

Maha Kirimatiyawa Cascade & Kokebe Cascade

ANURADHAPURA

ESR & EMP

Rehabilitation of Eight Tanks of Maha Kirimatiyawa Cascade, and Two Tank in Kokebe Cascade of Kahatagasdigiliya DSD in Anuradhapura District.

Project Management Unit

Integrated Rurban Development and Climate Resilience Project.

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1. Introduction

The **Maha Kirimatiyawa Cascade** (also referred to as the Kirimatiyawa village tank cascade system) and the **Kokebe cascades** are vital socio-ecological landscapes located in the **Kahatagasdigiliya** Divisional Secretariat Division of the Anuradhapura District.

These systems are classic examples of the ancient **Ellangawa** (Village Tank Cascade System), which was designed to manage water scarcity in the area through a series of interconnected tanks that capture, store, and reuse surface runoff. The **Maha Kirimatiyawa Cascade** consists of **thirty (30)** small and medium-sized tanks (*wewa*) arranged within a micro-catchment.

Both cascades are preserved through traditional, farmer community-based management practices, functioning under the formal supervision of the **DAD**[1]. Both cascade systems remain functional, with its constituent tanks effectively interconnected via a network of ancient canals to regulate water flow.

While the hydraulic landscape itself is a testament to indigenous engineering, there are no officially designated or preserved archaeological sites located within the immediate project impact zone. However, during the proposed rehabilitation civil works, strict precautions must be taken to protect any buried, submerged, or as-yet-unidentified archaeological monuments. There are forest reserves within and around the cascade systems, but not within the proposed sites.

In the face of erratic rainfall and prolonged droughts in the North Central Province, both cascades provide critical buffers, allowing farmers to engage in both **Maha** and **Yala** season cultivation. However, it was said by farmers that they receive water enough for Maha season to farm full extend of paddy fields, but half or quarter of it during the yala cultivation.

Like many cascade systems in the Anuradhapura district, the both cascade faces several challenges, including:

- Siltation: This reduces the storage capacity of the tanks over time.
- Infrastructure Deterioration: Issues include weak headworks and damaged canal systems.
- Ecological Threats: The spread of aquatic invasive species can choke waterways and negatively impact the local ecology.

This intervention proposed by the DAD, the tanks as illustrate in Table 1 will be rehabilitated under the IRDCRP. Proposed rehabilitation efforts focus on restoring the ancient hydraulic structures, farm structures and desilting of tank beds and canals to improve irrigation efficiency and strengthen the climate resilience of the farming community.

[1] Department of Agrarian Development

Table 1: Proposed Tanks under the Maha Kirimatiyawa Cascade and Kokebe cascade for rehabilitation under IRDCRP.

No	Name of Tank	GND's[2]	Cascade	Divisional Secretariat	GPS Coordinate	
1	Kelenika wewa	227 Kelenikawewa	Mahakaramatiyawa	Kahatagasdigiliya	8.2044N	80.4145E
2	Meegaskada Wewa				8.2049N	80.4146E
3	Nikakatuwa wewa				8.2119N	80.4146E
4	Ulpath wewa				8.34983N	80.6932E
5	Millagala wewa				8.217 N	80.4145E
6	Dik wewa				8.37610N	80.6996E
7	Kalukoka wewa				8.35582N	80.71020E
8	Wessiyadda wewa	215 Diwulwewa			8.2224N	80.4236E
9	Ramba wewa	210 Pandarellewa	Kokebe		8.42647N	80.77976E
10	Ihalagama wewa	211 Panwella			8.2321N,	80.4712E

1.1. Ecological Significance

- Soil and Terrain: The area around Kahatagasdigiliya is characterized by Low Humic Gley (LHG) soils in the valley bottoms, which are ideal for paddy cultivation but require careful water management due to their drainage properties.
- Biodiversity: Both cascades support a rich ecosystem, including various aquatic plants, aquatic fauna and terrestrial fauna and floral species. It also plays a crucial role in maintaining the wild animals including elephant habitats by providing distributed water sources throughout the jungle patches. The command areas/paddy fields associated with both cascades are subject to frequent incursions by the **e**lephants (*Elephas maximus*).
- The ecosystems support a diverse range of bird species too. Significant populations of water birds utilize the tank habitats, while various terrestrial birds occupy the surrounding scrublands and catchment areas.

[2] According to information provided by DAD – Head Quarters, the details regarding GNDs and tank names have been compiled. Please note that there are currently discrepancies between the data held by the DAD Headquarters and the presentation made by the Anuradhapura District Office on 08.05.2026.

- No apex predators in the project impact zone[3]. A preliminary survey of the floral composition indicates presence of invasive alien species both terrestrial and aquatic. Further to invasives, Kumbuk (*Terminalia arjuna*), Palu (*Manilkara hexandra*), Mee (*Madhuca longifolia*), Nuga (*Ficus benghalensis*), Kon (*Schleichera oleosa*), Tamarind (*Tamarindus indica*), Kohomba (*Azadirachta indica*) and many other dry zone floral species.
- Indigenous fish species inhabit the tanks, but none of these water bodies are currently utilized for artisanal fishing**.**

1.2. Archeological significance:

The Anuradhapura District contains an ancient civilization in Sri Lanka where a vast number of surface and underground archaeological artifacts are found. Because the historical tank cascade systems were built alongside this ancient civilization, there is a distinct possibility of 'chance finds' of buried archaeological objects during project implementation.

[3] As informed by the farmers and villages

2. Proposed Rehabilitation Works

2.1. Dik Wewa

Table 2: Proposed Rehabilitation works at Dik Wewa

Item	Description	Unit	Qty
	1. Head Work		
1.1	**Tank Bund**		
1.1.1	Clearing & grubbing Light jungle, including removing outside of the reservation by machinery & burning.	ha	1.96
1.1.2	Removing Tree (Girth 0.5 - 1.0 m) with root balls & debris outside of the site & fill the cavity with approved soil.	nos	11.00
1.1.3	Removing Tree (Girth 1.0 - 2.0 m) with roots balls & debris outside of the site & fill the cavity with approved soil.	nos	4.00
1.1.4	Demolishing small-sized anthills (1 m^3 - 2 m^3) in the tank bund, including removing queen ant & debris outside the site and applying suitable pesticides (chemical) & filling the cavity earth.	nos	22.00
1.1.5	Demolishing large-sized anthills (2 m^3 - 8 m^3) in the tank bund, including removing queen ant & debris outside the site, and applying suitable pesticides (chemical) & filling the cavity earth.	nos	6.00
1.1.6	Stripping top soil to a depth of 75 - 150 mm, to receive new earth & spoil to waste by machinery, including Loading & Transporting 0.4 km by Dump Truck.	sqm	7,010.00
1.1.7	Earth excavation & forming bund cut & lift up to 1.5 m & spread 30 m by machinery (B - hoe) including Watering & Compaction (For Benching).	cum	1,123.00
1.1.8	Stripping topsoil in the borrow area. Earth excavation hauling, and placement of fill material on the bund, spreading with a 150 to 225 mm thick layer by layer, including trimming for the required profile, watering & compaction using Machinery (Transport up to 2.0 km),	cum	7,748.00
1.1.9	Earth excavation from the burrow area, cut & lift 1m, placing, watering & compaction by machinery, including transport by Rear Dump within 30 m - 1 km. - Including Forming & Sloping (For construction of Ramps if necessary)	cum	445.00
1.1.10	Common earth excavation & spoil to waste or fill material cut up to 1.5 m, lift up to 1.5 m & remove outside the site by machinery (B - hoe) as directed by the Engineer. (For removing ramps if necessary)	cum	148.00
1.1.11	Slope preparation of the existing tank bund	sqm	5,249.00
1.1.12	Removing & Refixing of the existing Elephant fence along the Tank bund		Pro
1.2	**Construction of 225 mm dia HPT Sluices. (LB & RB)**		
1.2.1	Earth excavation for cut opening the tank bund & dump at the site, back filling 25% excavated soil & 75% burrow earth, including placing, watering & compaction. cut 1.5-4.5 m lift up to 4.5m spread 30m.	Cum	182.20
1.2.2	Demolishing the existing concrete structure & debris cleared away within the site using an excavator.	hrs	6.00

1.2.3	Excavation for foundation in any material except rock requiring blasting, ram and disposing of surplus within the site by manual labour as directed.	Cum	13.40
1.2.4	Puddle clay borrowing from the burrow area to construct a puddle clay wall by machinery, including watering & compaction by machinery & transport withing 0-1Km	Cum	60.70
1.3	**Construction of Spillway**		
1.3.1	Demolishing the existing spill structure & debris cleared away within the site using an excavator.	hrs	2.00
1.3.2	Excavation for foundation in any material except rock requiring blasting, ram and disposing of surplus within the site by manual labour as directed.	Cum	32.50
1.4	**Construction of Bathing Place. (01 Nos)**		
1.4.1	Excavation for foundation in any material except rock requiring blasting, ram and disposing of surplus within the site by manual labour as directed.	Cum	18.30
1.5	**Desilting**		
1.5.1	Desilting & spoil to waste, cut & lift 0-1.5 m, haul within 30 m-1 km by machinery & forming with crawler tractor as directed by the Engineer. (At sluice areas)	Cum	3,000.00
2	**D/S Development**		
2.1	**Canal Lining. (LB & RB)**		
2.1.1	Excavation for foundation in any material except rock requiring blasting, ram and disposing of surplus within the site by manual labour as directed.	Cum	13.00
2.1.2	Backfilling & forming earth bund on both sides of the concrete lining canal as directed	lm	200.00
2.1.3	Furnishing, placing & watering turf till take roots, Transport 1.6 Km by T.T.	sqm	120.00
2.2	**Canal Earth Work. (RB & LB)**		
2.2.1	Stripping top soil to a depth of 75 -150 mm, to receive new earth & spoil to waste by manual labour (within 30 m).	sqm	2,970.00
2.2.2	Earth excavation & forming canal bund, cut & lift up to 1.5 m & spread 30 m by machinery, including watering & compaction.	Cum	60.70
2.2.3	Earth excavation from the burrow, cut & lift up to 1.0 m, placing, watering & compaction of earth canal bund by machinery, including transport by Dump Truck.	Cum	486.00
2.2.4	Furnishing placing & watering turf till take roots, Transport 1.6 Km by T.T.	sqm	1,080.00
2.3	**One Way FTO with Regulator, 06 Nos. (LB & RB)**		
2.3.1	Excavation for foundation in any material except rock requiring blasting, ram and disposing of surplus within the site by manual labour as directed.	Cum	2.70
2.4	**450 mm dia Culverts, 06 nos.**		
2.4.1	Excavation for foundation in any material except rock requiring blasting, ram and disposing of surplus within the site by manual labour as directed.	Cum	13.20
2.5	**Drop Structures, 04 nos**		
2.5.1	Excavation for foundation in any material except rock requiring blasting, ram and disposing of surplus within the site by manual labour as directed.	Cum	2.70
2.6	**Spill tail canal with Agri Road**		

2.6.1	Stripping top soil to a depth of 75-150mm to receive new earth & spoil to waste by machinery. Including loading & transporting 0.4km by Dump Truck.	sqm	6,720.00
2.6.2	Earth excavation & forming canal bund cut & lift up to 1.5 m & spread 30 m by machinery (B - hoe) including Watering & Compaction.	Cum	1,728.00
2.6.3	Furnishing, placing & watering turf till take roots, Transport 1.6 Km by T.T.	sqm	960.00
2.6.4	Supplying gravel & placing, watering & compaction by machinery	Cum	360.00
2.7	**Access Road**		
2.7.1	Grading on the road surface, reducing the high side or cutting side drains of agri road by a motor grader	km	850.00
2.7.2	Stripping topsoil in the burrow area. Earth excavation, hauling, and placement of fill material on the road, spreading with a 150 to 225 mm thick layer by layer, including trimming for the required profile, watering & compaction using Machinery	cum	216.00
2.7.3	Supplying gravel & placing, watering & compaction by machinery	cum	382.00
2.8	**Agri Road**		
2.8.1	Stripping top soil to a depth of 75 - 150 mm, to receive new earth & spoil to waste by machinery	sqm	1,560.00
2.8.2	Stripping topsoil in the borrow area. Earth excavation, hauling and placement of fill material on the road, spreading with a 150 to 225 mm thick layer by layer, including trimming for the required profile, watering & compaction using Machinery	cum	432.00
2.8.3	Supplying gravel & placing, watering & compaction by machinery	cum	180.00

According to the farmer organization, no renovation activities have taken place on this tank for more than three decades. Consequently, both the upstream and downstream structures have become dilapidated.

Proposed Interventions[4]

- **Tank Bund:** The rehabilitation of the tank bund is proposed as illustrated in **Table 2**. The bund height will not be raised.
- **Spill Structure:** The existing spill structure will be demolished and replaced with a new one; however, the **spill height will not be raised**.
- **Desilting:** Both the spill and the canal are currently silted and are scheduled for desilting.
    - Excavated material will be reused for project purposes, spread across appropriate nearby areas, or released to farmers upon request through the farmer organization.
- **Downstream Infrastructure:** New downstream infrastructure will be constructed, including:
    - Farm turnouts and regulators.
    - Drop structures and culverts.

[4] Detailed in Table 2

- Farm access roads.



Figure 1: The spill and the spill tail canal of Dik wewa became silted heavily.



Figure 2: The tank bund of the Dik wewa and part of the tank where Salvinia has grown

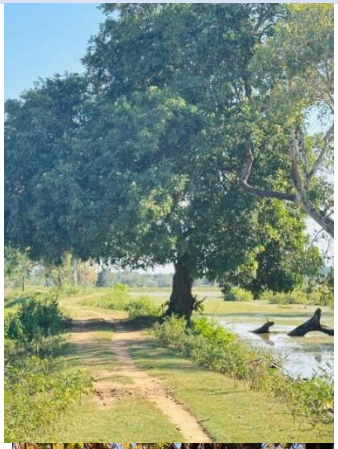
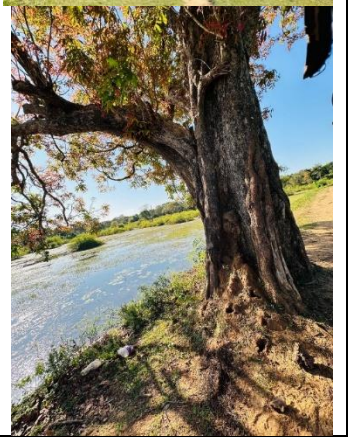
Compared to other tanks within the Mahakaramatiyawa cascade, the bund of the Dik wewa is relatively well-maintained by farmers. While aquatic invasive species were absent in the other tanks visited, Dik Wewa is currently infested with *Salvinia*. Hense, desilted materials shall be exposed carefully.

Active termite mounds were observed along the tank bund and throughout the downstream areas.Although the BoQ accounts for the removal of 15 trees from the tank bund for rehabilitation purposes, only two trees were identified as requiring removal during the actual civil works as illustrate in Table 3 below.

While the Human-Elephant Conflict (HEC) is prevalent in the area, it is not occurring on an accelerated scale. Furthermore, no endemic or endangered flora and fauna were recorded within the immediate construction impact zone.

While construction debris and excavated materials pose a potential concern, the Department of Agrarian Development (DAD) has indicated that these will be managed appropriately under their direct supervision. Additionally, a portion of the dredged material will be reused on-site as necessary.

Table 3: Tree list that proposed to remove for bund rehabilitation works at Dik Wewa

No	Name of the tree	Scientific Name	Diameter @ the DBH	Coordinates	Justification for Removing	Picture
01	Kon tree (Ceylon Oak tree)	*Schleichera oleosa*	119 cm	8.38060 ^{0}N 80.70180 ^{0}E	Both trees appear having extensive lateral root systems have permeated a significant section of the embankment. They may create "piping" paths (seepage channels) that compromise the compaction and structural stability of the bund, leading to potential breaches in future. To ensure the long-term safety of the tank, it is required to remove deep-rooted vegetation that weakens the embankment's core.	
02	Kon tree (Ceylon Oak tree)	*Schleichera oleosa*	126 cm		The current positioning of the tree obstructs the movement and operation of heavy machinery required for the proposed rehabilitation works. Removal is necessary to achieve the design specifications for bund widening and reinforcement.	

