


**FISHERIES DEPARTMENT**

# TAMIL NADU IRRIGATED AGRICULTURE MODERNIZATION PROJECT (TN-IAM PROJECT)

# PHASE III - 9 SUB-BASINS

# DETAILED PROJECT REPORT

## ESTIMATED PROJECT COST: Rs.444.77 LAKH

**Office of the Director of Fisheries.**
**Chennai – 600 035**

**INDEX**


| SL. NO. | DESCRIPTION | PAGE NO. |
|---|---|---|
| 1. | FISHERIES – INTRODUCTION & TN IAMP PERSPECTIVES | 3 |
| 2. | ABSTRACT OF COMPONENTS FOR 10 SUB-BASINS IN PHASE – III | 9 |
| **PHASE III – SUB-BASINS** | | |
| 3. | CHEYYAR | 10 |
| 4. | CHINNAR | 20 |
| 5. | GUMMIDIPOONDI | 28 |
| 6. | MANIMUKTHA NADHI | 35 |
| 7. | MUSUKUNDANADHI | 49 |
| 8. | PARAVANAR | 56 |
| 9. | VEGAVATHI | 73 |
| 10. | MARUDHAIYAR | 82 |
| 11. | NAMBIYAR | 92 |
| 12. | MONITORING SUPPORT IN SUB-BASIN & IAMP CELL | 99 |
| 13. | DOMESTICE TRAINING / EXPOSURE VISIT | 102 |
| 14. | DOCUMENTATION, OFFICE & TRANSPORT EXPENSES | 105 |
| 15. | ANNEXURES (I – VI) | 108 |
| 16. | DETAILED PROJECT REPORT – ABSTRACT | 115 |

**DEPARTMENT OF FISHERIES**

| | | |
|---|---|---|
| **Name of the Project** | **:** | **Tamil Nadu Irrigated Agriculture Modernization Project (TN IAMP)** |
| **Project Period** | **:** | **Phase – III** |
| **Sub-Basins Covered** | **:** | **10 (TEN)** |

## 1. Preface

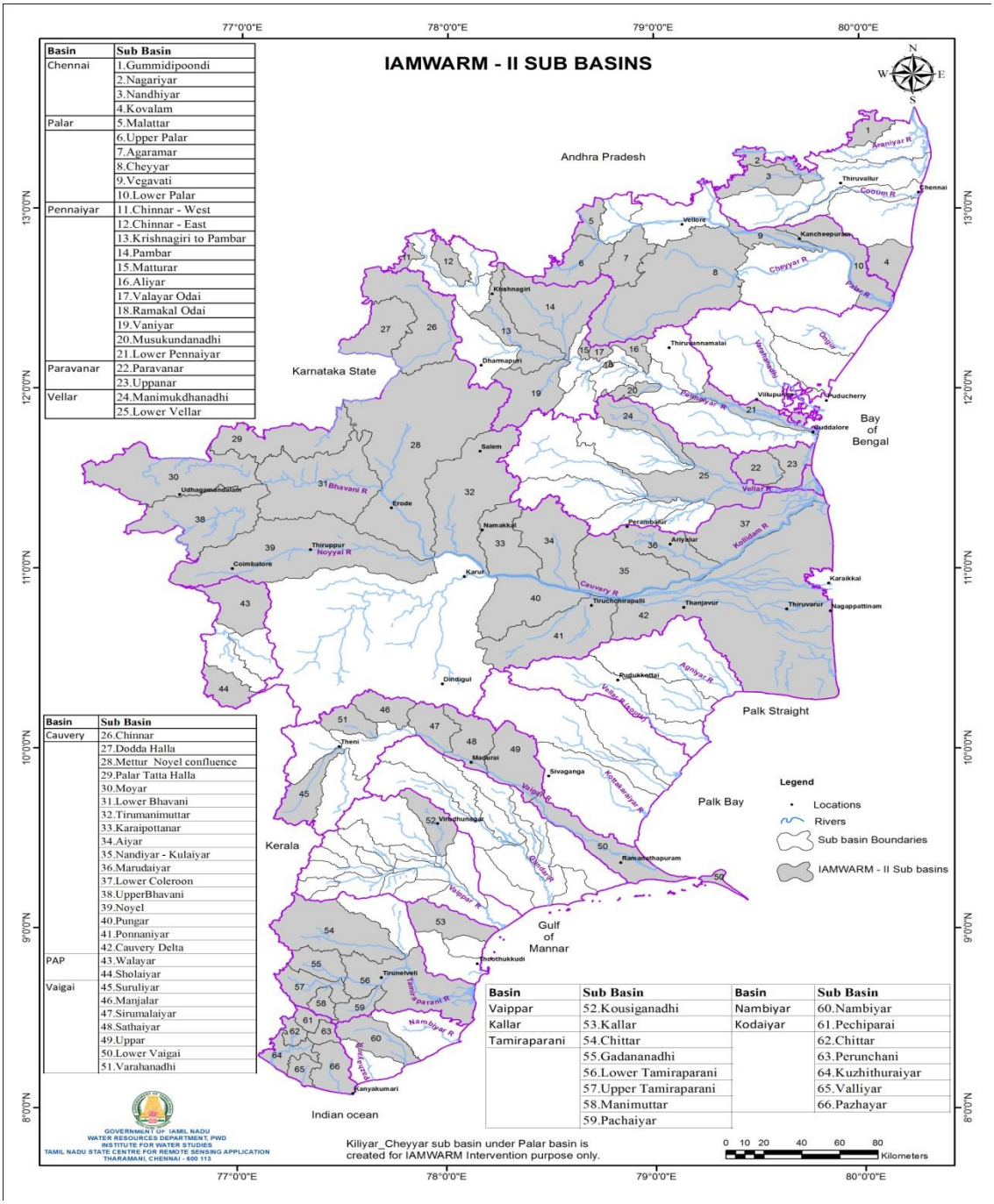
'**FISHERIES**' as a sector is one of the thrust areas in the overall economic development of the State. It plays a predominant role in the economic activity by contributing to direct and indirect employment for more than 11 lakh fishers. The sector is also contributing food security to a considerable portion of population and earning substantial revenue, especially from foreign exchange. Tamil Nadu ranks 4$^{th}$ in total fish production of the country and the total fish production of the State during 2017-18 is 7.12 lakh tons., in which 2.15 lakh tons, from Inland Fish Production.

Tamil Nadu possesses 3.83 lakh ha. of effective inland water resources comprising of Reservoirs (78 Nos. of 62,015 ha.), Long & Short Seasonal Irrigation Tanks (2,65,819 ha.), Brackish water (56,000 ha.), ponds, river, and derelict water bodies. These water bodies mainly depend on the seasonal rains. There are 60 Fish Seed Production centers *(Government Fish Farms – 11 & Private Fish Farms – 49)* and 270 Fish Seed Rearing centers *(Government Fish Farms – 37 & Private Fish Farms – 233)* caters to the need of fish seeds for the State.

In the Inland Fisheries sector, aquaculture is poised to play a pivotal role in increasing fish production, ensuring food security and enhancing growth of the State economy. Also, to maximize fish production from an unit area and to generate maximum income to the fish farmers, the Government has initiated innovative approaches such as stocking fast growing fish species in the short seasonal water bodies, integrating aquaculture in the existing irrigation systems / rain water harvesting systems, brood stock development to produce quality fish fingerlings, promotion of fish culture in farm ponds and introduction of cage culture in reservoirs etc.

To improve water delivery through modernization of irrigation system, improved water management and enhanced productivity adopting climate resilience of irrigated agriculture with improved Agricultural diversification & enhancing alternate livelihoods through Livestock and Inland Aquaculture, the Tamil Nadu Irrigated Agriculture Modernization Project (TN-IAMP) envisions improving the service delivery and enhancing unit productivity of water in a Sub-basin frame work. The World Bank Mission for Tamil Nadu Irrigated Agriculture Modernization Project (TN IAMP) has proposed to cover 66 Sub-basins in phased manner. Accordingly during Phase –III, Ten (10) Sub-basins have been identified by the MDPU.

**TN IAMP 66 SUB-BASINS MAP**




| Basin | Sub Basin |
|---|---|
| Chennai | 1.Gummidipoondi |
| | 2.Nagariyar |
| | 3.Nandhiyar |
| | 4.Kovalam |
| Palar | 5.Malattar |
| | 6.Upper Palar |
| | 7.Agaramar |
| | 8.Cheyyar |
| | 9.Vegavati |
| | 10.Lower Palar |
| Pennaiyar | 11.Chinnar - West |
| | 12.Chinnar - East |
| | 13.Krishnagiri to Pambar |
| | 14.Pambar |
| | 15.Matturar |
| | 16.Aliyar |
| | 17.Valayar Odai |
| | 18.Ramakal Odai |
| | 19.Vaniyar |
| | 20.Musukundanadhi |
| | 21.Lower Pennaiyar |
| Paravanar | 22.Paravanar |
| | 23.Uppanar |
| Vellar | 24.Manimukdhanadhi |
| | 25.Lower Vellar |

| Basin | Sub Basin |
|---|---|
| Cauvery | 26.Chinnar |
| | 27.Dodda Halla |
| | 28.Mettur_Noyel confluence |
| | 29.Palar Tatta Halla |
| | 30.Moyar |
| | 31.Lower Bhavani |
| | 32.Tirumanimuttar |
| | 33.Karaipottanar |
| | 34.Aiyar |
| | 35.Nandiyar - Kulaiyar |
| | 36.Marudaiyar |
| | 37.Lower Coleroon |
| | 38.UpperBhavani |
| | 39.Noyel |
| | 40.Pungar |
| | 41.Ponnaniyar |
| | 42.Cauvery Delta |
| PAP | 43.Walayar |
| | 44.Sholaiyar |
| Vaigai | 45.Suruliyar |
| | 46.Manjalar |
| | 47.Sirumalaiyar |
| | 48.Sathaiyar |
| | 49.Uppar |
| | 50.Lower Vaigai |
| | 51.Varahanadhi |

| Basin | Sub Basin | Basin | Sub Basin |
|---|---|---|---|
| Vaippar | 52.Kousiganadhi | Nambiyar | 60.Nambiyar |
| Kallar | 53.Kallar | Kodaiyar | 61.Pechiparai |
| Tamiraparani | 54.Chittar | | 62.Chittar |
| | 55.Gadananadhi | | 63.Perunchani |
| | 56.Lower Tamiraparani | | 64.Kuzhithuraiyar |
| | 57.Upper Tamiraparani | | 65.Valliyar |
| | 58.Manimuttar | | 66.Pazhayar |
| | 59.Pachaiyar | | |

GOVERNMENT OF TAMIL NADU
WATER RESOURCES DEPARTMENT, PWD
INSTITUTE FOR WATER STUDIES
TAMIL NADU STATE CENTRE FOR REMOTE SENSING APPLICATION
THARAMANI, CHENNAI - 600 113

## 2. Objectives

The integration of aquaculture with irrigation provides good scope for increasing the productivity of water by way of fish production without hindering the irrigation activity. The fisheries components in the Tamil Nadu Irrigated Agriculture Modernization Project (TN-IAMP) have been planned with the following objectives.

- ❖ Increase in water spread area under aquaculture and over all fish production.
- ❖ Increasing fish seed production and availability of good quality fish seed to fish farmers
- ❖ Increased fishing efficiency, by providing effective craft and gear.
- ❖ Promotion of suitable market linkages for better access to markets.
- ❖ Capacity building of farmers in adaption of latest aquaculture techniques and Institutional capacity building on aquaculture.
- ❖ Technology development of high value native ***Channa*** species.

## 3. Projects

The proposed activities are broadly grouped in to following categories.

A. Improved Fish Production Activities

B. Improved Fish Seed Production Activities

C. Improved Fish Marketing

D. IEC/ Capacity Building – Overseas / Domestic Training / Exposure Visit

E. Documentation, Office Equipment and Transport.

## 4. Phase –III Sub-Basins

| Sl. No. | Sub-Basins | Districts | No. of Taluks covered | Total No. of Tanks in the Sub-Basins |
|---|---|---|---|---|
| 1. | Cheyyar | Thiruvannamalai & Ranipet | 8 | 157 |
| 2. | Chinnar | Krishnagiri & Dharmapuri | 1 | 1 |
| 3. | Gummidipoondi | Thiruvallur | 1 | 24 |
| 4. | Manimuktha Nadhi | Kallakurichi | 2 | 33 |
| 5. | Musukundanadhi | Kallakurichi | 1 | 12 |
| 6. | Paravanar | Cuddalore | 3 | 11 |
| 7. | Vegavathi | Kanchipuram & Ranipet | 6 | 47 |
| 8. | Marudhaiyar | Ariyalur & Perambalur | 1 | 2 |
| 9. | Nambiyar | Tirunelveli | 3 | 40 |

## 5. Financial Requirement for Phase – III Sub-Basins

| Sl. No. | Sub-Basins | Amount (Rs. in lakh) |
|---|---|---|
| 1. | Cheyyar | 25.90 |
| 2. | Chinnar | 20.80 |
| 3. | Gummidipoondi | 5.50 |
| 4. | Manimuktha Nadhi | 49.95 |
| 5. | Musukundanadhi | 7.00 |
| 6. | Paravanar | 233.02 |
| 7. | Vegavathi | 17.30 |
| 8. | Marudhaiyar | 19.30 |
| 9. | Nambiyar | 11.00 |
| 10. | Monitoring Support | 40.00 |
| 11. | Domestic Training & Exposure Visit | 10.00 |
| 12. | Documentation, Office Equipments & Transport | 5.00 |
| **Total** | | **444.77** |

## 6. Project Output of Fisheries Interventions

- An area of 3,263 EWSA in Phase – III Sub-basins area will be brought under Improved Climate Resilient Aquaculture.
- The Improved Aquaculture activity shall benefit about 2000 persons.
- Fish seed rearing activities proposed will provide an output of about 10 lakh fingerlings per year after implementation of the Project.
- About 50 farmers will be directly benefited from improved seed rearing activities and an equal number of families will also be benefited.
- Fish marketing activity shall benefit more than 10 persons and majority of them will be women.
- There will be an equal number of indirect beneficiaries linked to all the activities.

**PROJECT IMPLEMENTATION ORDER AND MILESTONES WITH TIMELINE**

| S.No | Project Milestone Activities | Y1 | Y2 |
|---|---|---|---|
| 1. | *Improved Fish Production* | | |
| 1.1 | In irrigation tanks | | |
| 1.2 | In farm ponds | | |
| 1.3 | In High Value Native Species *Channa spp.* | | |
| 2. | *Improved Fish Seed Production Activities* | | |
| 2.1 | *Fish Seed rearing in cages* | | |
| 2.2 | *Earthen Fish seed rearing and culture farm* | | |
| 3. | *Improved Fish Marketing (Fish kiosk)* | | |
| 4. | *Staff training (capacity building*) | | |
| 4.1 | Domestic training | | |
| 5. | *Farmer training programs related to fish production in irrigation tanks, farm ponds, seed production, improved marketing* | | |
| 6. | *Documentation, Office and Transport expenses* | | |

## ABSTRACT OF COMPONENTS FOR 10 SUB-BASINS IN PHASE –III

***(Rupees in lakh)***

| Sl. No. | Interventions / Project | Units (Ha. / No.) | Unit Cost | Total Amount |
|---|---|---|---|---|
| ***I.*** | ***Improved Fish Production Activities*** | | | |
| 1. | Fish Culture in Long Seasonal Irrigation Tanks (@ 1500 Seed / Ha.-EWSA) | 1,200 Ha. | 0.03 / ha. | 36.00 |
| 2. | Fish Culture in Short Seasonal Irrigation Tanks (@ 2000 Seed / Ha.-EWSA) | 1,988 Ha. | 0.04 / ha. | 79.52 |
| 3. | Fishing Implements (Drag Net / Coracle with Gill Net) | 55 Nos. | 0.16 | 8.80 |
| 4. | Aquaculture in Farm Ponds (0.1 Ha.) | 118 Nos. | 0.30 | 35.40 |
| 5. | Murrel Hatchery | 1 Unit | 170.00 | 170.00 |
| ***II.*** | ***Improved Fish Seed Production Activities*** | | | 0 |
| 6. | Fish Seed Rearing in Cages | 13 Nos. | 0.40 | 5.20 |
| 7. | Earthen Fish Seed Rearing and Culture Farm | 7 Nos. | 5.55 | 38.85 |
| ***III.*** | ***Improved Fish Market*** | | | 0 |
| 8. | Fish Kiosk | 2 Nos. | 8.00 | 16.00 |
| ***IV*** | ***Others*** | | | 0 |
| 9. | Monitoring Support in Sub-Basin & IAMP Cell | .. | .. | 40.00 |
| 10. | Overseas / Domestic Training / Exposure Visit | .. | .. | 10.00 |
| 11. | Documentation, Office & Transport expenses | .. | .. | 5.00 |
| **Total** | | | | **444.77** |

**Rs.444.77 (Rupees four crore fourty four lakh and seventy seven thousand only)**

# CHEYYAR SUB-BASIN

**DEPARTMENT OF FISHERIES**

**Name of the Sub-basin** : **CHEYYAR**

**Districts Covered** : **TIRUVANNAMALAI and RANIPET**

## Preface

The Cheyyar Sub-basin is located in Tiruvannamalai, Ranipet and Kanchipuram Districts of Tamil Nadu. The 'Cheyyar' Sub-basin is located between the latitude12.3937°N and longitude 79.3235°E. The total command area of Cheyyar sub-Basin is 11540.69 Ha.

The Cheyyar sub-basin spread over in 7 Taluks (Tiruvannamalai, Arani, Chetpet, Chengam, Cheyyar, Kalasapakkam & Polur) & 11 Blocks (Arani, Arani west, Anakkavur, Chetpet, Chengam, Cheyyar, Kalasapakkam, Peranamallur, Polur, Pudupalayam & Thurinjapuram) in Tiruvannamalai Disrtict and 2 Taluks ( Arcot & Walaja) & 3 Blocks ( Arcot, Walaja & Thimiri) in Ranipet District. Total No. of tanks in this Sub-basin are 157, out of which 15 Nos. of tanks are taken under TN-IAMP. These tanks are classified as System Tanks and Non-System Tanks and are under the control of PWD-Water Resource Department. These tanks receive water mostly during North-East Monsoon (October to December). Availability of water after irrigation is unpredictable. As per the existing scenario, the scope for fisheries development activities in this Sub-basin is limited.

Rehabilitation of tanks proposed in TN IAMP Project in this Sub-basin shall improve the water retention period in the irrigation tanks and also by water conservation measures. As a result, the opportunity for fish culture in these irrigation tanks is also likely to improve.

## Objectives

The tank rehabilitation activities under TN IAM Project in this Sub-basin will improve water storage and delivery through modernization of irrigation system and improved water management practices. Hence there is scope for more water retention in the tanks and thus promoting aquaculture. The interventions are planned with the following objectives:-

- Increasing the water spread area under aquaculture.
- Increasing fish seed production and availability of good quality fish seed to fish farmers.

- Increased fishing efficiency, by providing effective craft and gear.
- Increasing the overall inland fish production.

**INTERVENTIONS PROPOSED IN CHEYYAR SUB BASIN IN TIRUVANNAMALAI AND RANIPETDISTRICT.**

**1.Fish Culture in Short Seasonal Irrigation Tanks (@ 2000 Carp Seed / ha. EWSA)**

**(i) Objective**

Demonstration of fish culture in suitable short seasonal tanks will be taken up by stocking quality fish seeds viz. Catla, Rohu, Mrigal, Common Carp and Grass Carp of >8cm size at stocking density of 2,000 Nos. / ha. of EWSA. Species combination and species will be decided after assessing the water quality, productivity of the tanks and availability of the fish seed at the time of the stocking to get maximum fish production.

It is proposed to take up fish culture activities in 'Short Seasonal Irrigation Tanks' of Cheyyar Sub-basin by direct stocking in 430 ha. EWSA in Tiruvannamalai District and 70 ha. EWSA in Ranipet district.

**(ii) Cost (Physical & Financial)**

***Physical***

| | | |
|---|---|---|
| (i) | Type of Aquaculture | Stock, Manage and Exploit. |
| (ii) | Proposed Effective Water Spread Area | **500ha. (430 ha Tiruvannamalai and 70 ha Ranipet)** |
| (iii) | Stocking Density | 2000 nos. / ha. of EWSA |
| (iv) | Total Seed Requirement | 10.00 lakh |
| (v) | Fish Species ( based on availability at the time of stocking) | Catla, Rohu, Mrigal, Common Carp and Grass Carp |
| (vi) | Stocking Size | >8 cm |

***Financial*** ***(Rs. in lakh)***

| | | |
|---|---|---|
| (i) | Fish Seed (Carp >8 cm @ Rs.2 / Seed x 2000 nos./ha. EWSA) | 0.04 / ha |
| (ii) | Total Seed Cost *(Area (500) x Rs.0.04 lakh)* | **20.00** |

**(iii) Area of Implementation**

The fish culture activities will be implemented to an extent of 500 Ha. EWSA in 'Short Seasonal Irrigation Tanks' in Cheyyar Sub-basin under TN-IAM Project. The following are the tanks identified based on the water availability / retention for fish culture activity.

