GOVERNMENT OF TAMIL NADU

TAMIL NADU IRRIGATED AGRICULTURE MODERNIZATION PROJECT

(TNIAMP) PHASE – III

MANIMUKTHANADHI SUB BASIN

COMBINED DETAILED PROJECT REPORT

Ayacut area 2834.210 Ha.

Total Project Cost Rs. 676.452 Lakh.

MULTI DISPLINARY PROJECT UNIT (MDPU)

CHEPAUK, CHENNAI - 600 005.

TAMIL NADU

CONSOLIDATED PROJECT COST FOR MANIMUKTHANATHI SUB BASIN

Sl.No.	Department	Project Cost in Lakh Rs.
1	Agriculture	45.973
2	Horticulture	336.120
3	Tamil Nadu Agricultural University	42.510
4	Agricultural Marketing	154.030
5	Agricultural Engineering	7.500
6	Fisheries	49.950
7	Animal Husbandry	39.074
8	TANUVAS	1.295
	TOTAL	**676.452**

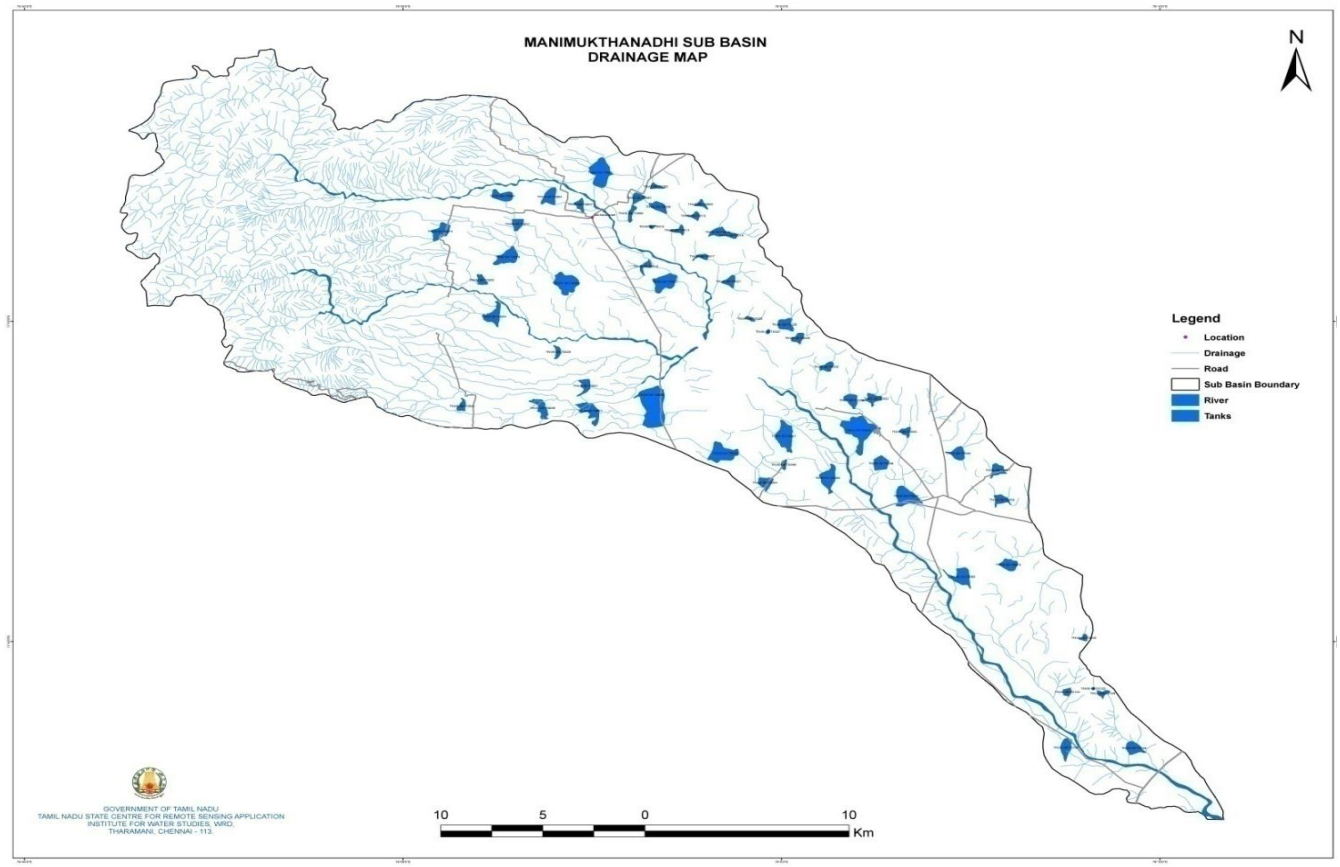
INDEX

Sl.No.	Details	Page Number
I	Introduction about Sub basin	4
II	Department wise Interventions	10
1	Agriculture	10
2	Horticulture	22
3	Tamil Nadu Agricultural University	29
4	Agricultural Marketing	37
5	Agricultural Engineering	46
6	Fisheries	50
7	Animal Husbandry	58
8	TANUVAS	66
9	Gender participation, ESMF, GRM, Geo Tagging	69
10	Annexures	75
	A. Walk through survey	75
	B. Fisheries IAMP Cell	76

COMBINED DETAILED PROJECT REPORT
MANIMUKTHANADHI SUB BASIN
KALLAKURICHI DISTRICT

INTRODUCTION

Tamil Nadu depends largely on the surface and ground water potentials to the maximum limit and hence the future development and expansion depends only on the efficient and economical use of water potential and Resources.



The Government of Tamil Nadu have taken number of progressive actions on Water Resources and Irrigation Management, for the modernization of the Traditional Irrigation systems in Tamil Nadu with loan assistance from World Bank. Under the World Bank funded project of "Irrigated Agriculture Modernization various river sub basins have been selected and proposed to be taken up under the control of Water Resources Department Wing of Public Works Department. This ManimukthaNadhi Sub Basin is one among them in vellar Basin.