2.2. Nikatuva Wewa

Table 4: Proposed Rehabilitation works at Nikatuva Wewa

Item No	Description of Work	Units	Qty
	1.0. Head Works		
	1.1. Repair of Tank Bund.		
1.1.1	Clearing & grubbing Light Jungle, including removal from the site by machinery as directed by the Engineer and burning.	ha	1.50
1.1.2	Removing the tree (0.5 - 1.0 m girth) with the root ball and debris from the site as directed by the Engineer and filling the cavity with approved soil.	Nos	16.00
1.1.3	Tree branches cutting, removing & burning by chainsaw and applying burn oil in cutting surfaces.	Pro Sum	
1.1.4	Demolishing small-sized anthills (1 m3 - 2 m3) in the tank bund, including removing queen ant & debris outside the site and applying suitable pesticides (chemical) & filling the cavity earth	Nos	20.00
1.1.5	Demolishing large-sized anthills (2 m3 - 8 m3) in the tank bund, including removing queen ant & debris outside the site and applying suitable pesticides (chemical) & fill the cavity earth	Nos	2.00
1.1.6	Stripping topsoil depth of 75 - 150 mm to receive new earth surface & spoil to waste by machinery including transporting 1.0 km - 2.0 km.	sqm	3,536.00
1.1.7	Earth excavation & forming bund cut & lift up to 1.5 m & spread 30 m by machinery (B - hoe) including Watering & Compaction (For Benching).	cum	340.00
1.1.8	Stripping top soil in the borrow area. Earth excavation hauling and placement of fill material on bund ,spreading with 150 to 225 mm thick, layer by layer, including trimming for required profile, watering & compaction using Machinery (Transport up to1.0 km), Rate including cutting and leveling upstream platform along the bund toe for providing facilities to horizontal moving of compacting machineries (Allow only upstream filling and compaction by specified compacting machineries only.)(Degree of compaction 98%)	cum	5,005.00
1.1.9	Slope preparation of the existing tank bund as directed	sqm	1,940.00
	1.2. Construction of 300mm dia. HPT Sluice. (02 Nos)		
1.2.1	Demolishing existing sluice structures using the excavator PC 200	Hr	8.00
1.2.2	Earth excavation for cut opening the tank bund & dump at the site with back filling 25 % excavated soil & 75 % borrow earth including	cum	196.00

	placing, watering & compaction by machinery, cut 1.5 - 3 m, lift up to 3 m & spread 30 m.		
1.2.3	Earth excavation for the foundation in any material by manually except for rock requiring blasting, including disposal of surplus within the site as directed	cum	13.50
1.2.4	Clay excavation from borrow area for puddle core wall, transporting within 1.0 km, placing as layers, watering & compacting by machinery as directed	cum	68.60
1.3.	**Spill & Spill Tail Canal.**		
1.3.1	Cement concrete, demolished, and debris cleared within the site as directed	cum	10.13
1.3.2	Common earth excavation & spoil to waste, cut 1.5 - 3.0 m, lift to 3.0 m & spread 30 m by machinery.	cum	53.00
1.3.3	Earth excavation for the foundation in any material by manually except rock requiring blasting including disposal of surplus within the site as directed by the Engineer.	cum	23.10
1.3.4	Drilling to a depth of 300 mm by machinery and dowelling using a 16 mm diameter high-yield rod.	nos	47.00
1.3.5	Clearing & grubbing Light Jungle, including removal from the site by machinery as directed	Ha	0.25
1.3.6	Stripping topsoil depth of 75 - 150 mm to receive new earth surface & spoil to waste by machinery, including transporting 1.0 km - 2.0 km.	sqm	2,520.00
1.3.7	Earth excavation from the burrow area within 30 m, placing as layers, watering & compacting, including forming & slopping the canal bund/agri road by machinery as directed	cum	630.00
1.4.	**Construction of Bathing Steps.**		
1.4.1	Earth excavation for the foundation in any material by manually except rock requiring blasting including disposal of surplus within the site as directed by the Engineer.	cum	8.00
1.5.	**Desilting**		
1.5.1	Desilting & spoilling to waste, cut 0 - 1.5 m, lift to 1.5 m by machinery including transporting 1.0km - 2.0 km and forming as directed.	cum	2,250.00
2.0. Down Stream Development.			
2.1	**Canal Lining.**		
2.1.1	Earth excavation for the foundation in any material by manually except rock requiring blasting including disposal of surplus within the site	cum	245.00
2.1.2	Earth excavation, backfilling & forming both side of concrete canal (bund height 450 mm - 1m, bund top width 300 mm & side slope 1:1) as directed	lm	650.00
	2.3. Access Road		

2.2.1	Clearing & grubbing Shrub Jungle including removal from the site by machinery as directed	ha	0.25
2.2.2	Removing the tree (0.5 - 1.0 m girth) with the root ball and debris from the site as directed by the Engineer and filling the cavity with approved soil.	Nos	2.00
2.2.3	Gradaring on road surface reducing high side or cutting side drain of agri road by Mortar Grader.	km	0.50
2.2.4	Earth excavation from borrow area, transporting 30 m - 1.0 km, placing as layers, watering & compacting including forming & slopping canal bund/agri road by machinery	cum	500.00
2.4.	**Construction of 450mm dia Culvert. (04 nos)**		
2.3.1	Earth excavation for the foundation in any material by manually except rock requiring blasting including disposal of surplus within the site as directed by the Engineer.	cum	13.10
	3.0 Special Works.		
3.1	Improvement of Kattakaduwa as per instruction and develop for the relevant requirements.		Pro Sum
3.2	Construction of Goda wala cut 0 - 1.5 m, lift to 1.5 m by machinery including transporting 1.0km - 2.0 km and forming	cum	850.00

Table 4 shows the proposed works at the headworks and downstream of the **Nikawatuwa Wewa**. Although 16 trees are proposed for removal from the tank bund (Activity No 1.1.2), no such requirement was observed during the site inspection (Figure 3). Hence the activity should be removed from the BoQ.



Figure 3: Tank bund of the Nikatuwa wewa, where no much clearing is required and there are no trees along the water edge.



Figure 4: The spill area of the Nikatuwa wewa also became silted.



Figure 5: Paddy fields irrigated under the Nikatuwa Wewa.



Figure 6: Upper catchment area consisting of forest.

No aquatic or terrestrial invasive species were observed in or around the Nikatuwa *Wewa*, and there are no protected areas within the project impact zone. While elephants are known to roam around the tank and adjacent paddy fields, consultations with local farmers indicate that the Human-Elephant Conflict (HEC) is not currently at a critical level. Forest cover remains intact in the upper catchment area; however, farmers report that wildlife encounters are not experienced near the bund or downstream areas.



Figure 7: The spill and the spill tail canal of the Nikatuwa tank is proposed to rehabilitate

All debris and desilted soil or mud shall be disposed of by the contractor at locations designated by the Department of Agrarian Development (DAD), under their direct supervision.

2.3. Kalukoka Wewa.

Table 5: Proposed Rehabilitation works of Kulukoka Wewa

Item	Description	Unit	Qty
1	**Head Work**		
1.1	**Tank Bund**		
1.1.1	Clearing & grubbing Light jungle, including removing outside of the reservation by machinery & burning.	ha	0.82
1.1.2	Removing Tree (Girth 0.5 - 1.0 m) with root balls & debris outside of the site & fill the cavity with approved soil.	nos	9.00
1.1.3	Removing Tree (Girth 1.0 - 2.0 m) with roots, balls & debris outside of the site & fill the cavity with approved soil.	nos	3.00
1.1.4	Demolishing small-sized anthills (1 m3 - 2 m3) in the tank bund, including removing queen ant & debris outside the site and applying suitable pesticides (chemical) & filling the cavity earth	nos	11.00
1.1.5	Demolishing large-sized anthills (2 m3 - 8 m3) in the tank bund, including removing queen ant & debris outside the site and applying suitable pesticides (chemical) & filling the cavity earth	nos	2.00
1.1.6	Stripping top soil to a depth of 75 - 150 mm, to receive new earth & spoil to waste by machinery	sqm	2,601.00
1.1.7	Earth excavation & forming bund cut & lift up to 1.5 m & spread 30 m by machinery (B - hoe)	cum	343.00
1.1.8	Stripping topsoil in the borrow area. Earth excavation, hauling, and placement of fill material on the bund, spreading with 150 to 225 mm thick, layer by layer, including trimming for the required profile, watering & compaction using Machinery	cum	2,420.00

1.1.9	Earth excavation from the burrow area, cut & lift 1m, placing, watering & compaction by machinery, including transport by Rear Dump within 30 m - 1 km. - Including Forming & Sloping (For construction of Ramps if necessary)	cum	445.00
1.1.10	Common earth excavation & spoil to waste or fill material cut up to 1.5 m, lift up to 1.5 m & remove outside the site by machinery (B - hoe)	cum	148.00
1.1.11	Slope preparation of the existing tank bund	sqm	1,655.00
1.2	**Construction of 225 mm dia HPT Sluice. (LB)**		
1.2.1	Earth excavation for cut opening the tank bund & dump at the site, back filling 25% excavated soil & 75% burrow earth	Cum	91.10
1.2.2	Demolishing the existing concrete structure & debris cleared away within the site using an excavator.	hrs	3.00
1.2.3	Excavation for foundation in any material except rock requiring blasting, ram and disposing of surplus within the site by manual labour.	Cum	6.70
1.2.4	Puddle clay burrowing from the burrow area to construct a puddle clay wall by machinery, including watering & compaction by machinery	Cum	30.30
1.3	**Removal of 225 mm dia HWT Sluice. (RB)**		
1.3.1	Earth excavation for cut opening the tank bund & dump at the site back filling 25% excavated soil & 75% burrow earth	Cum	37.50
1.3.2	Demolishing the existing concrete structure & debris cleared away within the site using an excavator.	hrs	2.00
1.4	**Construction of Spillway**		
1.4.1	Cutting & Leveling of spill site for spill structure & debris cleared away within the site using an excavator.	hrs	3.00
1.4.2	Excavation for foundation in any material except rock requiring blasting, ram and disposing of surplus within site by manual labour as directed.	Cum	8.60
1.5	**Desilting**		
1.5.1	Desilting & spoil to waste, cut & lift 0-1.5 m, haul within 30 m-1 km by machinery	Cum	3,000.00
2	**D/S Development**		
2.1	**Canal Lining. (LB & RB)**		
2.1.1	Excavation for foundation in any material except rock requiring blasting, ram and disposing of surplus within the site by manual labour as directed.	Cum	9.70
2.1.2	Backfilling & forming earth bund on both sides of the concrete lining canal	lm	150.00
2.2	**Canal Earth Work. (RB)**		

2.2.1	Stripping top soil to a depth of 75 -150 mm, to receive new earth & spoil to waste by manual labour (within 30 m).	sqm	1,320.00
2.2.2	Earth excavation & forming a canal bund, cut & lift up to 1.5 m & spread 30 m by machinery.	Cum	30.40
2.2.3	Earth excavation from burrow, cut & lift up to 1.0 m, placing, watering & compaction earth canal bund by machinery including transport by Dump Truck within 30 m - 1 km.	Cum	283.90
2.2.4	Common earth excavation & spoil to waste or fill material, cut up to 1.5 m, lift up to 1.5 m & remove outside the site by machinery	Cum	3.40
2.3	**One Way FTO with Regulator, 04 Nos. (LB & RB)**		
2.3.1	Excavation for foundation in any material except rock requiring blasting, ram and disposing of surplus within the site by manual labour	Cum	1.80
2.4	**450 mm dia Culverts, 04 nos. (LB & RB)**		
2.4.1	Excavation for foundation in any material except rock requiring blasting, ram and disposing of surplus within site by manual labour	Cum	8.80
2.5	**Drop Structures, 04 nos**		
2.5.1	Excavation for foundation in any material except rock requiring blasting, ram and disposing of surplus within the site by manual labour	Cum	2.70
2.6	**600 mm dia double barrel Culvert**		
2.6.1	Excavation for foundation in any material except rock requiring blasting, ram and disposing of surplus within site by manual labour as directed.	Cum	1.80
2.7	**Rehabilitation of spill tail canal with the Access Road**		
2.7.1	Stripping top soil to a depth of 75-150mm to receive new earth & spoil to waste by machinery.	sqm	3,360.00
2.7.2	Earth excavation & forming canal bund cut & lift up to 1.5 m & spread 30 m by machinery (B - hoe) including Watering & Compaction.	Cum	864.00
2.8	**Agri Road**		
2.8.1	Stripping top soil to a depth of 75 - 150 mm, to receive new earth & spoil to waste by machinery	sqm	840.00
2.8.2	Stripping topsoil in the burrow area. Earth excavation hauling and placement of fill material on Road, spreading with a 150 to 225 mm thick layer, layer by layer, including trimming for the required profile, watering & compaction using Machinery	cum	337.00
2.8.3	Supplying gravel & placing, watering & compaction by machinery	cum	90.00



Figure 8: Both small sized and large size termite hillls are found along the tank bund and in adjacent areas at the Kalukoka wewa.

There are quite number of termite hills as depict in Figure 8 along the tank bund, which need to be relocated. No aquatic invasives are present in the water column (Figure 9), and no terrestrial invasives around the tank bund also.



Figure 9: The main body of Kalukoka wewa is free of aquatic invasives.



Figure 10: The number of trees requiring removal from the Kalukoka Wewa bund is minimal.

Figure 10 illustrates the proposed bund/agricultural road to be rehabilitated. The same images demonstrate that the water's edge along the bund does not contain the 12 trees marked for removal in Table 5; only one tree (Kohomba/*Azadirachta indica*) which appears in Figure 10 has been identified for removal from the bund. However, due to the presence of overgrown vegetation along the tank bund, thorough screening and the relocation of bird nests and reptiles must be carried out.

The soil volume required for the proposed works is high. According to the DAD, the necessary earth will be sourced from outside the project area. Excavated soil from the various rehabilitation sites may be provided to local farmers upon request. If there is no demand from the farmers, the removed earth will be reused as appropriate or disposed of. Construction and rehabilitation of the numerous proposed downstream structures will be carried out strictly during the off-farming season.

Certain areas of the tank bed (Figure 11) and the spill canal have become silted and are proposed for desiltation. The desilted material shall be used to form small islands, deposited within the *Kattakaduwa* (interceptor zone) for its rehabilitation, or distributed to local farmers upon request. Regardless of the removal method utilized, excavation and transport activities must not cause siltation in any adjacent areas or downstream locations. The DAD should manage these operations appropriately.



Figure 11: Evidence of heavy siltation and sediment accumulation within specific zones of the tank bed.

There are no wildlife sanctuaries, forest reserves, or archaeologically protected areas within the project's impact zone. While elephants occasionally visit the tank area and adjacent paddy fields, local farmers report that the area is not considered a high HEC zone. Apart from common species, other wildlife activity remains minimal during the daytime.

2.4. Meegaskada Wewa

The Meegaskada tank is an integral component of the Mahakaramatiyawa cascade system. Currently, the full extent of the paddy fields is cultivated during the *Maha* season, while only a portion is farmed during the *Yala* season. Following the proposed rehabilitation of the tank bund and other headworks (Table 6), farmers anticipate cultivating the full acreage during the *Yala* season as well. The interceptor zone (*Kattakaduwa*) of the tank appears to be restored, the encroachment of thorny jungle vegetation and a lack of typical, native tree species remain key concerns. Notably, the tank's water column is free of aquatic IAS. However, terrestrial invasives, specifically *Lantana camara*, were observed as isolated plants near the spillway area and along the tank bund.

Table 6: Proposed Rehabilitation works of Meegaskada wewa

Item	Description	Unit	Qty
1.1. Improvement of Tank Bund			
1.1.1	Clearing & grubbing light jungle, including removing outside of the reservation by machinery & burning.	ha	1.0
1.1.2	Stripping top soil to a depth of 75-150mm, to receive new earth & spoil to waste by machinery (within 60m)	Sqm	3627.0
1.1.3	Demolishing small-sized anthills (1m3-2m3) outside the site and applying suitable pesticides (chemical), & fill the cavity with earth	Nos	16.0
1.1.4	Earth excavation & forming bund cut & lift up to 1.5m & spread 30m by machinery. Including watering & compaction (benching)	Cum	434.0
1.1.5	Stripping topsoil in the burrow area. Earth excavation, hauling and placement of fill material on bund, spreading with 150 to 225 mm thick, layer by layer, including trimming for the required profile, watering & compaction using machinery	Cum	3750.0
1.1.6	Slope preparation of the downstream of the existing tank bund with necessary filling.	Sqm	2000.0
1.1.7	Furnishing, placing & watering turf till take roots, transport up to 2.0 Km by T.T	Sqm	1875.0
1.1.8	Supplying gravel & placing, watering & compaction by machinery	Cum	85.00
1.1.9	Common earth excavation & spoil to waste or fill material, cut up to 1.5m, lift up to 1.5m & remove outside (up to 500 m) the site by machinery (B-hoe) (Removing **Ramp if necessary**)	Cum	150.00
1.1.10	Desilting & spoil to waste, cut & lift 0-1.5m, haul within 30m-2km by machinery (Transport by Dump Truck) & forming with crawler tractor	Cum	3,000
1.2. Construction of 300mm dia Sluices T/s type (LB, RB)			
1.2.1	Earth excavation for cut opening the tank bund & dump at the site, back filling 25% excavated soil & 75% borrow earth, including placing, watering & compaction. cut 1.5-4.5 m lift up to 4.5m spread 30m.	Cum	91.0
1.2.2	Demolishing existing concrete structure using excavator PC 120 (LB, RB)	Hr.	6.00

1.2.3	Excavation for foundation in any material except rock requiring blasting, ram and disposing of surplus within the site by manual labour.	Cum	14.25
1.2.4	Puddle clay borrowing from the burrow area to construct puddle clay wall by machinery, including watering & compaction by machinery & transport withing 0-1Km	Cum	12.65
1.3. Construction Of Spill (Causeway with Footpath)			
1.3.1	Demolishing existing Culvert Concrete Structures (Side wall) and safely removing 600mm Dia Hume pipes and debris, clearing the way from the site using machinery (Backhoe 120)	Hr.	5.00
1.3.2	Earth excavation to design level and earth to fill the tail bund (Spill upstream & Downstream area)	Cum	135.0
1.3.3	Excavation for foundation in any material except rock requiring blasting, ram and disposing of surplus within site by manual labour	Cum	36.20
2.2. Construction Of Concrete Lining, FTO & Tractor Crossing. (LB & RB)			
2.2.1	Excavation for foundation in any material except rock requiring blasting, ram and disposing of surplus within the site by manual labour as directed.	Cum	20.5
2.2.2	Earth excavation, backfilling & forming both sides of the concrete canal (bund height 450 mm, bund top width 300 mm & side slope 1:1) as directed	Lm	200.0
3.0. Demarcation of Reservation Boundary			
3.1	Fixing land marks boundary stones (as given drawing) in downstream of the tank bund reservation (Kattakaduwa) 15 Nos		Pro.
4.0	**(Others**		
4.1	Improvement of Kattakaduwa as per instructions and develop for the relevant requirements.	Pro	Sum



Figure 12: Meegaskada Wewa



Figure 13: Present condition of the Meegaskada tank interceptor zone, highlighting a significant lack of native tree cover.