The tentative list of tanks and the EWSA proposed for stocking is given below.

| Sl. No. | Tank/Reservoir Name | Village | District | WSA (ha.) | EWSA (ha.) |
|---|---|---|---|---|---|
| 1 | Thokkavadi Eri | Thokkavadi | Tiruvannamalai | 99.00 | 49.50 |
| 2 | Kariyamangalam Periya Eri | Kariyamangalam | Tiruvannamalai | 94.00 | 47.00 |
| 3 | Valaiyampattu Eri | Valaiyampattu | Tiruvannamalai | 54.00 | 27.00 |
| 4 | Munnurmangalam Eri | Munnurmangalam | Tiruvannamalai | 46.00 | 23.00 |
| 5 | Thorapadi Eri | Thorapadi | Tiruvannamalai | 63.00 | 31.50 |
| 6 | Kottakulam Eri | Kottakulam | Tiruvannamalai | 60.00 | 30.00 |
| 7 | Muthanur Eri | Muthanur | Tiruvannamalai | 58.00 | 29.00 |
| 8 | Padi Agragarm Chitheri | PadiAgragarm | Tiruvannamalai | 68.00 | 34.00 |
| 9 | Panaiolaipadi Eri | Panaiolaipadi | Tiruvannamalai | 52.00 | 26.00 |
| 10 | PadiAgragarm Periya Eri | PadiAgragarm | Tiruvannamalai | 77.00 | 38.50 |
| 11 | Melmudayanur periya Eri | Melmudayanur | Tiruvannamalai | 62.00 | 31.00 |
| 12 | Melmudayanur Chitheri | Melmudayanur | Tiruvannamalai | 42.00 | 21.00 |
| 13 | Eraiyur Periyar Eri | Eraiyur | Tiruvannamalai | 74.00 | 37.00 |
| 14 | Eraiyur Chitheri | Eraiyur | Tiruvannamalai | 39.00 | 19.50 |
| 15 | Korattampattu Eri | Korattampattu | Tiruvannamalai | 28.00 | 14.00 |
| 16 | Vasudevanpattu Eri | Vasudevanpattu | Tiruvannamalai | 22.00 | 11.00 |
| 17 | Karapattu Nellikuppam Eri | Karapattu | Tiruvannamalai | 24.00 | 12.00 |
| 18 | Veeranandhal PeriyaEri | Veeranandhal | Tiruvannamalai | 31.00 | 15.50 |
| 19 | Aridhari mangalam Eri | Aridhari mangalam | Tiruvannamalai | 39.00 | 19.50 |
| 20. | Eagambaranallur Tank | Eagambaranallur | Tiruvannamalai | 25.00 | 12.00 |
| 21. | Kooruvadi Tank | Malaiyampattu | Tiruvannamalai | 23.00 | 11.00 |
| 22. | Malaiyampattu Tank | Malaiyampatttu | Tiruvannamalai | 8.00 | 4.00 |
| 23. | Kolatheri | Kolatheri | Ranipet | 12.77 | 6.00 |
| 24. | Gundaleri tank | Gundaleri | Ranipet | 23.60 | 11.80 |

| | | | | | |
|---|---|---|---|---|---|
| 25. | Paradarami tank | Paradarami | Ranipet | 54.7 | 25.00 |
| 26. | Sembedu tank | Sembedu | Ranipet | 52.00 | 26.00 |

**(iv) Period**

The fish culture activities in 'Short Seasonal Irrigation Tanks' of Cheyyar sub-basin in Tiruvannamalai and Ranipet district will be implemented during 2021-2022 to 2023-2024. The year of implementation will depend on receipt of water in tanks which in turn depends on the North East Monsoon.

**(v) Output**

The increase in inland fish culture area and production will provide additional income to the fishermen/ lessee and ensure availability of protein rich quality fish at a cheaper cost to public. The expected fish production of 338 kg. / ha. EWSA of short seasonal tanks with 40% survival rate.

## 2. Fishing Implements

**(i) Objective**

The members of Inland Fishermen Cooperative Societies are engaged for fishing in Rivers, Reservoirs, Ponds, Irrigation Tanks and other leased out inland water bodies. In order to support the livelihood of the fishermen and to increase inland capture fisheries, it is imperative to provide subsidy assistance for the purchase of 'Fishing Implements' viz. Coracle / Gill Net /Coracle with Gill Net / Drag Net, to increase their fishing efficiency.

Therefore, it is proposed to provide 15 units of fishing implements at 80% subsidy assistance to the members of Inland Fishermen Cooperative Societies in Tiruvannamalai and Ranipet district for fishing in inland water bodies of Cheyyar sub-basin under TN IAM project.

**(ii) Cost (Physical & Financial)**

***Physical***

| | | |
|---|---|---|
| (i) | Total no. of units | **20 units** |
| (ii) | Type of Fishing Implements proposed | Coracle with Gill Net |

**Financial** ***(Rs. in lakh)***

| | | |
|---|---|---|
| (i) | Cost of Fishing Implements/ unit | 0.20 |
| (ii) | Total Cost | 4.00 |
| (iii) | Project Contribution as 80 % subsidy | **3.20** |
| (iv) | Beneficiary Contribution (20%) | 0.80 |

**(iii) Area**

Beneficiaries will be selected by the Department in Cheyyar Sub basin of Tiruvannamalai district for the supply of fishing implements.

**(iv) Period**

Supply of fishing implements in Tiruvannamalai and Ranipet district of Cheyyar sub-basin will be implemented during 2021-2022.

**(v) Output**

The socio-economic status of the members of Inland Fishermen Cooperative Societies / fish farmers will be improved due to increased fishing efficiency and exploitation of inland fish resources in the Cheyyar sub basin of Tiruvannamalai and Ranipet district.

## 3. Fish Seed Rearing in Cages

(i) **Objective**

For better survival of fish seeds, the seeds should be reared before stocking. Cage rearing of fish seeds is a common method which doesn't require artificial ponds for rearing fish seeds. Fish seeds will be reared from late fry to fingerlings in the cages that will be fixed in irrigation tanks. One unit of cage will consist of 3 cages of different mesh size (P16 – 1 & P8 – 2).

3 units will be provided to the farmers in Cheyyar Sub-basin of Tiruvannamalai. The project will provide cages, fish seed and feed at an estimated cost of Rs.40,000/-per unit. Installation and other expenditure will be borne by the beneficiaries.

**(ii) Cost (Physical & Financial)**

***Physical***

| | | |
|---|---|---|
| (i) | Total No. of Units | ***3 Units*** |
| (ii) | Size of the Cage | *10m x 4m x 1 m* |
| (iii) | Stocking density | *315 nos/$m^3$( 12500 nos. in 40 $m^3$ in a crop)* |
| (iv) | Survival rate | *80 %* |
| (v) | Expected fingerlings production/Crop | *10,000* |

***Financial*** *(Rs. in lakh)*

| | | |
|---|---|---|
| (i) | Cost of Cages [(1 unit with 3 cages (P16 – 1 & P8 – 2)] | 0.205 |
| (ii) | Purchase of Late Fry (37500 nos. @ 12500 nos./ cycle) | 0.095 |
| (iii) | Feed Mix (Rs.40 / kg. x 250 kg) | 0.10 |
| | Project Contribution – Total | 0.40 |
| | Total Cost *(3 Units x Rs.0.40 lakh)* | **1.20** |

**(iii) Area**

Suitable irrigational tanks of Cheyyar Sub-basin in Tiruvannamalai District under TN IAM Project.

**Period**

The intervention in Cheyyar sub basin will be implemented during the period of 2021-2022 to 2023-2024. The year of implementation will be depended on receipt of water in tanks.

**Output**

Availability of quality fish seeds for stocking in water bodies will be ensured. Additional income to the lessee / farmers either by sales of fish seed/ stocking in the leased out water bodies.

## 4. Aquaculture in Farm Ponds

**(i) Objectives**

Farm Ponds excavated for harvesting rain water in agricultural fields in the sub-basin will be promoted to do aquaculture. Besides farm ponds excavated by the Agriculture Engineering Department in the sub-basin, farm ponds excavated by other schemes (0.1 ha size) will also be taken up for aquaculture under this project.

The farm ponds are proposed to be stocked with quality GIF Tilapia seeds which would grow to marketable size within 4-6 months. Stocking density of 1500 Nos. / Pond is proposed. Department of fisheries and TNFU

will also provide training on Good Aquaculture Practices to the selected farmers.

The project will provide fish seed and feed to the farmers at an estimated cost of Rs.27,000/. It is proposed to promote aqua farming in 5 farm ponds in Cheyyar sub basin.

**(ii) Cost (Physical & Financial)**

***Physical***

| | | |
|---|---|---|
| (i) | No. of Units | **5 Units** |
| (ii) | Total Area to be developed for Aquaculture | 0.5ha. |

***Financial***

| | | |
|---|---|---|
| (i) | Fish Seed (GIFT seed >3 cm @ Rs.4 / seed – 1,500 Nos.) | 0.06 |
| (ii) | Fish Feed (Max. of 600 kg.) @ Rs.40/kg | 0.24 |
| (iii) | Project Contribution – Total | 0.30 |
| | Total Cost *(No. of Units (5) x Rs.0.30 lakh)* | **1.50** |

**(iii) Area**

Farm ponds excavated in Cheyyar sub-basin with supplementary water resources of Thiruvannamalai & Ranipet district.

**(iv) Period**

The intervention will be carried out in Cheyyar sub basin during 2021-2022 to 2022-2023

**(v) Implementation**

Department will create awareness on the intervention. Interested farmers will be identified and their ponds will be inspected. Suitability of the pond with respect to critical soil and water parameters to take up fish culture shall be studied. After selection of farm pond, the beneficiaries will be given training on Good Aquaculture Practices to get maximum yield.

**(vi) Output**

With 80 % survival rate and 500 grams of average body weight, fish production of about 600 kg per farm pond is expected which will give additional income to farmers.

## 5. Environmental and Social Management

This chapter envisages the mitigation of environmental impacts by assessing and effectively managing the potential environmental impacts due

to the interventions under TN-IAMP in Cheyyar sub basin in Tiruvannamalai and Ranipet District.

### 4.1. Summary of walk through survey

Walkthrough surveys were conducted in the sub basin in both the Districts. Officials from Water Resources Department (WRD), Agriculture Department, Horticulture Department, Tamil Nadu Agriculture University (TNAU), Agriculture Engineering Department (AED), Animal Husbandry and Fisheries Department interacted with farmers.

### 4.2 Summary of Feedback along with planned activities

The feedback of walk through survey and the planned activities are summarized below

1 Fish culture in Short seasonal irrigation tanks
2. Fishing implements
3. Fish seed rearing in cages
4. Aquaculture in farm ponds

### 4.3. Gender Strategy:

To ensure women participation in the project, women farmers will be informed and made aware of their role in decision making in fish culture, labour opportunities in fish culture, involvement in livelihood activities etc. Specific capacity building programs like exposure visits will be organized for women beneficiary, Women self help group and members of women inland fisheries co-operative society.

### 4.4. Grievance Redress Mechanism and Schedule for Establishment

At the district level, GRM sub-committee has been formed with Assistant Director of Fisheries as Chairman and executive field staff as member. The District Level Committee has been formed with District Collector as Chairman and the members being JDF / DDF, ADF, executive field staff as members. The Sub-Committee will meet on weekly or on need basis to redress the grievances of farmers / stakeholders. The District Level Committee headed by the Collector will meet on a monthly basis. The next level will be at State Level headed by the Director of Fisheries.

A register for GRM and a box for receiving the Complaints and Grievances will be maintained in the respective O/o Assistant Directors of Fisheries and

a monthly report on the Grievances received and the action taken will be sent to the Director of Fisheries for review and submission to the MDPU.

### 4.5. Plan of activities for Environmental Monitoring and Awareness:

A) The GIFT stocking in Short seasonal irrigations tanks as proposed in the overall DPR for 66 sub-basins, is being replaced with stocking of Carp seeds as per Government of India guidelines for culture of GIF Tilapia.

B) Culture of GIF Tilapia seeds in Aquaculture farm ponds will be undertaken in a secured manner in order to avoid them from entering into natural water bodies.

**ABSTRACT**

| Sl. No | Interventions | Unit (Ha/No) | | Amount (Rs.in Lakh) |
|---|---|---|---|---|
| | | Tiruvannamalai | Ranipet | |
| 1. | Fish culture in Short seasonal irrigation tanks | 430 Ha | 70 Ha | 20.00 |
| 2. | Fishing implements | 20 Units | 0 | 3.20 |
| 3. | Fish Seed rearing cages | 3 Units | 0 | 1.20 |
| 4. | Aquaculture in farm ponds | 5 units | 0 | 1.50 |
| **Total** | | | | **25.90** |

# CHINNARU SUB – BASIN

**DEPARTMENT OF FISHERIES**

**NAME OF THE SUB-BASIN : CHINNAR**

**DISTRICTS COVERED : KRISHNAGIRI and DHARMAPURI**

## 1. Preface

Chinnar sub Basin is located in Anchetty and Denkanikottai Taluk of Krishnagiri District and Palacode Taluk of Dharmapuri District. The Chinnar Sub Basin is located between the Latitude of 12.673 and Longitude of 77.816. The command area of the sub Basin comes under Anchetty and Denkanikottai Taluks of Krishnagiri District and Palacode Taluk of Dharmapuri District. The blocks lying in this sub Basin are Kelamangalam and Thally in Krishnagiri District and Palacode in Dharmapuri District. The total command area in Chinnar Sub Basin is 4000 ha in Krishnagiri District and 4476.19 ha in Dharmapuri District.

The Sub Basin covers 3 blocks and the total no of tanks in this sub Basin are 13 are taken under TNIAMP. These tanks are classified as Non System Tanks and are under the control of Water Resource Department. These tanks mostly get water during North East Monsoon (October to December). Surplus of water after irrigation is unpredictable. As per the existing scenario, the scope for fisheries development activities in this sub Basin is limited.

Rehabilitation of tanks proposed in TNIAMP project in this sub Basin shall improve the water retention period in the irrigation tanks and also by water conservation measures. As a result, the opportunity of fish culture in these irrigation tanks is also likely to improve.

## Objectives

The tank rehabilitation activities under TNIAMP project in this sub Basin will improve water storage and delivery through modernization of irrigation system and improved water management practices. Hence there is a scope for more water retention in tanks and thus promoting in fish culture.

- Increasing the water spread area under aquaculture
- Introducing Improved Production Models using fast growing fish varieties.

- Increased fishing efficiency, by providing effective craft and gear
- Increasing the overall inland fish production

**INTERVENTIONS PROPOSED IN CHINNAR SUB BASIN IN KRISHNAGIRI DISTRICT.**

## 1. Fish Culture in Short Seasonal Irrigation Tanks (Carp@ 2000 Seed / ha.(EWSA)

**(i) Objective**

Demonstration of fish culture in suitable short seasonal tanks will be taken up by stocking quality fish seeds viz. Catla, Rohu, Mrigal, Common Carp and Grass Carp of >8cm size at stocking density of 2,000 Nos. / ha. of EWSA. Species combination and species will be decided after assessing the water quality, productivity of the tanks and availability of the fish seed at the time of the stocking to get maximum fish production.

It is proposed to take up fish culture activities in 'Short Seasonal Irrigation Tanks' of Chinnar Sub-basin by direct stocking in 400 ha. EWSA in Krishnagiri district.

**(ii) Cost (Physical & Financial)**

***Physical***

| | | |
|---|---|---|
| (i) | Type of Aquaculture | Stock, Manage and Exploit. |
| (ii) | Proposed Effective Water Spread Area | **400 ha.** |
| (iii) | Stocking Density | 2000 nos. / ha. of EWSA |
| (iv) | Total Seed Requirement | 8.00 lakh |
| (v) | Fish Species ( based on availability at the time of stocking) | Catla, Rohu, Mrigal, Common Carp and Grass Carp |
| (vi) | Stocking Size | >8cm |

***Financial*** ***(Rs. in lakh)***

| | | |
|---|---|---|
| (i) | Fish Seed (Carp >8 cm @ Rs.2 / Seed x 2000 nos/ ha EWSA) | 0.04 / ha |
| (ii) | Total Seed Cost *(Area (400) x Rs.0.04 lakh)* | **16.00** |

**(iii) Area of Implementation**

The fish culture activities will be implemented to an extent of 294 ha. EWSA in 'Short Seasonal Irrigation Tanks' in Chinnar Sub-basin under TN

IAM Project. The following are the tanks identified based on the water availability / retention for fish culture activity.

The tentative list of tanks and the EWSA proposed for stocking is given below.

| Sl. No | Unique ID | Tank Name | Village Name | District | WSA (Ha.) | EWSA (Ha.) |
|---|---|---|---|---|---|---|
| 1. | TNCY-01-T0016 | Akkathangai Tank | Panai/ Anchetty | Krishnagiri | 15.18 | 8.00 |
| 2. | TNCY-01-T0013 | Adavanga Tank | Kundhukottai | Krishnagiri | 131.52 | 70.00 |
| 3. | TNCY-01-T0011 | Malligaarjunadurgam Tank | Durgam | Krishnagiri | 14.30 | 7.00 |
| 4. | TNCY-01-T0010 | Pedhacheruvu Tank | Andevanapalli | Krishnagiri | 77.70 | 38.00 |
| 5. | TNCY-01-T0008 | Thadikkal Tank | Rathnagiri | Krishnagiri | 25.20 | 12.00 |
| 6. | TNCY-01-T0002 | Nanjaiyen Tank | Kelamangalam | Krishnagiri | 59.57 | 29.00 |
| 7. | TNCY-01-T0006 | Onnammal Tank | Sarandapalli | Krishnagiri | 65.45 | 22.00 |
| 8. | TNCY-01-T0004 | Thally Big Tank | Thally | Krishnagiri | 230.41 | 150.00 |
| 9. | TNCY-01-T0009 | Jawalanayaken Tank | Palayamkottai | Krishnagiri | 44.17 | 22.00 |
| 10. | TNCY-01-T0001 | Veerarajan Tank | Ubbanur | Krishnagiri | 19.52 | 9.00 |
| 11. | TNCY-01-T0003 | Siddhyagoundan Tank | Devaganapalli | Krishnagiri | 62.16 | 31.00 |
| 12. | TNCY-01-T0005 | Mastihalla Tank | Belalam | Krishnagiri | 4.22 | 2.00 |
| | TOTAL | | | | 749.4 | 400 |

**(iv) Period**

The fish culture activities in 'Short Seasonal Irrigation Tanks' in Chinnar Sub-basin in Krishnagiri District will be implemented during 2021-2022 to 2023-2024.The year of implementation will depend on receipt of water in tanks which in turn depends on the North East Monsoon.

**(v) Output**

The increase in inland fish culture area and production will provide additional income to the fishermen/ lessee and ensure availability of protein

rich quality fish at a cheaper cost to public. The expected fish production of 338 kg. / ha. EWSA of short seasonal tanks with 40% survival rate.

## 2. Fishing Implements

### (i) Objective

The members of Inland Fishermen Cooperative Societies are engaged for fishing in Rivers, Reservoirs, Ponds, Irrigation Tanks and other leased out inland water bodies.In order to support the livelihood of the fishermen and to increase inland capture fisheries, it is imperative to provide subsidy assistance for the purchase of 'Fishing Implements' viz. Coracle / Gill Net /Coracle with Gill Net / Drag Net, to increase their fishing efficiency.

Therefore, it is proposed to provide 10 units of fishing implements in Krishnagiri district and 5 Units of fishing implements in Dharmapuri District at 80% subsidy assistance to the members of Inland Fishermen Cooperative Societies for fishing in inland water bodies of Chinnar sub-basin under TN IAM project.

### (ii) Cost (Physical & Financial)

***Physical***

| | | |
|---|---|---|
| (i) | Total no. of units | **15 units (10 Krishnagiri & 5 Dharmapuri)** |
| (ii) | Type of Fishing Implements proposed | Coracle with Gill net |

**Financial** ***(Rs. In lakh)***

| | | |
|---|---|---|
| (i) | Cost of Fishing Implements/ unit | 0.20 |
| (ii) | Total Cost | **3.00** |
| (iii) | **Project Contribution as 80 % subsidy** | **2.40** |
| (iv) | Beneficiary Contribution (20%) | 0.60 |

### (iii) Area

Beneficiaries will be selected by the Department in Chinnar Sub basin of Krishnagiri & Dharmapuri Districts for the supply of fishing implements.

### (iv) Period

Supply of fishing implements in Krishnagiri & Dharmapuri Districts of Chinnar sub-basin will be implemented during 2021-2022.

### (v) Output

The socio-economic status of the members of Inland Fishermen Cooperative Societies / fish farmers will be improved due to increased fishing efficiency and exploitation of inland fish resources in the Chinnar sub basin of Krishnagiri & Dharmapuri Districts.

## 3. Aquaculture in Farm Ponds

### (i) Objectives

Farm Ponds excavated for harvesting rain water in agricultural fields in the sub-basin will be promoted to do aquaculture. Besides farm ponds excavated by the Agriculture Engineering Department in the sub-basin, farm ponds excavated by other schemes (0.1 ha size) will also be taken up for aquaculture under this project.

The farm ponds are proposed to be stocked with quality GIF Tilapia seeds which would grow to marketable size within 4-6 months. Stocking density of 1500 Nos. / Pond is proposed. Department of fisheries and TNFU will also provide training on Good Aquaculture Practices to the selected farmers.

The project will provide fish seed and feed to the farmers at an estimated cost of Rs.30,000/. It is proposed to promote aqua farming in 5 farm ponds in Krishnagiri district and 3 farm ponds in Dharmapuri District.

### (ii) Cost (Physical & Financial)

***Physical***

| | | |
|---|---|---|
| (i) | No. of Units | **8 Units (5 Krishnagiri and 3 Dharmapuri** |
| (ii) | Total Area to be developed for Aquaculture | 0.8ha. |

***Financial***

| | | |
|---|---|---|
| (i) | Fish Seed (GIFT seed >3 cm @ Rs.4 / seed – 1,500 Nos.) | 0.06 |
| (ii) | Fish Feed (Max. of 600 kg.) @ Rs.40/kg | 0.24 |
| (iii) | Project Contribution – Total | 0.30 |
| | Total Cost *(No. of Units(8) x Rs.0.30 lakh)* | **2.40** |

### (iii) Area

Farm ponds excavated in Chinnar sub-basin with supplementary water resources of Krishnagiri & Dharmapuri Districts.

### (iv) Period

The intervention will be carried out in Krishnagiri & Dharmapuri Districts of Chinnar sub basin during 2021-2022 to 2022-2023.

**(v) Implementation**

Department will create awareness on the intervention. Interested farmers will be identified and their ponds will be inspected. Suitability of the pond with respect to critical soil and water parameters to take up fish culture shall be studied. After selection of farm pond, the beneficiaries will be given training on Good Aquaculture Practices to get maximum yield.

**(vi) Output**

With 80 % survival rate and 500 grams of average body weight, fish production of about 600 kg per farm pond is expected which will give additional income to farmers.

## 4. Environmental and Social Management

This chapter envisages the mitigation of environmental impacts by assessing and effectively managing the potential environmental impacts due to the interventions under TNIAMP in Chinnar sub-basin in Krishnagiri & Dharmapuri Districts.

