Animal Passage Plan

Name of Work: **Diversion of Surplus Water from the Ramanadhi Reservoir to Jambunadhi system of tanks And Excavation of a New Canal from Padmanabaperi Tank to Pungankulam and Lower Down Tanks in Tenkasi and Alangulam Taluks of Tenkasi District**

SCOPE OF THE SCHEME:

This scheme involves the diversion of flood water from Ramanadhi reservoir foreshore portion by constructing an offtake head sluice with discharging capacity 200 cusecs at 750m from the left flank end of the reservoir. The link canal offtaking from Ramanadhi reservoir runs a distance of 3215 m and it will infall into Jambunadhi river at U/S side of the Jambunadhi river's second anicut namely Narayanaperi anicut (Reach 1A). In between this, a supply channel will be excavated from this link canal to feed the first and upper anicut of Jambunadhi namely Kuthalaperi anicut (Reach 1B). The water sharing between Kuthalaperi anicut and Narayanaperi anicut will be controlled by regulators that are proposed. The water diverted through the link canal will be carried through existing Narayanaperi channel offtaking from Narayanaperi anicut to Narayanaperikulam. At inlet point of the Narayanaperi tank, water will be shared to Kaikondarkulam located adjacent to the Narayanaperi tank by introducing a regulator cum sluice.

The diverted water after filling Narayanaperi tank will be passed to two lower-down chain of tanks viz. Vellalanpudhukulam and Padmanabaperikulam. The surplus of the Padmanabaperi tank will then be diverted from its surplus course to Pungankulam by excavating a new link canal (Reach 2A - Pungankulam supply channel). A regulator cum sluice is proposed at LS150 m of this surplus course to facilitate this. (At present Padamanabaperi tank's surplus course flows to Nagalkulam which is a system tank under the Chittar system). Another two separate supply channels to feed Aladikulam (Reach 2B) and Chennathakulam (Reach 2C) will be excavated by introducing regulators at their respective offtake points from the Pungankulam supply channel.

SCHEME PROPOSALS:

The scheme contemplates the following reaches

(1) Reach 1A & 1B :

Reach 1A : Link canal from Ramanadhi reservoir to Jambunadhi river (ie upto u/s side of Kuthalaperi anicut) for length 3215 m

Reach 1B : Supply channel off-taking from LS. 2800 m of Reach 1A to Kuthalaperi anicut for a length of 125 m.

(2) **Reach 2A :** Pungankulam supply channel for a length of 2800 m off taking from LS 150 m of existing Padmanabaperikulam surplus course.

(3) **Reach 2B :** Aladikulam supply channel for a length of 1180 m off taking @ LS 1545 m of the proposed Pungankulam supply channel.

(4) **Reach 2C :** Chennathakulam supply channel for a length of 880m offtaking @ LS 2715 m of the proposed Pungankulam supply channel.

The Canal to be excavated in Reach 1A & Reach 1B lies in the Buffer zone of Kalakad Mundanthurai Tiger Reserve (KMTR) which is a non-forest area consisting of Agricultural lands and the people living in adjoining villages mainly depend on agriculture for their livelihood.

The Canal to be excavated in Reach 2A, 2B & 2C falls more than 3 km away from the Buffer area of KMTR.

ABOUT KALAKAD MUNDANTHURAI TIGER RESERVE

Location: Tenkasi, Tirunelveli, & Kanniyakumari Districts, of Tamil Nadu

Geo-codes:

Latitudes : Between 8°.25' N and 8°.53'N

Longitudes : Between 77°.10' E and 77°.35' E

Extent:

