.313
39.400	12.843	11.971	12.218	46.322
39.700	15.198	14.021	13.800	60.122

6. Kunchunachikulam

Contour level (m)	Area (Ac)	Mean Area (Ac)	Volume (Ac.ft)	Capacity (Ac.ft)
35.100	0.065	0.000	0.000	0.000
35.200	0.181	0.123	0.040	0.040
35.500	0.517	0.349	0.3432	0.384
35.800	1.260	0.889	0.875	1.258
36.100	3.223	2.242	2.206	3.465
36.400	4.996	4.109	4.044	7.509
36.700	6.836	5.916	5.823	13.331
37.000	9.852	8.344	8.212	21.544
37.300	13.339	11.595	11.413	32.957
37.600	16.811	15.075	14.837	47.794

7. Nallimurippukulam

Contour level (m)	Area (Ac)	Mean Area (Ac)	Volume (Ac.ft)	Capacity (Ac.ft)
32.400	0.282	0.000	0.000	0.000
32.700	0.320	0.301	0.296	0.296

33.000	0.668	0.494	0.487	0.783
33.300	2.035	1.352	1.330	2.113
33.600	3.929	2.982	2.935	5.048
33.900	5.759	4.844	4.768	9.816
34.200	7.769	6.764	6.657	16.474
34.500	17.967	12.868	12.665	29.139
34.800	26.282	22.124	21.775	50.915
35.100	31.720	29.001	28.544	79.459
35.400	33.408	32.564	32.051	111.510
35.700	33.601	33.505	32.977	144.487

1.6 Existing & Designed Parameters of Tanks

The existing surface water storage capacity of the cascade can be increased by significant amount after the renovation of downstream and head works of tanks under CSIAP (Table 3).

Table 4: Details of Existing and Designed Capacity

No	Name of Tank	Existing Capacity (Ac.ft)	Designed Capacity (Ac.ft)	Coordinate	
1	Meyankal kulam	3.80	3.80	9.115834753N	80.68937847 E
2	Thadamalaikulam	136.74	136.74	9.120702435 N	80.68924915 E
3	KunchupAaruthikulam	22.95	22.95	9.12763412 N	9.12763412 E
4	Periyaithimadukkulam	298.66	298.66	9.129363224 N	80.67613547 E
5	Ampalvanpattu kulam	38.03	38.03	9.138283832N	80.684500989E
6	Kunchunachikulam	21.54	21.54	9.12763412 N	80.68587457 E
7	Nallimurippukulam	79.45	79.45	9.14351704 N	80.68377475 E
8	Karuvile Aaru A Anicut	4.84	4.84	9.12311353N	80.65381846E
		601.17	601.17		

Based on the hydrological, PIR and engineering survey results, FSL levels will be raised to 300 mm for Nallimurippu kulam during the on-going development works initiated by CSIAP with the collaboration of PDOI and DAD.

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	Meyankal kulam	46.7	46.7	-
2	Thadamalaikulam	47.3	47.3	-
3	KunchupAaruthikulam	43.2	43.2	-
4	Periyaithimadukkulam	37.3	37.3	-
5	Ampalvanpattu kulam	39.4	39.4	-

6	Kunchunachikulam	37.01	37.01	-
7	Nallimurippukulam	35.4	35.7	0.3
8	Kuruvichi Aaru Anicut	37.4	37.4	-

Spills of all 7 tanks were abandoned during the past. It will be developed as much as possible according to the topography (Table 5).

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

No	Name of tank	Design Peak flow (m ³ /s)	Existing Spill Length (m)	Designed Afflux (m)	Design Spill length (m)
1	Meyankal kulam	19.5731	14.2	0.6	14.2
2	Thadamalaikulam	12.9802	103	0.6	103
3	KunchupAaruthikulam	11.0422	17.4	0.6	17.4
4	Periyaithimadukkulam	87.9853	34.3,14.9 (2 Spill)	0.6	34.3,14.9 (2 Spill)
5	Ampalvanpattu kulam	13.9300	17.7	0.6	17.7
6	Kunchunachikulam	13.3225	15.1	0.6	15.1
7	Nallimurippukulam	16.7650	20.0	0.6	20.0

There were no any proper bunds exist in **Vannanthiei, Ulavukoduthan and Thikkiri tanks**. The bund will be reformed and raised by 300 to 900 mm (Table 6).

Table 7: Bund Top Level

No.	Name of Tank	Existing BTL (MSL)	Designed BTL (m MSL)
1	Meyankal kulam	48.0	48.0
2	Thadamalaikulam	48.2	48.2
3	KunchupAaruthikulam	44.4	44.4
4	Periyaithimadukkulam	39.0	39.0
5	Ampalvanpattu kulam	2.30	2.60
6	Kunchunachikulam	38.2	38.2
7	Nallimurippukulam	37.0	37.2
8	Kuruvichi Aaru Anicut	37.7	37.7

1.7 Tanks Layouts with basic details

Figure 3: Layout of Meyankal Kulam

Meyankal kulam has a 540 m length earth bund and has 2 spills at the same FSL. One is a common spill for Thaddamalai and Meyankal and the other one is natural. After the rehabilitation part of the inflow water from the catchment area will flow to Thaddamalai tank through the bed area. The spill water from both spill will flow to Periyaiththimadu kulam

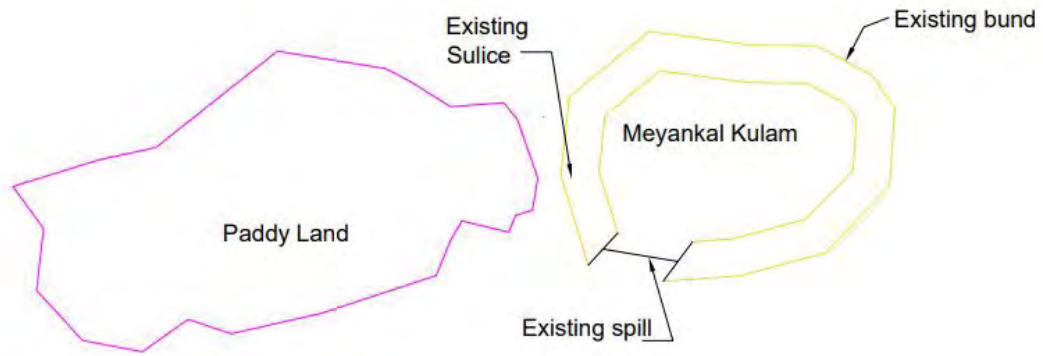


Figure 4: Layout of Thaddamalai kulam

Total length of Thaddamalai kulam Bund is 629 m. Thaddamalai kulam receives the water from its own catchment area and Meyaankal kulam. Spill water from Thaddamalai kulam flows to Periyaiththimadu kulam. Drainage water from the command area of this tank also flows to periyaiththimadu kulam. Spill path also will be rehabilitated under the CSIAP.

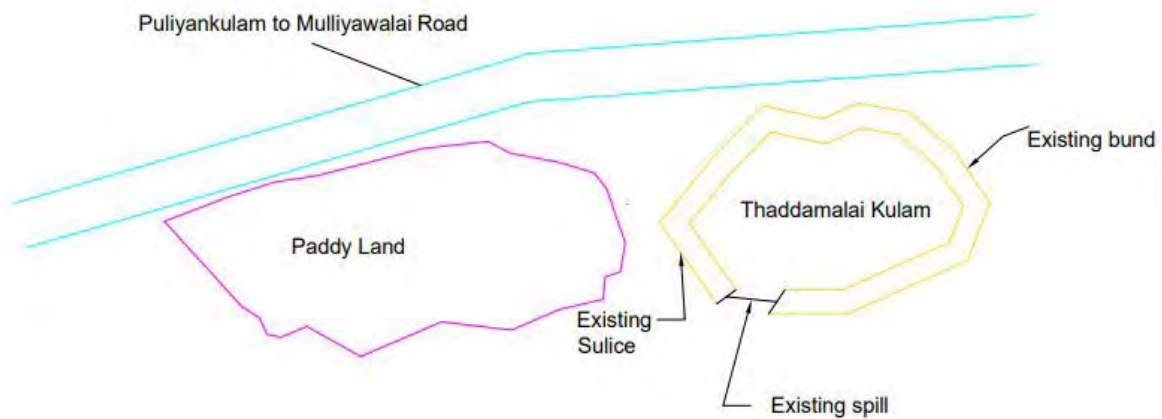
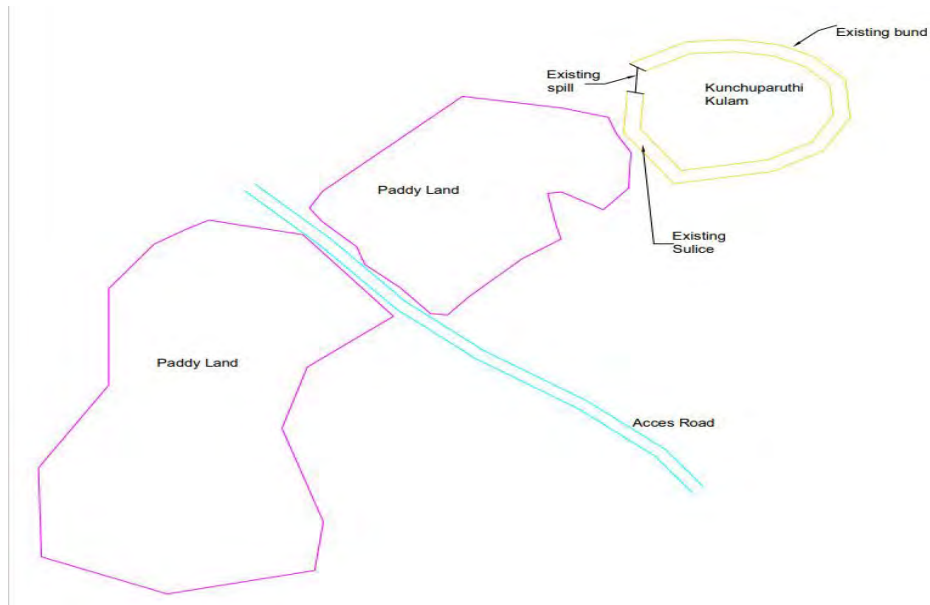


Figure 5: Layout of KunchupAaruthi Kulam

The length of the earth bund of KunchupAaruthi Kulam is 362 m and the spill water of KunchupAaruthi Kulam flows through the command area of Periyaiththimadu Kulam.

**Figure
Layout**



**6:
of**

Periyaithimadu kulam

Periyaiththimadu Kulam has a 1.1 km length earth bund, 1.9 km RB Canal and 0.4 km LB Canal. Periyaithimaddu Kulam receives water from its own catchment area, spill & drainage water from Meyankal, Thaddmalai and KunchupAaruthi kulam.

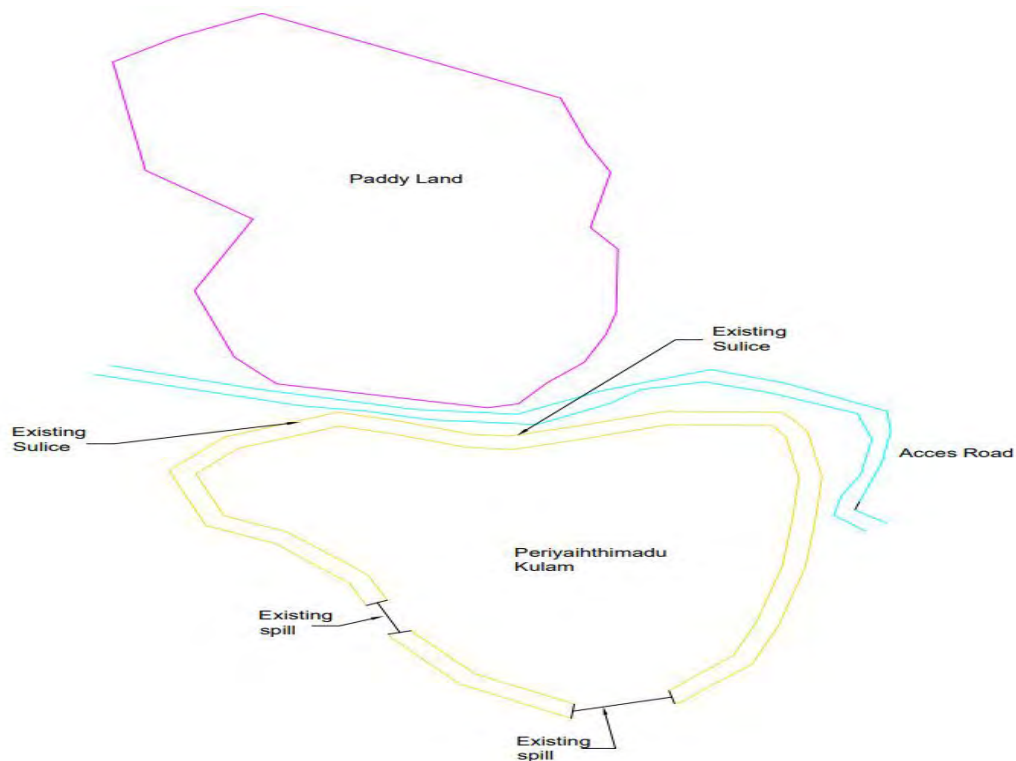


Figure 7: Layout of Kunchunachi Kulam

The total bund length of Kunchunaachi Kulam is 398 m. It has 256 m and 38 m LB and RB canals respectively. Spill water of Kunchunaachi Kulam flows through the command area of Periya Iththimadu Kulam and falls into the Karuwile Aaru.