### 4.1. Summary of walk through survey

Walkthrough surveys were conducted in the sub basin in both the Districts. Officials from Water Resources Department (WRD), Agriculture Department, Horticulture Department, Tamil Nadu Agriculture University (TNAU), Agriculture Engineering Department (AED), Animal Husbandry and Fisheries Department interacted with farmers.

### 4.2 Summary of Feedback along with planned activities

The feedback of walk through survey and the planned activities are summarized below

| | |
|---|---|
| 1. | Fish culture in Short seasonal irrigation tanks |
| 2. | Fishing implements |
| 3. | Aquaculture in Farm ponds |

### 4.3. Gender Strategy:

To ensure women participation in the project, women farmers will be informed and made aware of their role in decision making in fish culture, labour opportunities in fish culture, involvement in livelihood activities etc. Specific capacity building programs like exposure visits will be organized for

women beneficiary, Women self help group and members of women inland fisheries co-operative society.

### 9.4. Grievance Redress Mechanism and Schedule for Establishment

At the district level, GRM sub-committee has been formed with Assistant Director of Fisheries as Chairman and executive field staff as member. The District Level Committee has been formed with District Collector as Chairman and the members being JDF / DDF, ADF, executive field staff as members. The Sub-Committee will meet on weekly or on need basis to redress the grievances of farmers / stakeholders. The District Level Committee headed by the Collector will meet on a monthly basis. The next level will be at State Level headed by the Director of Fisheries.

A register for GRM and a box for receiving the Complaints and Grievances will be maintained in the respective O/o Assistant Directors of Fisheries and a monthly report on the Grievances received and the action taken will be sent to the Director of Fisheries for review and submission to the MDPU.

### 9.5. Plan of activities for Environmental Monitoring and Awareness:

C) The GIFT stocking in Short seasonal irrigations tanks as proposed in the overall DPR for 66 sub-basins, is being replaced with stocking of Carp seeds as per Government of India guidelines for culture of GIF Tilapia.
D) Culture of GIF Tilapia seeds in Aquaculture farm ponds will be undertaken in a secured manner in order to avoid them from entering into natural water bodies.

**ABSTRACT**

| Sl. No. | Interventions | Unit (Ha. / No.) | | Amount (Rs. in lakh) |
|---|---|---|---|---|
| | | Krishnagiri | Dharmapuri | |
| 1. | Fish Culture in Short Seasonal Irrigation Tanks | 400 ha | 0 | 16.00 |
| 2. | Fishing Implements | 10 Units | 5 Units | 2.40 |
| 3. | Aquaculture in Farm Ponds | 5 Nos. | 3 Nos. | 2.40 |
| **Total** | | | | **20.80** |

# GUMMIDIPOONDI SUB – BASIN

**DEPARTMENT OF FISHERIES**

**Name of the Sub-basin** : **GUMMIDIPOONDI**

**Districts Covered** : **TIRUVALLUR**

**Preface**

'**GUMMIDIPOONDI**' Sub-basin is located in Thiruvallur District of Tamil Nadu. The Gummidipoondi' Sub-basin is located between the latitude of $13^0$41'10"N and Longitude of $80^0$11'70"E. Thiruvallur district being situated near to Chennai, many industries were shooting up. This phenomenon is having adverse effect on agriculture and its allied sector by reducing the farming area and demand for daily labourers. This is right time to implement fisheries schemes which will increase the production and income of farmers by engaging very less labourers when compared to agriculture.

The Sub-basin covers total No. of tanks in this Sub-basin are 22, out of which 5 of tanks are taken under TN IAMP. These tanks are classified as Non-System Tanks and are under the control of Water Resource Department. These tanks mostly receive water during North-East Monsoon (October to December). Surplus of water after irrigation is unpredictable. As per the existing scenario, the scopes for fisheries development activities in this Sub-basin are limited.

Rehabilitation of tanks proposed in TN IAMP Project in this Sub-basin shall improve the water retention period in the irrigation tanks and also by water conservation measures. As a result, the opportunity for fish culture in these irrigation tanks is also likely to improve.

**Objectives**

The tank rehabilitation activities under TN IAMP Project in this Sub-basin will improve water storage and delivery through modernization of irrigation system and improved water management practices. Hence there is scope for more water retention in tanks and thus promoting aquaculture. The interventions are planned with the following objectives:-

- Increasing the water spread area under aquaculture
- Introducing Improved Production Models using fast growing fish varieties & Increasing the overall inland fish production

**INTERVENTIONS PROPOSED IN GUMMIDIPOONDISUB BASIN IN TIRUVALLURDISTRICT.**

## 1.Fish Culture in Short Seasonal Irrigation Tanks (@ 2000 Carp Seed / ha. EWSA)

### (i) Objective

Demonstration of fish culture in suitable short seasonal tanks will be taken up by stocking quality fish seeds viz. Catla, Rohu, Mrigal, Common Carp and Grass Carp of >8cm size at stocking density of 2,000 Nos. / ha. of EWSA. Species combination and species will be decided after assessing the water quality, productivity of the tanks and availability of the fish seed at the time of the stocking to get maximum fish production.

It is proposed to take up fish culture activities in 'Short Seasonal Irrigation Tanks' of Gummidipoondi Sub-basin by direct stocking in 100 ha. EWSA in Tiruvallur district.

### (ii) Cost (Physical & Financial)

***Physical***

| | | |
|---|---|---|
| (i) | Type of Aquaculture | Stock, Manage and Exploit. |
| (ii) | Proposed Effective Water Spread Area | **100ha.** |
| (iii) | Stocking Density | 2000 nos. / ha. of EWSA |
| (iv) | Total Seed Requirement | 2.00 lakh |
| (v) | Fish Species ( based on availability at the time of stocking) | Catla, Rohu, Mrigal, Common Carp and Grass Carp |
| (vi) | Stocking Size | >8 cm |

***Financial*** ***(Rs. in lakh)***

| | | |
|---|---|---|
| (i) | Fish Seed (Carp >8 cm @ Rs.2 / Seed x 2000 nos./ha. EWSA) | 0.04 / ha |
| (ii) | Total Seed Cost *(Area (100 ha) x Rs.0.04 lakh)* | **4.00** |

### (iii) Area of Implementation

The fish culture activities will be implemented to an extent of 100 ha. EWSA in 'Short Seasonal Irrigation Tanks' in Gummidipoondi Sub-basin under TN IAM Project. The following are the tanks identified based on the water availability / retention for fish culture activity.

The tentative list of tanks and the EWSA proposed for stocking is given below.

| Sl. No | Unique ID | Tank/Reservoir Name | Village | District | WSA (ha.) | EWSA (ha.) |
|---|---|---|---|---|---|---|
| 1 | TNCH-01-T0003 | Poovalai Large Tank | Poovalai | Thiruvallur | 33.00 | 15.00 |
| 2 | TNCH-01-T0007 | Edur Tank | Edur | Thiruvallur | 42.00 | 20.00 |
| 3 | TNCH-01-T0009 | Elavur Large Tank | Elavur | Thiruvallur | 44.00 | 20.00 |
| 4 | TNCH-01-T0026 | Narasingapuram Tank | Narasinga puram | Thiruvallur | 29.00 | 10.00 |
| 5 | TNCH-01-T0025 | PeriaNathamThattan Tank | Peria Natham | Thiruvallur | 56.00 | 20.00 |
| 6 | TNCH-01-T0004 | Elavoor HissaKattu Thangal | Elavur | Thiruvallur | 38.00 | 15.00 |

**(iv) Period**

The fish culture activities in 'Short Seasonal Irrigation Tanks' of Gummidipoondi sub-basin in Tiruvallur district will be implemented during 2021-2022 to 2023-2024. The year of implementation will depend on receipt of water in tanks which in turn depends on the North East Monsoon.

**(v) Output**

The increase in inland fish culture area and production will provide additional income to the fishermen/ lessee and ensure availability of protein rich quality fish at a cheaper cost to public. The expected fish production of 338 kg. / ha. EWSA of short seasonal tanks with 40% survival rate.

## 2. Aquaculture in Farm Ponds (0.1 ha.)

**(i) Objectives**

Farm Ponds excavated for harvesting rain water in agricultural fields in the sub-basin will be promoted to do aquaculture. Besides farm ponds excavated by the Agriculture Engineering Department in the sub-basin, farm ponds excavated by other schemes (0.1 ha size) will also be taken up for aquaculture under this project.

The farm ponds are proposed to be stocked with quality GIFTilapia seeds which would grow to marketable size within 4-6 months. Stocking density of 1500 Nos. / Pond is proposed. Department of fisheries and TNFU

will also provide training on Good Aquaculture Practices to the selected farmers.

The project will provide fish seed and feed to the farmers at an estimated cost of Rs.30,000/. It is proposed to promote aqua farming in 5 farm ponds in Tiruvallur district.

**(ii) Cost (Physical & Financial)**

***Physical***

| | | |
|---|---|---|
| (i) | No. of Units | **5 Units** |
| (ii) | Total Area to be developed for Aquaculture | 0.5ha. |

***Financial***

| | | |
|---|---|---|
| (i) | Fish Seed (GIFT seed >3 cm @ Rs.4 / seed – 1,500 Nos.) | 0.06 |
| (ii) | Fish Feed (Max. of 600 kg.) @Rs.40/kg | 0.24 |
| (iii) | Project Contribution – Total | 0.30 |
| | Total Cost *(No. of Units(5) x Rs.0.30 lakh)* | **1.50** |

**(iii) Area**

Farm ponds excavated in Gummidipoondi sub-basin with supplementary water resources of Tiruvallur district.

**(iv) Period**

The intervention will be carried out in Tiruvallur district of Gummidipoondi sub basin during 2021-2022 to 2022-2023.

**(v) Implementation**

Department will create awareness on the intervention. Interested farmers will be identified and their ponds will be inspected. Suitability of the pond with respect to critical soil and water parameters to take up fish culture shall be studied. After selection of farm pond, the beneficiaries will be given training on Good Aquaculture Practices to get maximum yield.

**(vi) Output**

With 80% survival rate and 500 grams of average body weight, fish production of about 600 kg per farm pond is expected which will give additional income to farmers.

## 3. Environmental and Social Management

This chapter envisages the mitigation of environmental impacts by assessing and effectively managing the potential environmental impacts due

to the interventions under TNIAMP in Gummidipoondi sub basin in Tiruvallur District.

### 3.1. Summary of walk through survey

Walkthrough surveys were conducted in the sub basin in both the Districts. Officials from Water Resources Department (WRD), Agriculture Department, Horticulture Department, Tamil Nadu Agriculture University (TNAU), Agriculture Engineering Department (AED), Animal Husbandry and Fisheries Department interacted with farmers.

### 3.2 Summary of Feedback along with planned activities

The feedback of walk through survey and the planned activities are summarized below

| | |
|---|---|
| 1. | Fish culture in Short seasonal irrigation tanks |
| 2. | Aquaculture in Farm ponds |

### 3.3. Gender Strategy:

To ensure women participation in the project, women farmers will be informed and made aware of their role in decision making in fish culture, labour opportunities in fish culture, involvement in livelihood activities etc. Specific capacity building programs like exposure visits will be organized for women beneficiary, Women self help group and members of women inland fisheries co-operative society.

### 3.4. Grievance Redress Mechanism and Schedule for Establishment

At the district level, GRM sub-committee has been formed with Assistant Director of Fisheries as Chairman and executive field staff as member. The District Level Committee has been formed with District Collector as Chairman and the members being JDF / DDF, ADF, executive field staff as members. The Sub-Committee will meet on weekly or on need basis to redress the grievances of farmers / stakeholders. The District Level Committee headed by the Collector will meet on a monthly basis. The next level will be at State Level headed by the Director of Fisheries.

A register for GRM and a box for receiving the Complaints and Grievances will be maintained in the respective O/o Assistant Directors of Fisheries and a monthly report on the Grievances received and the action taken will be sent to the Director of Fisheries for review and submission to the MDPU.

### 3.5. Plan of activities for Environmental Monitoring and Awareness:

E) The GIFT stocking in Short seasonal irrigations tanks as proposed in the overall DPR for 66 sub-basins, is being replaced with stocking of Carp seeds as per Government of India guidelines for culture of GIF Tilapia.

F) Culture of GIF Tilapia seeds in Aquaculture farm ponds will be undertaken in a secured manner in order to avoid them from entering into natural water bodies.

**ABSTRACT**

| Sl.No | Interventions | Unit (ha/No) | Amount (Rs.in Lakh) |
|---|---|---|---|
| | | Tiruvallur | |
| 1. | Fish culture in Short seasonal irrigation tanks | 100 ha | 4.00 |
| 2. | Aquaculture in Farm ponds | 5 Units | 1.50 |
| **TOTAL** | | | **5.50** |

# MANIMUKTHA NADHI SUB – BASIN

**DEPARTMENT OF FISHERIES**

**Name of the Sub-basin** : **MANIMUKTHANADHI**

**Districts Covered** : **KALLAKURUCHI**

**Preface**

Manimuktha Nadhi ' Sub-basin is located in Kallakuruchi District of Tamil Nadu. The Manimuktha Nadhi' Sub-basin is located between the latitude of 11°91'73" and 78°78'17" and Longtitude of 11°57'90" and 79°18'57" E. The command area of this Sub-basin comes under Kallakuruchi, Sankarapuram and Chinnasalem Taluk in Kallakuruchi District, The total command area of Manimuktha Nadhi Sub-basin in Kallakuruchi District is 2356.96 Ha.

The Sub-basin covers 5 blocks and the total No. of tanks in this Sub-basin are 156, out of which 33 Nos. of tanks are taken under TN IAMP. These tanks are classified as System Tanks and Non-System Tanks and are under the control of Water Resource Department. These tanks mostly water during North-East Monsoon (October to December). Surplus of water after irrigation is unpredictable. As per the existing scenario, the scope for fisheries development activities in this Sub-basin are limited.

Rehabilitation of tanks proposed in TN IAMP Project in this Sub-basin shall improve the water retention period in the irrigation tanks and also by water conservation measures. As a result, the opportunity for fish culture in these irrigation tanks is also likely to improve.

**Objectives**

The tank rehabilitation activities under TN IAM Project in this Sub-basin will improve water storage and delivery through modernization of irrigation system and improved water management practices. Hence there is scope for more water retention in the tanks and thus promoting aquaculture. The interventions are planned with the following objectives:-

- Increasing the water spread area under aquaculture.
- Increasing fish seed production and availability of good quality fish seed to fish farmers.
- Increased fishing efficiency, by providing effective craft and gear.
- Increasing the overall inland fish production.

**INTERVENTIONS PROPOSED IN MANIMUKTHA NADHI SUB BASIN IN KALLAKURUCHI DISTRICT.**

## 1. Fish Culture in Long Seasonal Irrigation Tanks (Carp@ 1500 Seed / ha.(EWSA)

**(i) Objective**

The tanks usually get water during North-East Monsoon (October – December). Tanks which retain water for more than 6 months are considered as long seasonal tanks. Inland fish culture will be promoted in suitable long seasonal tanks by stocking quality fish seeds viz. Catla, Rohu, Mrigal, Common Carp and Grass Carp of >8cm size at a stocking density of 1,500 Nos. / ha. of EWSA.

Species combination and species will be decided after assessing the water quality, productivity of the tanks and availability of fish seeds at the time of stocking to get maximum fish production. It is proposed to take up improved fish culture in 500 ha. of EWSA of long seasonal tanks in Kallakuruchi district in Manimuktha Nadhi sub basin.

**(ii) Cost (Physical & Financial)**

***Physical***

| | | |
|---|---|---|
| (i) | Type of Aquaculture | Stock, Manage and Exploit. |
| (ii) | Proposed Effective Water Spread Area | **500 ha.** |
| (iii) | Stocking Density | 1500 nos. / ha. of EWSA |
| (iv) | Total Seed Requirement | 3.00 lakh |
| (v) | Fish Species ( based on availability at the time of stocking) | Catla, Rohu, Mrigal, Common Carp and Grass Carp |
| (vi) | Stocking Size | >8cm |

***Financial***

***(Rs. in lakh)***

| | | |
|---|---|---|
| (i) | Fish Seed (Carp >8 cm @ Rs.2 / Seed x 1500 nos/ ha EWSA) | 0.03 / ha |
| (ii) | Total Seed Cost *(Area (500) x Rs.0.03 lakh)* | **15.00** |

**(iii) Area of Implementation**

The fish culture activities will be implemented to an extent of 500 ha. EWSA in 'long Seasonal Irrigation Tanks' in Manimuktha Nadhi Sub-basin under TN IAM Project. The following are the tanks identified based on the water availability / retention for fish culture activity.

The tentative list of tanks and the EWSA proposed for stocking is given below.

| Sl. No. | Unique ID | Tank/Reservoir Name | Village | District | WSA (ha.) | EWSA (ha.) |
|---|---|---|---|---|---|---|
| 1 | TNVE-06T 0037 | Ka.Alambalam Tank | Ka.Alambalam | Kallakuruchi | 90.00 | 45.00 |
| 2 | TNVE-06T 0054 | Peruvangur tank | Peruvangur | Kallakuruchi | 60.00 | 30.00 |
| 3 | TNVE-06T 0041 | Thandalai tank | Thandalai | Kallakuruchi | 120.00 | 60.00 |
| 4 | TNVE-06T 0031 | Thirukkanangur tank | Thirukkanangur | Kallakuruchi | 110.00 | 55.00 |
| 5 | TNVE-06T 0001 | Pandalam Tank | Pandalam | Kallakuruchi | 150.00 | 75.00 |
| 6 | TNVE-06T 0003 | Pootai Tank | Pootai | Kallakuruchi | 110.00 | 55.00 |
| 7 | TNVE-06T 0038 | Pallagacherry Tank | Pallagacherry | Kallakuruchi | 130.00 | 65.00 |
| 8 | TNVE-06T 0083 | Chittalur tank | Chittalur | Kallakuruchi | 150.00 | 75.00 |
| 9 | TNVE-06T 0057 | Prithivimangalam tank | Prithivimangalam | Kallakuruchi | 140.00 | 70.00 |
| 10 | TNVE-06T 0042 | Kachirapalayam tank | Kachirapalayam | Kallakuruchi | 80.00 | 40.00 |
| 11. | TNVE-06T 0034 | Vadakkanaendal Kalleri tank | Vadakkanaendal | Kallakuruchi | 100.00 | 50.00 |

**(iv) Period**

The fish culture activities in 'Long Seasonal Irrigation Tanks' in Manimuktha Nadhi Sub-basin in Kallakuruchi District will be implemented during 2021-2022 to 2023-2024.The year of implementation will depend on receipt of water in tanks which in turn depends on the North East Monsoon.

**(v) Output**

The increase in inland fish culture practice in hitherto underutilized water bodies will increase the fish production, which in turn will provide additional income to the fishermen/ lessee and ensure availability of protein rich quality fish at a cheaper cost to public. The expected fish production of 420 kg. / ha. EWSA of long seasonal tanks with 40% survival rate and 700 grams of average body weight.

## 2.Fish Culture in Short Seasonal Irrigation Tanks (Carp @ 2000 Seed / ha. EWSA)

**(i) Objective**

Demonstration of fish culture in suitable short seasonal tanks will be taken up by stocking quality fish seeds viz. Catla, Rohu, Mrigal, Common Carp and Grass Carp of >8cm size at stocking density of 2,000 Nos. / ha. of EWSA. Species combination and species will be decided after assessing the water quality, productivity of the tanks and availability of the fish seed at the time of the stocking to get maximum fish production.

It is proposed to take up fish culture activities in 'Short Seasonal Irrigation Tanks' of Manimuktha Nadhi Sub-basin by direct stocking in 200 ha. EWSA in Kallakuruchi district.

**(ii) Cost (Physical & Financial)**

***Physical***

| | | |
|---|---|---|
| (i) | Type of Aquaculture | Stock, Manage and Exploit. |
| (ii) | Proposed Effective Water Spread Area | **200 ha.** |
| (iii) | Stocking Density | 2000 nos. / ha. of EWSA |
| (iv) | Total Seed Requirement | 4.00 lakh |
| (v) | Fish Species ( based on availability at the time of stocking) | Catla, Rohu, Mrigal, Common Carp and Grass Carp |
| (vi) | Stocking Size | >8 cm |

***Financial*** ***(Rs. in lakh)***

| | | |
|---|---|---|
| (i) | Fish Seed (Carp >8 cm @ Rs.2 / Seed x 2000 nos./ha. EWSA) | 0.04 / ha |
| (ii) | Total Seed Cost *(Area (200) x Rs.0.04 lakh)* | **8.00** |

| No. | Unique ID | Tank/Reservoir Name | Village | District | WSA (ha.) | EWSA (ha.) |
|---|---|---|---|---|---|---|
| 1 | TNVE-06T0020 | Chellampattu Tank | Chellampattu | Kallakuruchi | 50.00 | 25.00 |
| 2 | TNVE-06T0048 | Kalayanallur small Tank | Kalayanallur | Kallakuruchi | 30.00 | 15.00 |
| 3 | TNVE-06T0040 | Kalayanallur Tank | Kalayanallur | Kallakuruchi | 40.00 | 20.0 |
| 4 | TNVE-06T0025 | Kallaerikuppam Tank | Kallaerikuppam | Kallakuruchi | 40.00 | 20.00 |
| 5 | TNVE-06T0014 | Kosapadi Tank | Kosapadi | Kallakuruchi | 60.00 | 30.00 |
| 6 | TNVE-06T00102 | Kudiyanallur Tank | Kudiyanallur | Kallakuruchi | 58.00 | 29.00 |
| 7 | TNVE-06T0156 | Koothakkudi Tank | Koothakkudi | Kallakuruchi | 88.00 | 44.00 |
| 8 | TNVE-06T0022 | Manjaputtur Tank | Manjaputtur | Kallakuruchi | 90.00 | 45.00 |
| 9 | TNVE-06T0126 | Ninnaiyur Tank | Ninnaiyur | Kallakuruchi | 50.00 | 25.00 |
| 10 | TNVE-06T0026 | Palaya Siruvangur Periya Eri | Palayam | Kallakuruchi | 54.00 | 27.00 |
| 11 | TNVE-06T0027 | Palayakorakachanda Tank | Palayakorakachanda | Kallakuruchi | 30.00 | 15.00 |
| 12 | TNVE-06T0030 | Pallipattu Tank | Pallipattu | Kallakuruchi | 30.00 | 15.00 |
| 13 | TNVE-06T0018 | Poikunam Tank | Poikunam | Kallakuruchi | 45.00 | 22.00 |
| 14 | TNVE-06T0011 | Sembarampattu Tank | Sembarampattu | Kallakuruchi | 50.00 | 25.00 |
| 15 | TNVE-06T0122 | Sithathur Tank | Sithathur | Kallakuruchi | 50.00 | 25.00 |
| 16 | TNVE-06T0079 | Thyiyagai Tank | Thyiyagai | Kallakuruchi | 60.00 | 30.00 |
| 17 | TNVE-06T0051 | Udayampattu Tank | Udayampattu | Kallakuruchi | 46.00 | 23.00 |
| 18 | TNVE-06T0124 | Udayanatchi Tank | Udayanatchi | Kallakuruchi | 60.00 | 30.00 |
| 19 | TNVE-06T0007 | Urangani Tank | Urangani | Kallakuruchi | 90.00 | 45.00 |
| 20 | TNVE-06T0046 | Vada Thorasalur Tank | Vada Thorasalur | Kallakuruchi | 50.00 | 25.00 |
| 21 | TNVE-06T0019 | Vadachettiyandal | Vadachettiyandal | Kallakuruchi | 48.0 | 24.00 |
| 22 | TNVE-06T0032 | Velanmandal Tank | Velanmandal30.00 | Kallakuruchi | 30.00 | 15.00 |

**(iii) Area of Implementation**

The fish culture activities will be implemented to an extent of 200 ha. EWSA in 'Short Seasonal Irrigation Tanks' in Manimuktha Nadhi Sub-basin under TN IAM Project.The following are the tanks identified based on the water availability / retention for fish culture activity.