Figure 14: Present condition of the Meegaskada Wewa tank bund, showing extensive weed and shrub growth requiring clearing.

The ecological and environmental baseline of the Meegaskada tank aligns with the common characteristics observed across the other tanks within the cascade system. While elephants are known to roam the area, the HEC is currently not at an acute or peak level. There are no designated protected areas located within the project's direct impact zone, and no human settlements exist in the immediate vicinity of the tank.However, a large number of active termite mounds (*termite hills*) were observed around the tank bund; these must be carefully relocated prior to construction, in strict accordance with the guidelines stipulated in the EMP. Furthermore, all structural earthworks and soil management required for the rehabilitation of the bund must

be carefully managed as guided by the EMP to mitigate potential erosion and sedimentation impacts.

2.5. Millagala wewa

Millagala *Wewa* (tank) is a village irrigation reservoir situated within the Kahatagasdigiliya Divisional Secretariat Division (DSD) of the Anuradhapura District, in the North Central Province. From a hydrological perspective, Millagala Wewa is a vital component of the Maha Kirimatiyawa Cascade System. It operates within an interconnected network of small tanks, playing a key role in capturing local catchment runoff, managing seasonal water storage, and regulating hydraulic discharges to downstream agricultural systems within the cascade.

The tank bund currently exhibits varying degrees of physical deterioration due to prolonged lack of major rehabilitation. Similar to other structures within the cascade, localized erosion, slope irregularities, and the growth of woody vegetation and thorny type vegetation along the embankment are present, which warrant stabilization to restore its design retention capacity and prevent potential piping issues.

The immediate project impact zone consists primarily of modified agricultural landscapes, home garden systems, and dry-zone secondary scrub vegetation. Baseline observations indicate that no endangered, critically threatened, or endemic species of flora and fauna are located within the direct footprint of the proposed construction area. However, the subproject area falls within broader elephant roaming ranges characteristic of the Kahatagasdigiliya region. While seasonal elephant movements occur around the peripheral catchment forests and adjacent paddy fields, current field consultations with local farming communities indicate that HEC pressures at this specific site are manageable and do not reflect an acute or critical conflict level.

Table 7: Proposed Rehabilitation works at the works of Millagala wewa

Item	Description	Unit	Qty
1.0.	**Improvement of Tank Bund**		
1.1.1	Clearing & grubbing light jungle, including removing outside of the reservation by machinery & burning.	Ha	1.08
1.1.2	Stripping top soil to a depth of 75-150mm, to receive new earth & spoil to waste by machinery (within 60m)	Sq.m	3180.0
1.1.3	Removing trees (girth 0.5-1.0m) with root balls & debris outside of the site & fill the cavity with approved soil.	Nos	2.00
1.1.4	Demolishing small-sized anthills (1m3-2m3) outside the site and applying suitable pesticides (chemical) & filling the cavity earth	Nos	25.00
1.1.5	Earth excavation & forming bund cut & lift up to 1.5m & spread 30m by machinery. Including watering & compaction (benching)	Cum	123.00

1.1.6	Stripping topsoil in the borrow area. Earth excavation hauling and placement of fill material on bund, spreading with 150 to 225 mm thick, layer by layer, including trimming for required profile, watering & compaction using machinery (transport up to 1.0 km),rate including cutting and leveling upstream platform along the bund toe for providing facilities to horizontal moving of compacting machineries (allow only upstream filling and compaction by specified compacting machineries only) Degree of compacting 95%)	Cum	3650.0
1.1.7	Slope preparation of the downstream of the existing tank bund with necessary filling as directed	Sqm	2476.0
1.1.8	Supplying gravel & placing, watering & compaction by machinery including transport. (on Tank bund)	Cum	203.00
1.1.9	Common earth excavation & spoil to waste or fill material, cut up to 1.5m, lift up to 1.5m & remove outside (up to 500m) the site by machinery (B - hoe) as directed **removing the ramp if necessary**)	Cum	150.00
1.1.10	Desilting & spoil to waste, cut & lift 0-1.5m, haul within 30m-2km by machinery (Transport by Dump Truck) & forming with crawler tractor as directed	Cum	3,000
1.1.	**Construction of 300mm dia Sluices T/s type (LB, RB)**		
1.2.1	Earth excavation for cut opening the tank bund & dump at the site, back filling 25% excavated soil & 75% borrow earth, including placing, watering & compaction. cut 1.5-4.5 m lift up to 4.5m spread 30m.	Cum	106.9
1.2.2	Demolishing existing concrete structure using excavator PC 120 (LB, RB & Center)	Hr.	6.00
1.2.3	Excavation for foundation in any material except rock requiring blasting, ram and disposing of surplus within site by manual labour as directed.	Cum	14.25
1.2.4	Puddle clay borrowing from burrow area to construct puddle clay wall by machinery including watering & compaction by machinery & transport withing 0-1Km	Cum	12.65
1.2.	**Repair Of CO Type Spill**		
1.3.1	Earth excavation to design level and, earth us to filling the tail bund (Spill upstream & Downstream area)	Cum	63.00
1.3.2	Demolishing existing Damaged Concrete Structures (Abutment) And debris clear way from site Using Machinery (PC 120)	Hrs.	2.00
1.3.3	Excavation for foundation in any material except rock requiring blasting, ram and disposing of surplus within the site by manual labour as directed.	Cum	21.00
1.4. Spill Channel Improvements			
1.4.1	Earth excavation to design level along the Spill channel & cutting earth use to form the Spill channel bund. (earth transport, trimming & forming watering & compaction)	Cum	200.0
2. Construction Of Concrete Lining, FTO, Drops & Tractor Crossing. (LB, RB)			

2.1	Excavation for foundation in any material except rock requiring blasting, ram and disposing of surplus within site by manual labour as directed.	Cum	26.60
2.2	Earth excavation, backfilling & forming both side of concrete canal (bund height 450 mm, bund top width 300 mm & side slope 1:1) as directed by the Engineer.	Lm	240.00
3.0. Others			
3.1	Improvement of Kattakaduwa as per instructions and develop for the relevant requirements.		Pro.

Further to depilated condition for the tank bund, the sluices, spill and the spill canals also at the depilated condition. The spill canal is silted, removed silt/soil shall use to raise the spill channel bund.



Figure 15: Current condition of Millagal Tank, showing high turbidity and suspended sediment load in the tank water.

The turbid condition of the tank water during a dry period suggests localized soil disturbance, potentially stemming from unauthorized maize farming within the cascade area—a common practice in the Anuradhapura District. Since the upper catchment is densely forested, it can be ruled out as the source of the muddy runoff. Although the precise cause remains unverified,

intervention by the relevant authorities is required to investigate and mitigate these catchment activities.



Figure 16: The upper catchment of the tank consists of forest, and the vast area of the tank bund consists of thorny type jungle.

The upstream catchment of the tank consists of forest cover; however, this forested area will not be impacted or encroached upon by the proposed civil works. All planned interventions and their associated impact zones are confined strictly to the downstream side of the tank bund.



Figure 17: Structures like sluices and the spill have become damaged, silted, and overgrown with vegetation.



Figure 18: The Bund of the tank is covered by larger trees and thorny type vegetation

Maintenance and routine clearance of the tank and its associated hydraulic structures are currently poor. The bund is heavily overgrown with thorny, woody vegetation, including terrestrial invasive species such as *Lantana camara*. To safeguard the structural integrity of the embankment, two large trees located along the water's edge (upstream slope) are proposed for removal. Conversely, the majority of the mature trees are situated along the downstream side of the bund; therefore, these will be preserved and will not be impacted by the clearance works.

Table 8: The tree list needs to remove from the Bund of Millagala Wewa

No	Name of the tree	Scientific Name	Diameter @ the DBH	Coordinates	Justification for Removing	Picture
01	Kohomba tree	*Azadirachta indica*	119 cm	8.38060 ^{0}N 80.70180 ^{0}E	Both trees appear having extensive lateral root systems have permeated a significant section of the embankment. They may create "piping" paths (seepage channels) that compromise the compaction and structural stability of the bund, leading to potential breaches in future. To ensure the long-term safety of the tank, it is required to remove deep-rooted vegetation that weakens the embankment's core.	
02	Kon tree (Ceylon Oak tree)	*Schleichera oleosa*			The current positioning of the tree obstructs the movement and operation of heavy machinery required for the proposed rehabilitation works. Removal is necessary to achieve the design specifications for bund widening and reinforcement.	

2.6. Kelanika Wewa

Table 9: Proposed Rehabilitation Works for the Kelanika Wewa

Item	Description	Unit	Qty
1	**Improvement of Tank Bund**		
1.1	Clearing & grubbing Secondary Growth jungle, including removing outside of the reservation & burning **by manual labour.**	Ha	1.65
1.2	Stripping top soil to a depth of 75-150mm, to receive new earth & spoil to waste by machinery	Sqm	4864
1.4	Demolishing small-sized anthills (1m3-2m3) outside the site and applying suitable pesticides (chemical) & filling the cavity earth	Nos	5.00
1.5	Stripping topsoil in the burrow area. Earth excavation, hauling and placement of fill material on the bund, spreading with a 150 to 225 mm thick layer by layer, including trimming for the required profile, watering & compaction using machinery	Cum	1037
1.6	Slope preparation of the downstream of the existing tank bund with necessary filling	Sqm	2900
1.7	Furnishing placing & watering turf till take roots, transport 1.0 Km by T.T	Sqm	1545
1.8	Supplying gravel & placing, watering & compaction by machinery	Cum	391
1.9	Desilting & spoil to waste, cut & lift 0-1.5m, haul within 30m-1km by machinery	Cum	6,000
2	**Construction of 300mm dia & 150mm dia Sluices T/s type (RB & LB)**		
2.1	Earth excavation for cut opening the tank bund & dump at the site, back filling 25% excavated soil & 75% burrow earth, including placing, watering & compaction. cut 1.5-4.5 m lift up to 4.5m spread 30m.	Cum	236.
2.2	Demolishing, removing & clearing existing concrete structure using excavator PC 120 (RB only)	Hr	3.0
2.3	Excavation for foundation in any material except rock requiring blasting, ram and disposing of surplus within the site by manual labour	Cum	14.4
2.4	Puddle clay burrowing from the burrow area to construct a puddle clay wall by machinery, including watering & compaction by machinery	Cum	14.4
3	**Repair Of Spill (Causeway)**		
3.1	Earth excavation to design level and earth to fill the tail bund (Spill upstream & Downstream area)	Cum	22.50
3.2	Excavation for foundation in any material except rock requiring blasting, ram and disposing of surplus within the site by manual labour as directed.	Cum	15.9
4	**Construction Of Bathing Place (2 Nos)**		
4.1	Excavation for foundation in any material except rock requiring blasting, ram and dispose surplus within site by manual labour as directed.	Cu.m	15.0
5	**Construction Of Concrete Lining, FTO & Tractor Crossing. (For LB Channel, RB Channel)**		
5.1	Excavation for foundation in any material except rock requiring blasting, ram and disposing of surplus within the site by manual labour	Cum	70.6
5.2	Earth excavation, backfilling & forming both side of concrete canal (bund height 450 mm, bund top width 300 mm & side slope 1:1) as directed by the Engineer.	Lm	720
6	**Miscellaneous**		

6.1	Improvement of Kattakaduwa as per instructions and develop for the relevant requirements.	Pro.



Figure 19: Kelanika wewa



The earthen bund of the Kelanika Wewa is currently in a dilapidated condition due to extensive erosion. Regarding flora and invasive species, the tank's water column remains free of aquatic IAS, though isolated terrestrial IAS plants are present along the bund. Notably, the proposed rehabilitation works will not require the removal of any mature trees; only light clearing of surface vegetation will be necessary along the project footprint. To meet construction requirements, it is anticipated that the borrow soil necessary for the bund renovation will be sourced directly from the tank, minimizing the need for external borrow pits.

Figure 20: The tank bund of the Kelanika wewa

The remaining two existing sluices are to be demolished and replaced with new structures. The resulting concrete debris and demolition waste shall be disposed of appropriately at an approved site, under the direct supervision of the DAD. Currently, the ambient water in the tank remains clear, and local communities regularly use the tank for bathing purposes.



Figure 21: Access/agri road to the Kelanika wewa and paddy fields

2.7: Wessyaddewa Wewa

Both the headworks and downstream works are proposed for rehabilitation under the Wessyaddewa wewa, as indicated in Table 10. The command area under the tank is farmed with paddy during both the Yala and Maha seasons.

The tank bund is maintained by the farmer organization and is free of scrub forest, unlike many other tanks under this cascade. However, there are a few trees at the water's edge that are proposed to be removed (Figure 17). Certain rehabilitation works on the tank bund is proposed and sluices are proposed to be demolished and reconstructed (Figure 18).

Table 10: Description of the Proposed Rehabilitation Works of Wessyaddewa Wewa

Item No	Description of Work	Units	Qty
1.0.	**Head Work**		
	1.1. Repair of Tank Bund.		
1.1.1	Clearing & grubbing **Shrub Jungle,** including removal from the site by machinery as directed.	ha	2.15
1.1.2	Clearing & grubbing Light Jungle, including removal from the site by machinery as directed	ha	1.80
1.1.3	Removing the tree (0.5 - 1.0 m girth) with the root ball and debris from the site as directed and filling the cavity with approved soil.	Nos	10.0
1.1.4	Tree branches cutting, removing & burning by chainsaw and applying burn oil in cutting surfaces.		Pro Sum
1.1.5	Demolishing small-sized anthills (1 m3 - 2 m3) in the tank bund, including removing queen ant & debris outside the site and applying suitable pesticides (chemical) & fill the cavity earth.	Nos	25.0

1.1.6	Demolishing large-sized anthills (2 m3 - 8 m3) in the tank bund, including removing queen ant & debris outside the site and applying suitable pesticides (chemical) & filling the cavity earth.	Nos	2.0
1.1.7	Stripping topsoil depth of 75 - 150 mm to receive new earth surface & spoil to waste by machinery	sqm	10,925.0
1.1.8	Earth excavation & forming bund cut & lift up to 1.5 m & spread 30 m by machinery (B - hoe) including Watering & Compaction (**For Benching).**	cum	1,150.0
1.1.9	Stripping topsoil in the borrow area. Earth excavation hauling and placement of fill material on bund, spreading with 150 to 225 mm thick, layer by layer, including trimming for required profile, watering & compaction using Machinery (Transport up to1.0 km), Rate including cutting and leveling upstream platform along the bund toe for providing facilities to horizontal moving of compacting machineries (Allow only upstream filling and compaction by specified compacting machineries only.)(Degree of compaction 98%)	cum	7,102.0
1.1.10	Slope preparation of the existing tank bund as directed	sqm	6,400
1.2. Construction of HPT Sluice (Mid & LB). 02 Nos			
1.2.1	Demolishing existing sluice structures using the excavator PC 200	Hrs	8.0
1.2.2	Earth excavation for cut opening the tank bund & dump at the site with back filling 25 % excavated soil & 75 % borrow earth, including placing, watering & compaction by machinery, cut 1.5 - 3 m, lift up to 3 m & spread 30 m.	cum	212.0
1.2.3	Earth excavation for the foundation in any material by manually except rock requiring blasting, including disposal of surplus within the site as directed	cum	13.5
1.2.4	Clay excavation from burrow area for puddle core wall, transporting within 1.0 km, placing as layers, watering & compacting by machinery as directed by the Engineer.	cum	74.0
1.2.	**Construction of Bathing Steps. (02 nos)**		
1.3.1	Earth excavation for the foundation in any material by manually except rock requiring blasting including disposal of surplus within the site as directed by the Engineer.	cum	15.9
1.4. Desilting			
1.4.1	Desilting & spoiling to waste, cut 0 - 1.5 m, lift to 1.5 m by machinery, including transporting 1.0km - 2.0 km and forming as directed. (Including any jungle clearing in that area.)	cum	6,000.0
1.5. Spill & Spill Tail Canal.			
1.5.1	Clearing & grubbing Light Jungle including removal from the site by machinery as directed, and burning.	Ha	0.1
1.5.2	Earth excavation from burrow area, transporting 30 m - 1.0 km, placing as layers, watering & compacting including forming & slopping canal bund/agri road by machinery as directed	cum	66.0