DESCRIPTION OF THE VELLAR BASIN

There are 17 major River basins in Tamilnadu. Vellar basin is one among them. Vellar river basin located in Salem, Villupuram, Perambalur, Ariyalur and Cuddalore districts of Tamil Nadu. The Vellar river originates in the Chitteri Hills of Dharmapuri District in the name of Anaimaduvu river and Thumbal river and Singipuram river are originates at Javvathu reserve forest area at 8 Km east of Salem in Salem district and flows through Villupuram, Namakkal, Perambalur, Ariyalur and Cuddalore District finally falls into the Bay

of Bengal.The Vellar basin is bounded by Pennaiyar and Paravanar basins at north, Cauvery basin in the west & south the Bay of Bengal in the east. This basin has been divided into 7 sub-basins namely as follows;

1. Upper Vellar
2. Swethanadhi
3. Chinnar
4. Anaivariodai
5. Gomukhinadhi.
6. Manimukthanadhi
7. Lower vellar.

DESCRIPTION OF THE MANIMUKTHA SUB BASIN

The basin originates in Kalryan hills with drainage Area of 749.54 Km having two drainages namely Mani River and Muktha River originating in the Northern part of the eastern slope of the Kalrayn Hills in SankarapuramTaluk at an altitude of about40 km and the Muktha River flows for 32 km. These two rivers confluence ManimukthaNadhi sub basin having18 Anicuts , 49 PWD tanks, and one ManimukthaNadhi reservoir having the total Ayacut of 5027 Hectares. Average rainfall is 950 mm in this sub basin

- Name of the sub Basin : Manimukthanadhi
- Nodal District : Kallakurichi
- Registered Ayacut Area : 2834.210 Ha.
- Fully Irrigated : 1009.29 Ha 1275.27 Ha
- Partially Irrigated : 973.33 Ha1011.65 Ha
- Gap : 512.44 Ha547.29 Ha

PROPOSED PROJECT AREA AT A GLANCE

Sl. No	Particulars	Area (Ha)
1	Total registered ayacut area	2834.21
2	Fully irrigated area	1275.27
3	Partially irrigated area	1011.65
4	Gap area	547.29
	Total	**2834.21**

LIST OF BLOCKS COVERED IN MANIMUKTHANADHI SUB BASIN WITH AYACUT

Ayacut in ha.