The tentative list of tanks and the EWSA proposed for stocking is given below.

**(iv) Period**

The fish culture activities in 'Short Seasonal Irrigation Tanks' of Manimuktha Nadhi sub-basin in Kallakuruchi district will be implemented during 2021-2022 to 2023-2024. The year of implementation will depend on receipt of water in tanks which in turn depends on the North East Monsoon.

**(v) Output**

The increase in inland fish culture area and production will provide additional income to the fishermen/ lessee and ensure availability of protein rich quality fish at a cheaper cost to public. The expected fish production of 338 kg. / ha. EWSA of short seasonal tanks with 40% survival rate.

## 3. Fishing Implements

**(i) Objective**

The members of Inland Fishermen Cooperative Societies are engaged for fishing in Rivers, Reservoirs, Ponds, Irrigation Tanks and other leased out inland water bodies.In order to support the livelihood of the fishermen and to increase inland capture fisheries, it is imperative to provide subsidy assistance for the purchase of 'Fishing Implements' viz. Coracle / Gill Net /Coracle with Gill Net / Drag Net, to increase their fishing efficiency.

Therefore, it is proposed to provide 80% subsidy assistance for supplying 5 units of fishing implements in Kallakuruchi district to the members of Inland Fishermen Cooperative Societies for fishing in inland water bodies of Manimuktha Nadhi sub-basin under TN IAM project.

**(ii) Cost (Physical & Financial)**

***Physical***

| | | |
|---|---|---|
| (i) | Total no. of units | **5 units** |
| (ii) | Type of Fishing Implements proposed | Drag Net |

**Financial** ***(Rs. in lakh)***

| | | |
|---|---|---|
| (i) | Cost of Fishing Implements/ unit | 0.20 |
| (iii) | Total Cost | 1.00 |
| (ii) | Project Contribution as 80 % subsidy | **0.80** |
| (iii) | Beneficiary Contribution | 0.20 |

**(iii) Area**

Beneficiaries will be selected by the Department in Manimuktha Nadhi Sub basin of Kallakuruchi district for the supply of fishing implements.

**(iv) Period**

Supply of fishing implements in Kallakuruchi district of Manimuktha Nadhi sub-basin will be implemented during 2021-2022.

**(v) Output**

The socio-economic status of the members of Inland Fishermen Cooperative Societies / fish farmers will be improved due to increased fishing efficiency and exploitation of inland fish resources in the Manimukthanadhi sub basin of Kallakuruchi district.

## 4. Aquaculture in Farm Ponds

**(i) Objectives**

Farm Ponds excavated for harvesting rain water in agricultural fields in the sub-basin will be promoted to do aquaculture. Besides farm ponds excavated by the Agriculture Engineering Department in the sub-basin, farm ponds excavated by other schemes (0.1 ha size) will also be taken up for aquaculture under this project.

The farm ponds are proposed to be stocked with quality GIFTilapia seeds which would grow to marketable size within 4-6 months. Stocking density of 1500 Nos. / Pond is proposed. Department of fisheries and TNFU will also provide training on Good Aquaculture Practices to the selected farmers.

The project will provide fish seed and feed to the farmers at an estimated cost of Rs.30,000/. It is proposed to promote aqua farming in 25 farm ponds in Kallakuruchi district.

**(ii) Cost (Physical & Financial)**

***Physical***

| | | |
|---|---|---|
| (i) | No. of Units | **25 Units** |
| (ii) | Total Area to be developed for Aquaculture | 2.5ha. |

***Financial***

| | | |
|---|---|---|
| (i) | Fish Seed (GIFT seed >3 cm @ Rs.4 / seed – 1,500 Nos.) | 0.06 |
| (ii) | Fish Feed (Max. of 600 kg.) @Rs.40/kg | 0.24 |
| (iii) | Project Contribution – Total | 0.30 |
| | Total Cost *(No. of Units(25) x Rs.0.30 lakh)* | **7.50** |

**(iii) Area**

Farm ponds excavated in Manimuktha Nadhi sub-basin with supplementary water resources of Kallakuruchi district.

**(iv) Period**

The intervention will be carried out in Kallakuruchi district of Manimukthanadhi sub basin during 2021-2022 to 2022-2023.

**(v) Implementation**

Department will create awareness on the intervention. Interested farmers will be identified and their ponds will be inspected. Suitability of the pond with respect to critical soil and water parameters to take up fish culture shall be studied. After selection of farm pond, the beneficiaries will be given training on Good Aquaculture Practices to get maximum yield.

**(vi) Output**

With 80 % survival rate and 500 grams of average body weight, fish production of about 600 kg per farm pond is expected which will give additional income to farmers.

## 5. Fish Seed Rearing in Cages

(i) **Objective**

For better survival of fish seeds, the seeds should be reared before stocking. Cage rearing of fish seeds is a common method which doesn't require artificial ponds for rearing fish seeds. Fish seeds will be reared from late fry to fingerlings in the cages that will be fixed in irrigation tanks. One

unit of cage will consist of 3 cages of different mesh size (P16 – 1& P8 – 2).

5 units will be provided to the farmers in Manimuktha Nadhi Sub-basin of Kallakuruchi District. The project will provide cages, fish seed and feed at an estimated cost of Rs.40,000/-per unit. Installation and other expenditure will be borne by the beneficiaries.

**(ii) Cost (Physical & Financial)**

***Physical***

| | | |
|---|---|---|
| (i) | Total No. of Units | ***5 Units*** |
| (ii) | Size of the Cage | *10mx 4m x 1 m* |
| (iii) | Stocking density | *315 nos/$m^3$( 12500 nos. in 40 m3 in a crop)* |
| (iv) | Survival rate | *80 %* |
| (v) | Expected fingerlings production/Crop | *10,000* |

***Financial***

*(Rs. in lakh)*

| | | |
|---|---|---|
| (i) | Cost of Cages [(1 unit with 3 cages (P16 – 1 & P8 – 2)] | 0.205 |
| (ii) | Purchase of Late Fry (37500 nos. @ 12500 nos./ cycle) | 0.095 |
| (iii) | Feed Mix (Rs.40 / kg. x 250 kg) | 0.10 |
| | Project Contribution – Total | 0.40 |
| | Total Cost *(5 Units x Rs.0.40 lakh)* | **2.00** |

**(iii) Area**

Suitable irrigational tanks of Manimuktha Nadhi Sub-basin in Kallakuruchi District under TN IAM Project.

**Period**

The intervention in Manimuktha Nadhi sub basin will be implemented during the period of 2021-2022 to 2023-2024. The year of implementation will be depended on receipt of water in tanks.

**Output**

Availability of quality fish seeds for stocking in water bodies will be ensured. Additional income to the lessee / farmers either by sales of fish seed/ stocking in the leased out water bodies.

## 6. Earthen Fish Seed Rearing and Culture Farm

**(i) Objective**

Stocking of quality fish seeds at the right time in required quantities will ensure optimum utilization of water for fish production. However the mismatch of the breeding season of Indian Major Carps (IMC) with that of the fish culture season in irrigation tanks of sub basin causes sudden spurt in fish seed demand soon after the onset of North-East monsoon rains. Establishment of fish seed rearing farms to maintain seed stock helps to meet the fish seed demand at the appropriate season. For meeting the fish seed demand of the sub-basin, it is proposed to establish earthen fish seed rearing and culture farms.

The fish seed farm will be established in a land area 0.50 ha. Having water spread area of 0.40 ha with an output of 6.00 lakh fingerlings per annum, the rearing of fish seeds would be taken up in two stages i.e. from Early Fry to Late Fry and Late Fry to Fingerlings.

After seed rearing, the ponds will also be utilized for culturing table size fish. This will enable the farmer to get dual income from given unit area of land.

It is proposed to provide 75% subsidy assistance (25% beneficiary contribution) for developing 3 Units of 'Earthen Fish Seed Rearing and Culture Farm' in Kallakuruchi District of Manimuktha Nadhi Sub-basin.

**(ii) Cost (Physical & Financial)**

***Physical***

| | | |
|---|---|---|
| (i) | Total Area | 0.50 ha. |
| (ii) | EWSA | 0.40 ha. |
| (iii) | No. of Units | 3 Units |

***Financial***

***(Rs. in lakh)***

| | | |
|---|---|---|
| (i) | Unit Cost | 7.10 |
| *Project Contribution* | | |
| (ii) | Capital Cost | 4.75 |
| (iii) | Operational Cost<br>Early Fry (600nos/$m^2$) + Feed @Rs.40/kg | 0.80 |
| Project Contribution (75 %) – Total | | 5.55 |
| Beneficiary Contribution towards labour, electricity charges and purchase of manure and lime) | | 1.55 |
| | Total Cost *(3 Units x Rs.5.55 lakh)* | **16.65** |

**(iii) Area**

Suitable sites of agriculturist/ farmer in Manimuktha Nadhi sub basin.

**(iv) Period**

The intervention in Manimuktha Nadhi sub basin will be implemented during the period of 2021-2022.

**(v) Implementation**

- Fish culture activity will be taken up by the beneficiary and monitored by the Department of fisheries.

**(vi) Output**

Additional income to the farmers by sales of fish seed. The farm will also produce table size fish and hence contributing to inland fish production of the State.

## 7. Environmental and Social Management

This chapter envisages the mitigation of environmental impacts by assessing and effectively managing the potential environmental impacts due to the interventions under TNIAMP in Manimuktha Nadhi sub basin in Kallakuruchi District.

### 7.1. Summary of walk through survey

Walkthrough surveys were conducted in the sub basin in both the Districts. Officials from Water Resources Department (WRD), Agriculture Department, Horticulture Department, Tamil Nadu Agriculture University (TNAU), Agriculture Engineering Department (AED), Animal Husbandry and Fisheries Department interacted with farmers.

### 7.2 Summary of Feedback along with planned activities

The feedback of walk through survey and the planned activities are summarized below

1. Fish culture in Long seasonal irrigation tanks
2. Fish culture in Short seasonal irrigation tanks
3. Fishing implements
4. Aquaculture in Farm ponds
5. Fish seed rearing in cages
6. Earthen Fish seed rearing and culture farm

### 7.3. Gender Strategy:

To ensure women participation in the project, women farmers will be informed and made aware of their role in decision making in fish culture, labour opportunities in fish culture, involvement in livelihood activities etc. Specific capacity building programs like exposure visits will be organized for women beneficiary, Women self help group and members of women inland fisheries co-operative society.

### 7.4. Grievance Redress Mechanism and Schedule for Establishment

At the district level, GRM sub-committee has been formed with Assistant Director of Fisheries as Chairman and executive field staff as member. The District Level Committee has been formed with District Collector as Chairman and the members being JDF / DDF, ADF, executive

field staff as members. The Sub-Committee will meet on weekly or on need basis to redress the grievances of farmers / stakeholders. The District Level Committee headed by the Collector will meet on a monthly basis. The next level will be at State Level headed by the Director of Fisheries.

A register for GRM and a boxfor receiving the Complaints and Grievances will be maintained in the respective O/o Assistant Directors of Fisheries and a monthly report on the Grievances received and the action taken will be sent to the Director of Fisheries for review and submission to the MDPU.

### 7.5. Plan of activities for Environmental Monitoring and Awareness:

G) The GIFT stocking in Short seasonal irrigations tanks as proposed in the overall DPR for 66 sub-basins, is being replaced with stocking of Carp seeds as per Government of India guidelines for culture of GIF Tilapia.
H) Culture of GIF Tilapia seeds in Aquaculture farm ponds will be undertaken in a secured manner in order to avoid them from entering into natural water bodies.

**ABSTRACT**

| Sl.No | Interventions | Unit (ha/No) | Amount (Rs.in Lakh) |
|---|---|---|---|
| | | Kallakurichi | |
| 1. | Fish culture in Long seasonal irrigation tanks | 500 ha | 15.00 |
| 2. | Fish culture in Short seasonal irrigation tanks | 200 ha | 8.00 |
| 3. | Fishing implements | 5 Units | 0.80 |
| 4. | Aquaculture in Farm ponds | 25 Units | 7.50 |
| 5. | Fish Seed rearing cages | 5 Units | 2.00 |
| 6. | Earthen Fish seed rearing and culture farm | 3 Units | 16.65 |
| **Total** | | | **49.95** |

# MUSUKUNDHANADHI SUB – BASIN

**DEPARTMENT OF FISHERIES**

**Name of the Sub-basin** : **MUSUKUNDHA NADHI**

**Districts Covered** : **KALLAKURUCHI**

**Preface**

Muskundha Nadhi sub basin originates from Kalrayan hills and extends through eastern part of Sankarapuram and Rizivandhayam area. The total area of the sub basin is 175.59 sq.km. The Muskundha Nadhi Sub-basin is located between the latitude of 12°02'56" and 78°86'38" and Longtitude of 12°02'98" and 79°02'98" E. It is having 11 anicuts and 22 tanks. The average annual rainfall of the sub basin is 950 mm. The registered ayacut of the sub basin is 1185.71 Ha.

The Sub-basin covers 2 blocks and the total No. of tanks in this Sub-basin are 22, out of which 9 Nos. of tanks are taken under TN IAMP. These tanks are classified as System Tanks and Non-System Tanks and are under the control of Water Resource Department. These tanks mostly water during North-East Monsoon (October to December). Surplus of water after irrigation is unpredictable. As per the existing scenario, the scope for Fisheries Development activities in this Sub-basin are limited.

**Objectives**

The tank rehabilitation activities under TN IAM Project in this Sub-basin will improve water storage and delivery through modernization of irrigation system and improved water management practices. Hence there is scope for more water retention in the tanks and thus promoting aquaculture. The interventions are planned with the following objectives:-

- Increasing the water spread area under aquaculture.
- Increasing the overall inland fish production.

**INTERVENTIONS PROPOSED IN MUSKUNDHA NADHI SUB BASIN IN KALLAKURUCHI DISTRICT.**

## 1.Fish Culture in Short Seasonal Irrigation Tanks (Carp @ 2000 Seed / ha. EWSA)

### (i) Objective

Demonstration of fish culture in suitable short seasonal tanks will be taken up by stocking quality fish seeds viz. Catla, Rohu, Mrigal, Common Carp and Grass Carp of >8cm size at stocking density of 2,000 Nos. / ha. of EWSA. Species combination and species will be decided after assessing the water quality, productivity of the tanks and availability of the fish seed at the time of the stocking to get maximum fish production.

It is proposed to take up fish culture activities in 'Short Seasonal Irrigation Tanks' of Muskundha Nadhi Sub-basin by direct stocking in 100 ha. EWSA in Kallakuruchi district.

### (ii) Cost (Physical & Financial)

***Physical***

| | | |
|---|---|---|
| (i) | Type of Aquaculture | Stock, Manage and Exploit. |
| (ii) | Proposed Effective Water Spread Area | **100 ha.** |
| (iii) | Stocking Density | 2000 nos. / ha. of EWSA |
| (iv) | Total Seed Requirement | 2.00 lakh |
| (v) | Fish Species ( based on availability at the time of stocking) | Catla, Rohu, Mrigal, Common Carp and Grass Carp |
| (vi) | Stocking Size | >8 cm |

***Financial*** ***(Rs. in lakh)***

| | | |
|---|---|---|
| (i) | Fish Seed (Carp >8 cm @ Rs.2 / Seed x 2000 nos./ha. EWSA) | 0.04 / ha |
| (ii) | Total Seed Cost *(Area (100) x Rs.0.04 lakh)* | **4.00** |

### (iii) Area of Implementation

The fish culture activities will be implemented to an extent of 100 ha. EWSA in 'Short Seasonal Irrigation Tanks' in Muskundha Nadhi Sub-basin under TN IAM Project. The following are the tanks identified based on the water availability / retention for fish culture activity.

The tentative list of tanks and the EWSA proposed for stocking is given below.

| Sl. No. | Unique ID | Tank/Reservoir Name | Village | District | WSA (ha.) | EWSA (ha.) |
|---|---|---|---|---|---|---|
| 1 | TNPE-13-TO275 | Arulampadi Tank | Sankarapuram | Kallakuruchi | 45.00 | 20.00 |
| 2 | TNPE-13-TO-282 | Lakkinayakkanpatti Tank | Sankarapuram | Kallakuruchi | 65.00 | 20.00 |
| 3 | TNPE-13-TO-285 | Rasayamudiram Tank | Sankarapuram | Kallakuruchi | 90.00 | 20.00 |
| 4 | TNPE-13-TO-271 | Melsiruvallur Tank | Sankarapuram | Kallakuruchi | 45.00 | 20.00 |
| 5 | TNPE-13-TO-269 | Olagalapadi Tank | Sankarapuram | Kallakuruchi | 35.00 | 20.00 |
| 6 | TNPE-13-TO-301 | Rangappanur Tank | Sankarapuram | Kallakuruchi | 65.00 | 20.00 |
| 7 | TNPE-13-TO-302 | Ravathanallur Tank | Sankarapuram | Kallakuruchi | 65.00 | 20.00 |
| 8 | TNPE-13-TO-303 | Pudupattu Tank | Sankarapuram | Kallakuruchi | 40.00 | 20.00 |
| 9 | TNPE-13-TO-318 | Pakkam Tank | Sankarapuram | Kallakuruchi | 63.00 | 20.00 |

**(iv) Period**

The fish culture activities in 'Short Seasonal Irrigation Tanks' of Muskundha Nadhi sub-basin in Kallakuruchi district will be implemented during 2021-2022 to 2023-2024. The year of implementation will depend on receipt of water in tanks which in turn depends on the North East Monsoon.

**(v) Output**

The increase in inland fish culture area and production will provide additional income to the fishermen/ lessee and ensure availability of protein rich quality fish at a cheaper cost to public. The expected fish production of 338 kg. / ha. EWSA of short seasonal tanks with 40% survival rate.

## 2. Aquaculture in Farm Ponds (0.1 ha.)

**(i) Objectives**

Farm Ponds excavated for harvesting rain water in agricultural fields in the sub-basin will be promoted to do aquaculture. Besides farm ponds excavated by the Agriculture Engineering Department in the sub-basin, farm

ponds excavated by other schemes (0.1 ha size) will also be taken up for aquaculture under this project.

The farm ponds are proposed to be stocked with quality GIFT Tilapia seeds which would grow to marketable size within 4-6 months. Stocking density of 1500 Nos. / Pond is proposed. Department of fisheries and TNFU will also provide training on Good Aquaculture Practices to the selected farmers.

The project will provide fish seed and feed to the farmers at an estimated cost of Rs.30,000/. It is proposed to promote aqua farming in 10 farm ponds in Kallakurichi district.

**(ii) Cost (Physical & Financial)**

***Physical***

| | | |
|---|---|---|
| (i) | No. of Units | **10 Units** |
| (ii) | Total Area to be developed for Aquaculture | 1.0ha. |

***Financial***

| | | |
|---|---|---|
| (i) | Fish Seed (GIFT seed >3 cm @ Rs.4 / seed – 1,500 Nos.) | 0.06 |
| (ii) | Fish Feed (Max. of 600 kg.) @Rs.40/kg | 0.24 |
| (iii) | Project Contribution – Total | 0.30 |
| | Total Cost *(No. of Units(10) x Rs.0.30 lakh)* | **3.00** |

**(iii) Area**

Farm ponds excavated in Muskundha Nadhi sub-basin with supplementary water resources of Kallakuruchi district.

**(iv) Period**

The intervention will be carried out in Kallakuruchi district of Muskundha Nadhi sub basin during 2021-2022 to 2022-2023.

**(v) Implementation**

Department will create awareness on the intervention. Interested farmers will be identified and their ponds will be inspected. Suitability of the pond with respect to critical soil and water parameters to take up fish culture shall be studied. After selection of farm pond, the beneficiaries will be given training on Good Aquaculture Practices to get maximum yield.

**(vi) Output**

With 80 % survival rate and 500 grams of average body weight, fish production of about 600 kg per farm pond is expected which will give additional income to farmers.

# 3. Environmental and Social Management

This chapter envisages the mitigation of environmental impacts by assessing and effectively managing the potential environmental impacts due to the interventions under TNIAMP in Muskundha Nadhi sub basin in Kallakuruchi District.

## 3.1. Summary of walk through survey

Walkthrough surveys were conducted in the sub basin in both the Districts. Officials from Water Resources Department (WRD), Agriculture Department, Horticulture Department, Tamil Nadu Agriculture University (TNAU), Agriculture Engineering Department (AED), Animal Husbandry and Fisheries Department interacted with farmers.