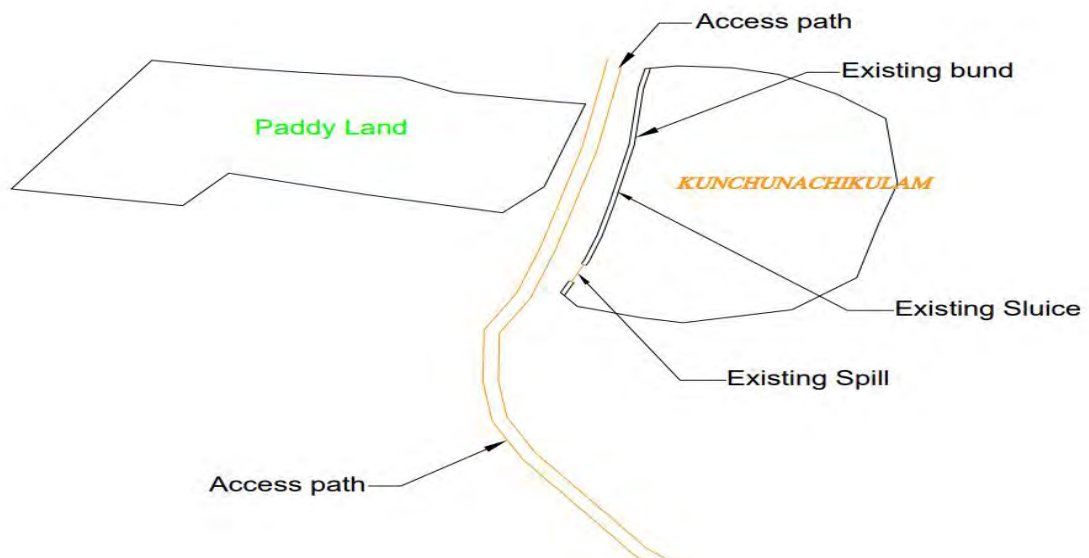


Figure 8: Layout of Ampalavanpattu Kulam

The total bund length of Ampalavanpattu Kulam is 375 m. Spill water of Ampalavanpattu Kulam flows through the command area of Periya iththimadu and falls into the Karuwile Aaru.

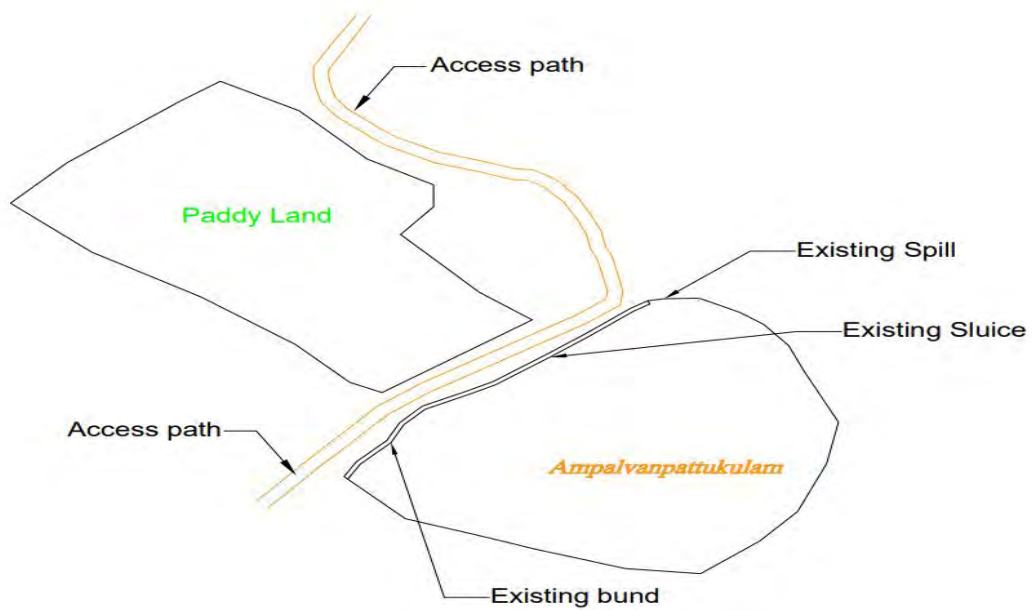
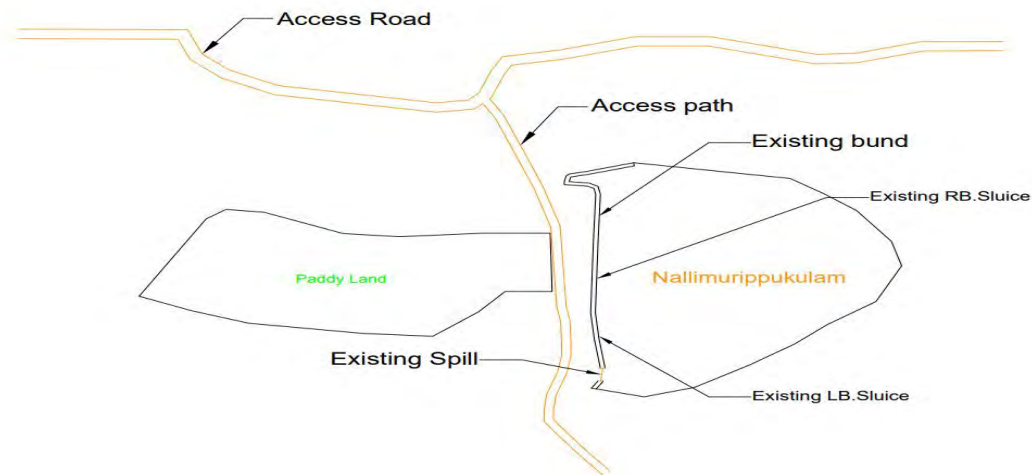


Figure 9: Layout of Nallimuripu Kulam



The total bund length of Nallimurippu Kulam is 690 m. Spill water of Nallimurippu kulam flows through the command area of Periya iththimadu and falls into the Karuwile Aaru.

1.8 Importance of Cascade Profile and Basic Development Plan

The Karuwile Aaru A cascade refers to a system of interconnected irrigation channels 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 scarcity is a challenge and where there is a need to optimize water usage for agricultural purposes.

The need for a well-designed cascade profile arises due to several reasons. Firstly, it enables equitable water distribution, ensuring that all agricultural fields within the system receive their required share. By following the natural contours of the land, the cascade profile helps in minimizing water wastage and reduces the risk of waterlogging or erosion.

Secondly, the Karuwile Aaru A cascade profile helps manage the gravity-driven flow of water. By constructing the channels and structures at appropriate elevations, the system can take advantage of the natural force of gravity to move water from higher to lower elevations, reducing the need for pumping and energy consumption.

Additionally, the cascade profile allows for the regulation of water flow and storage. By incorporating storage reservoirs at different levels, excess water can be stored during periods of high rainfall or low irrigation demand, ensuring a steady water supply during dry spells.

Overall, the Karuwile Aaru A cascade profile plays a vital role in maximizing water conveyance efficiency, minimizing losses, and promoting Climate Smart Agricultural practices in water-scarce areas. It allows for the optimal utilization of available water resources and helps farmers to meet their irrigation needs while minimizing environmental impact.

2. Details of the Current Profile of the Karuwile Aaru A Cascade

The main objective of the cascade profile is to facilitate and to learn the cascade status, and issues that affect the cascade negatively which enables developing a pragmatic cascade

management plan to ensure the sustainability of the cascade and the water productivity of the tank system in the area.

2.1 Geological Aspect

Topography

The Topography of Mullaitivu district is flat land, gently sloping to the East and North and in the western part it is directed towards the West and South. This district has 70 km of coastal belt and four lagoons namely Kokkulai, Nayaaru, Nanthikadal and Mathalan with high potential for prawn culture. The elevation varies from sea level to 36.5 meters.

Soil

Reddish Brown Earth and Red yellow latosols which are suitable for cultivation. Reddish brown earths cover 44 % of the land area in the district other soil types namely Grumusols, Alluvial soil, Regosols and Solodized solonetz and solonchaks are scattered in the district. Some of the surfaces are corded and it accounts about 12 % of the total land area of the district.

The district is located in the low country dry zone. There are two agroecological regions namely DL1 and DL3 are found in the district. The DL1 region sub divided into 4 sub regions *i.e.* DL1 b, DL1e, DL1f and DL1d.

2.2 Ecosystem

This cascade exhibits a remarkable biodiversity. There were several species of flora, fauna and natural aspects observed in and around the cascade during the transect walk.

a. Flora

The forest cover in Mullaitivu district is 148876.99 ha (57% of total area), and the type of forest cover found in this area is tropical thorn forest, which is primarily influenced by monsoon rains. The vegetation around the Karuwile Aaru A cascade system is diverse and includes both terrestrial and aquatic plant species. Common plant species found in the area include mangroves, grasses, reeds, water lilies, and various types of aquatic vegetation. 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 their surrounding areas attract numerous animals like elephants, monkeys, deer, sambar, rabbits, and wild boar, as well as birds, such as herons, egrets, wood peckers, jungle fowl, peacock, and waterfowl making it an excellent spot for bird watching. Other common fauna in the region includes reptiles like crocodiles, snakes, and lizards, as well as fish, amphibians, and small mammals.

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.

d. Natural Features

Karuwile Aaru A 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, ensuring a steady water supply for agriculture. Additionally, the tanks and their surrounding areas often attract migratory birds, especially during the winter months when bird populations from colder regions seek warmer climates. This seasonal influx of birds adds to the biodiversity of the area.

Effect on flora and fauna: The forest area of this cascade is enriched with different trees.

Muthirai (Chloroxyglon swietenia) a high timber value tree is commonly seen in this area. *Paalai* or *Pallu (Manilkara hexandra (Roxb)dubard)*, a high timber value tree is also common in the cascade. It bears edible, sweet fruit during May - August. Area residents pluck this fruit, sell it for passing by passengers and earn a substantial amount. *Veerai (Drypetes sepiaria)*, *Karungkali (Drospyros spp)*, *Kaddmanakku (Vitex altissimamilla)*, and *Kaya (Memecylon umbellatum)* are some of the trees that can be seen very commonly in the forest area of this cascade. It figures as one of the 100 flowers offered to Lord Shiva in the famous Tamil Poet Kapilar's work (Kurinjip Paatu). It is a treat to the eyes when it is in full bloom. The leaves (especially the midrib region) are rich in glucose and eaten by giant squirrels. The leaves are also offered as prasadam (like tulsi) by a saint. They taste slightly sweet and sour.

The forest area is the habitat of a wide range of animals and birds. Elephants, deer, shambar, rabbit, monitor lizard, and wild boar can be seen commonly in this area. Though leopard also live in this forest, it is rarely seen. Garganey (*Vennpuruwa Vaathu*), Eurasian Wigeon (*Naamaththalai Vaathu*), Asian Open Bill (*Nathaikuththi Naarai*), Cattle Egret (*Unnik Kokku*), Herons, Ibis and common Myna are some of the birds commonly seen in this area.

2.3 Hydrological Aspect

The cascade of Karuwile Aaru A at Oddusudan DSD in Mullaitivu faces several hydrological concerns and issues. The following hydrological issues were observed during the Focus group discussion and transect walk.

a. Water Scarcity

The proposed cascade experiences significant water scarcity due to limited water resources and irregular rainfall patterns. The region relies heavily on monsoon rains, and any deviation from normal precipitation levels can lead to water shortages, especially during the dry season.

b. Groundwater Depletion

The excessive extraction of groundwater for agriculture, domestic and industrial purposes has resulted in the depletion of the groundwater level in the area. Overexploitation of groundwater can lead to saltwater intrusion, making the water unfit for consumption and irrigation.

c. Flooding

Despite water scarcity issues, the cascade area is also prone to periodic flooding, particularly during the North-East monsoonal period. The region's flat topography and inadequate drainage systems contribute to flash floods, causing damage to infrastructure and agriculture and eventually displacing local communities.

d. Water Pollution

Pollution from agricultural runoff and inadequate wastewater treatment pose a significant threat to the water quality in the cascade area. Contamination of surface water and groundwater sources negatively affects human health and the ecosystem.