District	Block	Taluk	Tanks		Anicut		Total Ayacut
			Nos.	Ayacut	Nos.	Ayacut	
Kallakurichi	Kallakurichi	Kallakurichi, Sankarapuram	5	716.86	3	11.34	728.2
	Sankarapuram	Sankarapuram	9	693.95	5	88.14	782.09
	Rishivandiyam	Sankarapuram	5	118.21	0	0	118.21
	Thiagadurgam	Kallakurichi, Sankarapuram	13	946.26	2	60.77	1007.03
	Chinnasalem	Kallakurichi	2	198.68	0	0	198.68
			34	**2673.96**	**10**	**160.25**	**2834.21**

In the ManimukthaNadhi Sub Basin, 34 Tanks (34 Non – system Tanks) 31 Supply Channel and 11 Anicuts. The work Proposed in this Sub Basin, 34 Tanks (Non – system Tanks) 31 Supply Channel and 10 Anicuts.

Tank Ayacut (34 Tanks)	:	2673.96 ha
Anicut Ayacut (10 Anicuts)	:	160.25 ha
Total Ayacuts	:	**2834.21Ha.**

SEASON-WISE FOCUS CROPS

Though Paddy is the mainstay of farming, the other crops also are cultivated in considerable area in the Manimukthanadhi sub-basin

Sl.No	Season	Main crops cultivated
1	Summer season	Vegetables
2	South west monsoon	Paddy, Millets, Pulses, Oilseeds
3	North east monsoon	Paddy, Millets, Pulses, Oilseeds, Bhendi, Brinjal, Chilli
4	Perennial	Fodder crops
5	Annual	Sugarcane, Banana, Tapioco

DETAILS OF MANIMUKTHANADHI SUB BASIN – CROPPING PATTERN-KALLAKURUCHI

Name of the sub Basin **: Manimukthanadhi**
Nodal District **: Kallakuruchi**
Registered Ayacut Area **: 2834.21**

Fully Irrigated **: 1275.27 Ha**
Partially Irrigated **:1011.65 Ha**
Gap **: 547.29 Ha**
Total Ayacut Area **: 2834.21 Ha**

S.No.	Crop	Without Project				With Project				Increasing
		FI	PI	RF/G	TOTAL	FI	PI	RF/G	TOTAL	
I	**Perennial crop**									
1	Fodder crops	10	0	0	**10**	44	0	0	**44**	34
	Total	**10**	**0**	**0**	**10**	**44**	**0**	**0**	**44**	34
II	**Annual Crop**									
1	Sugarcane	152	0	0	**152**	40	0	0	**40**	-112
2	Tapiaco	85	0	0	**85**	205	0	0	**205**	120
3	Moringa	0	0	0	**0**	130	0	0	**130**	130
	Total	**237**	**0**	**0**	**237**	**375**	**0**	**0**	**375**	138
III	**1st crop**									0
1. a	Paddy	886.27	0	0	**886.27**	12	0	0	**12**	-874.27
b	Paddy - SRI	85	0	0	**85**	710	0	0	**710**	625
2	Maize	0	255	0	**255**	345	0	0	**345**	90
3	Ragi	0	131	0	**131**	173	0	0	**173**	42
4	Minor Millets	0	82	0	**82**	120	0	0	**120**	38
5	Pulses	0	363.65	0	**363.65**	500.21	0	0	**500.21**	136.56
6	Groundnut	0	135	0	**135**	169	0	0	**169**	34
7	Gingelly	0	45	0	**45**	30	0	0	**30**	-15
8	Bhendi	21	0	0	**21**	106	0	0	**106**	85