1.5.3	Earth excavation for the foundation in any material by manually except rock requiring blasting including disposal of surplus within the site as directed	cum	0.95
2.0.	**Down Stream Development.**		
2.1.	**Canal Lining.**		
2.1.1	Earth excavation for the foundation in any material by manually except rock requiring blasting including disposal of surplus within the site as directed	cum	450.00
2.1.2	Earth excavation, backfilling & forming both side of concrete canal (bund height 600 mm, bund top width 300 mm & side slope 1:1) as directed by the Engineer.	lm	1,200.0
2.2.	**Construction of Retaining Wall. -(02nos)**		
2.2.1	Earth excavation for the foundation in any material by manually except rock requiring blasting, including disposal of surplus within the site as directed	cum	8.10
2.3.	**Agri Road**		
2.3.1	Clearing & grubbing **Shrub Jungle,** including removal from the site by machinery as directed	ha	0.26
2.3.2	Grading on the road surface, reducing the high side or cutting side drain of agri road by Mortar Grader.	km	0.65
2.3.3	Earth excavation from burrow area, transporting 30 m - 1.0 km, placing as layers, watering & compacting including forming & slopping canal bund/agri road by machinery as directed	cum	645.0
2.3.4	Supplying gravel & placing, watering & compacting by machinery	cum	295.0
2.4.	**Construction of 450mm dia Culvert. 04 nos.**		
2.4.1	Earth excavation for the foundation in any material by manually except rock requiring blasting, including disposal of surplus within the site as directed	cum	13.10
3.0. Special Works.			
3.1	Improvement of Kattakaduwa as per instructions and develop for the relevant requirements.		Pro Sum
3.2	Construction of Goda wala cut 0 - 1.5 m, lift to 1.5 m by machinery, including transporting 1.0km - 2.0 km and forming as directed	ha	850.0



Figure 22: Current condition of the Wessyaddewa Wewa tank bund, highlighting localized erosion along the embankment.



Figure 23: Current appearance of the Bund of Wessyaddewa Wewa



Figure 24:Both sluices to be demolished and reconstructed.

Neither aquatic nor terrestrial invasive species are present in or around the tank structures. While elephants visit the tank area, Human-Elephant Conflict (HEC) is not a major concern. Daytime wildlife sightings are uncommon, though venomous snakes are somewhat common, especially in the paddy fields. There are no protected areas within the project's impact zone, and no endemic or threatened flora inhabit along the tank bund, spill area or within the project impact zone.



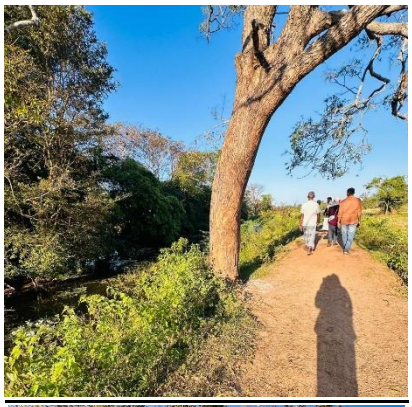
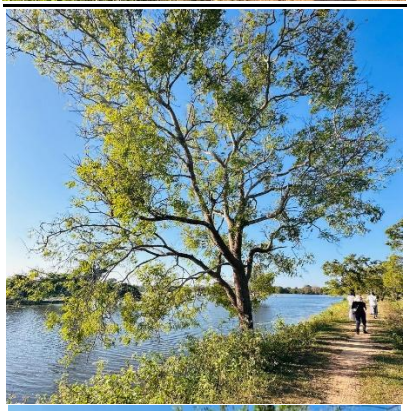
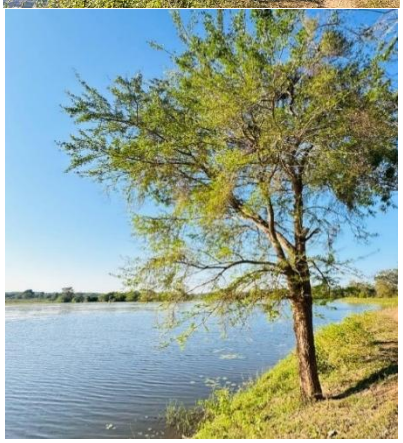
Figure 25: Spill tail canal of the Wessyaddewa Wewa *became silted.*

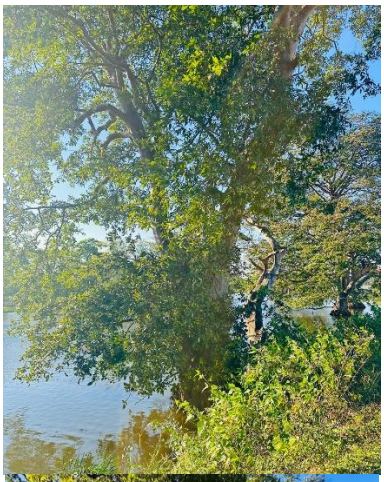
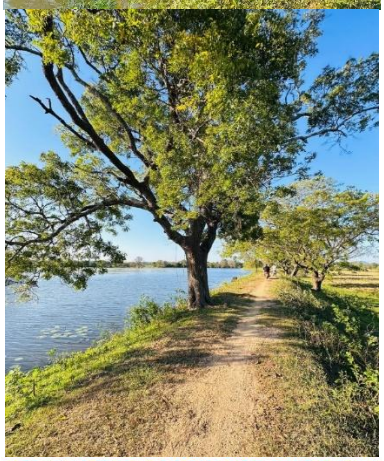
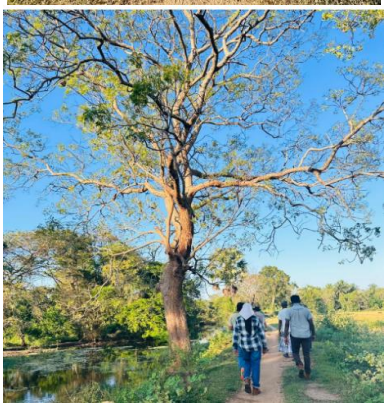


Figure 26: Spil of the Wessyaddewa Wewa

The spill tail canal is proposed to be rehabilitated by cleaning the channel and stabilizing the canal bund. No trees will be removed for the proposed rehabilitation works on either the spill or the spill tail canal.

Table 11: Tress that proposed to be removed from the tank bund of Wessyaddewa Wewa

No	Name/ Species	DBH	Reason for removing	**Photo**
1	*Azadirachta indica Kohomba*	158 cm	Few mature trees are located along the tank bund and water's edge, their removal is required as explained by the technical officer, to safeguard the structural integrity of the embankment. Deep root penetration poses a severe risk of internal soil erosion (piping) and structural cracking, while the potential uprooting of large trees during high winds especially during the monsoon periods could cause a catastrophic breach of the bund. Hence the tree mentioned in this table are proposed	
2	*Azadirachta indica*	130 cm		
3	*Bauhinia racemosa*. (Maila)	115 cm		

4	*Schleichera oleosa* (Kon tree)	178 cm	to remove by the DAD.	
5	*Azadirachta indica*	142 cm		
6	*Albizia odoratissima*	155 cm		

The Bill of Quantities (BoQ) submitted by the Department of Agrarian Development (DAD) indicates the removal of 10 trees with a girth of 0.5 to 1 meter. However, during the field inspection, it was noted that only the six trees listed in Table 11 actually need to be removed, though some of these exceed a girth of 1 meter. The tree removal process will follow the standard methods enforced by the government, and the DAD will ensure strict adherence to these procedures. Non-timber-valued tree branches may be distributed among local farmers for firewood or for fencing work around their agricultural lands.

2.8. Ulpath Wewa

Ulpath *Wewa* (tank) is a traditional village irrigation tank located within the Kahatagasdigiliya DSD in the Anuradhapura District, North Central Province. Hydrologically, the tank belongs to the Maha Kirimatiyawa Cascade System. It serves as a vital component of the localized multi-tank system, collecting water from upstream drainage and regulating flows down to successive tanks. The tank is crucial not only for local villagers and farmers but also for supporting wildlife within the intact forest patch persisting along the tank's upper margin/catchment area. However, the proposed civil works (Table 11) will not encroach upon or impact the forest area located in the upper catchment.

Table 12: Rehabilitation of Ulpath Wewa

Item	Description	Unit	Qty
1.1.	**Improvement of Tank Bund**		
1.1.1	Removing & Refixing elephant Fence, as per the necessary fittings as instructed		Pro
1.1.2	Clearing & grubbing light jungle, including removing outside of the reservation by machinery & burning.	ha	0.85
1.1.3	Stripping top soil to a depth of 75-150mm, to receive new earth & spoil to waste by machinery (within 60m)	Sqm	1825
1.1.4	Removing trees (girth 0.5-1.0m) with root balls & debris outside of the site & fill the cavity with approved soil.	Nos	5.00
1.1.5	Demolishing small-sized anthills (1m3-2m3) outside the site and applying suitable pesticides (chemical) & filling the cavity earth	Nos	11.00
1.1.6	Earth excavation & forming bund cut & lift up to 1.5m & spread 30m by machinery. including watering & compaction (For **Leak Arresting**)	Cum	40.50
1.1.7	Puddle clay burrowing from the burrow area to construct a puddle clay wall by machinery, including watering & compaction by machinery & transport withing 0-1Km	Cum	40.50
1.1.8	Stripping topsoil in the burrow area. Earth excavation, hauling and placement of fill material on the bund, spreading with a 150 to 225 mm thick layer by layer, including trimming for the required profile, watering & compaction using machinery	Cum	1463
1.1.9	Slope preparation of the downstream of the existing tank bund with necessary filling. Common earth excavation & spoil to waste or fill material, cut up to 1.5m, lift up to 1.5m & remove outside (up to 500m) the site by machinery (B-hoe) (Removing **Ramp if necessary**)	Cum	150
1.2.	**Construction of 225mm dia Sluices T/s type**		
1.2.1	Earth excavation for cut opening the tank bund & dump at the site back filling 25% excavated soil & 75% borrow earth, including placing, watering & compaction. cut 1.5-4.5 m lift up to 4.5m spread 30m.	Cum	88.7
1.2.2	Excavation for foundation in any material except rock requiring blasting, ram and disposing of surplus within the site by manual labour as directed.	Cum	14.25

1.2.3	Puddle clay burrowing from the burrow area to construct a puddle clay wall by machinery, including watering & compaction by machinery	Cum	6.30
1.3.	**Repair of Natural-type Spill**		
1.3.1	Earth excavation to design level and earth us to filling the tail bund (Spill upstream & downstream area)	Cum	63.00
1.3.2	Demolishing existing damaged concrete structures (Abutment) and debris, clearing the way from the site Using Machinery (PC 120)	Hr	2.00
1.3.3	Excavation for foundation in any material except rock requiring blasting, ram and disposing of surplus within the site by manual labour as directed.	Cum	13.00
1.4.	**Spill Channel Improvements**		
1.4.1	Clearing & grubbing light jungle, including removing outside of the reservation by machinery & burning.	ha	0.18
1.4.2	Earth excavation to design level along the Spill channel & cutting earth use to form the Spill channel bund. (earth transport, trimming & forming watering & compaction)	Cum	240.0
2.7.	**Construction Of Concrete Lining (LB,RB, Center)**		
2.2.1	Excavation for foundation in any material except rock requiring blasting, ram and disposing of surplus within the site by manual labour as directed.	Cum	27.00
2.2.2	Earth excavation, backfilling & forming both side of the concrete canal (bund height 450 mm, bund top width 300 mm & side slope 1:1)	Lm	300.00
3.00. Construction of 450mm Dia Culvert (2 Raw)			
3.1	Excavation for foundation in any material except rock requiring blasting, ram and disposing of surplus within the site by manual labour as directed.	Cum	7.00
4.0. Others			
4.1	Improvement of Kattakaduwa as per instructions and develop for the relevant requirements.		Pro.



Figure 27: Upper catchment of the Ulpath Wewa consists of forests.

Elephants frequently move toward the paddy fields and surrounding village at Ulpath *Wewa*; consequently, the tank bund is secured by an electric fence. The bund itself is currently in a dilapidated state, with significant tree growth threatening its structural integrity. Repairing the electric fence is part of the proposed scope. Additionally, the planned civil works include both headworks and downstream interventions, as illustrated in Table 11 above.

No aquatic or terrestrial invasive species were found in the project impact zone. However, the *kattakaduwa* (interceptor zone) of the tank is completely encroached upon for paddy farming. The feeder canals along the paddy fields remain clean. Although the upper catchment of the tank consists of forest, farmers reported no wildlife encounters during the daytime. Nonetheless, common species such as the Indian peafowl (*Pavo cristatus*), toque macaque (*Macaca sinica*), wild boar (*Sus scrofa*), and Indian crested porcupine (*Hystrix indica*) frequently appear as pests in neighboring agricultural lands.



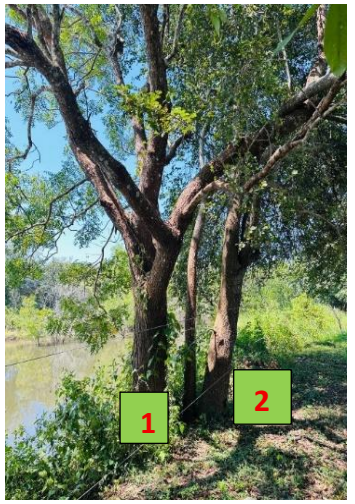
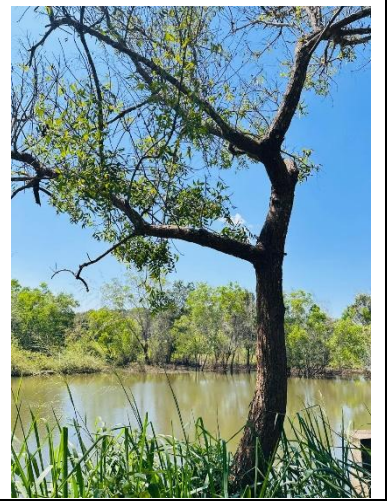


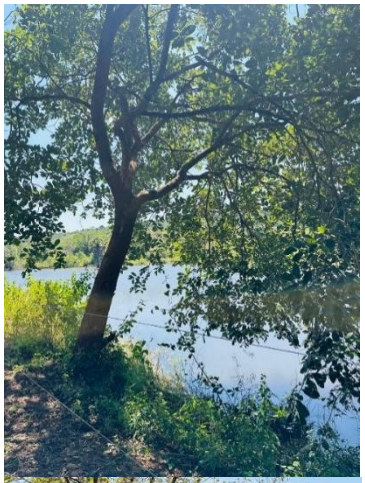
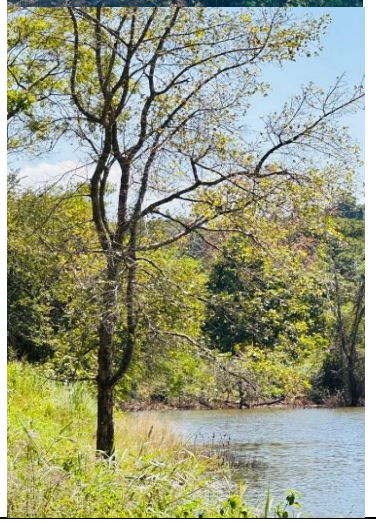
Figure 28: Feeder canals under the Ulpath wewa.