Table 08: Hydrological Characteristics of the Cascade

Hydrological Character	Current Status
Perung Kulam or Keell Kulam (Mahawewa or Pahala wewa) , is being used for agricultural activities.	Observed the hydrological characters of <i>Perungkulam</i> (Mahawewa) in all tanks under cascade Rehabilitation of these tanks is being implemented under CSIAP.
Kuluwewa (forest tank) was constructed in the upper catchment to capture rainwater, provide water for animals and filter debris and silt.	N/A
Kayan wewa is built in degraded or cleared upper catchment to trap sediments and control salinity.	Meyankulam is situated in the upper cascade area, and collects water from the upper catchment area. Rehabilitation works are being carried out by CSIAP.
Olagam Wewa is situated close to village and provide water for seasonal cultivation	KunchupAaruthi were used for seasonal agriculture
Goda wala (Water hole): constructed for the trapping and deposition of silt, to avoid siltation and sedimentation of the main village tank.	N/A
Ihala Wewa (Storage tank): constructed for the storage of water, and is associated with paddy cultivation and other community activities.	All the tanks were constructed for the storage of water and rehabilitation is being carried out under CSIAP

Table 09: Current Status of Cascade Elements (PE)

Elements	Current Status
Tank bed	Observed in all tanks under this cascade
Tank bund	Observed in all tanks under cascade
Soil ridge	Not observed in Cascade
Up-stream waterhole	Not observed in Cascade
Up-stream tree belt	Observed in most of the tanks in the cascade
Rain-fed farm	Observed in all ta in the cascade
Down-stream interceptor	Not observed in the Cascade
Hamlet buffer	Not observed in the Cascade
Paddy field	Observed in all tanks in the cascade
Drainage	Natural drainage paths were observed in the cascade
Shrub land	Observed in all tanks in the cascade

2.4 Environmental Aspect

2.4.1 Climate (Rainfall & Temperature)

The district is located in the dry zone of Sri Lanka. The average annual rainfall of the district is 1275mm with a bimodal rainfall pattern, where 75% of the rain is received during the early phase of the northeast monsoon period from November to February and temperature during this period is relatively low. The remaining periods are parched and warm, especially during the southwest monsoon season from June to August. The monthly average temperature ranges between 23 °C and 39 °C.

Table 10: Average Monthly Rainfall & Evaporation in Oddusudan during 2022

S/N	Month	Evaporation (mm/month)	Rainfall (mm/month)
1	January	11.32	99.5
2	February	105.35	70.4
3	March	136.03	24.7
4	April	139.67	39.5
5	may	130.85	81.1
6	June.	141.83	18.5
7	July	139.13	47.5
8	August	137.95	57.8
9	September	140.00	82.90
10	October	117.35	175.8
11	November	88.00	360.50
12	December	99.85	290.9

Source: Hydrology Study-Page no-31

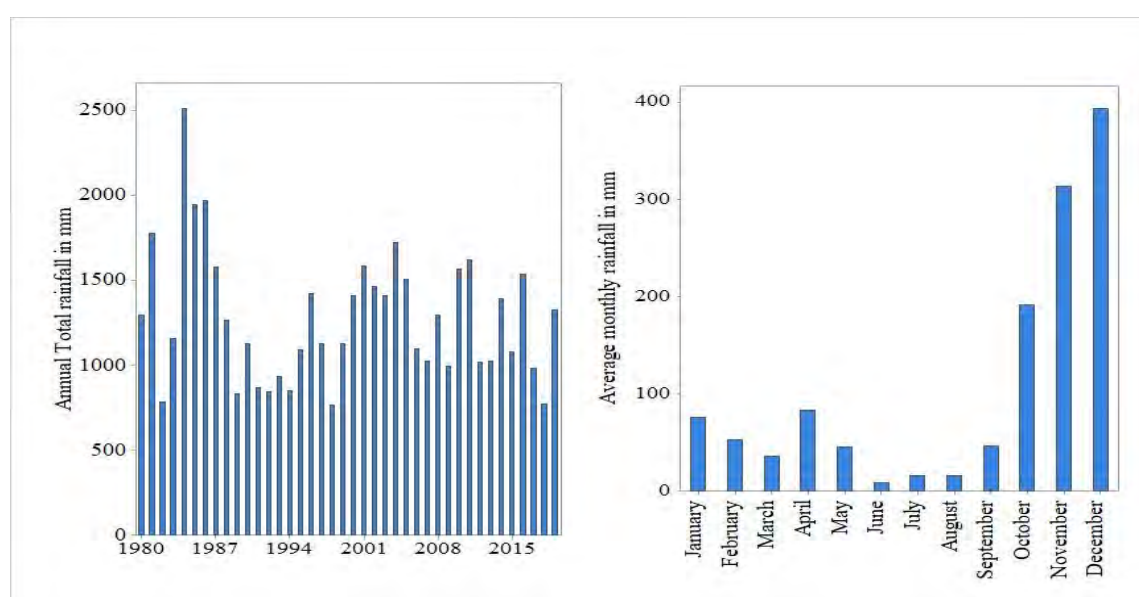


Figure 10: Annual total rainfall and average monthly rainfall pattern of the Mullaitivu District from 1980 to 2020.

(The data were gathered from the Spatio-temporal variability of drought over the Mullaitivu District in Sri Lanka from 1980 to 2020)

Rainfall is the leading cause of drought and flood hazards in the cascade area. Generally, very little rainfall is recorded in June, July, August and September and in some months, no rainfall is recorded in the study area in some years. Figure 3 illustrates the monthly pattern of rainfall for the Mullaitivu district. No rainfall in May-June leads to a water shortage in subsequent months because July onwards is the hottest months in the cascade area. There are no significant changes in the annual total rainfall for the Northern region of Sri Lanka. Still, there is a decreasing pattern in the monthly rainfall in the Mullaitivu district. The percentage of forest cover has been increased in the cascade area. The percentage of forest cover has been increased in the cascade area during the last two decades. Coastal stations have fewer drought conditions compared to the stations located far from the ocean. Generally, drought conditions originate in Western land areas such as Thunukkai, Naddankandal, or Ambalapperumal and extend eastward. There are many reasons for these conditions, such as geographical location (distance from the sea), soil, and land use patterns. Besides, groundwater is in poor condition in this area. Changes in sea surface temperature will impact Mullaitivu. Because its eastern boundary is a colossal sea surface (bay of Bengal). Previous studies on IOD in other parts of SL also revealed a positive relationship between IOD and rainfall in Sri Lanka.

The study area has seven (7) primary minor tanks and 01 anicut providing water for domestic and irrigation purposes. These tanks & anicut function as drought mitigation sources for the area during the first inter and southwest monsoon. If the reservoir's water-holding capacity is increased, the stored water can be used during high temperature and no/less rainfall periods to mitigate or prevent the impact of drought in the district.

2.4.2. Extent of Environmental Issues

- **Climate Change Impact:** The effects of climate change, such as rising temperatures and variation in precipitation patterns, increased frequency of droughts and intense storms exacerbate hydrological concerns in the cascade system. Since this village is in a coastal area, sea-level rise and intrusion pose additional challenges for water resource management.

Climate change poses additional challenges to irrigation management in the cascade area. The Cascade area is vulnerable to climate change and natural disasters such as floods and droughts, which negatively affect agriculture and other livelihoods. The availability of water from the Karuvili Aaru 'A' cascade system is crucial for agricultural activities. Adequate and reliable water supply is necessary for sustaining crops and ensuring a successful harvest. The farmers basically request to rehabilitate the Kuruvichchai Aaru Anicut to restore the water level and increase the extent of cultivation. Implementing adaptation strategies, promoting climate-smart agriculture techniques, and enhancing disaster preparedness are essential to mitigate these risks. Local government, community organizations, NGOs, and INGOs play crucial roles in addressing these issues and improving the livelihoods of the Karuwile Aaru A cascade area.

Erratic rainfall patterns, increased temperatures, and prolonged dry spells can affect water availability and crop water requirements. Developing climate-resilient irrigation strategies, such as implementing micro-irrigation systems, using drought-tolerant crop

varieties, and practising conservation agriculture, can help mitigate the adverse impacts of climate change and ensure the sustainability of agriculture in the area.

- **Effect on domestic water supply:** Water is not distributed from this cascade system for domestic consumption and there are no domestic water supply schemes identified within the 300 m radius of the cascade. During the transect walk, it was found that Nallimurippukulam Tank, Ampalavanpattukulam Tank, Kunchchunachikulam Tank, KunchchupAaruthikulam Tank, Thadamalaikulam Tank & Meyankalkulam Tank are used for bathing domestic pets and farm animals and drinking purpose for livestock other than agriculture purposes.
- **Soil erosion:** Water flowing through the cascade system can cause soil erosion, particularly in areas where the sandy type soil. This erosion can lead to the loss of fertile topsoil, affecting the long-term productivity of the land.
There is a high chance of inducing soil erosion due to the rehabilitation of this cascade system by clearing vegetation, excavation activities, and developing bunds, barrow pits, and soil piles. However, rehabilitation works are proposed to be carried out in the dry season with the aim of controlling soil erosion due to rehabilitation activities.
Being a flat terrain, there is less chance of getting soil eroded due to cultural 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 soils get compacted due to the absence of organic matter and tend to generate more runoff leaving soils with low water holding capacity. As a result, the soil soon becomes dry and crops are affected with soil moisture deficit even during a short dry spell. Since no one has done any study on this aspect in this area, it is appropriate to initiate studies on soil erosion and soil regeneration.
- **Siltation:** There is significant siltation was observed in this cascade area. This would have been due to mass-scale land clearing for cultivation soon after the war and the resettlement of a large number of families. The rehabilitation of the cascade system will mitigate these impacts. Anyway, farmers have an opinion that all the tanks in a cascade should be renovated to reap the full benefit of these neglected tanks for more than 40 years. However, the rehabilitation of all seven tanks in this cascade will immensely benefit the farmers. But if the anicut also could be rehabilitated the farmers will enjoy the full benefit of the cascade.
- **Encroachment:** There is no encroachment of tank beds and catchment area is recorded in this cascade.

2.5 Details of the Socio-Economic Aspect

Demographic Details

The proposed cascade profile demographic details are given below. Due to the prevailed war a significant increase in disabled and women-headed families was observed.

Table 11: Demographic Detail of Karuwile Aaru A cascade

Tank Name	Total Population	Total Families	Vulnerable Family			
			Women Headed	Disable	Elders	Samurahi
Meyankal kulam	62	15	4	-	8	11

Thaddamalaikulam	84	21	3	2	14	7
KunchupAaruthikulam	123	30	3	1	12	10
Periyaithimadukkulam	171	45	7	4	25	18
Ampalvanpattu kulam	131	32	4	1	11	20
Kunchunachikulam	72	17	1		9	8
Nallimurippukulam	74	14	8			6
Kuruvichi Aaru Anicut	-	-	-	-	-	-
Total in Cascade	717	174	30	08	79	80
Total in Periyaiththimadu GND	480	120	30	08	79	86
Total in Oddusudan ASC	20626	4026	170	126	2392	3340

The Karuvili Aaru 'A' cascade system is an irrigated agricultural-based small tanks located in the Periyaiththimadu Grama Niladhari division of the Oddusuddan Agrarian Service centre in the Mullaitivu district of Sri Lanka. To provide a comprehensive understanding of various aspects related to this agricultural system, we'll delve into several key dimensions including socio structure, economic patterns, farm families, farm practices, water availability, infrastructure development, traditional practices, land use patterns, income generation techniques, land issues, wild havoc issues, threat to human livelihood, and market linkages and facilities.

Social Structure:

The socio-structure in the area includes a mix of social classes, which can influence the distribution of resources and access to opportunities within the community. In addition to that, the Periyaiththimadu GND consists 68 families and 174 families are covered in the cascade area. Also, the Periyaiththimadu FO and Thaddamalai FO play a vital role in managing the irrigated agriculture organizational settings in the proposed area. The majority of the population are Tamil speaking Hindus and Christians living in the area. The kin of this community bound with some other community based organizations like women farmer's organization, rural development societies, sports clubs, women rural development societies in the proposed Karuvili Aaru A cascade.

Economic Pattern:

The economic pattern in the cascade is predominantly agrarian, with agriculture being a primary source of livelihood for the majority of the population. Farming and related activities constitute a significant portion of the local economy. Farm families in the area engage in paddy cultivation, vegetable farming, and some livestock rearing. Farming techniques and practices are influenced by local traditions and available resources. A minority of the population are employed in government and private sector.