9	Brinjal	5	0	0	**5**	15	0	0	**15**	10
10	Chillies (Green)	10	0	0	**10**	50	0	0	**50**	40
11	Snake gourd	5	0	0	**5**	20	0	0	**20**	15
12	Bitter gourd	1	0	0	**1**	20	0	0	**20**	19
13	Small Onion	10	0	0	**10**	75	0	0	**75**	65
14	Watermelon	5	0	0	**5**	70	0	0	**70**	65
15	Fallow	0	0	547.29	**547.29**	0	0	0	**0**	-547.29
16	Non Agrl. Purposes	0	0	0	**0**	0	0	0	**0**	0
	Total	**1028.3**	**1011.7**	**547.29**	**2587.21**	**2415.2**	**0**	**0**	**2415.21**	-172
G. Total (I+II+III)		**1275.3**	**1011.7**	**547.29**	**2834.21**	**2834.2**	**0**	**0**	**2834.21**	0
IV	**2 nd crop**									0
1. a	Paddy	210	0	0	**210**	20	0	0	**20**	-190
b	Paddy - SRI	65	0	0	**65**	485	0	0	**485**	420
2	Pulses	0	155	0	**155**	316	0	0	**316**	161
3	Bhendi	0	0	0	**0**	90	0	0	**90**	90
	Total	**275**	**155**	**0**	**430**	**911**	**0**	**0**	**911**	481
V	**3rd crop**									0
1. a	Paddy	205	0	0	**205**	95	0	0	**95**	-110
b	Paddy - SRI	55	0	0	**55**	463	0	0	**463**	408
	Total	**260**	**0**	**0**	**260**	**558**	**0**	**0**	**558**	298
Grand Total		**1810.3**	**1166.7**	**547.29**	**3524.21**	**4303.21**	**0**	**0**	**4303.21**	**779**
Cropping Intensity					**124%**				**152%**	

AREA, PRODUCTION AND PRODUCTIVITY OF EXISTING FOCUS CROPS

S.No	Crops	Area (Ha)	Production (MT)	Productivity (MT/ha)
1	Paddy	1506	6250	4.15
2	Blackgram	518	337	0.65
3	Maize	255	1326	5.2
4	Groundnut	135	311	2.3
	Total	**2414**	**8224**	**12.3**

DEPARTMENT WISE INTERVENTIONS

DEPARTMENT OF AGRICULTURE

1. INTERVENTION-WISE BREAK UP OF COST NORMS

PRODUCTIVITY ENHANCEMENT IN PADDY (IPT DEMOS: 180 HA)

In this sub- basin there is scope for improving the productivity to bridge the yield gap (1.0 - 1.2 MT / Ha) both in first and second seasons (Samba and Navarai). The DoA will conduct IPT Paddy Crop Demonstrations with all improved management practices, like planting of single seedling etc. and inputs like improved variety of crop, IPM, INM etc. are practiced in FFS mode, and also suggesting suitable interventions viz., Introduction of three crop sequence of Green Manure – SRI Paddy – Rice Fallow Pulses.

Growing green manure crops raised especially for their organic matter and ability to improve the soil fertility to augment to supply of required nutrients. Green manuring is demonstrated preceding to SRI crop to supply the required nutrients through the insitu incorporation.

System of Rice Intensification ensures saving of seed and water as they require in less, greater root growth due to young seedlings and wider spacing, more tillers ultimately more grains and yield. There is reduction of cost due to labour saving through the usage of power weeder, fertilizer saving through usage of Leaf Colour Chart and lesser pest and disease incidence.

Rice Fallow Pulses are sown as follow up crop after the harvest of Paddy. These rice fallow areas offer a huge potential niche for short season pulses. In this relay cropping sequence sowing of pulses is being followed before/after the harvest of SRI Paddy, under CA system (zero till). The rice fallow pulses are effectively utilizing the available residual moisture and nutrients after the harvest of the rice crop. It enhances the soil fertility status for the next crops due to nitrogen fixation.