Figure 29: An electric fence has established on the tank bund of Ulpath wewa

Removing Trees in Ulpath Wewa

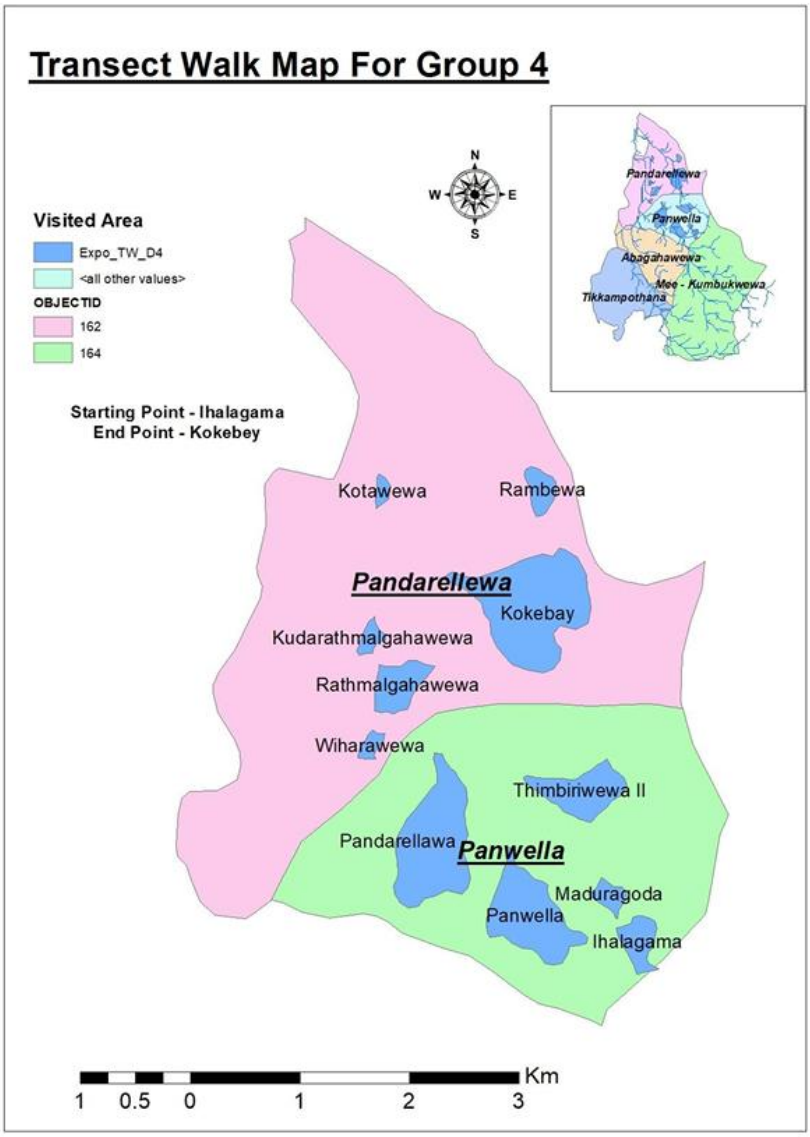
No	Name of the tree	Scientific Name	Diameter @ the DBH	Coordinates	Justification for Removing	Picture
01	i) Kohomba tree ii)Maila tree	*Azadirachta indica* *Bauhinia rocemosa*	i) 138 cm ii)120 cm	8.34983^0 N 80.69320^0 E	to ensure the structural integrity of the tank bund - High winds can uproot these trees. (If a large tree on the water's edge is uprooted, it will tear out a massive chunk of the bund slope, immediately compromising the retention capacity of the tank and risking an immediate breach). Bund rehabilitation works need a safe margin to work by mechinary.	
02	Kohomba tree	*Azadirachta indica*	105 cm	8.34983^0 N 80.69320^0 E		

03	Ketakela Tree	*Bridelia retusa*		8.34850^0 N 80.69596^0 E	
04	Halamba tree	*Mitragna parvifolia*	84 cm	8.34850^0 N 80.69596^0 E	

2.9. Ramba Wewa

Ramba Wewa is located within the Kahatagasdigiliya DS Division. According to CSIAP records[5], the tank is situated within the Kahatagasdigiliya-Kokebe cascade system inside the Pandarellewa GN Division[6]. However, alternative records indicate that the tank belongs to the Ramba Wewa cascade, which is adjacent to the Kokebe cascade. However, it may be that the Ramba Wewa and Kok-Ebe cascades[7] are closely nested, adjacent micro-catchments with overlapping boundaries that frequently share structural drainage corridors. Additionally, this cascade system is located in close proximity to the Mahakirimatiyawa cascade (Figure 25).

[5] කහටගස්දිගිලිය - කොක්එබේ එල්ලංගා පැතිකඩ සහ කළමනාකරණ සැලැස්ම



6

7

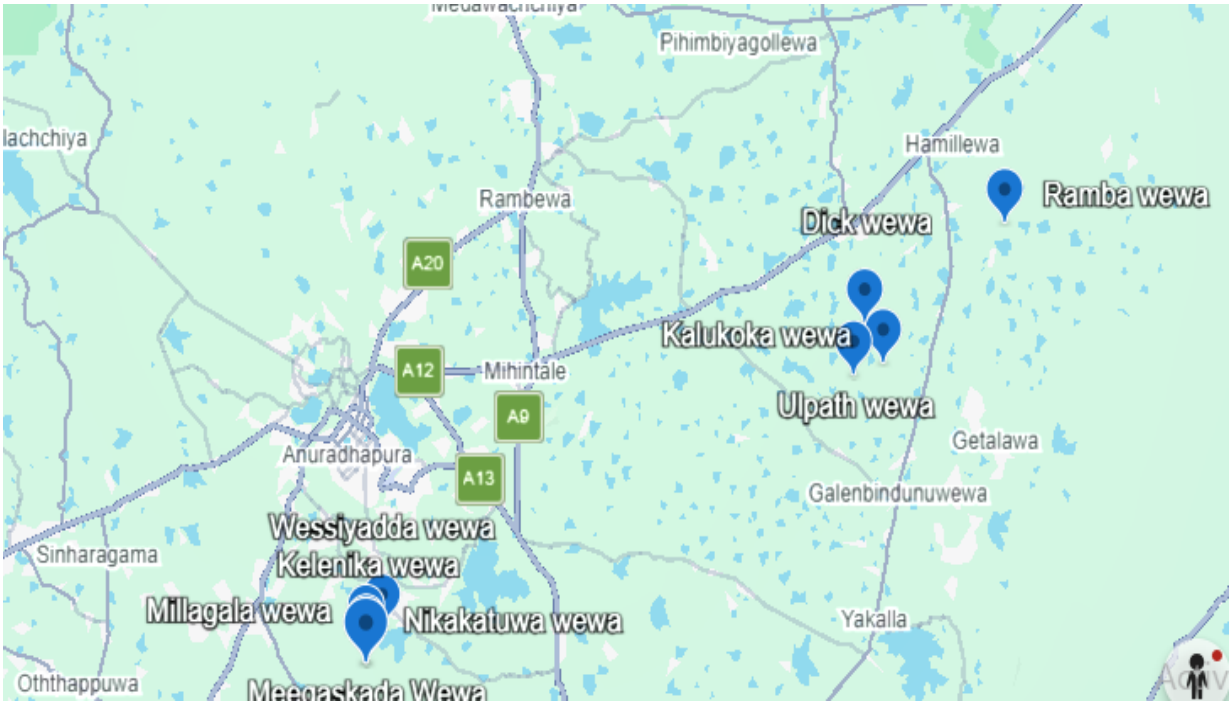


Figure 30: Location of three different cascades under this screening report.

Geographically, the area is anchored by Kokebe Hill—also known as Sangilimala Kanda (illustrated in Figure 25)—which marks the highest point of elevation in the Kahatagasdigiliya DSD. This mountain is enveloped by a dense, contiguous jungle canopy that functions as a critical sanctuary for wildlife, supporting high-priority species such as the Sri Lankan leopard (*Panthera pardus kotiya*) and the sloth bear (*Melursus ursinus*)[8]. Additionally, while the wider region hosts the historically significant Kokebe Megalithic Burial Ground, community consultations and farmer testimonies confirm that this heritage site is located more than 3 km away from the immediate area of operations, placing it well outside the direct project impact zone and ensuring no risk of disturbance during rehabilitation works.

At present, the tank's water retention capacity has significantly deteriorated, resulting in a severe hydrological deficit that completely prevents cultivation during the Yala season. This is driven by the extremely dilapidated condition of the entire earth embankment, which suffers from extensive vegetative overgrowth and severe soil erosion, culminating in a structural breach that leaves only a minimal fraction of its original operational storage capacity intact.

[8] As informed by the villagers and farmers.



Figure 31:The Kokabe mountain also known as Sangilimala Kanda)

The tank serves as an important seasonal water source for wild elephants (*Elephas maximus*); however, the area is prone to high-intensity HEC, however, human settlements and paddy fields maintain a buffer distance of more than one kilometer from the tank boundary. Other large mammalian wildlife is relatively uncommon in the immediate project vicinity. The observable fauna is primarily limited to avian and primate species, including the Indian peafowl (*Pavo cristatus*), the endemic toque macaque (*Macaca sinica / rilava*), and the tufted gray langur (*Semnopithecus priam*), alongside occasional reptilian/snake species. In contrast, the site supports a highly abundant and diverse population of butterflies. The local floral composition consists of common, resilient dry zone tree species, with prominent examples including Kumbuk (*Terminalia arjuna*), Kohomba (*Azadirachta indica*), Bo (*Ficus religiosa*), Nuga (*Ficus benghalensis*), Huri Mara (*Albizia odoratissima*), Na (*Mesua ferrea*), Dan (*Syzygium caryophyllatum*), and Burutha (*Chloroxylon swietenia*) *etc.*



Figure 32: View of heavy vegetation growth along the tank bund embankment.

The water contains mud particles, probably due to agricultural activities[9] in the upper catchment area rather than rainy-season surface runoff. However, a definitive cause could not be determined during the field investigation due to limited accessibility around the tank.

[9] The upper catchment appears to consist of forested land rather than privately owned agricultural land. However, this situation may only be temporary.



Figure 33: Minimal water retention in the tank due to a breach in the bund.

Furthermore, due to the extreme density of the overgrowth, obtaining clear photographic evidence of the bund's physical condition was impossible during the inspection. The proposed rehabilitation works for Ramba Wewa are illustrated in Table 14 below. Because the planned tree removal and earthworks are large-scale, specific environmental mitigation measures must be adopted. These include the systematic removal or relocation of local fauna and wildlife nesting sites prior to construction, as well as the implementation of strict precautionary measures to manage wild elephant encounters on-site



The tank bund exhibits two major breaches, and its entire length is heavily overgrown with large trees and dense, thorny scrub jungle. While the BoQ submitted by the DAD provisions for the removal of thirty (30) trees, verifying this count on-site was restricted. The trees situated on and adjacent to the waterline were completely inaccessible due to the impenetrable vegetation. Hence no description is available on the trees that need to be removed from the tank bund. However, during the construction, removed trees, handing over process, compensation replanting and disposal of branches etc. shall be documented in the ESMP and the DAD should monitor its implementation seriously.







Figure 34: Severe structural degradation across the Ramba Wewa embankment.

Table 13: Proposed civil works under Ramba Wewa

Item No	Description of Work	Units	Qty
1.0	**HEAD WORKS**		
1.1	**Tank Bund**		
1.1.1	Clearing & grubbing Light jungle, including removing outside of the Reservation by Machinery & burning.	**ha**	1.24
1.1.2	Removing Tree (Girth 0.5 - 1.0 m) with root balls & debris outside of the site & fill the cavity with approved soil.	**nos**	10.00
1.1.3	Removing Tree (Girth 1.0 - 2.0 m) with roots balls & debris outside of the site & fill the cavity with approved soil.	**nos**	15.00
1.1.4	Removing the tree (2.0 - 3.0 m girth) with the root ball and debris from the site as directed by the Engineer, and filling the cavity with approved soil (except palm trees).	**nos**	5.00
1.1.5	Stripping top soil to a depth of 75-150mm to receive new earth & spoil to waste by machinery. Including loading & transporting within 1km	**sqm**	2712.19
1.1.6	Demolishing small-sized anthills in the tank bund, including removing the queen ant and applying suitable pesticides (chemical), & fill the cavity earth as per instructions.	**no.s**	20.00
1.1.7	Earth excavation & forming bund cut & lift up to 1.5m spread 30m by machinery, including watering & compaction. (For Benching)	**cum**	288.09
1.1.8	Earth excavation from borrow area, cut & lift 1m placing & compaction by Machinery, including watering, compaction by machinery. Transport dump truck within 30m -1 km.	**cum**	2269.63
1.1.9	Furnishing turf, transporting within 1.0 km & planting using pegs including watering till take roots.	**sqm**	1302.00
1.1.10	Supplying Gravel and placing, watering and compaction of gravel along the tank bund road by machinery with transport	**cum**	139.50
1.1.11	Slope preparation of existing tank bund as directed by the Engineer.	**cum**	2407.43
1.1.12	Common earth excavation & spoil to waste, cut 0 - 1.5 m, lift to 1.5 m, and removal from the site as directed.	**cum**	326.70
1.2	**Repair of Sluice**		
1.2.1	Demolishing the existing damaged sluice inlet and outlet	**hrs**	2.00
1.2.2	Excavation for foundation in any material except rock requiring blasting, ram and disposing of surplus within the site by manual labour as directed.	**cum**	3.50
1.3	**Repair of Spill**		
1.3.1	Clearing & grubbing Light jungle, including removing outside of the Reservation by Machinery & burning	**ha**	0.18
1.3.2	Demolishing Damaged Cement concrete by machinery and debris cleared within site as directed	**cum**	3.78
1.3.3	Excavation for foundation in any material except rock requiring blasting, ram and surplus disposed within site as directed by manual labour.	**cum**	9.80

1.3.6	Common earth excavation & spoil to waste, cut 0 - 1.5 m, lift to 1.5 m & spread 30 m by machinery.	**cum**	310.50
2.0	**DS DEVELOPMENT**		
2.1	**Construction of Canal Lining**		
2.1.1	Stripping topsoil depth of 75 - 150 mm to receive new earth surface & spoil to waste & spread 60 m by machinery.	**sqm**	540.00
2.1.2	Excavation for foundation in any material except rock requiring blasting, ram and surplus disposed within site as directed by manual labour.	**cum**	56.00
2.1.5	Earth excavation, backfilling & forming both side of the concrete canal (bund height 600 mm, bund top width 300 mm & side slope 1:1) as directed	**lm**	400.00
2.1.7	Furnishing placing & watering turf till take roots, Transport within 1.0 Km by T.T.	**sqm**	240.00
2.2	**Agri Road**		
2.2.1	Clearing & grubbing Light jungle, including removing outside of the Reservation by Machinery & burning.	**ha**	0.78
2.2.2	Stripping topsoil depth of 75 - 150 mm to receive new earth surface & spoil to waste & spread 60 m by machinery.	**sqm**	7020.00
2.2.3	Earth excavation from the burrow area, transporting 1.0 km - 2.0 km, placing as layers, watering & compacting, including forming & sloping canal bund/agri road by machinery as directed	**cum**	1656.00
2.2.4	Gravel excavation and placing, watering, and compaction of gravel along the tank bund road by machinery	**cum**	877.50
2.2.6	Common earth excavation & spoil to waste, cut 0 - 1.5 m, lift to 1.5 m & spread 30 m by machinery.	**cum**	621.00
2.3	**Construction of 600mm dia RCC pipe culvert**		
2.3.1	Excavation for foundation in any material except rock requiring blasting, ram, and surplus is disposed of within the site as directed by manual labour.	**cum**	9.86

2.10. Ihalagama Wewa

The Ihalagama tank (Figure 35) is part of the Kokebe cascade system located within the Kahatagasdigiliya DSD[10]. The surrounding area is predominantly agricultural, situated within the 211 / Panwella GN Division. Paddy cultivation and small-scale, irrigation-reliant cropping systems associated with the Wewa form the backbone of local livelihoods, which are further supplemented by livestock farming.