## 3.2 Summary of Feedback along with planned activities

The feedback of walk through survey and the planned activities are summarized below

1. Fish culture in Short seasonal irrigation tanks
2. Aquaculture in Farm ponds

## 3.3. Gender Strategy:

To ensure women participation in the project, women farmers will be informed and made aware of their role in decision making in fish culture, labour opportunities in fish culture, involvement in livelihood activities etc. Specific capacity building programs like exposure visits will be organized for women beneficiary, Women self help group and members of women inland fisheries co-operative society.

## 3.4. Grievance Redress Mechanism and Schedule for Establishment

At the district level, GRM sub-committee has been formed with Assistant Director of Fisheries as Chairman and executive field staff as member. The District Level Committee has been formed with District Collector as Chairman and the members being JDF / DDF, ADF, executive field staff as members. The Sub-Committee will meet on weekly or on need basis to redress the grievances of farmers / stakeholders. The District Level

Committee headed by the Collector will meet on a monthly basis. The next level will be at State Level headed by the Director of Fisheries.

A register for GRM and a box for receiving the Complaints and Grievances will be maintained in the respective O/o Assistant Directors of Fisheries and a monthly report on the Grievances received and the action taken will be sent to the Director of Fisheries for review and submission to the MDPU.

### 3.5. Plan of activities for Environmental Monitoring and Awareness:

I) The GIFT stocking in Short seasonal irrigations tanks as proposed in the overall DPR for 66 sub-basins, is being replaced with stocking of Carp seeds as per Government of India guidelines for culture of GIF Tilapia.

J) Culture of GIF Tilapia seeds in Aquaculture farm ponds will be undertaken in a secured manner in order to avoid them from entering into natural water bodies.

**ABSTRACT**

| Sl.No | Interventions | Unit (ha/No) | Amount (Rs.in Lakh) |
|---|---|---|---|
| | | Kallakurichi | |
| 1. | Fish culture in Short seasonal irrigation tanks Carps@2000 seeds/ha.EWSA) | 100 ha | 4.00 |
| 2. | Aquaculture in Farm ponds | 10 Units | 3.00 |
| **Total** | | | **7.00** |

# PARAVANAR SUB – BASIN

**DEPARTMENT OF FISHERIES**

**Name of the Sub-basin** : **PARAVANAR**

**Districts Covered** : **CUDDALORE**

**Preface**

Paravanar sub-basin which is a leaf shaped river basin and second smallest river basin of Tamil Nadu lies within Cuddalore District of Tamil Nadu. The basin lying in between the latitude 11°18‟ to11°45‟ North and longitude 79°18‟ to 79°45‟East. Paravanar Basin is bounded on the North by Pennaiyar river basin, in the South and West by Vellar river basin and on the East by Bay of Bengal.

The Geographical extent of Paravanar basin is 872.34 Sq km. The major settlements of this basin and blocks are Neyvelitownship, Kurinjippadi, Nellikuppam, Kammapuram, Vadalur, Karunguzhi, Kattugudalur, Valaiyamadevi, Erumbur, Kullanchavadi and Bhuvanagiri. The basin is typically covered by sedimentary rock types of Tertiary to Recent age. Mean annual rainfall is about 1197.70 mm. Agriculture in this area depends on both surface and groundwater.

The groundwater in Paravanar basin occurs in both confined and unconfined aquifers of which the Neyveli artesian aquifer plays a major role in providing water for various human needs. This confined aquifer is pumped out continuously to keep the hydrostatic pressure low. The pumped water is diverted to thermal power station tanks and two other irrigation tanks, viz., Walajah tank and Perumal tank. These tanks are the major water bearers in the basin and the cultivation depends mainly on them. Both wet and dry crops are grown in this basin Maximum precipitation occurs during the North-East monsoon. As per the existing scenario, the scope for fisheries development activities in this Sub-basin is limited.

Rehabilitation of tanks proposed in TN IAMP (TN IAMWARM-II) Project in this Sub-basin shall improve the water retention period in the irrigation tanks and also by water conservation measures. As a result, the opportunity for fish culture in these irrigation tanks is also likely to Improve.

**Objectives**

The tank rehabilitation activities under TN IAM Project in this Sub-basin will improve water storage and delivery through modernization of irrigation system and improved water management practices. Hence there is scope for more water retention in the tanks and thus promoting aquaculture. The interventions are planned with the following objectives:-

- Increasing the water spread area under aquaculture.
- Increasing fish seed production and availability of good quality fish seed to fish farmers.
- Increased fishing efficiency, by providing effective craft and gear.
- Promotion of suitable market facilities for better access to markets.
- Increasing the overall inland fish production.

**INTERVENTIONS PROPOSED IN PARAVANAR SUB BASIN IN CUDDALORE DISTRICT.**

## 1. Fish Culture in Long Seasonal Irrigation Tanks (Carp@ 1500 Seed / ha.(EWSA)

**(i) Objective**

The tanks usually get water during North-East Monsoon (October – December). Tanks which retain water for more than 6 months are considered as long seasonal tanks. Inland fish culture will be promoted in suitable long seasonal tanks by stocking quality fish seeds viz. Catla, Rohu, Mrigal, Common Carp and Grass Carp of >8cm size at a stocking density of 1,500 Nos. / Ha. of EWSA.

Species combination and species will be decided after assessing the water quality, productivity of the tanks and availability of fish seeds at the time of stocking to get maximum fish production. It is proposed to take up improved fish culture in 500 ha. of EWSA of long seasonal tanks in Cuddalore district in Paravanar sub basin.

**(ii) Cost (Physical & Financial)**

***Physical***

| | | |
|---|---|---|
| (i) | Type of Aquaculture | Stock, Manage and Exploit. |
| (ii) | Proposed Effective Water Spread Area | **500 ha.** |
| (iii) | Stocking Density | 1500 nos. / ha. of EWSA |

| | | |
|---|---|---|
| (iv) | Total Seed Requirement | 7.50 lakhs |
| (v) | Fish Species ( based on availability at the time of stocking) | Catla, Rohu, Mrigal, Common Carp and Grass Carp |
| (vi) | Stocking Size | >8cm |

***Financial***

***(Rs. in lakh)***

| | | |
|---|---|---|
| (i) | Fish Seed (Carp >8 cm @ Rs.2 / Seed x 1500 nos/ ha EWSA) | 0.03 / ha |
| (ii) | Total Seed Cost *(Area (500) x Rs.0.03 lakh)* | **15.00** |

**(iii) Area of Implementation**

The fish culture activities will be implemented to an extent of 500 ha. EWSA in 'long Seasonal Irrigation Tanks' in Paravanar Sub-basin under TN IAM Project. The following are the tanks identified based on the water availability / retention for fish culture activity.

The tentative list of tanks and the EWSA proposed for stocking is given below.

| Sl. No. | Unique ID | Tank Name | Village | District | WSA (ha.) | EWSA (ha.) |
|---|---|---|---|---|---|---|
| 1 | TNPV-02-T0029 | Wallajah Tank | Kurnjipadi | Cuddalore | 673.68 | 500.00 |

**(iv) Period**

The fish culture activities in 'Long Seasonal Irrigation Tanks' in Paravanar Sub-basin in Cuddalore District will be implemented during 2021-2022 to 2023-2024.The year of implementation will depend on receipt of water in tanks which in turn depends on the North East Monsoon.

**(v) Output**

The increase in inland fish culture practice in hitherto underutilized water bodies will increase the fish production, which in turn will provide additional income to the fishermen/ lessee and ensure availability of protein

rich quality fish at a cheaper cost to public. The expected fish production of 420 kg. / ha. EWSA of long seasonal tanks with 40% survival rate and 700 grams of average body weight.

## 2.Fish Culture in Short Seasonal Irrigation Tanks (Carp @ 2000 Seed / ha. EWSA)

### (i) Objective

Demonstration of fish culture in suitable short seasonal tanks will be taken up by stocking quality fish seeds viz. Catla, Rohu, Mrigal, Common Carp and Grass Carp of >8cm size at stocking density of 2,000 Nos. / ha. of EWSA. Species combination and species will be decided after assessing the water quality, productivity of the tanks and availability of the fish seed at the time of the stocking to get maximum fish production.

It is proposed to take up fish culture activities in 'Short Seasonal Irrigation Tanks' of Paravanar Sub-basin by direct stocking in ha. EWSA in Cuddalore district.

### (ii) Cost (Physical & Financial)

***Physical***

| | | |
|---|---|---|
| (i) | Type of Aquaculture | Stock, Manage and Exploit. |
| (ii) | Proposed Effective Water Spread Area | **63ha.** |
| (iii) | Stocking Density | 2000 nos. / ha. of EWSA |
| (iv) | Total Seed Requirement | 1.26 lakh |
| (v) | Fish Species ( based on availability at the time of stocking) | Catla, Rohu, Mrigal, Common Carp and Grass Carp |
| (vi) | Stocking Size | >8 cm |

***Financial*** ***(Rs. in lakh)***

| | | |
|---|---|---|
| (i) | Fish Seed (Carp >8 cm @ Rs.2 / Seed x 2000 nos./ha. EWSA) | 0.04 / ha |
| (ii) | Total Seed Cost *(Area (63) x Rs.0.04 lakh)* | **2.52** |

### (iii) Area of Implementation

The fish culture activities will be implemented to an extent of 200 ha. EWSA in 'Short Seasonal Irrigation Tanks' in Paravanar Sub-basin under TN IAM Project. The following are the tanks identified based on the water availability / retention for fish culture activity.

The tentative list of tanks and the EWSA proposed for stocking is given below.

| S. No | Unique Id | Tank Name | Village | District | TWSA ( Ha) | EWSA (Ha) |
|---|---|---|---|---|---|---|
| 1 | TNPV-01-T0022 | MaruvaiManneri Tank | Maruvai | Cuddalore | 14.44 | 7.00 |
| 2 | TNPV-01-T0022 | Kummudimoolai Tank | Mel Bhuvanagiri | Cuddalore | 25.00 | 12.00 |
| 3 | TNPV-01-T0033 | Nellikollaieri | Mel Bhuvanagiri | Cuddalore | 26.00 | 13.00 |
| 4 | TNPV-01-0028 | Pinnalur | Mel Bhuvanagiri | Cuddalore | 11.00 | 5.00 |
| 5 | TNPV-01-T0014 | SerakuppamIyaneri | Mel bhuvanagiri | Cuddalore | 19.49 | 10.00 |
| 6 | TNPV-01-0021 | Kolappakkam Tank | Kammapuram | Cuddalore | 32.00 | 16.00 |
| TOTAL | | | | | 127.93 | 63.00 |

**(iv) Period**

The fish culture activities in 'Short Seasonal Irrigation Tanks' of Paravanarsub-basin inCuddaloredistrict will be implemented during 2021-2022 to 2023-2024. The year of implementation will depend on receipt of water in tanks which in turn depends on the North East Monsoon.

**(v) Output**

The increase in inland fish culture area and production will provide additional income to the fishermen/ lessee and ensure availability of protein rich quality fish at a cheaper cost to public. The expected fish production of 338 kg. / ha. EWSA of short seasonal tanks with 40% survival rate.

## 3. Fishing Implements

**(i) Objective**

The members of Inland Fishermen Cooperative Societies are engaged for fishing in Rivers, Reservoirs, Ponds, Irrigation Tanks and other leased out inland water bodies.In order to support the livelihood of the fishermen and to increase inland capture fisheries, it is imperative to provide

subsidy assistance for the purchase of 'Fishing Implements' viz. Coracle / Gill Net /Coracle with Gill Net / Drag Net, to increase their fishing efficiency.

Therefore, it is proposed to provide 80 % subsidy assistance for supplying 10 units of fishing implements in Cuddalore district to the members of Inland Fishermen Cooperative Societies for fishing in inland water bodies of Paravanar sub-basin under TN IAMP project.

**(ii) Cost (Physical & Financial)**

***Physical***

| | | |
|---|---|---|
| (i) | Total no. of units | **5units** |
| (ii) | Type of Fishing Implements proposed | Drag Net |

**Financial** ***(Rs. in lakh)***

| | | |
|---|---|---|
| (i) | Cost of Fishing Implements/ unit | 0.20 |
| (iii) | Total Cost | 1.00 |
| (ii) | Project Contribution as 80 % subsidy | **0.80** |
| (iii) | Beneficiary Contribution | 0.20 |

**(iii) Area**

Beneficiaries will be selected by the Department in Paravanar Sub basin of Cuddalore district for the supply of fishing implements.

**(iv) Period**

Supply of fishing implements in Cuddalore district of Paravanar sub-basin will be implemented during 2021-2022.

**(v) Output**

The socio-economic status of the members of Inland Fishermen Cooperative Societies / fish farmers will be improved due to increased fishing efficiency and exploitation of inland fish resources in the Paravanar sub basin of Cuddalore district.

## 4. Aquaculture in Farm Ponds (0.1 ha.)

**(i) Objectives**

Farm Ponds excavated for harvesting rain water in agricultural fields in the sub-basin will be promoted to do aquaculture. Besides farm ponds excavated by the Agriculture Engineering Department in the sub-basin, farm

ponds excavated by other schemes (0.1 ha size) will also be taken up for aquaculture under this project.

The farm ponds are proposed to be stocked with quality GIFTilapia seeds which would grow to marketable size within 4-6 months. Stocking density of 1500 Nos. / Pond is proposed. Department of fisheries and TNFU will also provide training on Good Aquaculture Practices to the selected farmers.

The project will provide fish seed and feed to the farmers at an estimated cost of Rs.30,000/. It is proposed to promote aqua farming in 15 farm ponds in Cuddaloredistrict.

**(ii) Cost (Physical & Financial)**

***Physical***

| | | |
|---|---|---|
| (i) | No. of Units | **15 Units** |
| (ii) | Total Area to be developed for Aquaculture | 1.5 ha. |

***Financial***

| | | |
|---|---|---|
| (i) | Fish Seed (GIFT seed >3 cm @ Rs.4 / seed – 1,500 Nos.) | 0.06 |
| (ii) | Fish Feed (Max. of 600 kg.) @ Rs.40/kg | 0.24 |
| (iii) | Project Contribution – Total | 0.30 |
| | Total Cost *(No. of Units(15) x Rs.0.30 lakh)* | **4.50** |

**(iii) Area**

Farm ponds excavated in Paravanar sub-basin with supplementary water resources of Cuddalore district.

**(iv) Period**

The intervention will be carried out in Cuddalore district of Paravanar sub basin during 2021-2022 to 2022-2023.

**(v) Implementation**

Department will create awareness on the intervention. Interested farmers will be identified and their ponds will be inspected. Suitability of the pond with respect to critical soil and water parameters to take up fish culture shall be studied. After selection of farm pond, the beneficiaries will be given training on Good Aquaculture Practices to get maximum yield.

**(vi) Output**

With 80% survival rate and 500 grams of average body weight, fish production of about 600 kg per farm pond is expected which will give additional income to farmers.

## 5. MURREL HATCHERY

### i. Introduction:

Murrel fish commonly called "Viraal meen" is considered one of the most delicious inland fish of the state. It is always in huge demand under live condition in almost all the inland fish markets.. The fish is hardy and can able to thrive in harsh environments with the help of its air-breathing habit. The fish fetches a high market price due to its boneless meat of high nutritional and medicinal value. The Murrel fish are caught from the ponds and tanks of the state, where it breeds during monsoon season. The artificial reproduction of Murrels are attempted and undertaken only in a few countries.

Murrels belong to the family Channidae and there are about 13 species in our country. Out of which, the commercially important species are Striped Murrel (*Channa striata*), Giant Snake head Murrel (*C. marulius)* and Dwarf Murrel (*C.gachua*). The seed production and culture methods are standardized for the Striped Murrel in India and elsewhere. However, the seed production technology of Murrel is not popular, so culture of Murrels depends on the natural collection of seeds during post monsoon periods. Even though the fish is in high demand and fetches high sale value, the stumbling block for its culture is due to its cannibalistic nature. The seeds collected from the wild feeds mostly on live insects, frogs, small fishes etc., and this feeding behavior hinders the survival of Murrels in artificial ponds, where their acceptance for artificial feeds are very low.

So, the technology of artificial propagation of seeds and weaning of Murrels with artificial diets / feeds plays an important role in the propagation of Murrel culture technology in the State. However, in South East Asian countries like Thailand, Vietnam, Cambodia, Malaysia, Indonesia etc., the seed production technology was already standardized and the culture of Murrels is in vogue for several decades.

Based on the above, it is proposed to demonstrate the seed production and culture technology of Murrels through this project in order to propagate the Murrel culture in the State which will improve the income of the inland fish farmers as well as the inland fish production potential of the state.

**ii.Objectives:**

Propagation of Murrel culture technology will ensure an alternative viable species that can be taken up for inland fish culture. This intervention is being planned with the following objectives:

i) Introduction of an alternative species for inland fish culture
ii) Demonstration of new technology for adoption
iii) Popularization of Murrel culture in an extensive way
iv) Increasing the socio economic status of the inland fish farmer
v) Increasing the overall inland fish production.

**(iii) Cost (Physical & Financial)**

***Physical***

| | | |
|---|---|---|
| (i) | Hatchery complex | 1 no. |
| (ii) | Nursery Complex | 1 no. |
| (iii) | Rearing Complex | 1 no. |
| (iv) | Mini Reservoir (Storage Tank) | 1 no. |
| (v) | Live feed culture Complex and lab | 1 no. |
| (vi) | Grow out pond | 1 no. |

***Financial***

a) Capital cost - Rs.140.00 lakh

b) Operational cost - Rs. 30.00 lakh

**Total Cost - Rs. 170.00 lakh**

(Initially allotted amount is Rs.70.00 lakh only. The estimate has bben revised and the remaining amount of Rs.100.00 lakh has been diverted from the *deleted activity*

**(iv) Area**

Suitable site in Agaram Government Fish Farm in Paravanar sub basin.

**(v) Period**

The intervention in Paravanar sub basin will be implemented during the period of 2021-2022 to 2023 -2024.

**(vi) Implementation**

- Construction will be taken up by the Civil Construction Wing (Fishing Harbor Division) of the Department.
- Specialised consultant/agency will be engaged for the operation of hatchery and grow out systems
- The seeds produces will be provided to registered fish farmers at subsidized price.

**(vii) Output**

Weaning of Murrel seeds with artificial feed and artificial seed production will help the inland fish farmers towards lucrative fish culture , which will increase the income level and thereby the socio economic status of inland fish farmers of the state.

## 5. Fish Seed Rearing in Cages

(i) **Objective**

For better survival of fish seeds, the seeds should be reared before stocking. Cage rearing of fish seeds is a common method which doesn't require artificial ponds for rearing fish seeds. Fish seeds will be reared from late fry to fingerlings in the cages that will be fixed in irrigation tanks. One unit of cage will consist of 5cages of different mesh size (P16 – 1 & P8 – 2).

5 units will be provided to the farmers in Paravanar Sub-basin of Cuddalore District. The project will provide cages, fish seed and feed at an estimated cost of Rs.40,000/-per unit. Installation and other expenditure will be borne by the beneficiaries.

**(ii) Cost (Physical & Financial)**

***Physical***

| | | |
|---|---|---|
| (i) | Total No. of Units | ***5 Units*** |
| (ii) | Size of the Cage | *10mx 4m x 1 m* |
| (iii) | Stocking density | *315 nos/$m^3$( 12500 nos. in 40 m3 in a crop)* |
| (iv) | Survival rate | *80 %* |
| (v) | Expected fingerlings production/Crop | *10,000* |

***Financial*** ***(Rs. in lakh)***

| | | |
|---|---|---|
| (i) | Cost of Cages [(1 unit with 3 cages (P16 – 1 & P8 – 2)] | 0.205 |
| (ii) | Purchase of Late Fry (37500 nos. @ 12500 nos./ cycle) | 0.095 |
| (iii) | Feed Mix (Rs.40 / kg. x 250 kg) | 0.10 |
| | Project Contribution – Total | 0.40 |
| | Total Cost *(5Units x Rs.0.40 lakh)* | **2.00** |

**(iii) Area**

Suitable irrigational tanks of Paravanar Sub-basin in Cuddalore District under TN IAM Project.

**(iv) Period**

The intervention in Paravanar sub basin will be implemented during the period of 2021-2022 to 2023-2024. The year of implementation will be depended on receipt of water in tanks.

**(v) Output**

Availability of quality fish seeds for stocking in water bodies will be ensured. Additional income to the lessee / farmers either by sales of fish seed/ stocking in the leased out water bodies.

## 7. Earthen Fish Seed Rearing and Culture Farm

**(i) Objective**

Stocking of quality fish seeds at the right time in required quantities will ensure optimum utilization of water for fish production. However the mismatch of the breeding season of Indian Major Carps (IMC) with that of the fish culture season in irrigation tanks of sub basin causes sudden spurt in fish seed demand soon after the onset of North-East monsoon rains. Establishment of fish seed rearing farms to maintain seed stock helps to

meet the fish seed demand at the appropriate season. For meeting the fish seed demand of the sub-basin, it is proposed to establish earthen fish seed rearing and culture farms.

The fish seed farm will be established in a land area 0.50 ha. Having water spread area of 0.40 ha with an output of 6.00 lakh fingerlings per annum, the rearing of fish seeds would be taken up in two stages i.e. from Early Fry to Late Fry and Late Fry to Fingerlings.

After seed rearing, the ponds will also be utilized for culturing table size fish. This will enable the farmer to get dual income from given unit area of land.

It is proposed to provide 75 % subsidy assistance (25% beneficiary contribution) for developing 4 Units of 'Earthen Fish Seed Rearing and Culture Farm' in ParavanarSub-basin, Cuddalore District.

**(ii) Cost (Physical & Financial)**

***Physical***

| | | |
|---|---|---|
| (i) | Total Area | 0.50 ha. |
| (ii) | EWSA | 0.40 ha. |
| (iii) | No. of Units | 4Units |

***Financial*** ***(Rs. in lakh)***

| | | |
|---|---|---|
| (i) | Unit Cost | 7.10 |
| *Project Contribution* | | |
| (ii) | Capital Cost | 4.75 |
| (iii) | Operational Cost<br>Early Fry (600nos/$m^2$) + Feed @Rs.40/kg | 0.80 |
| Project Contribution (75 %) – Total | | 5.55 |
| Beneficiary Contribution(25%) towards labour, electricity charges and purchase of manure and lime) | | 1.55 |
| | Total Cost *( 4Units x Rs.5.55 lakh)* | **22.20** |

**(iii) Area**

Suitable sites of agriculturist/ farmer in Paravanar sub basin.