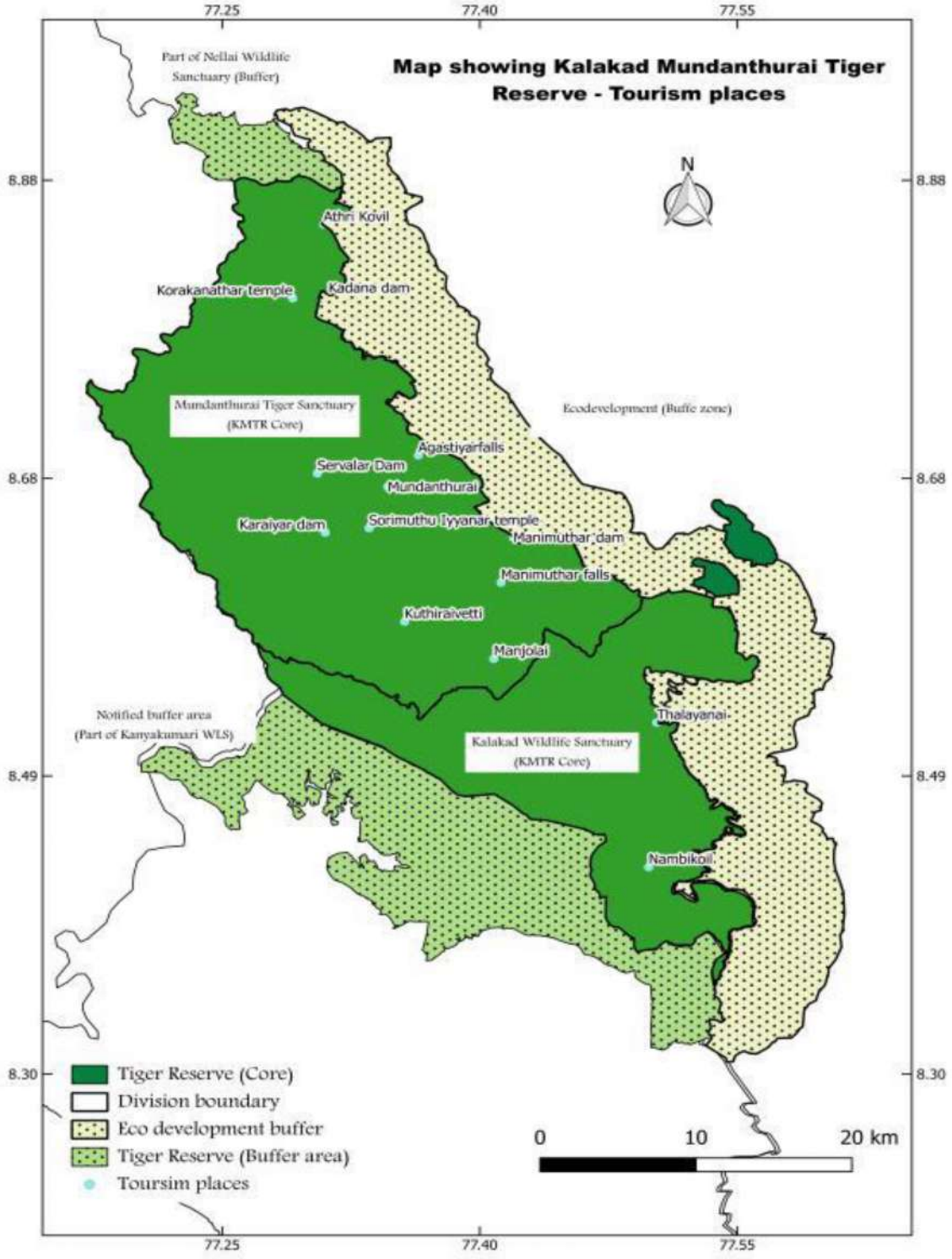
Kalakad Mundanthurai Tiger Reserve has 895 sq.km core area and 35.28 sq.km buffer area of Nellai Wildlife Sanctuary in the North, 201.36 sq.km of buffer zone area of Kanyakumari Wildlife Sanctuary and 469.90 sq.km of Eco Development Zone on the eastern front consisting of non-forest areas. The total extent of Kalakad Mundanthurai Tiger Reserve is 1601.542sq.km as shown in below figure 1.

Agriculture:

Agriculture is the main profession in the buffer area of KMTR. All the watersheds from where the rivers originating and irrigating the lands in the buffer area are from the Kalakad-Mundanthurai Tiger Reserve. Approximately 1,71,526 ha of agricultural land is being irrigated by the rivers in the districts of Tenkasi, Tirunelveli, Tuticorin and Kanyakumari. The irrigation is mainly for the cultivation of paddy which the livelihood of

the people, thus the water bodies serving as the economic backbone for agriculture and livelihood.

Fig.1 **Kalakad Mundanthurai Tiger Reserve – Core and Buffer Area**



MAN-ANIMAL CONFLICT

Almost the entire eastern periphery and the villages adjoining this area are vulnerable to conflict with wild animals. The peripheral villages mostly practice rained agriculture which is the most important source of livelihood. The Man – Animal conflicts are mainly due to crop damage by Wild Elephants, Wild pigs and other herbivores. To reduce this situation, **solar power electric fence along the eastern boundary of the Tiger Reserve has been erected** by the Forest Department and wherever possible **Elephant Proof Trenches** are being dug to restrict the Wild Elephants as well as animals such as Wild pigs inside the forests. Human death and Human Injury by wild animals are very meager in this Tiger Reserve.