Infrastructure Development:

The GOSL implemented the Infrastructure development in the area may include internal concrete roads, irrigation channel systems, rehabilitation of Meyyangalkulam, Thaddamali tank, Kunchuparuthi tank, Kunchnachi tank, Ampavalavan pattu tank, Nallimurippu Tank and Periyathimadu tank is undertaken by CSIAP at present. Also, the area keeps permanent houses with sanitation facilities and water storage facilities, and marketplaces. Even though, the area requires well-maintained infrastructure is essential for efficient agricultural operations and for improving market access in future.

Traditional Practices:

Traditional agricultural practices such as crop diversification like paddy and ground nuts in the paddy field, traditional irrigation methods by looking at auspicious times and producing seedlings during the dark moon period, and first harvesting on an auspicious day (*'Puthir eduththal'* in Tamil) and manual harvesting with traditional songs are prevalent in the region, passed down through generations.

Income Generation Techniques:

Farming is a major source of income for the local population. Income is generated through the sale of agricultural produce in local markets, supplemented by off-farm activities or employment.

Karuwile Aaru 'A' cascade system is occupied a region which govern diverse income-generating activities like Paddy & other field crops cultivation like Groundnut, Pulses and Millets. Further farmers cultivate low country Vegetable such as Brinjal, Chilli, Capsicum, Tomato, Beans, Pumpkin and Cassava, and other perennial crops like Coconuts, Mango, Bananas and Cashew.

In addition to that, small shops play a significant role in the income generation. These shops are typically managed by local entrepreneurs and offer a wide range of products such as Value-added Products, Groceries (Consumable items), Household items (non-consumable items), Snacks, and fruit juice etc. It's important to note that the specific income generation patterns may vary depending on willingness of individual farmers, land & water availability, market demand, and other local factors. The extent of land under cultivation determines the overall income potential. The larger the cultivated area, the higher the potential income, assuming favourable crop yield and market conditions. However, technologies such as transplanting of paddy seedlings, high yielding short age vegetables and OFC varieties will improve the income of farming communities in their limited extent of land.

In addition to crop production, farmers in the cascade system may have other income sources, such as livestock farming or other agricultural activities. These additional sources of income should be considered when calculating total income

2.6 Details of Construction Activities within the Cascade System

In the Karuwile Aaru A cascade area of Oddusudan DSD in Mullaitivu, various construction activities have been completed over the years. The Road Development Authority and Government have undertaken road and infrastructure development projects to improve connectivity and accessibility in the Cascade area. These projects involve the construction of main roads (Mullaitivu – Nedunkerny - Oddusudan), by-roads, bridges and other infrastructure facilities in the cascade area.

Also, housing projects supported rebuilding the homes and sanitation facilities in the proposed cascade area. The central electricity board also he electricity facilities to the community who live within the Karuwile Aaru A cascade over the years after 2009.

Renovation of 7 tanks out of 7 tanks in the cascade are being carried out under CSIAP. The proposed rehabilitation works for Kuruvichi Aaru existing anicut were curtailed due to fund reduction.

Table 12: Construction Activities are Planned to be Implemented under CSIAP

N o.	Meyankal kulam	Thadamal aikulam	KunchupA aruthikulam	Periyaithim adukkulam	Ampalvanp attu kulam	Kunchunac hikulam	Nallimuri pu Kulam
1	Improve ment of tank bund (Existing) – 545 m	Improvem ent of tank bund (Existing) – 629 m	Improveme nt of tank bund (Existing) – 361 m	Improveme nt of tank bund (Existing) – 1099 m	Improveme nt of tank bund (Existing) – 375 m	Improveme nt of tank bund (Existing) – 398 m	Improve ment of tank bund (Existing) – 687.2 m
2	Construc tion of canal lining - 50 m	Constructi on of canal lining - 200 m	Constructio n of canal lining -200 m	Constructio n of canal lining -650 m	Constructio n of canal lining -75 m	Constructio n of canal lining -295 m	Renovati on of Canal
3	Sluice Repairs	Sluice Repairs	Sluice Repairs	Sluice Repairs	Constructio n of Training Bund	Sluice Repairs	New gate for Sluice
4	Improve ment of Spill tail Canal	Improvem ent of Spill tail Canal	Improveme nt of Spill tail Canal	Constructio n of Rubble packing work (Road-side)	Improveme nt of Spill tail Canal	Improveme nt of Spill tail Canal	Renovati on of Spill
5	Construc tion of 100mm dia. hump pipe Farm Turnout (2.44 m Long) - 5.00 Nos	Constructi on of 100mm dia. hump pipe Farm Turnout (2.44 m Long) - 5.00 Nos.	Constructio n of 100mm dia. hump pipe Farm Turnout (2.44 m Long) - 6.00 Nos.	Turnout Repairing & Constructio n of 100mm dia. hump pipe Farm Turnout (2.44 m Long) - 5.00 Nos	Constructio n of cover slab (4.8m x .55m x 0.15m) at Maincanal (4Nos.	Turnout Repairing & Constructio n of 100mm dia. hump pipe Farm Turnout (2.44 m Long) - 5.00 Nos	
6			Spill Repairs Constructio n of cover	Improveme nt to SPILL WAY		Spill Repairs	

			slab (4.8m x .55m x 0.15m) at Maincanal (4Nos)				
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Government's Developments Project

There are various government projects have been undertaken under the Karuwile Aaru A cascade for infrastructure development, housing projects, Agricultural development, Education and skill development and health facilities.

- **Infrastructure Development:** The government has invested in the development of infrastructure at Oddusudan in Mullaitivu, including roads, bridges, and transportation networks, to improve connectivity within the district and with other parts of the country. Construction of Thanduvan Periyakulam bridge and A-34 and B334 roads are very helpful to the public and farmers of this cascade area to reach Mullaitivu and Vavuniya & Jaffna through Mankulam & Nedukerny.
- **Housing Projects:** After the end of the civil war in Sri Lanka, the government-initiated housing projects to provide shelter for those affected by the conflict. These projects aimed to rebuild homes and resettlement areas for the displaced population of Karuwile Aaru A cascade. The proposed Karuwile Aaru A cascade area residents have permanent houses with the personal sanitation (Toilets) facilities through the GOSL, Indian Govt. and UN habitat assistance.
- **Agricultural Development:** The farming community of Karuwile Aaru cascade adapt climate smart agriculture practices promoted by CSIAP at present. They have the existing local knowledge on the agricultural practices. After the Climate Smart Irrigated Agriculture project activities for the Agricultural production, irrigation and marketing, they were able to uplift their livelihood and family development.
- **Education and Skill Development:** Efforts have been made to improve the education sector in the cascade area, including construction of school buildings and providing educational resources. Skill development programs have also been implemented to enhance the employability of the local population.
- **Health Facilities:** The government has focused on improving healthcare services in the proposed cascade area by establishing clinics and medical facilities. These initiatives aim to provide better access to healthcare services for the local population.

2.7. Land Use and Crop Pattern within the Cascade System

The land use pattern includes a mix of paddy fields, vegetable plots, and possibly some small-scale agroforestry or horticulture in up lands. The allocation of land for various purposes is influenced by local customs and economic considerations. The Cascade area is primarily an agricultural area, with paddy cultivation and other crops being major sources of income for the local population. Landmines and unexploded ordnance from the war have posed serious threats to agricultural activities. Even though most of area are declared as safe for inhabiting there were incidence of exploding land mines. Clearance of these hazards and land rehabilitation efforts are necessary for safe and sustainable farming practices. Farmers are not allowed to return to certain areas where they were cultivating before the displacement. When they returned to their lands for cultivation, especially in Ampalavan pattu, and Kunchuparuthi tank area, they

were not allowed to clear shrub jungles in their land and these lands were declared as forest land. So, farmers had lost their livelihood and became daily wage earners.

OFC and Paddy cultivation is the primary agricultural activity in the Karuwile Aaru A cascade system. Groundnut is a prominent crop in this cascade, and it can be cultivated throughout the year in 3 seasons.

Based on the water availability in each tank in the cascade extent of cultivation is decided and water level in the tanks are carefully managed. Fields are prepared using appropriate machineries and cultivated with OFCs and suitable vegetables.

To maintain soil fertility and minimize pest and disease problems, farmers often practice crop rotation and crop diversification. After the Ground nut harvest, crops like vegetables (Brinjal or pumpkin), legumes, or fruits may be grown in rotation. This practice helps to maximize land productivity and provides farmers with a diverse range of produce for consumption and sale.

The total cultivable extent in Karuwile Aaru A cascade is from 499.25ac to 516.75ac in the Maha and from 03ac to 64ac in Yala season, respectively. The detail is shown in Table

Table 13: Details of Crop Pattern under the Small Tanks within the Cascade

No	Name of Tank	Cultivation area (ac) before rehabilitation		Cultivation area (ac) After rehabilitation		
		Yala	Maha	Yala	Maha	OFC
1	Meiyankal Tank	-	50 Paddy 10 Highland	-	50ac Paddy	10ac
2	Thaddamalai tank	-	64 paddy 10 Highland	64ac	64ac	10ac and 15ac-abandoned high land
3	Kunchuparuththi tank	-	32 Paddy 20 High land	-	32ac Paddy	20ac High land
4	Periyaiththimadu	3ac	210 Paddy	-	212.5ac Paddy	-
5	Ampalavanpaddu	-	38.75Paddy	-	38.75ac Paddy	-
6	Kunchunachchi	-	20 Paddy	-	20ac Paddy	-
7	Nallimurippu	-	44.5aPaddy	-	44.5ac Paddy	-
8	Kuruvichchai Aaru anicut	-	-	-	-	-

2.8 Details of Irrigation Management within the Cascade System

Restoration of 300 m length of branch channel is essential under Kunchuparuththi tank in order to minimize the seepage loss and ease flow of water. Restoration of an abandoned agro well situated closer to main bund of Meiyankal tank is necessary. Farmers use this well water to mix the agro chemicals for spraying the crop. The identified key issues and potential solutions related to irrigation management in this area are given below.

2.8.1 The Identified Key Issues regard to Irrigation Management and Potential Solutions

Limited infrastructure for water storage and distribution hampers effective water management in the area. Insufficient river paths, irrigation systems, and canals lead to inefficient water management, hindering agricultural productivity, and economic development. The critical issues were identified and ranked during the workshop; and interventions were proposed for each critical issue.

- **Improper Feeder & Drainage Network:** One of the primary issues in irrigation management is improper feeder & drainage network. Due to outdated or poorly maintained infrastructure in most of the tanks in the cascade, water may not reach all areas evenly, leading to water scarcity for some farmers in down-stream tanks while others face waterlogging especially during heavy rainfall or when excessive irrigation occurs. Waterlogged soil can negatively impact crop growth, causing root suffocation and increased susceptibility to diseases and then resulted in uneven growth and yield variations among the cultivated crops. It requires careful planning and monitoring to ensure equitable water distribution throughout the cascade system. To address this issue, modernizing and upgrading the irrigation infrastructure with proper water sharing plans. Proper drainage infrastructure is crucial to prevent waterlogging and ensure optimal growing conditions.
- **Lack of Water Storage Facilities:** Another issue in the cascade area is the limited availability of water storage. During the monsoon season, a significant amount of water is lost due to inadequate storage capacity. Constructing the Anicuts across the streams or rehabilitating tanks and small-scale surface water harvesting structures can help to capture and store water for dry periods, ensuring a more consistent water supply throughout the year.
- **Inaccurate Irrigation Scheduling:** Improper irrigation scheduling lead to over- or under-irrigation and negatively impacting crop productivity and water conservation efforts. Implementing modern irrigation management techniques like precision agriculture, which utilizes sensors and analytical data, can provide real-time information on soil moisture levels, weather patterns, and crop water requirements. This data-driven approach enables farmers to optimize irrigation schedules and apply water precisely when and where it is needed, minimizing water wastage.
- **Poor Irrigation Efficiency:** Most of the farmers adopt surface irrigation methods the cultivation of OFC, fruit crops and perennial crops. Considering the soil and weather conditions of the cascade, the introduction of micro irrigation can help to optimize water usage.
- **Lack of Awareness:** Most of the layman farmers in the cascade area are lack of knowledge about efficient irrigation practices and water management techniques. At present, the CSIAP is conducting training programs on CSA and workshops to educate farmers about the benefits of sustainable irrigation practices, including water-saving methods, which can enhance their awareness and understanding of the irrigation schemes of this cascade area.

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

2.9 Issues in the Command Area

Addressing these issues requires a comprehensive approach that includes improved water governance, sustainable water management practices, investment in infrastructure development, and initiatives to promote water conservation and pollution control. It is crucial to prioritize long-term solutions that ensure water availability, quality, and resilience in the Karuwile Aaru A cascade.

- **Land Issues:**

Land issues may encompass concerns related to land ownership, land fragmentation, land tenure systems, and disputes over land boundaries. These issues affect agricultural productivity and livelihoods. For example, nearly 100ac middle colony land in the Periyathimadu FO area has document related issues.