There are no residential dwellings, public or private structures, or private properties in the immediate vicinity of the proposed project site. However, the interceptor zone (K*attakaduwa*) has been completely encroached upon by local paddy farmers. (Figure 36)

Table 14: Proposed civil works under Ihalagama Wewa

Item No	Description of Work	Units	Qty
1.0	**Head Works**		
1.1	**Repair of Tank Bund**		
1.1.1	Elephant Fence removing & replacing.		Pro Sum
1.1.2	Clearing & grubbing Light Jungle, including removal from the site by machinery as directed by the Engineer and burning.	ha	2.6
1.1.3	Removing the tree (0.5 - 1.0 m girth) with the root ball and debris from the site as directed by the Engineer and filling the cavity with approved soil.	Nos	28
1.1.4	Removing the tree (1.0 - 2.0 m girth) with the root ball and debris from the site as directed by the Engineer and filling the cavity with approved soil.	Nos	4
1.1.5	Tree branches cutting, removing & burning by chainsaw and applying burn oil in cutting surfaces.		Pro Sum
1.1.6	Demolishing small-sized anthills (1 m3 - 2 m3) in the tank bund, including removing queen ant & debris outside the site and applying suitable pesticides (chemical) & fill the cavity with earth.	Nos	25
1.1.7	Demolishing large-sized anthills (2 m3 - 8 m3) in the tank bund, including removing queen ant & debris outside the site and applying suitable pesticides (chemical) & fill the cavity earth.	Nos	2
1.1.8	Stripping topsoil depth of 75 - 150 mm to receive new earth surface & spoil to waste by machinery	sqm	7,735

[10] කහටගස්දිගිලිය - කොක්ඒබේ එල්ලංගා පැනිකඩ සහ කළමනාකරණ සැලැස්ම *(Kahatagasdigiliya - Kokebe Cascade Profile and Management Plan)*

1.1.9	Clearing & grubbing Jungle, Stripping top soil in the borrow area. Earth excavation hauling and placement of fill material on bund ,spreading with 150 to 225 mm thick, layer by layer, including trimming for required profile, benching, watering & compaction, forming & slopping tank bund by using Machinery (Transport up to1.0 km), Rate including cutting and leveling upstream platform along the bund toe for providing facilities to horizontal moving of compacting machineries (Allow only upstream filling and compaction by specified compacting machineries only.)(Degree of **compaction 98%**)	cum	3,615
1.1.10	Slope preparation of the existing tank bund as directed	sqm	1,800
1.1.11	Furnishing turf, transporting within 1.0 km & planting using pegs, including watering till take roots.	sqm	3,180
1.1.12	Supplying gravel & placing, watering & compacting by machinery	cum	395
1.2	**Construction of HPT Sluice. 02 Nos**		
1.2.1	Demolishing existing sluice structures -02 Nos	-	Pro Sum
1.2.2	Earth excavation for cut opening the tank bund & dump at the site with back filling 25 % excavated soil & 75 % burrow earth, including placing, watering & compaction by machinery, cut 1.5 - 3 m, lift up to 3 m & spread 30 m.	cum	106
1.2.3	Earth excavation for the foundation in any material by manually except rock requiring blasting including disposal of surplus within the site as directed	cum	13.5
1.3	**Construction of New Bathing Steps & Repair old Bathing Steps.**		
1.3.1	Cement concrete, demolished, and debris cleared within the site as directed. (Damage section in old bathing steps.)		Pro Sum
1.3.2	Earth excavation for the foundation in any material by manually except rock requiring blasting, including disposal of surplus within the site as directed	cum	13.70
1.4	**Access Road**		
1.4.1	Clearing & grubbing Light Jungle, including removal from the site by machinery as directed	ha	0.10
1.4.2	Stripping topsoil depth of 75 - 150 mm to receive new earth surface & spoil to waste by machinery, including transporting 1.0 km - 2.0 km.	sqm	1,000.00
1.4.3	Removing the tree (0.5 - 1.0 m girth) with the root ball and debris from the site as directed by the Engineer and filling the cavity with approved soil.	Nos	4.00
1.4.4	Common earth excavation & spoil to waste or fill material, cut up to 1.0 m, lift up to 1.0 m & spread 30m by manual labour. (cutting side drain)	cum	81.00
1.4.5	Earth excavation from burrow area, transporting 30 m - 1.0 km, placing as layers, watering & compacting, including forming & slopping canal bund/agri road by machinery as directed by the Engineer. (Including Clearing & grubbing Jungle, Stripping top soil in the borrow area.) (Degree of **compaction 98%**)	cum	338.00
1.4.7	**Construction of 450mm dia Culvert. 02 nos.**		

1.4.7.1	Earth excavation for the foundation in any material by manually except rock requiring blasting, including disposal of surplus within the site as directed	cum	6.60
1.5	**Desilting**		
1.5.1	Desilting & spoiling to waste, cut 0 - 1.5 m, lift to 1.5 m by machinery, including transporting 1.0km - 2.0 km and forming as directed	cum	6,000.00
2.0	**Down Stream Development.**		
2.1	**Canal Lining**		
2.1.1	Earth excavation for the foundation in any material by manually except rock requiring blasting, including disposal of surplus within the site	cum	103.35
2.1.2	Earth excavation, backfilling & forming both side of concrete canal (bund height 600 mm, bund top width 300 mm & side slope 1:1) as directed	lm	1,060.00
3.0	**Special Works.**		
3.1	Improvement of Kattakaduwa as per instructions and develop for the relevant requirements.		Pro Sum
3.2	Construction of Goda wala cut 0 - 1.5 m, lift to 1.5 m by machinery, including transporting 1.0km - 2.0 km and forming as directed	cum	850.00



Figure 35: The Ihalagama Wewa

The presence of elephants in the upper periphery of the tank is common throughout most of the year. This frequentation is primarily driven by the availability of foraging grounds, such as grasslands and adjacent forest patches located within the upper catchment area (Figure 35). Periodically, elephants cross the tank bed to access downstream agricultural command areas (paddy fields). To mitigate potential HEC, an electric fence has been installed to secure and protect the tank bund.

In terms of terrestrial flora, the tank remains largely free of aquatic IAS, while terrestrial invasive species are minimally present. The existing woody vegetation on the tank bund consists primarily of dry-zone evergreen species. Although the BoQ specifies the removal of 32 trees from the bund,

joint field verifications conducted with DAD officials revealed that this estimate was overstated. Consequently, only **10** trees were identified for removal, as detailed in Table 16.[11]



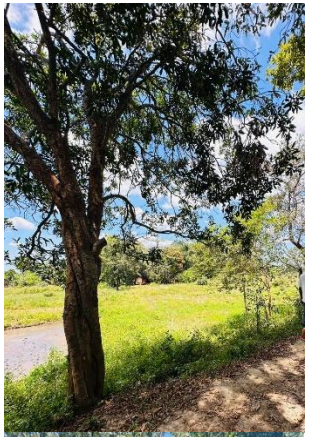
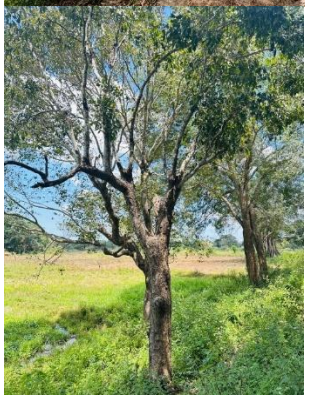
Figure 36: The bund, the interceptor zone, and paddy fields of Ihalagama wewa.

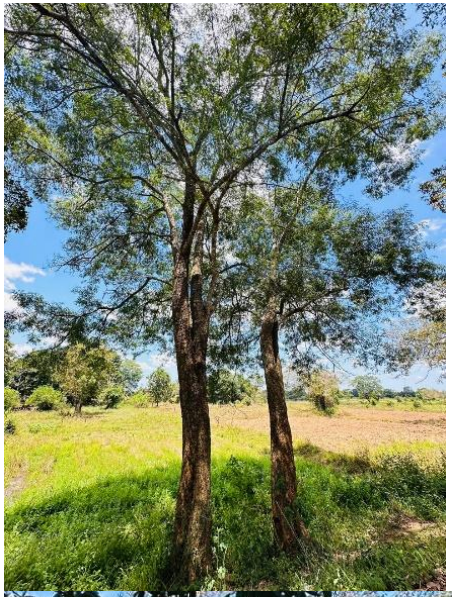
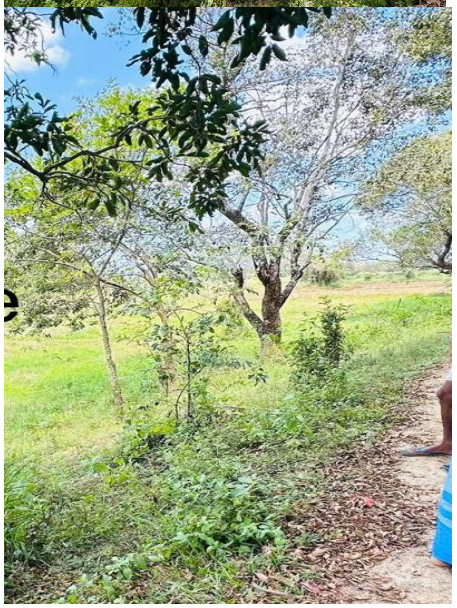


Figure 37: The tank bund and the paddy fields are protected by an electric fence

[11] However, this number may change during the works as removing or not on few other trees will be decided during the works are ongoing, as informed by the DAD – TO.

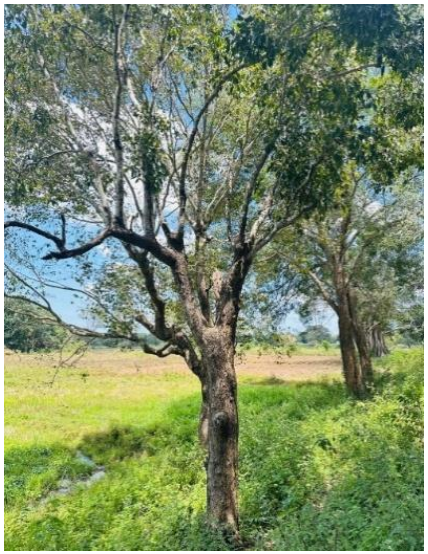
Table 15: Removing Trees in Ihalagama Wewa

No	Name of the tree	Scientific Name	Diameter @ the DBH	Coordinates	Justification for Removing	Picture
01	*Igini tree - clearing-nut tree*	*Strychnos potatorum*	108 cm	8.38970^0 N 80.78680^0 E	Tree removal on the tank bund is strictly limited to areas where it is essential for structural integrity and construction safety. Removing specific trees creates the necessary workspace between the water's edge and the construction zone to properly	
02	*Ma dan tree (Java Plum)*	*Syzygium cumini*	87 cm	8.38709^0 N 80.78074^0 E		

03	Huri tree *(Black Siris)*	*Albizia odoratissima*	69 cm	8.39011^{0} N 80.78688^{0} E	deposit and compact new soil layers, while providing a clear, safe pathway for heavy machinery to operate without risk of accidents. Additionally, eliminating large trees prevents root networks from penetrating the ancient bund structure, which can cause internal water leaking, soil loosening, and long-term structural breaches.	
04	*Kon tree (Ceylon Oak tree)* *Removing Igini Tree*	*Schleichera oleosa*	126 cm	8.38060 ^{0}N 80.70180 ^{0}E		

05	Kon tree (Ceylon Oak tree)	Schleichera oleosa	72 cm		
06	Igini tree - clearing-nut tree	*Strychnos potatorum*	138 cm	8.38970^0 N 80.78680^0 E	

07	**Two** Ma dan tree (Java Plum)	*Syzygium cumini*	1. 114 cm 2.178 cm	8.38709^0 N 80.78074^0 E



08	**Two** Huri tree (Black Siris) [12]	*Albizia odoratissima*	1. 2.	8.39011^0 N 80.78688^0 E

[12] Photographs are not available, but two trees were identified and recorded.

3. Impact Matrix Code

Table 16: Impact Matrix Code

Risk Level	Nature of Assessment/Impact-Based Criteria	Mitigation Based Criteria
High Risk	The subproject will be classified as 'High risk' if: The sub project is expected to cause significant, severe, long-lasting, or permanent damage to the natural, physical, or social environment, cannot be mitigated or; ○ Sub-projects that involve significant conversion or degradation of critical natural habitats such as sensitive ecosystems (e.g., wetlands, primary forests, protected areas). ○ The effects extend beyond the project site, potentially impacting entire regions or even neighboring provinces. ○ The risks of the sub project are novel, complex, or the project involves specialized or hazardous processes that are difficult to manage. ○ Sub projects involving large-scale use of hazardous materials, significant air emissions, or large volumes of untreated industrial waste. ○ Sub projects that significantly alter major hydrological systems, such as large dams or barrages, which can affect river flow, aquatic biodiversity, and downstream communities. ○ Sub projects requiring the physical displacement or economic displacement (loss of land, assets, or access to resources) of a large number of people. ○ Sub projects impact on Indigenous Peoples/Vulnerable Groups ○ Sub projects that negatively affect the land, natural resources, culture, or livelihoods of Indigenous Peoples or other significantly vulnerable populations, often requiring Free, Prior, and Informed Consent (FPIC). ○ Major construction activities or infrastructure that poses severe risks to the health, safety, and security of surrounding communities (e.g., large-scale labor influx, major traffic hazards, or structural risks). ○ Destruction or significant damage to nationally or internationally recognized physical cultural resources or heritage sites.	Mitigation necessitates meticulous planning and the implementation of high-tech, costly design solutions. Even with such measures, residual effects are likely to persist.
Substantial Risk	The Subproject will be classified as a substantial risk intervention if it will directly lead to the following;	Mitigation is feasible and effective,

	○ Activities that could lead to invasion or spread of weeds and feral animals or the use of toxic chemicals, intensive use of pesticides. ○ Activities that could dangerously lead to the exposure of sensitive/critical/vulnerable habitats. ○ Construction of large new infrastructure within or directly adjacent (in buffer zones) to protected areas. ○ Illegal Activities as defined specifically under the Forest Ordinance and Fauna and Flora Protection Ordinance. ○ Subprojects, those involve collection of seeds/farming materials from the wild. ○ Sub-projects that may impose changes in land use that restrict access to resources in legally designated parks or protected areas or other common property resources on which local people may depend for livelihood purposes. In addition, as per the screening the subproject will have a majority of large-scale E&S impacts that will cause irreversible damage to the environment and communities.	requiring only moderate design-based and/or operational planning. Residual effects are expected to be nil, minor, or temporary in nature.
Moderate Risk	The subproject will be classified as 'Moderate risk' if: ○ The subproject will have a majority of reversible, small-medium scale E&S impacts, specifically limited to the civil works phase of the project that can be managed by site specific mitigation measures. ○ Require minor land acquisition or restrictions on land use, as a result of which there will be no significant impact on incomes or livelihoods. ○ Subprojects requiring adoption of Abbreviated Resettlement Action Plan (ARAP), Environmental and Social Management Plans (ESMPs) and or E&S Assessment and require further screening in line with the detailed technical designs of the respective subproject.	Mitigation is straightforward and low-cost, and it is expected to fully address the impact. No residual impacts shall remain.
Low Risk	A subproject will be classified as 'Low risk,' if: ○ The Subproject has low-negligible E&S impacts that can be managed via mitigatory codes of practice that will be defined as part of the contractual agreement/memorandums of understanding with project implementing contractors or operators. ○ The Subproject does not require any land acquisition or lead to any impact on incomes or livelihoods. ○ The Sub-project does not require formal E&S assessment, nor preparation of ESMPs and do not have identifiable negative E&S impacts.	No mitigation required or minimal preventive measures sufficient within O & M.

4. Environmental Screening

Table 17: Environmental Screening for the proposed rehabilitation works

No	Screening Questions	Yes/No	Scale of Impact	Remarks
1	Will the proposed project involve the **construction of new physical infrastructure or the rehabilitation of existing infrastructure**? Or; Will the project involve any of the following? (Select all that apply) **1.1.** Construction of new physical infrastructure (e.g., buildings, roads, anicuts, canals, sluice gates, pipelines *etc.*). **1.2.** Rehabilitation, expansion, or upgrade of existing physical infrastructure. **1.3.** Will the project activities involve changes to the original design levels of the headworks (Raise the height of tank bund? And/or raise the height or length of existing spill?) that could lead to the inundation of new areas within the catchment?	**1.1. Yes** **1.2. Yes** **1.3. No** **1.4. No**	**Low Risk**	**Rehabilitation of the headworks** and **downstream developments** are proposed. The specific scope of work is outlined below: **1.1. New Works** The following new structures and improvements are proposed for both tanks: • Canal Lining • Farm Turnouts • Tractor Crossings • Hume Pipe Culverts **1.2. Bund, spill and canal rehabilitation works, and Agri Road Improvements** • Rehabilitation of tank bunds • General rehabilitation of canals. • Improvements to the existing farm access roads. **1.4. Tank Bed Dredging** • Dredging is proposed for specific tanks as outlined in Chapter 2 (Eg. Dik wewa, Nikatuwa wewa, Kalukota wewa, and Wessyaddewa Wewa). The management of dredged spoil will follow a beneficial reuse strategy:

No	Screening Questions	Yes/No	Scale of Impact	Remarks
	1.4. Dredging of the tank bed and the subsequent disposal of dredged materials? **1.5.** If yes, will the dredged material be disposed of on-site or off-site?? **1.6.** Solid waste management:			• **Structural Applications:** Gravel and coarse aggregates will be utilized for tank bund rehabilitation, while suitable fill material will be used for canal restoration and access road improvements. • **Agricultural Use:** Organic-rich sediments will be made available to local farmers as soil amendments upon request. • **Habitat Enhancement:** Where feasible, and in consultation with the DAD, dredged material may be used to construct internal mounds (islands) to promote aquatic bird nesting. • **Disposal:** Off-site disposal will only be considered as a final resort if the material is unsuitable for the applications mentioned above.
2	Will any of the planned improvements necessitate an artificial lowering of the reservoir's water level? * If the water level will be artificially lowered, please specify the anticipated duration and magnitude of the drawdown.	No	--	Based on discussions held with the DAD and the Farmer Organizations, there is no intention to lower the tank water levels for the proposed rehabilitation works. Construction activities shall only be carried out following the completion the cultivation seasons.
3	If the water level will be artificially drawn down, please assess the potential impacts on:	**No**	--	

No	Screening Questions	Yes/No	Scale of Impact	Remarks
	16.1. Surface Water: Will the draw down alter water flows in nearby streams, rivers, or canals, particularly during the dry season? **16.2. Groundwater:** Will the draw down affect the groundwater table or flow in local wells, especially during the dry season? **16.3. Ecology:** Is there a risk that this activity will affect the ecology of the tank bed or other important wetlands around and canal systems that depend on it? **16.4**. If a risk is identified, please describe the specific potential impacts on the ecosystem (e.g., impact on aquatic life, changes to vegetation, effects on migratory birds and other fauna).			
4	Will the project cause localized flooding and/or poor drainage during construction?	**No**	--	No such impact is expected.
5	Will the construction and operation of the Project involve actions which will cause physical changes in the locality (topography, land use, changes in water bodies, *etc*.)	**No**	**--**	No such an impact is possible.
6	Will construction of the project cause soil erosion within the site due to steep grade or soil content?	**No**	**--**	The proposed **tank bund renovation** and **canal rehabilitation** works in the selected tanks involve significant earthworks. However, the risk of significant soil erosion is considered minimal due to the following factors:

No	Screening Questions	Yes/No	Scale of Impact	Remarks
				• The construction design does not require steep embankment cuts, ensuring better structural stability of the slopes. • The prevailing soil profile in the Anuradhapura region is not predominantly sandy; instead, it consists of cohesive properties that are less susceptible to rapid erosion. • The construction schedule is aligned with the **dry season**. By avoiding periods of heavy monsoon rainfall, the potential for sediment runoff and water-induced erosion is significantly reduced.
7	Will the Project release pollutants or any hazardous, toxic or noxious substances to **7.1.** Air? **7.2**. Nearby surface or groundwater sources? **20.3**. Soil?	**7.1. Yes** **7.2. No** **7.3. No**	Low Risk	7.1. The project will generate temporary, localized emissions from the combustion of fossil fuels by construction equipment and project-related vehicles. However, these emissions will not be on a significant scale. While dust emissions may occur due to soil disturbance during dry periods, the overall impact is considered negligible and insignificant given the limited duration and scope of construction. These activities will not result in the long-term release of hazardous, toxic, or noxious substances. **7.2.** There are no groundwater sources along the project boundary; therefore, no such impact is expected, as interventions are limited to the surface layers of the soil.