NEED AND NECESSITY OF ANIMAL PASSAGE PLAN IN THIS PROJECT:

The total length of the Canal proposed to be excavated in Reach 1A & 1B of this project is 3340 m (3215 m + 125 m) which lies in the Buffer zone of Kalakkad Mundandurai Tiger Reserve (KMTR). This canal runs parallel to the protected boundary of KMTR forest area. This Buffer zone lies in the eastern side of KMTR consisting of an Agricultural non-forest area. As reported by the forest department, almost the entire eastern periphery and the villages adjoining this area are vulnerable to conflict with wild animals. In order to reduce the Man-Animal conflict in the Buffer zone where this project is proposed, **Solar power electric fence along the eastern boundary of the Tiger Reserve has been erected by the forest department** and wherever possible **Elephant Proof Trenches** are being dug by the forest department to restrict the Wild Elephants as well as animals such as Wild pigs entering from the forest area to this Buffer Zone.

As this project lies in the Buffer zone of KMTR, where already wild animals were restricted by the forest department by the way of erecting **Solar power electric fence and excavating Elephant Proof Trenches** to reduce the man-animal conflicts & crop damage by wild animals, the possibility of Wild animals crossing this buffer area is very less. Even though the possibility of Wild animals crossing this buffer area is very less, the canal proposed to be excavated in this project is designed in such a way that the wild animals can able to cross the canal at various places along the canal and the need and necessity of animal passage plan are described as mentioned below.

1. The canal from LS 0m to 500 m runs along the foot of the hills consisting of steep slopes and also lies very near to the foreshore area of the already existing Ramanadhi Reservoir. Hence the possibility of wild animals coming from the forest entering this area is very less.

2. The canal from LS 500 m to 1600 m runs very near to the forest boundary. In this reach from LS 600 m to 1300 (700 m length) trough Aqueduct is provided which is at the height of 3 m to 9m above the ground level to carry the canal water. Hence in this entire reach of 700 m length, all types of wild animals including wild elephants can also easily pass under the aqueduct (underpass) without any difficulty if any wild animals cross this area from the forest boundary. The guidelines recommend that the underpasses have an openness ratio or index of at least 2.0 to be effective for the movement of wild animals. The openness ratio of this underpass is ranging from 9.375 to 28.125 which is very effective for the movement of wild animals and it is calculated below.

   $$\text{Openness ratio} = \frac{\text{Height of the opening x Width of the structure}}{\text{Length of the underpass}}$$

   Openness ratio = (3 m x 10 m) / 3.2 m = 9.375 (For 3 m height underpass)

   Openness ratio = (9 m x 10 m) / 3.2 m = 28.125 (For 9 m height underpass)

3. The canal from LS 2000 m to 3250 m (endpoint) runs parallel to the already existing Jambunadhi River which is also running parallel to the already protected **Solar Power Electric Fenced** Forest boundary area. Hence the possibility of wild animals crossing the already protected area and also crossing the already existing jumbunadhi river is very less.

4. The proposed canal is crossing the existing cart track road in the buffer area at LS 2900 m and at LS 3135 m. Road culverts for a width of 4.25 m are provided at the above places which will also help in the movement of wild animals to cross the canal (overpass) at the above places. The above details are shown in the animal passage plan attached below.

The Total cost of construction of animal passage structures included in this project is **Rs. 6.436 Crores** as detailed below.

S.NO	Animal Passage Structures	AMOUNT (Rs.)
1	Construction of RCC Trough aqueduct from L.S 600m to 1300m (Underpass)	58624430
2	Construction of Road culvert at L.S 2900m (Overpass)	3929476
3	Construction of Road culvert at L.S 3135m (Overpass)	1808014
	TOTAL	**64361920**

By considering the above facts it is justified that the animal passage plan provided in this project is adequate for the movement of wild animals which helps in the conservation of wild animals and ecosystems.

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MODEL PICTURE OF TROUGH AQUEDUCT (UNDERPASSGE FOR WILD ANIMALS)

NAME OF WORK: DIVERSION OF SURPLUS WATER FROM RAMANADHI RESERVOIR TO JAMBUNADHI SYSTEM OF TANKS AND EXCAVATION OF NEW CANAL FROM PADMANABAPERI TANK TO PUNGANKULAM AND LOWERDOWN TANKS IN TENKASI AND ALANGULAM TALUKS OF TENKASI DISTRICT.

PLAN SHOWING THE ANIMAL PASSAGE PATH IN PROPOSED CANAL