- **Land Fragmentation:** The Karuile Aaru A cascade command area is often divided into smaller plots to accommodate the flow of water. This fragmentation can make it challenging for farmers to manage their crops efficiently, especially when it comes to mechanized farming practices. It may also lead to difficulties in accessing and maintaining the land.
- **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.
- **Land Subsidence:** Intensive irrigation practices, especially if not managed properly, can lead to land subsidence. Over-extraction of groundwater in the dry season can cause the soil to compact and sink, resulting in a permanent loss of land elevation at proposed command areas. Land subsidence can affect the overall stability of the irrigation cascade system and may require remedial measures such as groundwater management and land-use planning.

2.8.2 Other Issues

- **Disaster**

Various threats found in the area to human livelihood may include natural disasters (e.g., droughts 2022), changes in weather patterns affecting crop yields, and economic fluctuations impacting market prices.

Wild animals' havocs include the challenges posed by wild animals (elephant, monkeys, wildboar and peacocks) damaging crops, which is a common problem in the cascade area. This leads to huge economic losses for farmers. A person was attacked by elephant in the kunchunaachi tank area is recorded as a wild havoc in 2013. Further, steps have been taken to erect wild animal protection fence in this cascade and the necessary materials are already distributed among the respective ASCs.

- **Market Linkages and Facilities:**

The Karuwili Aaru cascade system in the Periyathimadu area faces significant challenges related to market facility and linkages. The existing market infrastructure and connectivity are inadequate and inefficient, hindering the smooth flow of agricultural produce and other goods from the region to larger markets. This lack of proper market facilities limits the opportunities for farmers and local producers to get better prices and to reach broader market. Improving market facilities and enhancing linkages within the cascade system are crucial to address these issues, and to promote economic development.

- **Health hazard:** Increased hardness of groundwater, fertilizer run-off from agricultural activities and extensive agricultural practices are often blamed for the incidence of

Chronic Kidney Diseases in this area. Studies on groundwater quality indicated the necessity for prior treatment before consumption since quality parameters of samples from most ground water sources exceeded the drinking water standard of WHO and also contaminated with coliforms and *Salmonella*.

Table 14: Critical Issues of the Cascade System

No	Critical Issues	Subject Area
1	Lack of knowledge in water management techniques and irrigation scheduling	Lack of awareness
2	Lack of stakeholder collaboration and governance	Participatory approach
3	Lack of interest in farming among the young generation.	Lack of awareness
4	Restriction of the Department of Forest, land ownership and Land fragmentation.	Land issue
5	Lack of maintenance of infrastructure of the cascade (tank bed, feeder canals, drainage networks etc..).	Operation and maintenance
6	Change of weather pattern (Unexpected drought, flood, and high temporal rainfall variation.	Climate change
7	Limited access paths/ roads to tank and farm fields.	Mobility
8	Extinction of Medicinal herbs.	Bio diversity
9	Limitation of grazing land during cultivation time.	Cattle rearing
10	Involvement in illegal activities – illegal logging/ timber trafficking, mining sand & gravel, theft dam materials.	Illegal activities

4 Major Elements of Cascade Management Plan (CMP)

4.1. Goal

The goal of the CMP, Karuwile Aaru A cascade is to improve access to water and to ensure the efficiency in water management (Water Conveyance Efficiency and Water Use Efficiency)

4.2 Objectives

The specific objectives are:

- To reduce vulnerability of climate change
- To enhance the living standards of rural communities on sustainable basis.
- To restore the watershed of the system to enhance biodiversity (Flora & Fauna, Wild animals, etc.) through integrated management
- To address the water scarcity faced by rural communities living in the cascade (addressing the farming, drinking and environmental water requirements of the area)
- To manage water and associated natural resources in a sustainable manner

- To promote crop zoning programmes and facilitate marketing
- To reduce wastage of water by 25 to 35 % through creating awareness and knowledge sharing in water management techniques, irrigation scheduling and operation and maintenance of tank cascade area, tank bed, feeder canals, and drainage networks.

4.3 Targets/ Specific Objectives

1. To ensure availability of water throughout the year
2. To enhance the biodiversity
3. To facilitate transportation and marketing.
4. To promote irrigation practices
5. To solve land ownership.
6. To prevent the illegal activities
7. To establish a legally empowered entity to safeguard the cascade

4.4 Proposed Strategic Interventions to Resolve/Mitigate Critical Issues

1. Construction of 300m access from “Kunchunachchi” to “Kunchuparuththi” tank
2. Restoration of 300 m length of branch channel in Kunchup Aaruththi Tank
3. Complete renovation of Varavupilavu Tank
4. Restoration of abandoned agro well at the main bund of Varavupilavu tank.
5. Protracting and reconstructing of Spill Way including Drainage channel
6. Construction of New Anicut across the natural stream under Kuruvichai Aaru
7. Construction/reforming of soil erosion bunds
8. Widening and deepening of existing Causeway
9. Replanting of saplings
10. Recapturing and restoration of 500m length of the access road to “Meiyankal Tank”
11. Construction of 300m of ago road in “Varavupilavu” area.
12. Conduct awareness, training and capacity building programs (CBPs) for officers, members of CBOs and farmers.
13. Reforestation & establishment of agroforestry
14. Advocate to resolve land issues among famers and between the community and the departments.
15. Strictly adopt the government laws related to forests and the environment
16. Introduce CSA practices in the tank commanding area.

Table 15: Proposed Intervention for Critical Issues

Critical Issues	Rank	Proposed Intervention
Lack of knowledge in water management techniques and irrigation scheduling	1	12 & 16
Lack of maintenance of infrastructure of the cascade (tank bed, feeder canals, drainage networks etc..).	2	2, 3, 4, 5, 6,7, & 8

Lack of interest in farming among the young generation.	3	12
Lack of stakeholder collaboration and governance	4	12
Restriction of the Department of Forest, land ownership and Land fragmentation.	5	14
Change of weather pattern (Unexpected drought, flood, and high temporal rainfall variation.	6	9
Limited access paths/ roads to tank and farm fields.	7	1, 10 & 11
Extinction of Medicinal herbs.	8	13
Limitation of grazing land during cultivation time.	9	14
Involvement in illegal activities – illegal logging/ timber trafficking, mining sand & gravel, theft dam materials.	10	15

Table 16: Proposed Activities to Achieve the Targets / Specific Objectives

Targets / Specific Objectives		Proposed Activities	
1	To ensure availability of water throughout the year	1	Construction of new Anicut with regulator across the river of Kuruvichai Aaru
		2	Reconstruction of Varavupilavu Tank
		3	Restoration of 300 m length of branch channel Kunchup Aaruththi tank
		4	Rehabilitation of existing Kuruvichai Aaru Anicut
		5	Widening and deepening of existing Causeway
2	To enhance the biodiversity	6	Reforestation & establishment of agroforestry
		7	Promote the existence of traditional ecosystems in the cascade area
3	To facilitate transportation and marketing.	8	Construction of 300m access from “Kunchunachchi” to “Kunchuparuththi” tank
4	To promote irrigation practices	9	Conduct awareness, training and capacity building programs (CBPs) for officers, members of CBOs and farmers.
		10	Introduce CSA Practices
5	To solve Land related issues	11	Advocate to resolve land issues among farmers and between the community and the departments.
6	To prevent the illegal activities	13	Strictly adopt the government laws related to forests and environment
7	To establish a legally empowered entity to safeguard the cascade	14	Legalize the Cascade Management Committee (CMC) with all relevant stakeholders

4.5 Community's Responsibilities in the Cascade

Community responsibilities in a proposed cascade area encompass a wide range of essential actions that individuals undertake to contribute to the well-being and progress of their local community.

Recognizing the ecological importance of the cascade area, community members actively engage in practices that promote environmental conservation and sustainability. This can involve initiatives such as organizing local clean-up events, promoting recycling and waste reduction, and supporting the preservation of natural habitats.

Being an active participant in community affairs is crucial for the development and growth of the Karuvile Aaru 'A' cascade area. The responsibilities entail attending meetings, Sramadana activities & voicing opinions on important issues, and actively participating in farmers' organizations and initiatives. By engaging in civic affairs, individuals can help shape local policies and promote positive change.

Embracing the spirit of giving back, community members actively seek opportunities to volunteer their time, skills, and resources. This could involve mentoring local youth, assisting with community events, providing support to vulnerable populations, or participating in local service organizations. Volunteering fosters social cohesion and empowers individuals to make a tangible difference in the lives of others.

Recognizing the value of education as a catalyst for progress, community members prioritize supporting educational initiatives within the cascade area. This can involve advocating for quality schools, promoting adult education programs, or participating in mentoring programs. By investing in education, individuals help equip community members with the knowledge and skills needed to thrive in rapidly changing farming practices and community as well.

Fostering economic growth and stability is a critical responsibility within a cascade area. Community members contribute by supporting local businesses, encouraging entrepreneurship, and attracting investments that align with sustainable development goals. This responsibility also includes advocating for job creation, providing training opportunities, and supporting initiatives that enhance the economic viability of the community.

Celebrating and preserving the unique cultural heritage of the cascade area is an important responsibility. Community members engage in activities that promote local art, music, traditions, and historical preservation. By valuing and promoting cultural diversity, individuals contribute to a vibrant and inclusive community that fosters pride and unity among its members.

4.6 Total Estimated Cost for Implementing Interventions and Contribution Expected from the Stakeholder Agencies

- **Stakeholder Collaboration and Governance:** Effective irrigation management requires strong collaboration among various stakeholders, including farmers, government agencies, water authorities, and community organizations. Establishing participatory irrigation management systems that involve 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 use and irrigation practices are essential for efficient and equitable water allocation.

Table 17: Gantt Chart for Proposed Activities and Responsible Entities for Implementing

No.	Proposed Activities	Tentative Budget (Rs. Mn.)	Time Frame																Responsibility of Implementation	
			Short Term (Jul - Dec 2023)						Mid Term (Jan - Dec 2024)				Long Term (Jan - Dec 2025)				Major	Others		
			Jul	Aug	Sep	Oct	Nov	Dec	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
1	Construction of New Anicut across the natural stream under Kuruvichai aaru	30.0																DAD	FO	
2	Reconstruction of Varavupilavu Tank at Periyaththimadu Village	20.0																DAD	FO	
3	Restoration of 200m length of branch channel	2.0																DAD	FO	
4	Rehabilitation of Kuruvichaia Aaru anicut	30																DAD	FO	
5	Widening and deepening of existing Causeway	1.0																DAD	FO	
6	Reforestation & establishment of agro forestry	1.0																DAD	FO	

7	Promote the traditional eco systems in the cascade area	1.0															DAD	FO
8	Construction of 3 nos of access roads (1.1 km)	2.5															DAD	FO
9	Conduct awareness, training and CBPs for officers, members of CBOs and farmers	1.0															DAD	FO
10	Introduce CSA Practices	1.5															DOA	FO
11	Advocate to resolve land issue among the farmers and between the community and the Departments	0.2															DS Office	FO
12	Strictly adopt the government laws related to forests and the environment	0.1															DS Office	FO & DoF
14	Form and legalize a Cascade Management Committee (CMC) with all relevant stakeholders	0.2															DAD	FO

Table 18: Proposed Activities with Expected Contribution from Stakeholder Agencies

No.	Proposed Activities	Total Budget (Rs. Mn.)	Expected Budget Contribution in Rs. Mn.			
			Private	Line Agencies	Farmer	Funding Agencies
1	Construction of New Anicut across the natural stream under Kuruvichai aaru	30.0				30.0

2	Reconstruction of Varavupilavu Tank at Periyathimadu Village	20.0				20.0
3	Restoration of the branch channel	2.0				2.0
4	Rehabilitation of Kuruvichai Aaru anicut	30				30
5	Widening and deepening of existing Causeway	1.0				1.0
6	Reforestation & establishment of agroforestry	1.0				1.0
7	Promote the traditional ecosystems in the cascade area	1.0				1.0
8	Construction of 3 nos of access roads (1.1 km)	2.5				2.5
9	Conduct awareness, training and CBPs for officers, members of CBOs and farmers	1.0				1.0
10	Introduce CSA Practices	1.5			0.5	1.0
11	Advocate to resolve land issue among the farmers and between the community and the Departments	0.2			0.2	0.05
12	Strictly adopt the government laws related to forests and the environment	0.1			0.1	
13	Form and legalize a Cascade Management Committee (CMC) with all relevant stakeholders	0.2				0.2

4.1 Interventions and Major Activities Expected to be Implemented by the CSIAP within its Project Period

Table 19: Gantt Chart for Proposed Activities to be Implemented by CSIAP

No.	Proposed Activities	Total Budget (Rs. Mn.)	Time Frame								
			2023					2024			
			Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
1	Construction of New Anicut across the natural stream under Kuruvichai aaru	30.0									
2	Reforestation & establishment of agro-forestry	1.0									
3	Promote the traditional eco systems in the cascade area	1.0									
4	Conduct awareness, training and CBPs for officers, members of CBOs and farmers	1.0									

5	Introduce CSA Practices	1.0									
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4.7 Implementation Methodology of the Cascade Management Plan

CMBDP should be submitted to the Divisional Agriculture Committee and the District Agriculture Committee for approval. After getting the approval, it will be implemented.