No	Screening Questions	Yes/No	Scale of Impact	Remarks
8	Will the proposed activities cause **8.1**. Noise? **8.2**. Vibration? **8.3**. dust emission? **8.4.** Release of light? **8.5**. Heat energy? **8.6**. Electromagnetic radiation?	**8.1.** Yes **8.2**. Yes **8.3**. Yes **8.4.** No **8.5**. No **8.6**. No	Low Risk	While the proposed rehabilitation works—specifically tank bund renovation and excavation—will generate noise and vibration, the overall impact on the local community is expected to be temporary and localized. In specific project locations, sensitive receptors (residential units) have been identified within a 100-meter radius of the work site. Potential noise emissions from heavy machinery, including backhoe loaders and construction vehicle movements, will be intermittent and confined to the active construction phase. To mitigate these impacts, work will be restricted to standard daylight hours, and all equipment must be maintained to comply with national noise emission standards. **8.3**. Dust emission will occur with the dry weather and wind action prevails. But in the sense of the community, it is not a concern. However, the gravel and sand access roads may be a source of dust during construction due to vehicle movements, and dust suppression measures should be implemented along them concerning the wildlife even. **8.4**. No nighttime works shall be involved under this contract 8.5 & 8.6. No

No	Screening Questions	Yes/No	Scale of Impact	Remarks
9	Does the proposed location fall within or border any gazetted protected areas (PAs) designated by the Forest Department (FD) or the Department of Wildlife Conservation (DWC), Department of Archaeology or any other?	**Yes**	**Low risk**	While forests exist within the broader catchment area, they are situated outside the immediate impact zone of the proposed tank rehabilitation sites. Direct impacts on forest vegetation are therefore not anticipated. However, the project may indirectly affect wildlife populations that utilize these forests as primary habitats. Consideration must be given to the potential for human-wildlife conflict or behavioral shifts caused by machinery operation and increased human presence in the vicinity.
10	Is the proposed project location known to contain any species protected under the Fauna and Flora Protection Ordinance, or any other sensitive species of fauna or flora? If yes, please provide details on the species and why they are considered sensitive (e.g., critical for breeding, migration routes, *etc.).*"	**Yes**	**Moderate risk**	Wild elephants are the main protected species in the area. Other species protected under the FFPO may exist; however, a comprehensive biodiversity assessment was beyond the scope of this screening.
11	Will the proposed project activities cause negative effects on wildlife habitats, populations, corridors or movement?	**No**	**--**	The project areas are identified as a **Human-Elephant Conflict (HEC) zones**. Elephants are encroaching paddy lands frequently. Additionally, there have been sightings of other common wildlife species around the tanks' vicinity.
12	Will the proposed project activities cause negative effects on impact on fish migration and navigation?	**No**	--	Such an impact is not expected.

No	Screening Questions	Yes/No	Scale of Impact	Remarks
13	Will the proposed project activities will cause increased risk of wildlife poaching and forest fires?	**Yes**	**Low Risk**	Wildlife may approach the tank for water, particularly during the evening hours, which presents a potential risk for poaching. This risk should be mitigated by establishing appropriate protective measures and monitoring programs.
14	Will tree felling be required for the proposed project activities? If yes, please provide an estimate of the number of trees to be felled and their species.	**Yes**	**Low Risk**	Details are provided under chapter 2 above.
15	Are there any areas or features of high landscape or scenic value on or around the location which could be affected by construction activity?	**No**		The project site is situated on relatively **flat terrain**, primarily characterized by **human habitation** and **paddy cultivation**. Forest can be observed at the upper catchment areas. However, no significant impacts on the natural environment or scenic value of the surrounding environment are anticipated or considered likely as a result of the proposed works.
16	Any invasive fauna or flora presents in the tank or surrounding area?	**Yes**	**Low Risk**	There are no aquatic invasive plants found in the tanks or along the canal segment or around the paddy field. But terrestrial invasive plants such as *Lantana* sp. were observed along the tank bunds and canal segments as isolated plants.
17	**Details of headwork structures and reservoir** • Bund Height:	**Bund Height / Tank Storage:** "Variable across the cascade; official data unavailable at the DAD regional office."		

No	Screening Questions	Yes/No	Scale of Impact	Remarks
	• Tank storage volume: • Year of last rehabilitation:	**Year of Last Rehabilitation:** "Unknown/Unrecorded; approximately 25–30 years ago according to local farmers." **Structural Assessment:** "No records of a formal structural assessment prior to the current proposal." **Siltation Issues:** "Significant siltation observed across most tank beds; requires desilting to restore design capacity."		
18	**Structural Integrity of Bund and Structures** 18.1. Has a structural assessment been done prior to the proposed rehabilitation? 18.2. Is the spill and tail canal large enough and clear of debris, trees, and sediment? 18.3. Are the spillway and the bund protected against erosion? 18.4. Is there enough height between the normal water level and the top of the dam to handle unexpected rainfall?	18.1. No formal structural assessment has been conducted prior to this proposal. 18.2. While the spillway and tail canal function adequately under normal weather conditions, the current capacity of the few tanks is insufficient to handle extreme weather events (e.g., heavy monsoonal storms, Cyclones). Since some of the spill tail canals become sedimented, vegetation over grown *etc.* 18.3. The tank bunds are primarily covered by naturally occurring vegetation, which provides some protection; however, there is minimal evidence of active maintenance or anthropogenic intervention by farmers to reinforce the bunds against erosion. 18.4. The freeboard is generally sufficient, as spilling typically only occurs during the Northeast Monsoon. Under normal circumstances, there are no records of water overtopping the tank bunds.		
19	**Potential Losses of a Bund Failure** 19.1. Are there any houses and community buildings within the potential flood path downstream? If yes, please define.	 		

No	Screening Questions	Yes/No	Scale of Impact	Remarks
	• Would a bund failure wash out roads, bridges, culverts? • Are there other tanks downstream that could fail in a cascade effect? • Would a bund failure result in significant environmental or severe economic loss (e.g., to farmland, houses, roads, culverts)?	These photographs show the spill area of the Millagala tank. The spill tail canal crosses a village access road, and one edge of the tank bund is adjacent to that same road. Additionally, there is a house situated parallel to the canal. These are some of the conditions encountered during the screening process. The smaller tanks and bunds within the Maha Kirimatiyawa cascade are situated adjacent to village access roads. In some cases, residential units are located within a 200 m periphery, or project impact zone. There are also road culverts in the vicinity. Consequently, any failure of the tank bunds could result in considerable loss or damage to humans, roads, culverts, and nearby few residences. Impact on wildlife is not known actually. The tanks selected for this intervention are located along nearly the same contour line and are interconnected by canals, all of which are less than one kilometer in length. There are no downstream tanks in the immediate vicinity.		

5. Screening Decision

5.1. Project Context and Scope

The proposed rehabilitation works for ten selected tanks in the **Maha Kirimatiyawa** and **Kokebe** cascades are located within well-established agricultural command areas within the Kahatagasdigiliya DSD in the Anuradhapura District. As detailed in Chapter 2, the project scope encompasses bund renovation, selective tank desilting, and specific downstream irrigation improvements.

5.2 Key Findings

Social & Occupational Health and Safety (OHS): The project entails standard construction-related health and safety risks, which must be managed by strictly adhering to mandatory OHS protocols. Additionally, specific field mitigation measures will be implemented to manage wildlife-related hazards, specifically focusing on preventing snakebites and human-elephant encounters.

Physical Environment: The proposed civil works will involve extensive earthworks. Risks of localized soil erosion and fugitive dust emissions are anticipated during the rehabilitation of tank bunds, canal linings, agricultural/access roads, and road gravelling. Consequently, the transport of soil, management of stockpiles, and the rehabilitation of borrow/excavated sites must be executed and monitored systematically. These impacts are localized, temporary, and manageable through standard engineering best practices.

Biological and Cultural Context: Wildlife activity within the project footprint is notable, with evidence of HEC. While the proposed works are not located within or adjacent to designated forests or any other protected areas, the potential for archaeological chance finds remains a concern during earthworks. Furthermore, the presence of aquatic or terrestrial IAS within the selected tanks poses a minor risk; however, controlled biosecurity practices must be enforced during the construction phase to prevent further spread.

The removal of trees and clearing of riparian vegetation for bund rehabilitation works present potential risks to local fauna, particularly nesting birds and reptiles. Therefore, site-clearing operations must be closely monitored, and active nesting sites must be protected. To offset the loss of vegetation, compensatory tree-planting program must be implemented and managed appropriately in accordance with local environmental regulations. Number of trees mentioned in the BoQs for removal should be revisited by the DAD, and inform inwriting to the PMU.

Desilting: Desilting is proposed for few tanks, namely Dik wewa, Nikatuwa wewa, Kalukoka Wewa, Wessyaddewa wewa of Mahakarametiyawa cascade and and Ihalagama wewa of Kokebe cascade. While it supports to the ancient cascade systems to restore water capacity, it can severely disrupt

local ecosystems if unmanaged. Heavy machinery often destroys vegetative buffer zones like the *Kattakaduwa*, harms aquatic fauna, and triggers the rapid spread of invasive species on exposed soil. Furthermore, the noise and human presence at rural tanks can displace local wildlife.

Hydraulically and structurally, improper dredging risks puncturing the tank's natural clay seal/hard core, which can permanently ruin its water retention capacity through excessive leaking. It also causes high water turbidity that depletes dissolved oxygen, threatening fish populations. Finally, moving heavy equipment can destabilize fragile ancient bunds, while a lack of site-specific disposal planning often results in dredged silt washing right back into the tank or damaging adjacent paddy/agricultural lands.

Hence, desilting activity should be managed carefully by the DAD, concerning the desilting depth (at least not mentioned in the BoQs) and waste disposal plan.

Agricultural Continuity: To minimize socio-economic impacts on the local farming community, all physical rehabilitation works must be scheduled during the dry season (**post-Yala season**) or during the fallow period between cultivation cycles. This phasing ensures zero disruption to the irrigation water delivery schedules.

5.3 Conclusion and Recommendation

In conclusion, the activities proposed by the DAD, Anuradhapura District, are not anticipated to cause significant, long-term, or irreversible environmental degradation.

Therefore, the project is **recommended for implementation**, subject to the strict adherence and execution of the standard mitigation measures outlined in the **EMP**.

Name: Maheeni Samarakoon Singappuli
Title: Senior Environmental Specialist - IRDCRP
Date: 24.06.2026

6. Environmental Management Plan

Table 18: Environmental Management Plan for the Selected Tanks under Maha Kirimatiyawa and Kokebe Cascades.

No	Potential Environmental Impacts	Key project activities causing the impacts	Mitigation Measures proposed and action to be implemented by the Contractor	Mitigation Cost	Implementation	Compliance Monitoring
1	Occupational Health and Safety: Risks to workers, particularly the potential for snake attacks during material transport, site access, and construction activities. Dehydration for workers.	**During the site access** **Material transport** **During the physical work**	1.1. Environment, Occupational Health and Safety Officer (EOHS Officer) shall be employed by the contractor covering the entire work program under this contract. He or she will be responsible for the daily implementation of EMP and SMP[13] (ESMP[14]). 1.2. Implement measures to prevent heat stroke and dehydration during the hot sunny days. Mandatory provision of safe, clean drinking water accessible at all times. It may schedule heavy work for cooler parts of the day (e.g., early morning). Clean food shall be provided for the workers at all times. 1.3. A **temporary workers' shelter** shall be constructed near the site to provide a rest area for the workers. 1.4. Possible risks of snake bites, insect attacks. - safety shoes and/or boots shall be provided for all workers, and their use is mandatory on the worksite to protect against snake bites, sharp objects, and	Construction cost	Contractor	DAD PMU

[13] Social Management Plan
[14] Environment and Social Management Plan

			other ground hazards. No one shall remain on the site after working hours. 1.5. First Aid and Emergency Response: In the event of an incident (such as a snake bite, insect attack, or any other), a designated sentinel person trained in first aid and emergency response should be kept ready on site. Immediate Hospitalization Protocol: readily available facilities must be established on site for immediate hospitalization, ensuring rapid access to the necessary medical facilities. 1.6. Cooking shall not be allowed on the sites. However, if it is essential to make tea/coffee on site, the following procedure shall be followed. Select a location on bare soil, rock, or gravel, away from overhanging branches, dry grass, or fallen leaves. Create a fire buffer zone by clearing all flammable material (leaves, dry grass, twigs, *etc*.) down to the soil in a circle at least 10 feet (3 meters) in diameter around the fire site. Lay a ground cloth or large piece of foil/rock to protect the ground, then spread a layer of mineral soil, sand, or gravel at least 3-5 inches thick on top. Build the fire on this mound. The fire should be kept small to boil the required amount of water. No kerosene, diesel, or petrol is used to ignite the fire. Use only dead and downed wood that can be easily broken by hand. Never cut wood from standing trees (dead or alive). Gather wood from a wide area to minimize impact or bring it from outside. Keep extra			

			firewood and flammable items well away from the fire buffer zone. Keep a bucket of water (or a large pot of water) and a shovel nearby at all times to quickly extinguish any embers or spreading flames. Never leave the fire unattended, even for a moment. A responsible person must be responsible for supervising the fire until it is completely out. Finally, allow the fire to burn down to fine white ash and small embers. Pour lots of water onto the fire, ensuring all embers, coals, and wood fragments are thoroughly soaked. Do NOT use dirt to put out the fire, as it can smother the flames but insulate hot coals, allowing them to reignite later. Use a stick or shovel to stir the ashes and coals to ensure the water reaches the center and bottom layers. Drown and stir repeatedly until the mixture is cool to the touch. (The ashes and pit must be cool to the touch before leave the site in the evening. Once completely cool, scatter the ashes and any unburned wood widely over the prepared area to further minimize impact. **1.7**. Ensure all equipment and vehicles are inspected, well-maintained, and operated only by certified and licensed operators. **1.8.** To prevent accidental falls and vehicle-induced collapses, all sites must be clearly demarcated. **Physical Barriers:** Use rigid barricades (e.g., scaffolding pipes or heavy-duty plastic fencing) at a minimum height of **1.1 meters** around the perimeter of the cut, as appropriate.			