**(iv) Period**

The intervention in Paravanar sub basin will be implemented during the period of 2021-2022.

**(v) Implementation**

- Fish culture activity will be taken up by the beneficiary and monitored by the Department of fisheries.

**(vi) Output**

Additional income to the farmers by sales of fish seed. The farm will also produce table size fish and hence contributing to inland fish production of the State.

## 8. Fish Kiosk

**(i) Objective**

Fish is a perishable commodity. To market fish in good hygienic condition to fetch good price, Modern Fish Kiosks with aesthetic appearance and hygienic environment will ensure availability of good quality fishes to the consumers.

**(ii) Cost (Physical & Financial)**

***Physical***

| | | |
|---|---|---|
| (i) | No. of Units | **2** |
| (ii) | Place | *Suitable site will be selected in Paravanr sub basin of CuddaloreDistrict.* |

***Financial***

*(Rs. in lakh)*

| | | |
|---|---|---|
| | Unit Cost | 8.00 |
| *Capital Cost – Rs.8.00 lakh* | | |
| (a) | Super structure of 300 Sq.ft. area including water supply, | 8.00 |

| | | |
|---|---|---|
| | electrical, and other facilities. | |
| (b) | Accessories including Processing Table (Stainless Steel with accessories), Insulated Ice Boxes,, Electronic Weighing Machines, Fly Catcher Equipment, Furniture and Fittings.) | |
| | Total Cost (2nosx Rs.8.00 lakh) | **16.00** |

**(iii) Area:**

This intervention will be carried out in the selected site in Paravanar sub basin of Cuddalore district.

**(iv) Period:**

The intervention will be carried out in Cuddalore district of Paravanar sub basin during 2021-2022.

**(v) Implementation**

This intervention will be implemented through eligible FCS members/SHG etc.

**(vi) Output:**

By implementing this scheme, freshly caught fishes will be preserved, stored and marketed in good hygienic condition. The proposed modern fish Kiosk will have good storage and marketing facilities to sell the fish in hygienic condition. The Fish Kiosk established will be handed over to the FCS/SHG. It will help in increase their income and socio economic status of the fishermen and also support for their livelihood by providing employment opportunity.

# 9. Environmental and Social Management

This chapter envisages the mitigation of environmental impacts by assessing and effectively managing the potential environmental impacts due to the interventions under TNIAMP in Paravanar subbasin in Cuddalore District.

## 9.1. Summary of walk through survey

Walkthrough surveys were conducted in the sub basin in both the Districts. Officials from Water Resources Department (WRD), Agriculture Department, Horticulture Department, Tamil Nadu Agriculture University

(TNAU), Agriculture Engineering Department (AED), Animal Husbandry and Fisheries Department interacted with farmers.

### 9.2 Summary of Feedback along with planned activities

The feedback of walk through survey and the planned activities are summarized below

| | |
|---|---|
| 1. | Fish culture in Long seasonal irrigation tanks |
| 2. | Fish culture in Short seasonal irrigation tanks |
| 3. | Fishing implements |
| 4. | Aquaculture in Farm ponds |
| 5. | Murrel hatchery |
| 6. | Fish seed rearing in cages |
| 7. | Earthen Fish seed rearing and culture farm |
| 8. | Fish Kiosk. |

### 9.3. Gender Strategy:

To ensure women participation in the project, women farmers will be informed and made aware of their role in decision making in fish culture, labour opportunities in fish culture, involvement in livelihood activities etc. Specific capacity building programs like exposure visits will be organized for women beneficiary, Women self help group and members of women inland fisheries co-operative society.

### 9.4. Grievance Redress Mechanism and Schedule for Establishment

At the district level, GRM sub-committee has been formed with Assistant Director of Fisheries as Chairman and executive field staff as member. The District Level Committee has been formed with District Collector as Chairman and the members being JDF / DDF, ADF, executive field staff as members. The Sub-Committee will meet on weekly or on need basis to redress the grievances of farmers / stakeholders. The District Level Committee headed by the Collector will meet on a monthly basis. The next level will be at State Level headed by the Director of Fisheries.

A register for GRM and a box for receiving the Complaints and Grievances will be maintained in the respective O/o Assistant Directors of Fisheries and a monthly report on the Grievances received and the action taken will be sent to the Director of Fisheries for review and submission to the MDPU.

### 9.5. Plan of activities for Environmental Monitoring and Awareness:

K) The GIFT stocking in Short seasonal irrigations tanks as proposed in the overall DPR for 66 sub-basins, is being replaced with stocking of Carp seeds as per Government of India guidelines for culture of GIF Tilapia.

L) Culture of GIF Tilapia seeds in Aquaculture farm ponds will be undertaken in a secured manner in order to avoid them from entering into natural water bodies.

M) The waste generated from the Fish Kiosk will be disposed off in a hygienic manner through urban / rural local administration.

**ABSTRACT**

| **Sl. No** | **Interventions** | **Unit (ha/No)** | **Amount (Rs.in Lakh)** |
|---|---|---|---|
| | | **Cuddalore** | |
| 1. | Fish culture in Long seasonal irrigation tanks | 500 ha | 15.00 |
| 2. | Fish culture in Short seasonal irrigation tanks | 63 ha | 2.52 |
| 3. | Fishing implements | 5 Units | 0.80 |
| 4. | Aquaculture in Farm ponds | 15 Units | 4.50 |
| 5. | Murrel hatchery | 1 Unit | 170.00 |
| 6. | Fish Seed rearing in cages | 5 Units | 2.00 |
| 7. | Earthen Fish seed rearing and culture farm | 4Units | 22.20 |
| 8. | Fish Kiosk | 2Unit | 16.00 |
| **Total** | | | **233.02** |

# VEGAVATHI SUB – BASIN

**DEPARTMENT OF FISHERIES**

**Name of the Sub-basin** : **VEGAVATHI**

**Districts Covered** : **KANCHEEPURAM and RANIPET**

**Preface**

Vegavathy Sub-basin is located in Ranipet and Kanchipuram Districts of Tamil Nadu. The 'Vegavathy' Sub-basin is located between the latitude12.89315567° N and longitude 79.43440801° E. The total command area of Vegavathy Sub-basin is 1127.53Ha.

The sub basin covers 411.16 sq.km out of Entire Palar Basin area of 10,273.18 sq.km and flows over Kancheepuram and Walajabad Blocks in Kancheepuram District, Vembakkam Block of Thiruvannamalai District and Kaveripakkam, Nemili, Thimiri, Walajah and Arcot Blocks of Ranipet District. This sub basin administratively spread out in 6 Revenue Taluks in Vellore, Thiruvannamalai and Kancheepuram Districts.

Total No. of tanks in this Sub-basin are 87, out of which 76 Nos. of tanks are taken under TN IAMP. These tanks are classified as System Tanks and Non-System Tanks and are under the control of PWD-Water Resource Department. These tanks receive water mostly during North-East Monsoon (October to December). Availability of water after irrigation is unpredictable. As per the existing scenario, the scope for fisheries development activities in this Sub-basin is limited.

Rehabilitation of tanks proposed in TN IAMP Project in this Sub-basin shall improve the water retention period in the irrigation tanks and also by water conservation measures. As a result, the opportunity for fish culture in these irrigation tanks is also likely to improve.

**Objectives**

The tank rehabilitation activities under TN IAM Project in this Sub-basin will improve water storage and delivery through modernization of irrigation system and improved water management practices. Hence there is scope for more water retention in the tanks and thus promoting aquaculture. The interventions are planned with the following objectives:-

- Increasing the water spread area under aquaculture.
- Increased fishing efficiency, by providing effective craft and gear.

- Increasing the overall inland fish production.

**INTERVENTIONS PROPOSED IN VEGAVATHISUB BASIN IN KANCHIPURAM DISTRICT.**

## 1. Fish Culture in Short Seasonal Irrigation Tanks (Carp @ 2000 Seed / ha. EWSA)

### (i) Objective

Demonstration of fish culture in suitable short seasonal tanks will be taken up by stocking quality fish seeds viz. Catla, Rohu, Mrigal, Common Carp and Grass Carp of >8cm size at stocking density of 2,000 Nos. / ha. of EWSA. Species combination and species will be decided after assessing the water quality, productivity of the tanks and availability of the fish seed at the time of the stocking to get maximum fish production.

It is proposed to take up fish culture activities in 'Short Seasonal Irrigation Tanks' of Vegavathi Sub-basin by direct stocking in 200 ha. EWSA in Kanchipuram district and 25 ha EWSA in Ranipet District.

### (ii) Cost (Physical & Financial)

***Physical***

| | | |
|---|---|---|
| (i) | Type of Aquaculture | Stock, Manage and Exploit. |
| (ii) | Proposed Effective Water Spread Area | **225ha. ( 200 ha Kanchipuram and 25 ha Ranipet)** |
| (iii) | Stocking Density | 2000 nos. / ha. of EWSA |
| (iv) | Total Seed Requirement | 4.50 lakh |
| (v) | Fish Species ( based on availability at the time of stocking) | Catla, Rohu, Mrigal, Common Carp and Grass Carp |
| (vi) | Stocking Size | >8 cm |

***Financial*** ***(Rs. in lakh)***

| | | |
|---|---|---|
| (i) | Fish Seed (Carp >8 cm @ Rs.2 / Seed x 2000 nos./ha. EWSA) | 0.04 / ha |
| (ii) | Total Seed Cost *(Area (225) x Rs.0.04 lakh)* | **9.00** |

### (iii) Area of Implementation

The fish culture activities will be implemented to an extent of 225 ha. EWSA in 'Short Seasonal Irrigation Tanks' in Vegavathi Sub-basin under TN IAM Project. The following are the tanks identified based on the water availability / retention for fish culture activity.

The tentative list of tanks and the EWSA proposed for stocking in Kanchipuram District is given below.

| **Sl. No.** | **Unique ID** | **Tank/Reservoir Name** | **Village** | **District** | **WSA (ha.)** | **EWSA (ha.)** |
|---|---|---|---|---|---|---|
| 1 | TNPL-06-T0187 | Damal Tank | Damal | Kanchipuram | 2658 | 85 |
| 3 | TNPL-06-T0210 | KilarPeriaEri (Kilar) | Kilar | Kanchipuram | 69 | 25 |
| 4 | TNPL-06-T0339 | Villivalam Tank | Villivalam | Kanchipuram | 94 | 35 |
| 5 | TNPL-06-T0191 | Thirupukkuzhi Tank | Thirupukkuzhi | Kanchipuram | 27 | 10 |
| 6 | TNPL-06-T0232 | Musaravakkam Tank | Musaravakkam | Kanchipuram | 41 | 20 |
| 7 | TNPL-06-T0217 | Keelambi Tank | Keelambi | Kanchipuram | 44 | 25 |
| | | **Total** | | | | **200** |

The tentative list of tanks and the EWSA proposed for stocking in Ranipet District is given below.

| Sl. No. | Tank Name | Village | District | WSA (ha.) | EWSA (ha.) |
|---|---|---|---|---|---|
| 1 | Gurumudithangal tank | Gurumudithangal | Ranipet | 2.00 | 1.00 |
| 2 | Ananthangal big tank | Ananthangal | Ranipet | 4.00 | 2.00 |
| 3 | AnanthangalPudheri | Ananthangal | Ranipet | 2.00 | 1.00 |
| 4 | Kalathur tank | Kalathur | Ranipet | 12.00 | 6.00 |
| 5 | Esaiyanur tank | Esaiyanur | Ranipet | 4.00 | 2.00 |
| 6 | Sakkaramallur tank | Sakkaramallur | Ranipet | 4.00 | 2.00 |
| 7 | Karivedu tank | Karivedu | Ranipet | 8.00 | 4.00 |
| 8 | PoondiPudheri tank | Poondi | Ranipet | 3.00 | 1.50 |
| 9 | Arumpakkam Big tank | Arumpakkam | Ranipet | 50.00 | 25.00 |

**(iv) Period**

The fish culture activities in 'Short Seasonal Irrigation Tanks' of Vegavathi sub-basin in Kanchipuram and Ranipet districts will be implemented during 2021-2022 to 2023-2024. The year of implementation will depend on receipt of water in tanks which in turn depends on the North East Monsoon.

**(v) Output**

The increase in inland fish culture area and production will provide additional income to the fishermen/ lessee and ensure availability of protein rich quality fish at a cheaper cost to public. The expected fish production of 338 kg. / ha. EWSA of short seasonal tanks with 40% survival rate.

## 2. Fishing Implements

**(i) Objective**

The members of Inland Fishermen Cooperative Societies are engaged for fishing in Rivers, Reservoirs, Ponds, Irrigation Tanks and other leased out inland water bodies. In order to support the livelihood of the fishermen and to increase inland capture fisheries, it is imperative to provide subsidy assistance for the purchase of 'Fishing Implements' viz. Coracle / Gill Net /Coracle with Gill Net / Drag Net, to increase their fishing efficiency.

Therefore, it is proposed to provide 80 % subsidy assistance for supplying 5units of fishing implements in Kanchipuram district to the members of Inland Fishermen Cooperative Societies for fishing in inland water bodies of Vegavathi sub-basin under TN IAM project.

**(ii) Cost (Physical & Financial)**

***Physical***

| | | |
|---|---|---|
| (i) | Total no. of units | **5units** |
| (ii) | Type of Fishing Implements proposed | Coracle / Gill Net /Coracle with Gill Net / Drag Net |

**Financial** ***(Rs. in lakh)***

| | | |
|---|---|---|
| (i) | Cost of Fishing Implements/ unit | 0.20 |
| (ii) | Total Cost | 1.00 |
| (iii) | Project Contribution as 80 % subsidy | **0.80** |
| (iv) | Beneficiary Contribution | 0.20 |

**(iii) Area**

Beneficiaries will be selected by the Department in Vegavathi Sub basin of Kanchipuram district for the supply of fishing implements.

**(iv) Period**

Supply of fishing implements in Kanchipuram district of Vegavathi sub-basin will be implemented during 2021-2022.

**(v) Output**

The socio-economic status of the members of Inland Fishermen Cooperative Societies / fish farmers will be improved due to increased fishing efficiency and exploitation of inland fish resources in the Vegavathi sub basin of Kanchipuram district.

## 3. Aquaculture in Farm Ponds

**(i) Objectives**

Farm Ponds excavated for harvesting rain water in agricultural fields in the sub-basin will be promoted to do aquaculture. Besides farm ponds excavated by the Agriculture Engineering Department in the sub-basin, farm ponds excavated by other schemes (0.1 ha size) will also be taken up for aquaculture under this project.

The farm ponds are proposed to be stocked with quality GIF Tilapia seeds which would grow to marketable size within 4-6 months. Stocking density of 1500 Nos. / Pond is proposed. Department of fisheries and TNFU will also provide training on Good Aquaculture Practices to the selected farmers.

The project will provide fish seed and feed to the farmers at an estimated cost of Rs.30,000/. It is proposed to promote aqua farming in 25 farm ponds in Kanchipuram district.

**(ii) Cost (Physical & Financial)**

***Physical***

| | | |
|---|---|---|
| (i) | No. of Units | **25 Units** |
| (ii) | Total Area to be developed for Aquaculture | 2.50 ha. |

***Financial***

| | | |
|---|---|---|
| (i) | Fish Seed (GIFT seed >3 cm @ Rs.4 / seed – 1,500 Nos.) | 0.06 |
| (ii) | Fish Feed (Max. of 600 kg.) @Rs.40/kg | 0.24 |
| (iii) | Project Contribution – Total | 0.30 |
| | Total Cost *(No. of Units(25) x Rs.0.30 lakh)* | **7.50** |

**(iii) Area**

Farm ponds excavated in Vegavathi sub-basin with supplementary water resources of Kanchipuram district.

**(iv) Period**

The intervention will be carried out in Kanchipuram district of Vegavathi sub basin during 2021-2022 to 2022-2023.

**(v) Implementation**

Department will create awareness on the intervention. Interested farmers will be identified and their ponds will be inspected. Suitability of the pond with respect to critical soil and water parameters to take up fish culture shall be studied. After selection of farm pond, the beneficiaries will be given training on Good Aquaculture Practices to get maximum yield.

**(vi) Output**

With 80 % survival rate and 500 grams of average body weight, fish production of about 600 kg per farm pond is expected which will give additional income to farmers.

# 4. Environmental and Social Management

This chapter envisages the mitigation of environmental impacts by assessing and effectively managing the potential environmental impacts due to the interventions under TNIAMP in Vegavathi sub basin in Kanchipuram and Ranipet Districts.

## 4.1. Summary of walk through survey

Walkthrough surveys were conducted in the sub basin in both the Districts. Officials from Water Resources Department (WRD), Agriculture

Department, Horticulture Department, Tamil Nadu Agriculture University (TNAU), Agriculture Engineering Department (AED), Animal Husbandry and Fisheries Department interacted with farmers.

### 4.2 Summary of Feedback along with planned activities

The feedback of walk through survey and the planned activities are summarized below

| | |
|---|---|
| 1. | Fish culture in Short seasonal irrigation tanks |
| 2. | Fishing implements |
| 3. | Aquaculture in Farm ponds |

### 4.3. Gender Strategy:

To ensure women participation in the project, women farmers will be informed and made aware of their role in decision making in fish culture, labour opportunities in fish culture, involvement in livelihood activities etc. Specific capacity building programs like exposure visits will be organized for women beneficiary, Women self help group and members of women inland fisheries co-operative society.

### 4.4. Grievance Redress Mechanism and Schedule for Establishment

At the district level, GRM sub-committee has been formed with Assistant Director of Fisheries as Chairman and executive field staff as member. The District Level Committee has been formed with District Collector as Chairman and the members being JDF / DDF, ADF, executive field staff as members. The Sub-Committee will meet on weekly or on need basis to redress the grievances of farmers / stakeholders. The District Level Committee headed by the Collector will meet on a monthly basis. The next level will be at State Level headed by the Director of Fisheries.

A register for GRM and a box for receiving the Complaints and Grievances will be maintained in the respective O/o Assistant Directors of Fisheries and a monthly report on the Grievances received and the action taken will be sent to the Director of Fisheries for review and submission to the MDPU.

### 4.5. Plan of activities for Environmental Monitoring and Awareness:

N) The GIFT stocking in Short seasonal irrigations tanks as proposed in the overall DPR for 66 sub-basins, is being replaced with stocking of Carp seeds as per Government of India guidelines for culture of GIF Tilapia.

O) Culture of GIF Tilapia seeds in Aquaculture farm ponds will be undertaken in a secured manner in order to avoid them from entering into natural water bodies.

**ABSTRACT**

| Sl.No | Interventions | Unit (ha/No) | | Amount (Rs.in Lakh) |
|---|---|---|---|---|
| | | Kanchipuram | Ranipet | |
| 1. | Fish culture in Short seasonal irrigation tanks | 200 ha | 25ha | 9.00 |
| 2. | Fishing implements | 5 Units | 0 | 0.80 |
| 3. | Aquaculture in Farm ponds | 25 Units | 0 | 7.50 |
| **Total** | | | | **17.30** |

# MARUDAIYAR SUB – BASIN

**DEPARTMENT OF FISHERIES**

**Name of the Sub-basin** : **MARUDAIYAR**

**District Covered** : **ARIYALUR & PERAMBALUR**

**Preface**

'**Marudaiyar**' Sub-basin is located in Ariyalur & Perambalur Districts of Tamil Nadu. The Marudaiyar Sub-basin is located between the latitude of $10^0$56'00" N to $11^0$14'56" N and Longitude from $78^0$47'36" E to $79^0$19'44"E. Marudaiyaru originates from eastern slope of Pachaimalai hills in Perambalur Taluk. This river confluence with river Coleroon near Sathampady village, after travelling a total distance of nearly 66.00 km in Perambalur and Ariyalur Districts.

**Walk Through Survey And Farmers (Stakeholders) Demand:**

Fisheries Department in coordination with all line Department has conducted walk through survey in the Marudaiyar Sub basin in different dates. At the time of walk through survey, the farmers (stakeholders) placed their demand and views to increase the fish production in Ariyalur & Perambalur Districts into the implementing team. As per the stakeholders demand the following intervention is proposed as a fisheries activities in Marudaiyar sub basin in Ariyalur & Perambalur Districts.

**Objectives**

The tank rehabilitation activities under TN IAM Project in this Sub-basin will improve water storage and delivery through modernization of irrigation system and improved water management practices. Hence there is scope for more water retention in the tanks and thus promoting aquaculture. The interventions are planned with the following objectives:-

- Increasing the water spread area under aquaculture.
- Increased fishing efficiency, by providing effective craft and gear.
- Increasing the overall inland fish production.

**INTERVENTIONS PROPOSED IN MARUDAIYARSUB BASIN IN ARIYALURDISTRICT.**

## 1. Fish Culture in Long Seasonal Irrigation Tanks (Carp@ 1500 Seed / ha.(EWSA)

**(i) Objective**

The tanks usually get water during North-East Monsoon (October – December). Tanks which retain water for more than 6 months are considered as long seasonal tanks. Inland fish culture will be promoted in suitable long seasonal tanks by stocking quality fish seeds viz. Catla, Rohu, Mrigal, Common Carp and Grass Carp of >8cm size at a stocking density of 1,500 Nos. / ha. of EWSA.

Species combination and species will be decided after assessing the water quality, productivity of the tanks and availability of fish seeds at the time of stocking to get maximum fish production. It is proposed to take up improved fish culture in 200 ha. of EWSA of long seasonal tanks in Ariyalur district in Marudaiyar sub basin.

**(ii) Cost (Physical & Financial)**

***Physical***

| | | |
|---|---|---|
| (i) | Type of Aquaculture | Stock, Manage and Exploit. |
| (ii) | Proposed Effective Water Spread Area | **200 ha. (Ariyalur Dist)** |
| (iii) | Stocking Density | 1500 nos. / ha. of EWSA |
| (iv) | Total Seed Requirement | 3.00 lakh |
| (v) | Fish Species ( based on availability at the time of stocking) | Catla, Rohu, Mrigal, Common Carp and Grass Carp |
| (vi) | Stocking Size | >8cm |

***Financial***

***(Rs. in lakh)***

| | | |
|---|---|---|
| (i) | Fish Seed (Carp >8 cm @ Rs.2 / Seed x 1500 nos/ ha EWSA) | 0.03 / ha |
| (ii) | Total Seed Cost *(Area (200) x Rs.0.03 lakh)* | **6.00** |

**(iii) Area of Implementation**

The fish culture activities will be implemented to an extent of 200 ha. EWSA in 'long Seasonal Irrigation Tanks' in Marudaiyar Sub-basinunder TN

IAM Project. The following are the tanks identified based on the water availability / retention for fish culture activity.