The sub-project proposal (Attachment No. 04) will be prepared by CMC with the support of the relevant implementing agencies for obtaining capital assistance

Major partner institutions are committed to implementing the proposed activities, preparing and supporting existing investment plans, budget reports and implementation plans, and assisting CMC in submitting grant funding proposals to be provided.

Social Audit Committees of sub-project implementation effectiveness. CMC appoints Social Audit Committees and gives active contributions to the beneficiaries to enhance the quality of work performed by the CMC

Annexure 1: Circular No 6 of 2023 issued by the Department of Agrarian Development on 3rd August 2023 to establish cascade management committees

சுற்றறிக்கை இலக்கம் – 06/2023

அனைத்து மாவட்ட செயலாளர்களுக்கும் பிரதேச செயலாளர்களுக்கும்,

குளஅடுக்குத் தொடர் அமைப்பு முகாமைத்துவ குழு உருவாக்கம் மற்றும் நடாத்திச்செல்லல் ஒழுங்கு முறைகள்

நாட்டின் உள்ளகத்திலிருந்து கடலுக்கு வழிந்தோடும் பிரதான ஆறுகள் மூன்றாம் நிலை நீர்வழிகள் எனவும், அப்பிரதான ஆறுகளை சேரும் கிளை ஆறுகள் இரண்டாம் நிலை நீர்வழிகள் எனவும் அக்கிளை ஆறுகளுக்கு நீர் வழங்கும் சிறிய நீர்வழிகள் ஆரம்ப நிலை நீர்வழிகள் எனவும் அழைக்கப்படும். கிராமிய மட்டத்திலான குளங்களும் நீர்த்தேக்கங்களும் பெரும்பாலும் ஆரம்ப நிலை நீர்வழிகளினூடு அமைக்கப்பட்டுள்ளதோடு பூமியின் மேற்பரப்பில் நீரைத்தேக்கி கீழே வழிந்தோடச் செய்ய அமைக்கப்பட்டிருக்கும் வாவி்களும் இதனுள் அடங்கும்.

02. நாட்டின் உள்ளகத்தில் காணப்படும் ஆரம்ப நிலை நீர்வழியொன்று அல்லது நீர்வழி வலையமைப்பிலுள்ள நீரியல் ரீதியாக ஒன்றிணைந்த சிறு மற்றும் நடுத்தர அளவிலான வாவி அமைப்புக்கள் அல்லது குளங்கள் மற்றும் நீர்த்தேக்க அமைப்புக்கள் அல்லது நீர்த்தேக்க அமைப்புக்களினாலான நடுத்தர அளவிலான நீரேந்து பகுதி குளஅடுக்குத் தொடர் அமைப்பு என கூறப்படும்.

03. இலங்கையில் 1166 குளஅடுக்குத் தொடர் அமைப்புக்கள் கண்டுபிடிக்கப்பட்டுள்ளன. இக் குளஅடுக்குத் தொடர் அமைப்புக்களை மையமாகக்கொண்டு புவியியல், நீரியல், சூழலியல் மற்றும் சமூக பொருளாதார மேம்பாடு குறித்து வளப்பயன்பாட்டினை வினைத்திறனாகவும் நிலையானதாகவும் கொண்டு செல்வதனை இலக்காகக் கொண்டு 1968 இலக்கம் 48 நீர்ப்பாசன (திருத்தங்கள்) கட்டளைச் சட்டத்தின் திருத்தியமைக்கப்பட்ட 1946 இலக்கம் 32 நீர்ப்பாசன கட்டளைச்சட்டத்தின் 1(அ) 1,2,3,4 உறுப்புரைகளின் பிரகாரம் கமநல அபிவிருத்தி ஆணையாளர் நாயகத்திற்கு வழங்கப்பட்டிருக்கும் அதிகாரங்களுக்கமைய மேற்குறிப்பிட்ட சட்டத்திற்கமைய நடாத்தப்படும் மாவட்ட வேளாண்மை குழுவின் போது, நீர்ப்பாசனக் கைத்தொழிலை மையமாகக் கொண்ட நெல் உற்பத்தி உள்ளிட்ட வேளாண்மையில் தாக்கம் செலுத்தும் அல்லது அனைத்து துணைக்காரணிகள் குறித்து நடவடிக்கைகளை மேற்கொள்ள குறித்த சட்டத்தினால் உங்களுக்கு வழங்கப்பட்டுள்ள அதிகாரங்களின் பிரகாரம் குளஅடுக்குத் தொடர் அமைப்பு முகாமைத்துவ குழுக்களை உருவாக்குதல் மற்றும் நடாத்திச்செல்லுதல் ஒழுங்கு முறைகள் தொடர்பாக வேளாண்மைக் குழுவில் கலந்துரையாடுமாறும் அதற்கு கீழ் குறிப்பிட்டுள்ள விடயங்களை வழிகாட்டிகளாக பயன்படுத்துமாறு கனிவுடன் தெரிவிக்கிறேன்.

3.1 குளஅடுக்குத் தொடர் அமைப்பு முகாமைத்துவ குழுக்களை உருவாக்குவதற்கான குறிக்கோள்கள்

- குளஅடுக்குத் தொடரில் அமைந்துள்ள அனைத்து இயற்கை வளங்கள், அதாவது மண், நீர், வன வளம், உயிரியல் அமைப்புக்கள், காணி மற்றும் நீர்ப்பாசன கட்டமைப்புக்களை முகாமைத்துவம் செய்வதற்காக நலன்விரும்பிகள் மற்றும் குறித்த அரச அதிகாரிகள் ஒருமித்த அணுகுமுறையுடன் செயல்படுவதற்கான நிறுவன கட்டமைப்பொன்றினை அமைத்தல்.
- நீர்ப்பாசன வேளாண்மை, கால்நடை தொடர்பான நடவடிக்கைகள் மற்றும் நன்னீர் மீன்பிடி கைத்தொழிலிற்கு நீர் வழங்கல், வன வளம் மற்றும் வன விலங்குகளின் தேவைப்பாடுகளை சமாந்தரமாக நடாத்திச் செல்லல், நிலத்தடி நீரினை உகந்தவாறு

பேணுதல் வீட்டுத்தோட்ட பராமரிப்பு உள்ளிட்ட வீட்டு நீர் பாவனையினை முறையாக முகாமைத்துவம் செய்தல்.

- iii) வேளாண்மை நடவடிக்கைகளுக்கு நீர்ப்பாவனை செய்பவர்கள் உள்ளிட்ட படிநிலை அமைப்பினை பராமரிப்பு செய்வதற்காக வேறு பயனாளிகள் மற்றும் பங்குதாரர்களின் ஒத்துழைப்பினை பெற்றுக் கொள்ளல்.

3.2 குளஅடுக்குத் தொடர் அமைப்பு முகாமைத்துவ குழுக்களை உருவாக்குவதற்கான நோக்கங்கள்

- i) குளஅடுக்குத் தொடர் அமைப்பு முகாமைத்துவம் மற்றும் நிலையான பேணுக்கைக்காக சட்டபூர்வ அங்கீகாரத்துடனான நிறுவன கட்டமைப்பொன்றினை உருவாக்குதல்.
- ii) ஒவ்வொரு குளஅடுக்குத் தொடர் அமைப்புக்களுக்கு ஏற்ப அதன் செயல்பாட்டிற்கும் நிலையான பாவனைக்கும் தொடர்புடைய பிரச்சினைகள் மற்றும் முன்மொழிந்த தீர்வுகளை ஒருங்கிணைந்த அணுகுமுறையுடன் கலந்தாலோசித்து சட்டபூர்வ அங்கீகாரத்துடனான முறைமை ஒன்றினை உருவாக்குதல்.
- iii) குளஅடுக்குத் தொடரிற்குள் உள்ள வேளாண்மை, நீர் முகாமைத்துவ, குழலியல், சமூக பொருளாதார மற்றும் புவியியல் காரணி அமைப்பின் செயல்திறனுக்காக தொடர்ச்சியாகவும் வினைத்திறனாகவும் நடாத்திச் செல்வதற்கான முறையையொன்றை ஏற்படுத்தல்.
- iv) குளஅடுக்குத் தொடர் அமைப்பின் அபிவிருத்தி நடவடிக்கைகளில் முழு அமைப்பிற்கும் இடம்பெறும் சேதங்களைத் தடுத்து தேவைகளை உறுதிப்படுத்தல், நீர்வளத்தினை வினைத்திறனான முறையில் பாவனை செய்வதற்காக சாகுபடி உற்பத்தியினை அடித்தளமாகக் கொண்டு திட்டங்களை நிர்மாணித்தல்.
- v) குளஅடுக்குத் தொடர் அமைப்பிற்கு ஒருங்கிணைந்த வேளாண்மை உற்பத்தி திட்டமொன்றினை நிர்மாணித்தல் மற்றும் அத்திட்டத்தின் செயல்திறன் நிலைமையை கண்காணித்தல்.
- vi) குளஅடுக்குத் தொடர் அமைப்பொன்றில் காணப்பட வேண்டிய கூறுகளை மாற்றுவதற்கு தேவையான நடவடிக்கைகளை மேற்கொள்ளல்.
- vii) குளஅடுக்குத் தொடர் அமைப்புடன் தொடர்புடைய சமூக பொருளாதார தொடர்புகளை பேணுதல் மற்றும் அது தொடர்பிலான பங்குதாரர்களை விழிப்புணர்த்துதல்.

3.3 குளஅடுக்குத் தொடர் அமைப்பு முகாமைத்துவ குழுவின் பணிகள்

- i) குளஅடுக்குத் தொடர் அமைப்பிற்கான திட்டங்களை தயாரித்தல், நடைமுறைப்படுத்தல் மற்றும் கண்காணித்தல்.
- ii) குளஅடுக்குத் தொடர் அமைப்பு முகாமைத்துவ குழு அங்கத்தவர்களால் முன்வைக்கப்படும் பிரச்சினைகள், முன்மொழிவுகள் மற்றும் திட்டங்களுக்காக தீர்வுகளை முன்வைத்தாலும் தீர்வு காண முடியாத பிரச்சனைகளை பொருத்தமான பிரதேச/ மாவட்ட வேளாண்மை குழுவிடம் முன்வைத்து தீர்த்துக் கொள்ளல்.
- iii) குளஅடுக்குத் தொடர் அமைப்பு முகாமைத்துவத்துடன் தொடர்புடைய அறிக்கையினை சந்தர்ப்பத்திற்கேற்றவாறு பிரதேச/மாவட்ட வேளாண்மை குழுவிடம் முன்வைத்தல்.
- iv) கிராமிய குளஅடுக்குத் தொடர் களில் அமையப்பெற்றிருக்கும் அனைத்து நீர் மூலங்கள் மற்றும் நீர் நுகர்வோர்கள் ஒன்றிணைத்து குளஅடுக்குத் தொடர் சேர்ந்த மத்திய நீர்ப்பிடிப்புப் பகுதிக்காக ஒருங்கிணைந்த வேளாண்மை திட்டமொன்றினை உருவாக்கி நடைமுறைப்படுத்தல்.
- v) குளஅடுக்குத் தொடர் அமைப்பொன்றினுள் நடவடிக்கைகளில் ஈடுபடும் அனைத்து நீர் நுகர்வோர்களினதும் தேவைப்பாடுகளுக்கேற்ப நீர்ப்பிடிப்பு பிரதேசத்திலுள்ள