			Warning Signage: Post high-visibility "Deep Excavation" and "Authorized Personnel Only" signs at 10-meter intervals, as appropriate/if required. **Night Visibility:** All delineation zones must be equipped with solar-powered amber flashing lights to ensure visibility during low-light conditions or heavy rain. **Surcharge Loading:** No heavy machinery, excavated spoil, or construction materials shall be placed within **1.5 meters** (or a distance equal to the depth of the cut) from the edge of the excavation. **1.9. Elephant Sentinel:** A dedicated **elephant sentinel** (or lookout person) with local knowledge of elephant behavior and movement patterns must be hired. This person's sole responsibility is to monitor for approaching elephants and alert the workers. **Early Warning System:** The sentinel should be equipped with a communication device (e.g., a horn, whistle, or mobile phone) to provide a clear and immediate warning to all on-site personnel. **Emergency Supplies:** A supply of **firecrackers** should be obtained from the DWC regional office under the recommendation of the Department of Agricultural Development (DAD). These are to be used only in **emergency situations** to deter elephants and should be deployed by trained personnel. **Temporary Electric Fencing:** If recommended by the DWC, a temporary electric fence shall be erected around the immediate work area. The fence must be clearly marked and powered by a low-voltage unit designed for wildlife deterrence.			

			No Harm Principle: Under no circumstances shall any elephant be harmed, injured, or killed as a result of project activities. All personnel must be briefed on this non-negotiable principle. **1.10. Traffic Management and Public Safety** **Site Access and Haulage** Construction materials may need to transported via main roads as well as village roads (which are not constructed appropriately). Almost all the tanks located within the villages where public use the tank access roads. Hence; ▪ **Driver Briefings:** All drivers must be formally briefed on defensive driving techniques, strict adherence to national speed limits, and local traffic regulations. • **Scheduling:** To minimize congestion and risk, material haulage should be scheduled during **off-peak hours** (low traffic periods) whenever possible. ▪ **Safety on Village roads, Agricultural Roads & Tank Bunds.** Where above roads are utilized as tank access roads, the following safety measures are mandatory to protect local commuters and infrastructure: • **Signage and Awareness:** Clear, high-visibility warning signs (e.g., **"Construction in Progress," "Caution: Deep Excavation"**) must be installed at least **50 meters** ahead of the work zone from both approach directions. • **Night Safety and Perimeter Control:** Any excavations remaining open overnight must			

			be securely cordoned off using **high-visibility reflective tape**, **orange safety cones**, or **barricades** equipped with amber flashing lights to ensure visibility in low-light conditions. **1.11. Construction Material Management:** ▪ No stockpiling of excavated silt or construction materials on the road surface. Ensure the road remains clear for the passage of vehicles at all times. ▪ Identify a suitable area for temporary material storage near the tank where sufficient space is available, subject to the authority and approval of the DAD. **1.12. Dust and Air Quality Control** **Water Sprinkling:** The contractor must implement regular water sprinkling on the dry canal banks and the road shoulder during active work hours to suppress dust, which can affect the health of villagers and visibility for riders. **1.13. Vehicle Maintenance:** Ensure that all machinery (backhoes, tractors) is well-maintained to prevent excessive smoke emissions or oil leaks onto the public roadway. **1.14. Work Scheduling:** Coordinate with the local **Farmer Organization (FO)** to avoid construction during peak cultivation or harvesting times when vehicle movement (tractors/trailers) might increase temporarily.			
2	Biological Invasion: The	Rehabilitation of pond dikes,	**Terrestrial or aquatic invasive species occurrence are very limited within the both catchments; therefore,**	-----	Contractor	DAD PMU

	risk of spreading invasive terrestrial and aquatic plant species.	canal dikes, cleaning/rehabilitation of canals, and Material transportation.	**no chance shall be kept to introduce invasives under this contract.** 2.1. None of the chance shall be kept to inoculate aquatic invasives or any other species to the canal segments. 2.2. All tools and machinery (machetes, shovels, vehicle tires, and boots) shall be cleaned before leaving the site. 2.3. Borrow material for farm road rehabilitation works to be brought from properly identified borrow pits and quarry sites; the sites should be inspected in order to ensure that no other form of invasive plant species is being carried with the borrow material. As much as possible, locate burrow sites within a radius of 10Km to the site.			
3.	Accumulation and disposal of solid waste due to proposed activities.	Removal of vegetation. Solid waste from construction staff.	3.1. Disposal should be coordinated with the Department of Agrarian Development and the local Farmer Organization (Govi Sanvidhana). 3.2. Demolished structures, such as sluices and concrete spill structures, should be **disposed of** in an appropriate location or buried **in consultation with** the DAD Engineer. 3.3. Always consider surrounding paddy fields. Ad-hoc dumping in one area can cause rapid pollution in the next tank in the cascade. 3.4. No labour quarters shall be allowed on site under this contract on or around the worksite due to elephant encounters. A suitable location shall be found by the contractor. 3.5. Reusable waste, shall be either resold or reused.	------	Contractor	DAD

			3.6. Any hazardous waste must be handled with special care and according to instructions from the local authority. 3.7. The contractor shall document all types and quantities of waste generated, including their removal from the site and their disposal locations, under the supervision of the TO - DAD officer. 3.8. **Food waste must not be discarded** into the surrounding environment under any circumstances. All organic and food-related waste shall be collected in containers and **removed from the site daily**. Strict adherence to this protocol is mandatory to prevent the **attraction of elephants** and other wildlife to the work site, thereby minimizing the risk of human-wildlife conflict and ensuring the safety of personnel. 3.9. There should be no burning of wastes on site. 3.10. Workforce-related solid waste shall be removed from the site on a daily basis. 3.11. Any cleared vegetation shall be removed from the construction sites under the supervision of the DAD before the commencement of proposed interventions in the bund. No debris shall be burned on the site. Timber should be handed over to the Timber cooperation via the Divisional Secretary or following the existing regulations by the DAD. **Cleared vegetation/branches of trees along the canal may be hand over to the community, for fire woods.** 3.12. All excess material should be moved immediately to a pre-identified disposal site away from the road drainage system to prevent clogging during rainy spells.			

4	Air and Noise Pollution: Impacts related to dust, noise, and vibration.	**Operation of equipment and machinery. Material storage and transport.**	4.1. Working time for noise/vibration generation activities should be restricted and carried out only from 7.00 am to 5.00 pm. 4.2. All equipment and machinery should be operated of noise not to exceed 75 dB (during construction) as practically possible. Regular maintenance of all construction vehicles and machinery to meet noise control regulations stipulated by the CEA in 1996 (Gazette Extraordinary, No 924/12). Due to urgent or unavoidable reasons, if the construction activities happen during the nighttime, it is necessary to maintain the noise level below 50 dB.	----	Contractor	DAD
5	**Extraction of natural resources**	**Material (soil/earth/gravel) Sourcing**	The proposed bund and road rehabilitation works require a considerable amount of earth. 5.1. The contractor shall source materials from pits/quarries that hold a valid Industrial Mining License (IML) or Artisanal Mining License (AML). Every load of sand, gravel, or soil transported to the site must be accompanied by a GSMB-issued Transport Permit. (Unauthorized transport is a legal offense). If purchasing from a third party, they must hold a Mineral Trading License. 5.2. Sourcing or purchasing of any material that is sourced from any protected areas and/or designated natural areas, is strictly prohibited. Materials cannot be extracted from within the statutory reservations of rivers, streams, or the tanks themselves (usually defined as 60m from a river bank and specific limits from the high-flood level of a tank) unless specifically approved for desilting.	-----	Contractor	PID PMU

			5.3. The contractor is required to ensure that sand, aggregates (if required for this contracts), and other quarry material is sourced from licensed sources or the instructions given by the tank ownership (The Department of Agrarian Services). The contractor is required to maintain the necessary licenses and environmental clearances for all burrow and quarry material they are sourcing – including soil, fine aggregate, and coarse aggregate. 5.4. If the contractor uses a non-commercial burrow/quarry site or tank bed, the site should be remediated accordingly once material sourcing has been completed. Prior approval shall be taken from the Engineer – DAD. For new borrow pits, under recommendation and approval of the DAD, a **Restoration Plan** must be submitted to the PMU (or else should inform to the PMU for restoration plan). This includes plans for backfilling, slope stabilization, and replanting to prevent the pits from becoming breeding grounds for mosquitoes or safety hazards. 5.5. When there is a requirement, the contractor must submit in writing all relevant numbers and details of prerequisite licenses and their current status to the DAD and/or the PMU. 5.6. To prevent accidents, borrow pits must be finished with slanted edges. This will reduce the danger to both humans and animals.			

6	**Soil erosion, sedimentation of paddy fields.**	**Construction work including, clearing surface vegetation** **Removal of top soil along the canal segments and farm road.**	6.1. Installing and maintaining erosion and sediment control measures, such as silt traps, to avoid sediment runoff into the tank and nearby lands and paddy fields, shall be done. 6.2. For any activity related to the construction, the excessive clearing of ground vegetation, or the removal of trees shall not be done. 6.3. Avoid stockpiling disposed material such as removed earth from canal rehabilitation works. Those shall be reused or disposed of appropriately as guided by the TO-DAD. 6.4. All exposed soil areas shall be stabilized and re-vegetated as soon as possible on completion of works to prevent potential future erosion. 6.5. Prohibit stockpiling within riparian buffers. All stockpiles should be at least 10 m away from the edge of a canal/waterway or the tank bund. 6.6. Cover all stockpiles with tarpaulins, or dry coconut leaves *etc*. or any other suitable locally sourced material and carry out water sprinkling prevent wind erosion. 6.7. Construct temporary containment bunds and catch basins around storage piles to capture runoff shall be done as required.	Construction cost	Contractor	PID
7	**Removal of Trees**	**Tree removal for bund rehabilitation works**	The number of trees listed for removal in the Bill of Quantities (BoQ) may not reflect the actual number required for removal. Therefore, before any physical implementation begins on site, the DAD must reassess the trees that need to be removed and inform the PMU in writing of the exact number for each site.	Construction cost	DAD Contractor	PMU

			7.1. Furthermore, the DAD must mark all trees designated for removal before the contractor mobilizes. 7.2. Only trees that have been reconsidered, approved, and physically marked with high-visibility paint by the DAD shall be removed. The Contractor must ensure that adjacent trees, particularly mature native canopy trees and those within the *Kattakaduwa* – Interceptor zone, are fully protected from accidental damage by heavy machinery. 7.3. Prior to the removal of any marked trees or any other vegetation, the Contractor—under the supervision of the DAD Technical Officer or an Environmental officer—must conduct a thorough physical inspection of the branches and canopy for active bird nests, roosting sites, or wildlife habitats. 7.4. **Protection of Active Bird Nests:** If an active bird nest (containing eggs or chicks) is discovered, the tree must not be cut, trimmed, or disturbed. A temporary buffer zone with a minimum radius of 10 meters must be established around the tree. Removal activities for that specific tree and its immediate surroundings must be suspended until the nesting cycle is complete and the fledglings have permanently left the nest. 7.5. Standard administrative procedure for removal of trees shall be followed by the contractor under supervision and guidance of the DAD. Required approvals, clearances shall be obtained. Timber handing over procedure to the Timber cooperation via the divisional secretary shall be sticky followed.			

			7.6. Unwanted segments such as branches of the trees etc. shall be handed over to the community as per their request for fire wood etc. or else shall be removed from the site appropriately under supervision of DAD.			
8	**Compensation replanting**[15]	**Removal of three trees along the** tank bunds.	**8.1. Compensatory replanting** shall maintain a **1:5 ratio** for every tree removed. **8.2. Species selection** is subject to the approval of the **DAD**. **8.3.** The **DAD** will facilitate the selection of replanting sites within **DAD-managed lands**. **8.4.** Minimum sapling height shall be **2 feet**. **8.5.** The contractor shall initiate planting at the start of the contract and manage maintenance (watering/monitoring) until project completion, after which the relevant Farmer **Organization** will assume care.	Construction cost.	Contractor FO[16] DAD	PMU
9	**Exposing and damaging physical and cultural resources**	**Site preparatory work**	Upon discovery of physical cultural materials of Archaeological importance during construction work, the following shall be carried out; 9.1. Immediately stop the performing activity. (With the approval of the resident engineer, delineate the discovered site area. 9.2. Secure the site to prevent any damage or loss of removable objects. In case of removable antiquities or sensitive remains, a night guard should be present until the responsible authority takes over.	---	Contractor	DAD PMU

[15] If the **Department of Agriculture Development (DAD) Engineer** determines that additional plant removal is required during the project implementation period, a **replanting ratio of 1:5** shall be strictly maintained. All replanting activities, including subsequent maintenance and monitoring, must be conducted in accordance with the protocols specified in the **EMP**.

[16] Farmer organization.

			9.3. Through the responsible officer of DAD, notify the responsible authorities, the Department of Archaeology, and local authorities within as soon as possible. 9.4. Submit a brief chance find report under the supervision of the DAD officer, within a specified time period, with date and time of discovery, location of discovery, description of finding, estimated weight and dimension of PCR, and temporary protection implemented. 9.5. Responsible authorities would be in charge of protecting and preserving the site before deciding on the proper procedures to be followed. 9.6. An evaluation of the finding will be performed by the Department of Archaeology who may decide to either remove the Physical Cultural Resources (PCR) deemed to be of significance, further excavate within a specified distance of the discovery point and conserve on-site, and/or extend/reduce the areas demarcated by the contractor, etc. This should ideally take place within about 7 days. 9.7. Construction work could resume only when permission is given by the Department of Archaeology after the decision concerning the safeguard of the heritage is fully executed.			
10.	Water Quality Degradation: Tank water pollution stemming from construction	**From the machinery, vehicles, and stores.**	10.1. Fuel or lubricants shall not be stored anywhere on the site. 10.2. Store all oil and lubricant containers (including drums, tanks, and static plant equipment like generators) in a larger container.	Construction cost	Contractor	DAD PMU

	materials and runoff.	**Cement/concrete works.**	10.3. Regularly inspect equipment, hoses, and storage containers for leaks, drips, or signs of wear. 10.4. Designate and use a safe area for vehicle and equipment fueling and maintenance that is away from the water body and surrounding forest patches. 10.5. If a contamination happens, use absorbent socks, granular absorbents, or temporary barriers to immediately surround the spill and prevent its spread. 10.6. Clean up the spilled area in an appropriate manner, and dispose of it appropriately under consultation with the Local Government Authority (LA - Pradeshiya Sabha). 10.7. Reporting to the DAD and the PMU on the event should be performed.			
11.	Damage to aquatic fauna, downstream siltation temporally, spreading of aquatic invasives, benthic communities. It can wipe out nesting sites for indigenous fish species and disturb freshwater turtles and amphibians.	**Desilting of tanks' bed**	1.1. **Definition of Scope:** Where dredging of tank beds, canals, or spillway canals is required, the predetermined desilting depth and spatial extent shall be clearly defined by the DAD and communicated in writing to the Contractor. 11.2. **Hardpan Identification:** A trial pit or hand-auger test must be performed under the supervision of the Engineer - DAD to identify the distinct color and texture of the natural clay liner (hardpan) to ensure machinery operators do not breach it. 11.3. **Maximum Excavation Depth:** Excavation is strictly limited to the removal of accumulated organic silt and debris. A "buffer layer" of at least 15–20 cm of existing silt/clay shall be left completely intact above the natural hardpan to	Construction cost	DAD Contractor	PMU

	drying up of tanks.		maintain the tank's water retention and sealing integrity. 11.4. **Equipment Restrictions:** Only wide-track, low-ground-pressure excavators shall be used within the tank bed to minimize compaction or structural cracking of the substrata. The use of heavy rippers or pointed bucket teeth is strictly prohibited to prevent accidental puncturing of the hardpan layer. 11.5. **Monitoring of Water Levels:** If a sudden, anomalous drop in water level is observed during or immediately after desilting (indicating a potential breach or sinkhole), all excavation work must cease immediately. The Contractor must report the incident to the PMU and deploy a alternative sealing method as directed by the Engineer - DAD. 11.6. **Prohibited Substances and Refueling:** No refueling, oil changes, or maintenance of heavy machinery shall occur within 30 meters of the tank bed, bunds, or associated watercourses to prevent hydrocarbon contamination. Drip trays must be utilized for all stationary equipment. 11.7. **Silt Dewatering:** Removed silt must be dewatered in a designated area enclosed by perimeter silt bunds or sediment traps to prevent sediment-laden runoff from re-entering the tank, downstream canals, or local drainage paths. 11.8. **Beneficial Reuse of Silt:** nutrient-rich desilted material shall be prioritized for distribution to local farmers for agricultural land enrichment,			

			upon their formal request, rather than being disposed of as waste. 11.9. **Protection of Sensitive Ecological Zones:** Desilted material must not be stockpiled or spread within the interceptor bund (*Kattakaduwa*) or tree belt (*Gasgommana*) zones to avoid damaging the specialized flora and fauna of these ecosystems. Depending on site-specific approvals, the material may be reused for structural works, shaped into engineered internal islands within the tank to serve as waterbird habitats, or transported to a pre-approved disposal site. 11.10. **Supervision and Documentation:** A qualified Technical Officer from the DAD must be present on site during all mechanized desilting activities. The Contractor shall maintain a daily logbook recording the location, depth of silt removed, and any notable geological or hydrological observations.			