The tentative list of tanks and the EWSA proposed for stocking is given below.

| Sl. No. | Tank/Reservoir Name | Village | District | WSA (ha.) | EWSA (ha.) |
|---|---|---|---|---|---|
| 1 | Sukiran Eri | Kamarasavalli | Ariyalur | 474.60 | 200.00 |

**(iv) Period**

The fish culture activities in 'Long Seasonal Irrigation Tanks' in Marudaiyar Sub-basin in Ariyalur District will be implemented during 2021-2022 to 2023-2024. The year of implementation will depend on receipt of water in tanks which in turn depends on the North East Monsoon.

**(v) Output**

The increase in inland fish culture practice in hitherto underutilized water bodies will increase the fish production, which in turn will provide additional income to the fishermen/ lessee and ensure availability of protein rich quality fish at a cheaper cost to public. The expected fish production of 420 kg. / ha. EWSA of long seasonal tanks with 40% survival rate and 700 grams of average body weight.

## 2.Fish Culture in Short Seasonal Irrigation Tanks (Carp @ 2000 Seed / ha. EWSA)

**(i) Objective**

Demonstration of fish culture in suitable short seasonal tanks will be taken up by stocking quality fish seeds viz. Catla, Rohu, Mrigal, Common Carp and Grass Carp of >8cm size at stocking density of 2,000 Nos. / ha. of EWSA. Species combination and species will be decided after assessing the water quality, productivity of the tanks and availability of the fish seed at the time of the stocking to get maximum fish production.

It is proposed to take up fish culture activities in 'Short Seasonal Irrigation Tanks' of Marudaiyar Sub-basin by direct stocking in 200 ha. EWSA in Ariyalur district.

**(ii) Cost (Physical & Financial)**

***Physical***

| | | |
|---|---|---|
| (i) | Type of Aquaculture | Stock, Manage and Exploit. |
| (ii) | Proposed Effective Water Spread Area | **200ha. (Ariyalur Dist.)** |
| (iii) | Stocking Density | 2000 nos. / ha. of EWSA |
| (iv) | Total Seed Requirement | 4.00 lakh |
| (v) | Fish Species ( based on availability at the time of stocking) | Catla, Rohu, Mrigal, Common Carp and Grass Carp |
| (vi) | Stocking Size | >8 cm |

***Financial*** ***(Rs. in lakh)***

| | | |
|---|---|---|
| (i) | Fish Seed (Carp >8 cm @ Rs.2 / Seed x 2000 nos./ha. EWSA) | 0.04 / ha |
| (ii) | Total Seed Cost *(Area (400) x Rs.0.04 lakh)* | **8.00** |

**(iii) Area of Implementation**

The fish culture activities will be implemented to an extent of 200 ha. EWSA in 'Short Seasonal Irrigation Tanks' in Marudaiyar Sub-basin under TN IAM Project. The following are the tanks identified based on the water availability / retention for fish culture activity.

The tentative list of tanks and the EWSA proposed for stocking is given below.

| Sl.No | Name of the Tanks | Name of the District | WSA (In Ha) | EWSA (In Ha) |
|---|---|---|---|---|
| 1. | ArasanEri | Ariyalur | 216.8 | 100 |
| 2. | ThoothurEri | Ariyalur | 73.00 | 35 |
| 3. | ManakudyPeriyaEri | Ariyalur | 52.52 | 25 |
| 4. | UppodaiPeriyaEri | Ariyalur | 82.15 | 40 |
| **Total** | | | **424.47** | **200** |

**(iv) Period**

The fish culture activities in 'Short Seasonal Irrigation Tanks' of Marudaiyar sub-basin in Ariyalur district will be implemented during 2021-2022 to 2023-2024. The year of implementation will depend on receipt of water in tanks which in turn depends on the North East Monsoon.

**(v) Output**

The increase in inland fish culture area and production will provide additional income to the fishermen/ lessee and ensure availability of protein rich quality fish at a cheaper cost to public. The expected fish production of 338 kg. / ha. EWSA of short seasonal tanks with 40% survival rate.

## 3. Fishing Implements

**(i) Objective**

The members of Inland Fishermen Cooperative Societies are engaged for fishing in Rivers, Reservoirs, Ponds, Irrigation Tanks and other leased out inland water bodies. In order to support the livelihood of the fishermen and to increase inland capture fisheries, it is imperative to provide subsidy assistance for the purchase of 'Fishing Implements' viz. Coracle / Gill Net /Coracle with Gill Net / Drag Net, to increase their fishing efficiency.

Therefore, it is proposed to provide 80 % subsidy assistance for supplying 5units of fishing implements in Ariyalur district to the members of Inland Fishermen Cooperative Societies for fishing in inland water bodies of Marudaiyar sub-basin under TN IAM project.

**(ii) Cost (Physical & Financial)**

***Physical***

| | | |
|---|---|---|
| (i) | Total no. of units | **5 units (Ariyalur Dist.)** |
| (ii) | Type of Fishing Implements proposed | Drag Net |

**Financial** ***(Rs. in lakh)***

| | | |
|---|---|---|
| (i) | Cost of Fishing Implements/ unit | 0.20 |
| (iii) | Total Cost | 1.00 |
| (ii) | Project Contribution as 80 % subsidy | **0.80** |
| (iii) | Beneficiary Contribution | 0.20 |

**(iii) Area**

Beneficiaries will be selected by the Department in Marudaiyar Sub basin of Ariyalur district for the supply of fishing implements.

**(iv) Period**

Supply of fishing implements in Ariyalur district of Marudaiyar sub-basin will be implemented during 2021-2022.

**(v) Output**

The socio-economic status of the members of Inland Fishermen Cooperative Societies / fish farmers will be improved due to increased fishing efficiency and exploitation of inland fish resources in the Marudaiyar sub basin of Ariyalur district.

## 4. Aquaculture in Farm Ponds

**(i) Objectives**

Farm Ponds excavated for harvesting rain water in agricultural fields in the sub-basin will be promoted to do aquaculture. Besides farm ponds excavated by the Agriculture Engineering Department in the sub-basin, farm ponds excavated by other schemes (0.1 ha size) will also be taken up for aquaculture under this project.

The farm ponds are proposed to be stocked with quality GIF Tilapia seeds which would grow to marketable size within 4-6 months. Stocking density of 1500 Nos. / Pond is proposed. Department of fisheries and TNFU will also provide training on Good Aquaculture Practices to the selected farmers.

The project will provide fish seed and feed to the farmers at an estimated cost of Rs.30,000/. It is proposed to promote aqua farming in 10farm ponds in Ariyalur district and 5 farm ponds in Perambalur District .

**(ii) Cost (Physical & Financial)**

***Physical***

| | | |
|---|---|---|
| (i) | No. of Units | **15 Units (10 Ariyalur and 5 Perambalur)** |
| (ii) | Total Area to be developed for Aquaculture | 1.0ha. |

***Financial***

| | | |
|---|---|---|
| (i) | Fish Seed (GIFT seed >3 cm @ Rs.4 / seed – 1,500 Nos.) | 0.06 |
| (ii) | Fish Feed (Max. of 600 kg.) @Rs.40/kg | 0.24 |
| (iii) | Project Contribution – Total | 0.30 |
| | Total Cost *(No. of Units(15) x Rs.0.30 lakh)* | **4.50** |

**(iii) Area**

Farm ponds excavated in Marudaiyar sub-basin with supplementary water resources of Ariyalur & Perambalur districts.

**(iv) Period**

The intervention will be carried out in Ariyalur & Perambalur districts of Marudaiyar sub basin during 2021-2022 to 2022-2023.

**(v) Implementation**

Department will create awareness on the intervention. Interested farmers will be identified and their ponds will be inspected. Suitability of the pond with respect to critical soil and water parameters to take up fish culture shall be studied. After selection of farm pond, the beneficiaries will be given training on Good Aquaculture Practices to get maximum yield.

**(vi) Output**

With 80 % survival rate and 500 grams of average body weight, fish production of about 600 kg per farm pond is expected which will give additional income to farmers.

# 5. Environmental and Social Management

This chapter envisages the mitigation of environmental impacts by assessing and effectively managing the potential environmental impacts due to the interventions under TNIAMP in Marudaiyar sub basin in Ariyalur & Perambalur Districts.

## 5.1 Summary of walk through survey

Walkthrough surveys were conducted in the sub basin in both the Districts. Officials from Water Resources Department (WRD), Agriculture Department, Horticulture Department, Tamil Nadu Agriculture University (TNAU), Agriculture Engineering Department (AED), Animal Husbandry and Fisheries Department interacted with farmers.

## 5.2 Summary of Feedback along with planned activities

The feedback of walk through survey and the planned activities are summarized below

1. Fish culture in Long seasonal irrigation tanks
2. Fish culture in Short seasonal irrigation tanks
3. Fishing implements
4. Aquaculture in Farm ponds

**5.3 Gender Strategy**:

To ensure women participation in the project, women farmers will be informed and made aware of their role in decision making in fish culture, labour opportunities in fish culture, involvement in livelihood activities etc. Specific capacity building programs like exposure visits will be organized for women beneficiary, Women self help group and members of women inland fisheries co-operative society.

**5.4 Grievance Redress Mechanism and Schedule for Establishment**

At the district level, GRM sub-committee has been formed with Assistant Director of Fisheries as Chairman and executive field staff as member. The District Level Committee has been formed with District Collector as Chairman and the members being JDF / DDF, ADF, executive field staff as members. The Sub-Committee will meet on weekly or on need basis to redress the grievances of farmers / stakeholders. The District Level Committee headed by the Collector will meet on a monthly basis. The next level will be at State Level headed by the Director of Fisheries.

A register for GRM and a boxfor receiving the Complaints and Grievances will be maintained in the respective O/o Assistant Directors of Fisheries and a monthly report on the Grievances received and the action taken will be sent to the Director of Fisheries for review and submission to the MDPU.

**5.5 Plan of activities for Environmental Monitoring and Awareness:**

P) The GIFT stocking in Short seasonal irrigations tanks as proposed in the overall DPR for 66 sub-basins, is being replaced with stocking of Carp seeds as per Government of India guidelines for culture of GIF Tilapia.
Q) Culture of GIF Tilapia seeds in Aquaculture farm ponds will be undertaken in a secured manner in order to avoid them from entering into natural water bodies.

**ABSTRACT**

| Sl. No | Interventions | Unit (ha/No) | | Amount (Rs.in Lakh) |
|---|---|---|---|---|
| | | Ariyalur | Perambalur | |
| 1. | Fish culture in Long seasonal irrigation tanks | 200 ha | 0 | 6.00 |
| 2. | Fish culture in Short seasonal irrigation tanks | 200 ha | 0 | 8.00 |
| 3. | Fishing implements | 5 Units | 0 | 0.80 |
| 4. | Aquaculture in Farm ponds | 10 Units | 5 Units | 4.50 |
| **Total** | | | | **19.30** |

# NAMBIYAR SUB – BASIN

**DEPARTMENT OF FISHERIES**

**Name of the Sub-basin** : **NAMBIYAR**

**Districts Covered** : **TIRUNELVELI**

**Preface**

The Nambiyar river runs across Nanguneri taluk in Tirunelveli district in Tamil Nadu state in India. It is a small river which runs for only 45 kilometres. The river originates near Thirukkurungudi village in the Western Ghats, about 1,500 metres (4,900 ft) above sea level and ends at the Gulf of Mannar.

The Nambiyar basin falls in Tirunelveli, Thoothukudi and Kanyakumari districts. There are three rivers in this basin. The Karamaniyar is in the northern part of the basin and Hanumanadhi river is in the southern part of the basin and the Nambiyar river is in between these two rivers. Tamiraparani basin on north and Kodaiyar basin on south and the Gulf of Mannar on the east surround this basin. The Nambiyar river basin falls in part of the Survey of India toposheets 58H and 58L and it lies between the following co-ordinates. North Latitudes 08° 08'00" - 08° 33' 00" and East - Longitude 77° 28'00" - 78° 15' 00". The total area of the basin is 2018.4 sq.km and it covers the part of Kanyakumari, Tirunelveli and Thoothukudi districts.

The Sub-basin covers 4 blocks of Tirunelveli District, 4 blocks of Thoothukudi District and 2 blocks of Kanniyakumari District. There are 95 nos of tanks in this system out of these 11 system tanks with have been selected. These tanks are classified as System Tanks and Non-System Tanks and are under the control of Water Resource Department. These tanks receive mostly during North-East Monsoon (October to December) and have water retention period of three months. Surplus of water after irrigation is unpredictable. As per the existing scenario, the scope for fisheries development activities in this Sub-basin is limited.

Rehabilitation of tanks proposed in TN IAMP Project in this Sub-basin shall improve the water retention period in the irrigation tanks and also by water conservation measures. As a result, the opportunity for fish culture in these irrigation tanks is also likely to improve.

**Objectives**

The tank rehabilitation activities under TN IAM Project in this Sub-basin will improve water storage and delivery through modernization of irrigation system and improved water management practices. Hence there is scope for more water retention in the tanks and thus promoting aquaculture. The interventions are planned with the following objectives:-

- Increasing the water spread area under aquaculture.
- Increasing the overall inland fish production.

**INTERVENTIONS PROPOSED IN NAMBIYARSUB BASIN IN TIRUNELVELI DISTRICT.**

## 1.Fish Culture in Short Seasonal Irrigation Tanks (Carp @ 2000 Seed / ha. EWSA)

**(i) Objective**

Demonstration of fish culture in suitable short seasonal tanks will be taken up by stocking quality fish seeds viz. Catla, Rohu, Mrigal, Common Carp and Grass Carp of >8cm size at stocking density of 2,000 Nos. / ha. of EWSA. Species combination and species will be decided after assessing the water quality, productivity of the tanks and availability of the fish seed at the time of the stocking to get maximum fish production.

It is proposed to take up fish culture activities in 'Short Seasonal Irrigation Tanks' of Nambiyar Sub-basin by direct stocking in 200 ha. EWSA in Tirunelveli district.

**(ii) Cost (Physical & Financial)**

***Physical***

| | | |
|---|---|---|
| (i) | Type of Aquaculture | Stock, Manage and Exploit. |
| (ii) | Proposed Effective Water Spread Area | **200ha.** |
| (iii) | Stocking Density | 2000 nos. / ha. of EWSA |
| (iv) | Total Seed Requirement | 4.00 lakh |
| (v) | Fish Species ( based on availability at the time of stocking) | Catla, Rohu, Mrigal, Common Carp and Grass Carp |
| (vi) | Stocking Size | >8 cm |

***Financial*** ***(Rs. in lakh)***

| | | |
|---|---|---|
| (i) | Fish Seed (Carp >8 cm @ Rs.2 / Seed x 2000 nos./ha. EWSA) | 0.04 / ha |
| (ii) | Total Seed Cost *(Area (200) x Rs.0.04 lakh)* | **8.00** |

**(iii) Area of Implementation**

The fish culture activities will be implemented to an extent of 200 ha. EWSA in 'Short Seasonal Irrigation Tanks' in Nambiyar Sub-basin under TN IAM Project. The following are the tanks identified based on the water availability / retention for fish culture activity.

The tentative list of tanks and the EWSA proposed for stocking is given below.

| Sl. No. | Unique ID | Tank Name | Village | District | WSA (ha.) | EWSA (ha.) |
|---|---|---|---|---|---|---|
| 1 | TNTP04T1050 | Senthilanpannaikulam | Kottaikarungulam | Tirunelveli | 10.9 | 5.50 |
| 2 | TNTP04T1051 | Nambikurichikulam | Kottaikarunkulam | Tirunelveli | 27.4 | 14.00 |
| 3 | TNTP04T1054 | Kottaikarun kulam | Kottaikarun Kulam | Tirunelveli | 88.8 | 44.00 |
| 3 | TNTP04T1022 | Tuthikulam | Kottaikarunkulam | Tirunelveli | 13.9 | 7.00 |
| 4 | TNTP04T0994 | Kannankulam | Kottaikarunkulam | Tirunelveli | 18.9 | 10.00 |
| 5 | TNTP04T1032 | Erumaikualam | Thisayanvilai | Tirunelveli | 25.13 | 13.00 |
| 6 | TNTP04T1042 | Urumankulam | Urmankulam | Tirunelveli | 42.8 | 21.00 |
| 7 | TNTP04T1037 | KesavaneriKulam | Vadakkuvallioor | Tirunelveli | 7.8 | 4.00 |
| 8 | TNTP04T1048 | ValliyoorPeriyakulam | VadakkuValliyoor | Tirunelveli | 146.8 | 73.00 |
| 9 | TNTP04T1039 | Karisalkulam | Thirukkurangudy | Tirunelveli | 4.7 | 2.00 |
| 10 | TNTP04T1045 | Padalayar Tank | Thirukkurangudy | Tirunelveli | 12.88 | 6.50 |

**(iv) Period**

The fish culture activities in 'Short Seasonal Irrigation Tanks' of Nambiyar sub-basin in Tirunelveli district will be implemented during 2021-2022 to 2023-2024. The year of implementation will depend on receipt of water in tanks which in turn depends on the North East Monsoon.

**(v) Output**

The increase in inland fish culture area and production will provide additional income to the fishermen/ lessee and ensure availability of protein rich quality fish at a cheaper cost to public. The expected fish production of 338 kg. / ha. EWSA of short seasonal tanks with 40% survival rate.

## 2. Aquaculture in Farm Ponds

**(i) Objectives**

Farm Ponds excavated for harvesting rain water in agricultural fields in the sub-basin will be promoted to do aquaculture. Besides farm ponds excavated by the Agriculture Engineering Department in the sub-basin, farm ponds excavated by other schemes (0.1 ha size) will also be taken up for aquaculture under this project.

The farm ponds are proposed to be stocked with quality GIFTilapia seeds which would grow to marketable size within 4-6 months. Stocking density of 1500 Nos. / Pond is proposed. Department of fisheries and TNFU will also provide training on Good Aquaculture Practices to the selected farmers.

The project will provide fish seed and feed to the farmers at an estimated cost of Rs.27,000/. It is proposed to promote aqua farming in 10farm ponds in Tirunelveli district.

**(ii) Cost (Physical & Financial)**

***Physical***

| | | |
|---|---|---|
| (i) | No. of Units | **10 Units** |
| (ii) | Total Area to be developed for Aquaculture | 1.0ha. |

***Financial***

| | | |
|---|---|---|
| (i) | Fish Seed (GIFT seed >3 cm @ Rs.4 / seed – 1,500 Nos.) | 0.06 |
| (ii) | Fish Feed (Max. of 600 kg.) @Rs.40/kg | 0.24 |
| (iii) | Project Contribution – Total | 0.30 |
| | Total Cost *(No. of Units(10) x Rs.0.30 lakh)* | **3.00** |

**(iii) Area**

Farm ponds excavated in Nambiyar sub-basin with supplementary water resources of Tirunelveli district.

**(iv) Period**

The intervention will be carried out in Tirunelveli district of Nambiyar sub basin during 2021-2022 to 2022-2023.

**(v) Implementation**

Department will create awareness on the intervention. Interested farmers will be identified and their ponds will be inspected. Suitability of the pond with respect to critical soil and water parameters to take up fish culture

shall be studied. After selection of farm pond, the beneficiaries will be given training on Good Aquaculture Practices to get maximum yield.

**(vi) Output**

With 80 % survival rate and 500 grams of average body weight, fish production of about 600 kg per farm pond is expected which will give additional income to farmers.

## 3. Environmental and Social Management

This chapter envisages the mitigation of environmental impacts by assessing and effectively managing the potential environmental impacts due to the interventions under TNIAMP in Nambiyar sub basin in Tirunelveli District.

### 3.1. Summary of walk through survey

Walkthrough surveys were conducted in the sub basin in both the Districts. Officials from Water Resources Department (WRD), Agriculture Department, Horticulture Department, Tamil Nadu Agriculture University (TNAU), Agriculture Engineering Department (AED), Animal Husbandry and Fisheries Department interacted with farmers.

### 3.2 Summary of Feedback along with planned activities

The feedback of walk through survey and the planned activities are summarized below

| | |
|---|---|
| 1. | Fish culture in Short seasonal irrigation tanks |
| 2. | Aquaculture in Farm ponds |

### 3.3. Gender Strategy:

To ensure women participation in the project, women farmers will be informed and made aware of their role in decision making in fish culture, labour opportunities in fish culture, involvement in livelihood activities etc. Specific capacity building programs like exposure visits will be organized for women beneficiary, Women self help group and members of women inland fisheries co-operative society.

### 3.4. Grievance Redress Mechanism and Schedule for Establishment

At the district level, GRM sub-committee has been formed with Assistant Director of Fisheries as Chairman and executive field staff as member. The District Level Committee has been formed with District Collector as Chairman and the members being JDF / DDF, ADF, executive field staff as members. The Sub-Committee will meet on weekly or on need basis to redress the grievances of farmers / stakeholders. The District Level

Committee headed by the Collector will meet on a monthly basis. The next level will be at State Level headed by the Director of Fisheries.

A register for GRM and a box for receiving the Complaints and Grievances will be maintained in the respective O/o Assistant Directors of Fisheries and a monthly report on the Grievances received and the action taken will be sent to the Director of Fisheries for review and submission to the MDPU.

### 3.5. Plan of activities for Environmental Monitoring and Awareness:

R) The GIFT stocking in Short seasonal irrigations tanks as proposed in the overall DPR for 66 sub-basins, is being replaced with stocking of Carp seeds as per Government of India guidelines for culture of GIF Tilapia.

S) Culture of GIF Tilapia seeds in Aquaculture farm ponds will be undertaken in a secured manner in order to avoid them from entering into natural water bodies.