- இயற்கை வள முகாமைத்துவம் தொடர்பிலான தீர்மானங்களை மேற்கொள்ளுதல் மற்றும் நடைமுறைப்படுத்துதல்.
- vi) இயற்கை அனர்த்தங்கள், அழிவுகள், தீங்கு விளைவிக்கும் மனித நடவடிக்கைகளை குறைக்கக்கூடிய வகையில் அனைத்து நீர்மூலங்களையும் முகாமை செய்தல்.
- vii) குளஅடுக்குத் தொடரிலுள்ள அனைத்து நீர் மூலங்களையும் மையமாகக் கொண்ட நீர் வாடிக்கையாளர்களுக்கிடையே வினைத்திறனான தகவல் தொடர்பாடல் முறையொன்றினை உருவாக்குதல்.
- viii) படிநிலையிலுள்ள சுற்றுச்சூழல் அமைப்புக்களுடன் தொடர்புடைய உள்ளீடுகள் மற்றும் வெளியீடுகள் திறனான முறையில் முகாமைத்துவம் செய்ய முறையான வழிமுறை ஒன்றினை உருவாக்குதல்.
- ix) தற்போதைய மற்றும் எதிர்காலத்தில் நிகழும் என கணிக்கப்படும் காலநிலை மாற்றங்களுக்கு தகுந்த காலநிலை நட்பு உபாயமுறை திட்டங்களை நடைமுறைப்படுத்தலும் நீர் நுகர்வோர்களை அவ்வாறான காலநிலை மாற்றங்களுக்கு பழக்கப்படுத்துதல்.
- x) குளஅடுக்குத் தொடர் அமைப்பு முறைமைக்குள் நீர் வாடிக்கையாளர்களிடையே அறிவு, திறன், மனப்பாங்கு மற்றும் வளங்களை வினைத்திறனான முறையில் பரிமாற்றம் செய்து கொள்ளல்.
- xi) நீர் நுகர்வோர்களின் காணி, நீர் மற்றும் சுற்றுச்சூழல் அமைப்புக்களின் வினைத்திறனை மேம்படுத்துவதற்கான நடவடிக்கைகளை மேற்கொள்ளல்.
- xii) வேளாண்மைக்கு மற்றும் நீர் நுகர்விற்கேற்ற சுற்றுச்சூழல் அமைப்புக்களுடன் தொடர்புடைய பாரம்பரிய சட்டங்கள் மற்றும் இயற்றப்பட்ட சட்டங்களை அமுலுக்கு கொண்டு வருவதற்குத் தேவையான ஆதரவினை வழங்குதல்.
- xiii) காணி உரித்துடைய விவசாயிகள் மற்றும் உரிமையாளர்களின் கூட்டத்தினை(சாகுபடி உற்பத்திக் கூட்டம்) நடாத்த தேவையான அடிப்படை தீர்மானங்களை மேற்கொள்ள விவசாயிகளுக்கு உதவி புரிதல்,அதனோடு தொடர்புடைய ஒருங்கிணைப்பு நடவடிக்கைகளை மேற்கொள்ளுதல் மற்றும் கண்காணித்தல்.
- xiv) குளஅடுக்குத் தொடர் அமைப்பு அதிகாரப்பிரதேசக்குள்ளான அனைத்து நீர் மூலங்கள் மற்றும் அதனோடு தொடர்புடைய ஏனைய சுற்றுச்சூழல் அமைப்புக்களின் நிலையான தன்மையினை பேணுவதற்காக குறித்த குறித்த அரசு நிறுவனங்களின் வழிகாட்டல்கள் மற்றும் அறிவுறுத்தல்களை பின்பற்றி பாதுகாப்பதற்கு உரிய நடவடிக்கைகளை மேற்கொள்ளல்.
- xv) குளஅடுக்குத் தொடர் அமைப்பிற்கு பாதிப்பினை உண்டுபண்ணும் பங்குதாரர்களுக்கு எதிராக சட்ட செயற்பாடுகளை மேற்கொள்வதற்கு தேவையான நடவடிக்கைகளை மேற்கொள்ளல்.
- xvi) குளஅடுக்குத் தொடர் அமைப்பின் அனைத்து அபிவிருத்தி நடவடிக்கைகளிலும் செயன்முறை ரீதியாக பங்களிப்பினை வழங்கலும் முன்னேற்றத்தை கலந்தாலோசித்தலும்
- xvii) குளஅடுக்குத் தொடர் அமைப்பில் நீர்ப்பாசன கைத்தொழிலில் கூட்ட தீர்மானங்களை நடைமுறைப்படுத்தும் நிலைமையினை கண்காணித்தல்.
- xviii) குளஅடுக்குத் தொடர் அமைப்பின் நீர்ப்பாசன கைத்தொழில்களின் செயல்பாடுகள் மற்றும் பராமரிப்பு நிகழ்வுகளை கண்காணித்தல்.

3.4 குளஅடுக்குத் தொடர் அமைப்பு முகாமைத்துவ குழுவின் கலவை

3.4.1 பிரதேச மட்டம்

இக்குழு குறித்த பிரதேச செயலக அதிகாரப் பிரதேசத்தின் கீழுள்ள அதிகாரிகளினால் உள்ளடக்கியதாகும்.

- i. பிரதேச செயலாளர்
- ii. கமநல அபிவிருத்தி பிரதேச அதிகாரி
- iii. வேளாண்மை ஆலோசகர்
- iv. மாகாண நீர்ப்பாசன திணைக்களத்தினை பிரதிநிதித்துவப்படுத்துமாறு பொறியியலாளர் / தொழிநுட்ப அதிகாரி
- v. கமநல அபிவிருத்தி திணைக்களத்தினை பிரதிநிதித்துவப்படுத்தும் பிரதேச பொருளியலாளர் / தொழிநுட்ப அதிகாரி
- vi. வேளாண்மை ஆராய்ச்சி மற்றும் உற்பத்தி உதவியாளர்
- vii. கிராம அலுவலர்
- viii. சமுர்தி அபிவிருத்தி உத்தியோகத்தர்
- ix. பொருளாதார அபிவிருத்தி உத்தியோகத்தர்
- x. காணி பயன்பாடு மற்றும் கொள்கை உருவாக்க திணைக்களத்தின் பிரதிநிதி ஒருவர்
- xi. மாகாண மீன்பிடித் திணைக்களத்தின் பிரதிநிதி ஒருவர்
- xii. நீர் உயிரினவளர்ப்பு அபிவிருத்தி அதிகார சபையின் பிரதிநிதி ஒருவர்
- xiii. சுற்றாடல் அதிகாரசபையின் பிரதிநிதி ஒருவர்
- xiv. பொலிஸ் சுற்றாடல் பிரிவின் பிரதிநிதி ஒருவர்
- xv. விலங்குற்பத்தி மற்றும் சுகாதார திணைக்களத்தின் பிரதிநிதி ஒருவர்
- xvi. வேளாண்மை மற்றும் கமநல காப்புறுதி சபையின் பிரதிநிதி ஒருவர்
- xvii. நீர்ப்பாசன பொறியியலாளர் / தொழிநுட்ப அதிகாரி
- xviii. வனசீவராசிகள் பாதுகாப்புத் திணைக்களத்தின் பிரதிநிதி ஒருவர்
- xix. வனப் பாதுகாப்புத் திணைக்களத்தின் பிரதிநிதி ஒருவர்
- xx. புவிச்சரிதவியல் மற்றும் சுரங்கப் பணியகத்தின் பிரதிநிதி ஒருவர்
- xxi. தேசிய நீர்வழங்கல் மற்றும் வடிகாலமைப்பு சபையின் பிரதிநிதி ஒருவர்
- xxii. தொல்பொருளியல் திணைக்களத்தின் பிரதிநிதி ஒருவர்
- xxiii. சிவில் பாதுகாப்புத் திணைக்களத்தின் பிரதிநிதி ஒருவர்
- xxiv. உள்ளூராட்சி நிறுவனங்களை பிரதிநிதித்துவப்படுத்தும் அதிகாரமுடைய அலுவலர் ஒருவர்
- xxv. விவசாய அமைப்புக்கள், மாதர் விவசாய அமைப்புக்கள், உற்பத்தி விவசாய குழுக்களை பிரதிநிதித்துவப்படுத்தி ஒவ்வோர் அமைப்புக்களினதும் தலைவர் அல்லது செயலாளர்
- xxvi. சமுதாய நீர் வழங்கல் அமைப்பொன்றின் பிரதிநிதி ஒருவர்
- xxvii. வேறு சமூக அமைப்புக்கள் மற்றும் சுற்றாடல் அமைப்புக்களை பிரதிநிதித்துவப்படுத்தி அமைப்பொன்றின் பிரதிநிதி ஒருவர்

3.4.2 மாவட்ட மட்டம்

இக்குழு குறித்த மாவட்டத்தின் கீழுள்ள அதிகாரிகளை உள்ளடக்கியது.

- i. மாவட்ட தலைவர் அல்லது மாவட்ட செயலாளர்
- ii. பிரதேச செயலாளர்
- iii. கமநல அபிவிருத்தி பிரதி / உதவி ஆணையாளர்
- iv. உள்ளூராட்சி நிறுவனங்களை பிரதிநிதித்துவப்படுத்தி உள்ளூராட்சி உதவி ஆணையாளர் அல்லது பிரதிநிதி ஒருவர்

- v. மாவட்ட வேளாண்மை பணிப்பாளர்
- vi. மாகாண மற்றும் மாகாணங்களுக்கிடையேயான பிரதி வேளாண்மை பணிப்பாளர்கள்
- vii. நீர்ப்பாசனத்துறை பணிப்பாளர் அல்லது பிரதான பொறியியலாளர்
- viii. மாகாண நீர்ப்பாசனத் திணைக்களத்தினை பிரதிநிதித்துவப்படுத்தி பிரதி பணிப்பாளர் அல்லது பிரதிநிதி ஒருவர்
- ix. காணி உபயோகம் மற்றும் கொள்கை உருவாக்க திணைக்களத்தின் உதவிப் பணிப்பாளர் அல்லது மாவட்ட அதிகாரி
- x. மாகாண மீன்பிடி திணைக்களத்தின் பணிப்பாளர் அல்லது பிரதிநிதி ஒருவர்
- xi. நீர் உயிரினவளர்ப்பு அபிவிருத்தி அதிகார சபையின் உதவிப் பணிப்பாளர் அல்லது மாவட்ட அதிகாரி
- xii. சுற்றாடல் அதிகார சபையின் மாவட்ட உதவிப்பணிப்பாளர் அல்லது மாவட்ட அதிகாரி
- xiii. விலங்குற்பத்தி மற்றும் சுகாதார திணைக்களத்தின் பிரதிப்பணிப்பாளர் அல்லது பிரதிநிதி ஒருவர்
- xiv. வேளாண்மை மற்றும் கமநல காப்புறுதி சபையின் உதவிப்பணிப்பாளர் அல்லது பிரதிநிதி ஒருவர்
- xv. வனசீவராசிகள் பாதுகாப்புத் திணைக்களத்தின் உதவிப்பணிப்பாளர் அல்லது மாவட்ட அதிகாரி
- xvi. வனப் பாதுகாப்புத் திணைக்களத்தின் மாவட்ட வனபாதுகாப்பு அதிகாரி அல்லது பிரதிநிதி ஒருவர்
- xvii. தேசிய நீர்வழங்கல் மற்றும் வடிகாலமைப்பு சபையின் மாவட்ட அதிகாரி அல்லது பொறியியலாளர்
- xviii. தொல்பொருளியல் திணைக்களத்தின் உதவிப்பணிப்பாளர் அல்லது மாவட்ட அதிகாரி
- xix. புவிச்சரிதவியல் மற்றும் சுரங்கப் பணியகத்தின் பிரதிநிதி ஒருவர்
- xx. கமநல அபிவிருத்தி பிரதேச அதிகாரி
- xxi. பொலிஸ் சுற்றாடல் பிரிவின் நிலைய அதிகாரி
- xxii. சிவில் பாதுகாப்பு திணைக்களத்தின் பிரதிநிதி ஒருவர்
- xxiii. மாவட்ட விவசாய அமைப்புக்களின் கூட்டமைப்பினை பிரதிநிதித்துவப்படுத்தி தலைவர் / செயலாளர் அல்லது பிரதிநிதி ஒருவர்
- xxiv. சமூக நீர் வழங்கல் அமைப்பின் பொறுப்பதிகாரி அல்லது மாவட்ட பிரதிநிதி ஒருவர்
- xxv. வேறு சமூக அமைப்புக்கள் மற்றும் சுற்றாடல் அமைப்புக்களின் மாவட்ட மட்டத்தினை பிரதிநிதித்துவப்படுத்தி ஒரு அமைப்பிலிருந்து ஒரு பிரதிநிதி

க:வே :- குளஅடுக்குத் தொடர் அமைப்பு கட்டுப்பாட்டு பிரதேச எல்லைக்குள் குறித்த நிறுவனத்தில் கட்டுப்பாட்டு பிரதேசங்கள் ஒன்றை விடக் கூடுதலாகக் காணப்படும் சந்தர்ப்பத்தில் அவ்வவ் கட்டுப்பாட்டு பிரதேசங்களை பிரதிநிதித்துவப்படுத்தி மேலுள்ளவாறு பொறுப்பதிகாரிகள் கலந்து கொள்ள வேண்டும்.

3.5 குளஅடுக்குத் தொடர் அமைப்பு முகாமைத்துவ குழுவொன்றின் அதிகாரிகள் குழாம் – பிரதேச மட்டம்

- i. படிநிலை அமைப்பிற்கு பிரதேச செயலாளர் பிரிவுகள் ஒன்றை விடக்கூடுதல் காணப்படும் சந்தர்ப்பத்தில் கலந்து கொள்ளும் அனைத்து பிரதேச செயலாளர்களும் குழுவின் இணைத்தலைவராக உத்தியோகபூர்வமாக செயல்பட வேண்டும்.

ii. படிநிலை அமைப்பிற்கான கமநல சேவை கட்டுப்பாட்டு பிரதேசத்தில் கமநல அபிவிருத்தி பிரதேச அதிகாரி குழுவின் செயலாளராக உத்தியோகபூர்வமாக செயல்பட வேண்டும். படிநிலை அமைப்பிற்கு கமநல சேவை கட்டுப்பாட்டு பிரதேசங்கள் ஒன்றை விடக்கூடுதல் காணப்படும் சந்தர்ப்பங்களில் கூடிய நீரேந்து ஏக்கர் எண்ணிக்கையினை கொண்ட கட்டுப்பாட்டு பிரதேசத்தின் கமநல அபிவிருத்தி பிரதேச அதிகாரி செயலாளராக செயல்பட வேண்டும்.

iii. குழு தலைவரின் அறிவுரைகளுக்கேற்ப செயலாளரால் கூட்டம் ஏற்பாடு செய்யப்பட வேண்டும்.

3.6 குளஅடுக்குத் தொடர் அமைப்பு முகாமைத்துவ குழுவொன்றின் அதிகாரிகள் குழாம் – மாவட்ட மட்டம்

i. குளஅடுக்குத் தொடர் அமைப்பிற்கு மாவட்டங்கள் ஒன்றை விடக்கூடுதல் காணப்படும் சந்தர்ப்பத்தில் கலந்து கொள்ளும் அனைத்து மாவட்ட செயலாளர்களும் குழுவின் இணைத்தலைவராக உத்தியோகபூர்வமாக செயல்பட வேண்டும்.

ii. குளஅடுக்குத் தொடர் அமைப்பின் மாவட்ட பிரதி / உதவி ஆணையாளர்கள் குழுவின் செயலாளராக உத்தியோகபூர்வமாக செயல்பட வேண்டும். குளஅடுக்குத் தொடர் அமைப்பிற்கு கமநல சேவை கட்டுப்பாட்டு பிரதேசங்கள் ஒன்றை விடக்கூடுதல் காணப்படும் சந்தர்ப்பங்களில் கூடிய நீரேந்து ஏக்கர் எண்ணிக்கையினை கொண்ட மாவட்ட பிரதி / உதவி ஆணையாளர்கள் செயலாளராக செயல்பட வேண்டும்.

iii. குழு தலைவரின் அறிவுரைகளுக்கேற்ப செயலாளரால் கூட்டம் ஏற்பாடு செய்யப்பட வேண்டும்.

04. இலங்கையின் வேளாண்மைத்துறையின் நிலையான தன்மை தங்கி நிற்கும் பிரதான காரணியான உயிரியல் அமைப்புக்களின் முகாமைத்துவத்திற்காக குளஅடுக்குத் தொடர் நீர்ப்பாசன முகாமைத்துவத்தினை முறைமையாக்குமுகமாக உருவாக்கப்படும் குளஅடுக்குத் தொடர் அமைப்பு முகாமைத்துவ குழுக்கள் மூலம் எதிர்பார்க்கப்படும் பணிகளை நிறைவேற்ற ஒருங்கிணைந்து செயற்படுவீர்கள் என எதிர்பார்க்கின்றேன்.

ஏ.எச்.எம்.எல்.அபேரத்ன

கமநல அபிவிருத்தி ஆணையாளர் நாயகம்

பிரதி :-

- i. செயலாளர், பொது நிர்வாக, உள்நாட்டலுவல்கள், மாகாண சபைகள் மற்றும் உள்ளூராட்சி அமைச்சு
- ii. செயலாளர், விவசாயத் திணைக்களம்
- iii. அனைத்து மாகாண பிரதான செயலாளர்கள்
- iv. கணக்காய்வாளர், தேசிய கணக்காய்வு அலுவலகம்
- v. பொலிஸ் மா அதிபர், இலங்கை பொலிஸ் திணைக்களம்
- vi. பணிப்பாளர் நாயகம், விவசாய திணைக்களம்
- vii. பணிப்பாளர் நாயகம், நீர்ப்பாசன திணைக்களம்
- viii. பணிப்பாளர் நாயகம், சமுர்தி அபிவிருத்தித் திணைக்களம்
- ix. பணிப்பாளர் நாயகம், வனசீவராசிகள் பாதுகாப்புத் திணைக்களம்
- x. வனப்பாதுகாப்பு நாயகம், வனப்பதுகாப்புத் திணைக்களம்
- xi. பணிப்பாளர் நாயகம், விலங்குறப்பத்தி மற்றும் சுகாதார திணைக்களம்

- xii. பணிப்பாளர் நாயகம், காணி உபயோக கொள்கை திட்டமிடல் திணைக்களம்
- xiii. பணிப்பாளர் நாயகம், தொல்பொருளியல் திணைக்களம்
- xiv. பணிப்பாளர் நாயகம், இலங்கை சிவில் பாதுகாப்பு திணைக்களம்
- xv. பணிப்பாளர் நாயகம், நீர் உயிரினவளர்ப்பு அபிவிருத்தி அதிகார சபை
- xvi. பணிப்பாளர் நாயகம், மத்திய சுற்றாடல் அதிகார சபை
- xvii. பணிப்பாளர் நாயகம், புவிச்சரிதவியல் மற்றும் சுரங்கப் பணியகம்
- xviii. தலைவர், வேளாண்மை மற்றும் கமநல காப்புறுதி சபை
- xix. தலைவர், தேசிய நீர்வழங்கல் மற்றும் வடிகாலமைப்பு சபை
- xx. அனைத்து மாகாண செயலாளர்கள், மாகாண வேளாண்மை திணைக்களம்
- xxi. செயலாளர், மாகாண நீர்ப்பாசன அமைச்சு
- xxii. அனைத்து மாகாண வேளாண்மை பணிப்பாளர்கள், மாகாண வேளாண்மை திணைக்களம்
- xxiii. அனைத்து மாகாண விலங்குற்பத்தி மற்றும் சுகாதார பணிப்பாளர்கள், மாகாண விலங்குற்பத்தி மற்றும் சுகாதார திணைக்களம்
- xxiv. கருத்திட்ட பிரதானிகள் – CSIAP / CRIWMP / SARP
- xxv. அனைத்து கமநல அபிவிருத்தி பிரதி / உதவி ஆணையாளர்கள்

(தகவலறிவதற்காகவும் தேவையான விவகாரங்களுக்காக)

Annexures 2: List of stakeholder agencies participated in transect walk to learn the participated in transect walk to learn the Karuwili Aaru A cascade system.



F-7
m-31



**Climate Smart Irrigated Agriculture Project (CSIAP), Northern Province.
Attendance of Participations**

Province : Northern

DS Division :

Venue : Periyathiruv

District :

ASC Division :

Date : 02/02/2023

Objectives of the Programme / Awareness :

No	Name of the Participant (අමත)	Name of the Organization (ප්‍රකාශය)	ID NO (ප්‍ර. අ. අ. අංකය)	Contact no (දුරකථන අංකය)	M (මුද්‍රා) / F (අකුර)	Signature
1	R. Mouna Manu	CSIAP		0760669824	M	
2	Eng B. Perera	CSIAP			M	
3	R. Sugantha	ADO		0772272432	M	
4	M. V. Kirubasurthy	ADO		0774233047	F	
5	R. Sanjeepan	ID&CBS		077-7777131		
6	J. Niroshanth	CSIAP-AF	95218220TV	0765424894	M	
7	P. Rajenthiran	CSIAP-AF	950040130V	0776969796	M	
8	K. Niroshan	Alkappurath		0769862220	M	
9	R. Vinetha		976062507V	0765068822	R	
10			723334551V	0775004681		
11			19671100424V	0776219985		
12			220974417V	0768002829		
13			912433357V	0774532444		
14			19983312002020	0774127841		V. Vasudevan
15	S. Sujith	DO	91297577V	0772453199	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 (අමුත්ත)	Name of the Organization (அமைப்பு)	ID NO (අයි.එන්.එස්. අංකය)	Contact no (දුරකථන අංකය)	M (මුද්‍රා) / F (අකුර)	Signature
1	V. Vasantharajan	CSIAP-NP	—	0772170621	M	V.V.
2	T. Ramji	DAD-Mallai		0776416447	M	T.R.
3	C.J.R. Peries	CSIAP-NP		0759178284	m	C.J.R.
4	K. Suseendran	CSIAP-NP		0779122913	M	K.S.
5	V. Kiritharan	DAI		0769806872	M	V.K.
6	S. Sathyanarayanan			0769899992	M	S.S.
7	R. Sathyanarayanan			0773159547	M	R.S.
8	S. Nitharsan	ESAP		0772267220	M	S.N.
9	T. Geetha	Irrigation		0767760336	M	T.G.
10	P. Yatharsan	Irrigation	922211515 V	077-0366296	M	P.Y.
11	V. Ramanan	Irrigation		0772276651	m	V.R.
12	N. Sugandhini	G.N. 125	198060060491	077-21020063	F	N.S.
13	R. Neelaji	G.N. 126	1943861033 57	0761585432	F	R.N.
14	N. Janarethan	G.N. 126	198708803056	0777364043	M	N.J.
15	M. Apetharan	DO-125	198532604223	076468296	m	M.A.



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 (பேர்)	Name of the Organization (அமைப்பு)	ID NO (தே.அ.அ. இல)	Contact no (தே.பெ.இல)	M (ஆண்) / F (பெண்)	Signature
1	A. Yogeshwaran	CSIAP-NP	-	-	M	
2	P. Kanistan	DS DN	9310627404	0771347420	M	
3	S. Nilayan	CSIAP-NP	783272313V	0771488155	M	
4	K. Lomon	FO	820974417V	0768002829		
5	K. Vasanthan	AS	791083438V	0777250993	M	
6	B. J. Senthil			0773159347		
7	S. Senthil			07609 0000		
8	MS. Senthil					
9						
10						
11						
12						
13						
14						
15						

Annexure 3: List of Stakeholder agencies to prepare and validate the cascade management plan

No.	Position	Name	Contact No.	Address
1	Chairman	S. Kirubasuthan	077-4233047	ADP, DS Office, Oddusudan
2	Co-Chairman	M. Mangala Kanthan	076-8002829	Farmer, Periyaththimadu
3	Secretary	P. Kankaiyamaran	077-8758519	Thaddamalai
4	Members	R. Sugantha	077-2272972	ADO, Oddusudan
5	Members	T. Ramgi	077-6416447	DAO, Mullaitivu
6	Members	N. Janarthanan	077-7364043	DO, Periyaththimadu
7	Members	M.Vigneswaran	077-5235181	Farmer, Meyankal, Thadamali
8	Members	K.Sankeethan	077-7031351	DAEO, ACAD Mullaitivu
9	Members	S. Sownthara Rajan	077-2010554	Farmer, Thadamali
10	Members	R. Ajanthan	077-0724102	Farmer, Kunsunahsi Kulam
11	Members	N.Varathan	077-2051230	Farmer, Periyaththimadu

Annexure 4: Basic Data of Karuwile Aaru A Cascade

S/N	Tank Name	Bund Length (m)	LB.Spillway		RB.Spillway		LB.Sluices		RB.Sluices		Catchment Area (Km2)
			Length	Type	Length	Type	Type	H.P. Sizes (mm)	Type	H.P. Sizes (mm)	
1	Meyankal kulam	545	14.2	Natural			H.P.T	450			0.951
2	Thadamalai kulam	629	103	Natural			H.P.T	450	H.P.T	450	0.624
3	KunchupAaruthi kulam	361	17.4	Co			Head Wall	225			0.510
4	Periyaithimaduk kulam	1099	14.9	Co	34.3	Co	Head Wall	460	Head Wall	460	4.560
5	Ampalvanpattu kulam	375	17.7	Natural			H.P.T	305			0.652
6	Kunchunachi kulam	398	15.1	Natural			Head Wall	225	Head Wall	225	0.618
7	Nallimurippu kulam	687.2	20	Co			H.P.T	225	H.P.T	225	1.260

Annexure 5: Guidance format for preparation of subproject proposals to raise funds to implement interventions and major activities

Format for preparing a Subproject Proposal (SPPs) to obtain funds for implementation of interventions.

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 estimate d cost in LKR	Community Contribution (LKR)	Other sources(sp ecify) (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:

(please annex all relevant additional details to provide adequate information to justify the subproject proposal and thereby to expedite the approval process.

Annexure 6: Plates



Tansect Walk



Focus Group Discussion at Periyaithimadhu



Group Formation to conduct



Site Visits in Karuwile Aaru A





Sensitive Places



Ongoing Construction work at Periaththimadu