**ABSTRACT**

| Sl.No | Interventions | Unit (ha/No) | Amount (Rs.in Lakh) |
|---|---|---|---|
| | | Tirunelveli | |
| 1. | Fish culture in Short seasonal irrigation tanks | 200 ha | 8.00 |
| 2. | Aquaculture in Farm ponds | 10 Units | 3.00 |
| **Total** | | | **11.00** |

# MONITORING SUPPORT IN SUB-BASINS & IAMP CELL

**DEPARTMENT OF FISHERIES**

**Name of the Intervention : Monitoring Support in Sub-Basins & IAMP Cell**

**Districts Covered : TN IAMP Cell in Head Quarters and Sub-basin Level**

## 1. Objective

The activities proposed needs constant technical support to farmers for successful implementation. Since, the Fisheries Department is not equipped with adequate number of field staff that can constantly support the farmers, hence it is proposed to employ field Staff on contract basis. They will support the Nodal Officers of the respective Sub-basin for executing project activities, provide technical support to farmers and monitor the implementation progress. TN IAMP Cell at Head Quarters shall be provided with adequate Staff for monitoring and reporting to World Bank / Multi Disciplinary Project Unit (MDPU) on the implementation and progress. A sum of Rs.180.00 lakh has been approved during the project and financial assistance of Rs.120.00 lakh was also approved and provided in Phase-I and Phase II DPR. Further assistance of Rs.40.00 lakh to be provided in Phase III from the project in the implementation years on justification and approval of World Bank.

TN Fisheries Department will prepare job specification for the recruitment of support staff and template for monitoring the progress of project implementation. The Nodal Officers shall assign the field work of the Project to Department staff and Field Activity Monitors. The short term training / orientation shall be given to **Field Activity Monitor**. The TN IAMP Cell at Head Quarters shall review the execution.

## 2. Cost (Physical & Financial)

***Physical***

| | | |
|---|---|---|
| (i) | No. of Field Activity Monitor | 10 + 3 |
| (ii) | Method of Recruitment | Contract Basis either Centrally or at Sub-basin Level |
| (iii) | Work Allotment | Nodal Officers shall assign the field work. |

***Financial***

*(Rs. in lakh)*

| | | |
|---|---|---|
| (i) | Contract Payment (Per Month) | Rs.2.72 |
| (ii) | Period | Project Period |
| (iii) | Total Project Cost | Rs.180.00 lakh |
| (iv) | Total Cost During Phase – III | Rs.40.00 lakh |

**3. Area**

The Field Activity Monitors already recruited will be deployed for execution of activities, technical support to the farmers and monitoring of the respective Sub-basins.

**4. Period**

The Field Activity Monitors will be deployed for technical support to the farmers and implementation of Project activities of the Sub-basins during the Phase III project period of TN IAMP.

**5. Output**

The Field Activity Monitors will provide technical support and constant guidance to the farmers in the respective Sub-basins which shall lead to good aquaculture practices by farmers, increased fish production and income to farmers. Documentation of activities and recording of sustainability of activities will be ensured which is critical for project evaluation.

**ABSTRACT**

| Sl. No. | Interventions | Unit (No.) | Amount (Rs. in lakh) |
|---|---|---|---|
| 1. | Monitoring Support in Sub-Basin & IAMP Cell | 13 | 40.00 |
| **Total** | | | **40.00** |

# DOMESTIC TRAINING / EXPOSURE VISIT

**DEPARTMENT OF FISHERIES**

**Name of the Intervention : Domestic Training / Exposure Visit**

**Districts Covered : Districts of Phase III Sub-basins**

## 1. Objective

The farmers selected for the activities will be given orientation training by the Department. This will be organized by the field level functionaries. Based on the type and design of the training, funds will be provided to the Nodal officers by the HOD. The Implementing officer will organize and design the training on the basis of the need of the farmers.

Capacity building of the TN IAMP implementing officials and farmers in new activities like GIF Tilapia seed production units, Pureline Brooder Development and Multiplication , Murrel production technology etc. will be done. Appropriate exposure visit and training in countries where these activities are widely practiced as per Steering Committee viz., Indonesia, Thailand, Vietnam, China, and Philippines will be undertaken subject to Government regulations.

Exposure visit to proactive States where Inland Aquaculture is better off will be made. Arrangements with Central and State Institutes and other State Fisheries Departments will be made to train the farmers and Department Staff after assessing the need and requirement.

## 2. Cost (Physical & Financial)

***Physical***

| | | |
|---|---|---|
| (i) | Trainees / Participant | Farmers / Beneficiaries, Departmental Officials |
| (ii) | Training / Exposure | Domestic / Overseas ( subject to Govt. regulations) |

***Financial***

(i) Training Cost *(Rs. in lakh)* 10.00 (*During Phase – III)*

## 3. Area

The capacity building of the TN IAMP implementing officials and farmers will be given training / exposure visit (Domestic) in the fields related to the approved activities under TN IAMP.

## 4. Period

The Training period depends upon the nature of training / exposure visit (Domestic) in the fields related to the approved activities of TN IAMP.

## 5. Output

The experience gained from the Domestic Training will help make good fish culture management practices in both farms and inland water bodies, which in turn increase the revenue to farmers.

**ABSTRACT**

| Sl. No. | Interventions | Unit (Ha. / No.) | Amount (Rs. in lakh) |
|---|---|---|---|
| 1. | Domestic Training / Exposure Visit | .. | 10.00 |
| **Total** | | | **10.00** |

# DOCUMENTATION, OFFICE EXPENSES & TRANSPORT CHARGES

**DEPARTMENT OF FISHERIES**

**Name of the Intervention : Documentation, Office Expenses & Transport Charges**

**Districts Covered : Phase III Sub-basins**

## 1. Objective

The project interventions need effective documentation, which is vital for the project report preparation, implementation and evaluation. Hence for effective evaluation of results, fund allocation has been provided for documentation. For monitoring seed stocking, growth of fish, harvesting as well as for providing training to fish farmers and transport fish seed etc. by the nodal officers, transport cost is essential. A sum of Rs.70.00 lakh has been approved during the project and financial assistance of Rs.35.00 lakh was approved in Phase-I DPR and Rs.25.00 lakh was approved in Phase II DPR. Further assistance of Rs.5.00 lakh in Phase III shall be provided from the project on justification and approval by the World Bank.

## 2. Cost (Physical & Financial)

***Physical***

| | | |
|---|---|---|
| (i) | Documentation, Office Expenses and Transport Charges | Based on Requirement |

***Financial***

| | | |
|---|---|---|
| (i) | Total Project Cost | Rs.70.00 lakh |
| (ii) | Already approved cost for Phase I and Phase II DPR | Rs.60.00 lakh |
| (ii) | For Phase – III DPR | Rs.5.00 lakh |

## 3. Area

The TN IAMP Cell in Head Quarters is equipped with Computers, Xerox Machine, Handy Cam for which maintenance expenses is required. Documentation of the project activities & transport for TN IAMP Cell and Nodal Officers are essential for implementation of projects under TN IAMP.

## 4. Period

The office expenses, documentation & transport for TN IAMP Cell and Nodal Officers will be incurred during Phase III project period.

## 5. Output

The documentation of project interventions under TN IAMP will be effective for evaluation& monitoring of seed stocking, growth of fish, harvesting, training to fish farmers. Effective implementation of the project is thus ensured.

**ABSTRACT**

| Sl. No. | Interventions | Unit (Ha. / No.) | Amount (Rs. in lakh) |
|---|---|---|---|
| 1. | Documentation, Office expenses & Transport Charges | .. | 5.00 |
| **Total** | | | **5.00** |

# PHASE III

# ANNEXURES

***Activity wise Estimate details of Unit Cost and Economics***

**Annexure – I**

***Estimate details of Unit Cost and Economics***

***FISH CULTURE IN LONG SEASONAL IRRIGATION TANKS***
***(@ 1500 SEED / HA.-EWSA)***

| | | |
|---|---|---|
| (i) | Type of Aquaculture | Stock, Manage and Exploit |
| (ii) | Stocking Density | 1,500 Nos. / ha. of EWSA |
| (iii) | Fish Species | Catla, Rohu, Mrigal, Common Carp and Grass Carp |
| (iv) | Stocking Size | >8 cm |

***Economics (Per one ha of EWSA)***

*(Rs.in lakh)*

| | | |
|---|---|---|
| ***A.*** *Beneficiary Contribution – Rs.0.155 lakh* | | |
| (a) | Lease Amount for Tank (Per Ha. / Year) | 0.025 |
| (b) | Ward & Watch (@ 1 person x Rs.5,000 / month x 8 months for 10 ha.) | 0.040 |
| (c) | Fishing Expenditure (@ 15 days x 2 persons x Rs.300 / day for 1 ha.) | 0.090 |
| Beneficiary Contribution – Total | | 0.155 |
| ***B.*** *Project Contribution – Rs.0.03 lakh* | | |
| (a) | Fish Seed (Carp >8 cm @ Rs.2 / Seed x 1,500 Nos.) | 0.030 |
| Project Contribution – Total | | 0.030 |
| **(i)** | **Unit Cost *(Economics Per Ha. of EWSA)* (A+B)** | **0.185** |
| **(ii)** | Anticipated Revenue | |
| | Fish Sales (Rs.100 / kg. x 420 kg.) | 0.420 |
| | (Survival @ 40%, Ave. Growth 700 gm. period >6 months) | |
| **Net Profit** | | **0.235** |

**Annexure – II**

***Estimate details of Unit Cost and Economics***

***FISH CULTURE IN SHORT SEASONAL IRRIGATION TANKS***
***(@ 2000 SEED (CARP) / HA.-EWSA)***

| | | |
|---|---|---|
| (i) | Type of Aquaculture | Stock, Manage and Exploit |
| (ii) | Stocking Density | 2,000 Nos. / ha. of EWSA |
| (iii) | Fish Species | Catla, Rohu, Mrigal, Common Carp and Grass Carp |
| (iv) | Stocking Size | >8cm |

***Economics (Per one ha of EWSA)***

*(Rupees in lakh)*

| | | |
|---|---|---|
| ***A. Beneficiary Contribution – Rs.0.122 lakh*** | | |
| (a) | Lease Amount for Tank (Per Ha. / Year) | 0.020 |
| (b) | Ward & Watch (@ 1 person x Rs.5,000 / month x 6 months for 10 ha.) | 0.030 |
| (c) | Fishing Expenditure (@ 12 days x 2 persons x Rs.300 / day for 1 ha.) | 0.072 |
| **Total** | | **0.122** |
| ***B. Project Contribution 25% – Rs.0.04 lakh*** | | |
| (a) | Fish Seed (Carp >8 cm @ Rs.2 / Seed x 2,000 Nos.) | 0.040 |
| **Total** | | **0.040** |
| **(i)** | **Unit Cost *(Economics Per Ha. of EWSA)* (A+B)** | **0.162** |
| (ii) | Anticipated Revenue | |
| | Fish Sales (Rs.100 / kg. x 338 kg.) | 0.338 |
| | (Survival @ 40%, Ave. Growth 400 gm. period <6 months) | |
| **Net Profit** | | **0.176** |

**Annexure – III**

***Estimate details of Unit Cost and Economics***

**AQUACULTURE IN FARM PONDS**

| | | |
|---|---|---|
| (i) | Stocking Species | GIFT |
| (ii) | Stocking Size | > 3 cm |
| (iii) | Seed Cost | Rs.4 / Seed |
| (iv) | Stocking Area | 0.1 ha. (1000 $m^2$) / Unit |
| (v) | Stocking Density | 1,500 Nos. / 0.1 ha. |
| (vi) | Culture Period | 5 – 6 Months |
| (vii) | Feed Requirement | Max. 600 Kg. / Unit |

*Economics (Per Unit)*

*(Rupees in lakh)*

| | | |
|---|---|---|
| *(A) Fixed Cost – Rs. Nil* | | |
| (a) | Pond (Available – Constructed by AED or Other Dept., etc.) 0.1 ha. Area | .. |
| ***(B) Project Contribution – 67%*** | | |
| *Operational Cost – Rs.0.30 lakh* | | |
| (a) | Fish Seed (GIFT > 3 cm @ Rs.4 / Seed – 1,500 Nos.) | 0.060 |
| (b) | Fish Feed (Max – 600 kg. @ Rs.40 / kg) | 0.240 |
| | **Total** | **0.300** |
| *(C)* ***Beneficiary Contribution – 33%*** | | |
| (a) | Lime – 100 Kg. | 0.018 |
| (b) | Manure – Organic (Cow dung – 1.5 ton.) | 0.030 |
| (c) | Labour (Own / Family) Charges (Rs.50 x 150 days) | 0.075 |
| (d) | Harvest Expense (Rs.300 / day x 9 days) | 0.027 |
| **Total** | | **0.150** |
| (i) | **Unit Cost** | **0.450** |
| (ii) | Anticipated Revenue | |
| | Fish Sales (Rs.110 / kg. x 600 kg.) | 0.660 |
| | (Survival @ 80%, Ave. Growth 500 gm. in 5 – 6 Months) | |
| **Gross Profit (Per Crop)** | | **0.210** |

**Annexure – IV**

***Estimate details of Unit Cost and Economics***

**FISH SEED REARING IN CAGES**

| | | |
|---|---|---|
| (i) | Size of One Unit Cage | 3 cages of size P16-1, P8-2 |
| (ii) | Species (Late Fry) | Catla, Rohu, Mrigal, Common Carp and Grass Carp etc., |
| (iii) | No. of Cycles | 3 / Annum |
| (iv) | Stocking Density | *315 nos/$m^3$*<br>*( 12500 nos. in 40 m3 in a crop)* |
| (v) | Survival Rate | *80 %* |
| (vi) | Anticipated Fingerlings Production | *30,000*/ Annum |

*Economics (Per Unit)*

*(Rupees in lakh)*

| | | |
|---|---|---|
| *(A)* ***Project Contribution – 80%*** | | |
| *Operational Cost – Rs.0.40 lakh* | | |
| (a) | Cost of Cages [(1 unit with 3 cages (P16,1 & P8-2)] | 0.205 |
| (b) | Purchase of Late Fry (12500 Nos./ cycle, for 3 cycle- 37500) | 0.095 |
| (c) | Feed Mix (Rs.40 / kg. x 250 kg) | 0.100 |
| | **Total** | **0.400** |
| *(B)* ***Beneficiary Contribution – 20%*** | | |
| (a) | Cost of Installation Material (Poles, Rope etc.,), Buckets, Hand Nets etc. | 0.040 |
| (b) | Cage Cleaning, Harvesting Expenditure (Rs.2,000 x 3 Cycles) | 0.060 |
| **Total** | | 0.100 |
| (i) | **Unit Cost (A+B)** | **0.500** |
| (ii) | Anticipated Revenue | |
| | Fish Seed Sales (Rs.2.00 / Seed x 30,000) | 0.600 |
| **Net Profit (Per Annum)** | | **0.100** |

**Annexure – V**

***Estimate details of Unit Cost and Economics***

**EARTHEN FISH SEED REARING AND CULTURE FARM**

Total Area : 0.50 ha.
EWSA : 0.40 ha.

| **A.** | **Capital Cost:- ( Project Contribution-75%)** | **(Rs. In lakh)** |
|---|---|---|
| 1 | Excavation of nurseries and providing pipeline (4000 sq m) | 4.00 |
| 2 | Conditioning Pond | 0.25 |
| 3 | Shed for Packing | 0.25 |
| 4 | Farm Equipments<br>(Oxygen Cylinder, Nets for harvesting, etc.) | 0.25 |
| **Sub-total (A)** | | **4.75** |
| **B.** | **Operational cost** | |
| 1 | Early Fry (500 nos/$m^2$) (Rs.1000 x 20 lakh) | 0.20 |
| 2 | Feed (1500 kg x Rs.40.00/kg) | 0.60 |
| **Sub-total (B)** | | **5.55** |
| **C.** | (Beneficiary Contribution -25%) | |
| 1 | Electricity | 0.30 |
| 2 | Wage (2 persons) 150 days@Rs.300/-per day | 0.90 |
| 3 | Lime, Manure etc. | 0.20 |
| 4 | Harvesting expenses | 0.15 |
| **Sub-total (C)** | | **1.55** |
| **Grand Total (A+B+C)** | | **7.10** |
| | | |

*Economics (Per Unit)* *(Rupees in lakh)*

| *(A) Project Contribution – 75%* | | 5.55 |
|---|---|---|
| *(B) Beneficiary Contribution – 25%* | | 1.55 |
| (i) | **Unit Cost (A+B)** | **7.10** |
| (ii) | Anticipated Revenue | |
| | a) Fish Seed Sales (Rs.1.00 / Seed x 2,00,000) | 2.00 |
| | b) Fish Sales (1600 kg x Rs.120/-) | 1.92 |
| | Total Revenue | 3.92 |
| **Net Profit (Per Annum)** | | **2.37** |

**Annexure – VI**

***Estimate details of Unit Cost and Economics***

**FISH KIOSK**

*Economics (Per Unit)*

*(Rupees in lakh)*

| | | |
|---|---|---|
| (i) | Unit Cost | 8.00 |
| ***A. Project Contribution – 100%*** | | |
| *Capital Cost – Rs.8.00 lakh* | | |
| (a) | Building 300 Sq.ft. including water supply, electrical, and other facilities. | **8.00** |
| (b) | Accessories including Processing Table (Stainless Steel with accessories), Insulated Ice Boxes, Deep Freezer, Electronic Weighing Machines, Fly Catches Equipment, Furniture and Fittings. | |
| (c) | Working Capital | |
| *B. Beneficiary Contribution (Per Month)* | | |
| *Operational Cost – Rs.3.35 lakh* | | |
| (a) | Fresh Fish (Ave. 150 kg. / day for 16 days = 2400 kg.) | |
| | Procurement Rate Rs.100 / kg. | 2.40 |
| (b) | Fish Fry & Fishery Products | |
| | Fish 15 kg. / day (30 days x 450 kg. x Rs.100/-) | 0.45 |
| | Transport | 0.15 |
| | Oil, Masala & Others | 0.03 |
| | Electricity | 0.04 |
| | Wages (2 Persons) (Rs.300 / day) | 0.18 |
| | Fuel (Cooking Gas) | 0.05 |
| | Rent of Land | 0.05 |
| **Beneficiary Contribution – Total** | | **3.35** |
| (ii) | Anticipated Revenue | |
| | a) Fresh Fish Sales (Rs.130 / kg. | 3.12 |
| | b) Fish Fry & Fishery Products Sales (Rs.200 / kg.) | 0.90 |
| **Gross Revenue** | | **4.02** |
| | | |
| **Net Profit / Month** | | **0.67** |

| DEPARTMENT OF FISHERIES - TN-IAM PROJECT | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PHASE III- 10 SUB-BASINS - DETAILED PROJECT REPORT - ABSTRACT | | | | | | | | | | | | | | | | | | | | | | |
| Sl. No. | Sub-Basin | Districts | Fish Culture in Long Seasonal Irrigation Tanks | | Fish Culture in Short Seasonal Irrigation Tanks (Carp) | | Fishing Implements | | Murrel Culture | | Aquaculture in Farm Ponds | | Fish Seed Rearing in Cages | | Earthen Fish Seed Rearing & Culture Farm | | Fish Kiosk | | Monitoring Support & IAMP | Overseas Training & Exposure Visit | Doc., OE & Tran. | Total |
| | | | Phy. (in ha.) | Fin. (in lakh) | Phy. (in ha.) | Fin. (in lakh) | Phy. (in No.) | Fin. (in lakh) | Phy. (in No.) | Fin. (in lakh) | Phy. (in No.) | Fin. (in lakh) | Phy. (in No.) | Fin. (in lakh) | Phy. (in No.) | Fin. (in lakh) | Phy. (in No.) | Fin. (in lakh) | Fin. (in lakh) | Fin. (in lakh) | Fin. (in lakh) | |
| 1 | Cheyyar | Tiruvannamalai | | | 430 | 17.20 | 20 | 3.20 | | | 5 | 1.50 | 3 | 1.20 | | | | | | | | 23.10 |
| | | Ranipet | | | 70 | 2.80 | | | | | | | | | | | | | | | | 2.80 |
| 2 | Chinnar | Krishnagiri | | - | 400 | 16.00 | 10 | 1.60 | | | 5 | 1.50 | | - | | | | | | | | 19.10 |
| | Chinnar | Dharmapuri | | | | - | 5 | 0.80 | | | 3 | 0.90 | | - | | | | | | | | 1.70 |
| 3 | Gummidi poondi | Tiruvallur | | | 100 | 4.00 | | - | | | 5 | 1.50 | | - | | | | | | | | 5.50 |
| 4 | ManimukthaNadhi | Kallakurichi | 500 | 15.00 | 200 | 8.00 | 5 | 0.80 | | | 25 | 7.50 | 5 | 2.00 | 3 | 16.65 | | | | | | 49.95 |
| 5 | MusukundaNadhiu | Kallakurichi | | | 100 | 4.00 | 0 | - | | | 10 | 3.00 | | - | | - | | - | | | | 7.00 |
| 6 | Paravanar | Cuddalore | 500 | 15.00 | 63 | 2.52 | 5 | 0.80 | 1 | 170.00 | 15 | 4.50 | 5 | 2.00 | 4 | 22.20 | 2 | 16.00 | | | | 233.02 |
| 8 | Vegavathi | Kanchipuram | | | 200 | 8.00 | 5 | 0.80 | | | 25 | 7.50 | | | | - | | - | | | | 16.30 |

| | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Ranipet | | | 25 | 1.00 | | - | | | | | | | | | | | | | | 1.00 |
| 9 | Marudhaiyar | Ariyalur | 200 | 6.00 | 200 | 8.00 | 5 | 0.80 | | | 10 | 3.00 | | - | | - | | - | | | | 17.80 |
| | | Perambalur | | | | - | | - | | 0.00 | 5 | 1.50 | | - | | - | | | | | | 1.50 |
| 10 | Nambiyar | Tirunelveli | | | 200 | 8.00 | | - | | | 10 | 3.00 | | | | - | | - | | | | 11.00 |
| 11 | TN IAMP Cell | | | | | | | - | | | | | | | | | | | 40.00 | 10.00 | 5.00 | 55.00 |
| **Phase III DPR TOTAL** | | | **1200** | **36.00** | **2063** | **82.52** | **60** | **9.60** | **1** | **170.00** | **128** | **38.4** | **13** | **5.20** | **10** | **55.50** | **2** | **16.00** | **40.00** | **10.00** | **5.00** | **468.22** |
| | | | | | | | | | | | | | | | | | | | | | **Grand Total** | **444.77** |