Sl. No	Technology	Area (ha)	Unit Cost L.Rs.	Budget (Rs. In lakh)
1	IPT Demo. Of Green Manure Crop - SRI - Rice Fallow Pulses (3 Crop Sequence)	180	0.100	18.000

Unit Cost – GM-SRI-RFP Crop Demonstration:

a) Green Manure

Sl. No	Particulars	Unit Cost (Rs. /Kg)	Amount (Rs.)
1	Seed cost with seed treatment components - 40 Kg / Ha	50	2,000
	Total		**Rs.2,000**

b) SRI [Paddy]

Sl. No	Particulars	Unit Cost (Rs. / Kg)	Amount (Rs.)
1	Cost of Soil testing	20	20
2	Seed cost with seed treatment components - 8 Kg / Ha	50	400
3	Cost of nursery raising and Bio-fertilizers		600
4	Cost of fertilizers (150:50:50 Kg NPK / Ha)		
	Urea - 300 Kg	6	1,800
	Muriate of Potash – 80 Kg	16	1,280
	$ZnSO_4$ 25 Kg	70	1,750
5	IPM - Plant protection charges	1,000	1,000
	Total	**Rs. 6850 (Assistance Restricted to) Rs. 6,000**	

c) Rice Fallow Pulses

Sl. No	Particulars	Unit Cost (Rs. / Kg)	Amount (Rs.)
1	Seed cost with seed treatment components -20 Kg/ Ha	100	2,000

2. IMPROVED PRODUCTION TECHNOLOGY CROP DEMOS THROUGH CROP DIVERSIFICATION:

i. Promotion of Hybrid Maize production (IPT Demos: 40 Ha.):

In the river basins, Maize crop is grown mostly with varieties, Now, it is proposed to shift from variety to hybrids in the Maize crop so as to increase the yield potential by conducting IPT Maize Crop Demos and suggest suitable interventions viz.

a. Usage of high quality, high yielding hybrid seeds.
b. Crop Diversification of Paddy area during second season especially to Maize to increase water productivity by minimizing water requirement.
c. Spraying with Maize Growth promoter (TNAU promoter) - Maize Maxim
d. Adopting the latest innovative technologies

Sl. No	Technology	Area (ha)	Unit Cost L.Rs.	Budget (Rs. In lakh)
1	IPT Demo. of Maize	40	0.100	4.000

Unit Cost – Maize:

Sl. No	Particulars	Unit Cost (Rs. / Kg)	Amount (Rs.)
1	Seed Cost @ 15Kg/Ha.	320	4800

2	Cost of Fertilizers(150:75:75 kg/NPK/Ha)		1980
3	Cost of Biofertilizers - Azospirillum & Phosphobacteria@10 nos each	10/Packet (200gm each)	200
4	Seed Treatment with *Beauveria bassiana* 10g/kg	200g/ha	75
5	Raising border crops either sunflower or cowpea or sesame (2-3 rows around Maize)		500
6	Monitoring with Pheromone trap @ 12Nos/ha and @ 36 sex lures /ha (at monthly interval)	Rs.62.50 & Rs.27.80	1750
7	Spraying with *Metarhizium anisopiliae* on 20days after sowing @ 4kg/ha	400	1600
8	2nd spray with azadirachtin 1% @1000ml/ha		1700
	Total Cost		**12605**
			Assistance Restricted to Rs.10000/-

ii. Stabilizing the area under Ragi and Minor Millets:

(IPT Demos: a. Ragi -24 Ha. and b. Minor Millets-32 Ha.)

The area of cultivation of Minor millets viz. Ragi (Finger Millet), Samai (Little Millet), Varagu (Kodo Millet), PaniVaragu (Proso Millet), Thenai (Fox Tail Millet) and Kuthiraivaali (Barnyard Millet) has come down by 50 per cent in three decades. Millets are healthy food irrespective of the age group. Hence, it is proposed to stabilize the depleting area under Minor Millets, The DoA would analyse the constraints in each sub-basin by conducting Improved Production Technology Minor Millets Crop Demonstrations and suggest suitable interventions viz..

a. Usage of high quality, high yielding variety seeds, adapting the technologies viz., Integrated Nutrient Management (INM), Integrated Weed Management and Integrated Water Management (IWM) – including the use of Drought Mitigation Substances, Integrated Pest Management (IPM).

b. Diversification of Paddy area during second season especially to Minor Millets to increase water productivity by minimizing water requirement.

Sl.No	Technology	Area (ha)	Unit Cost L.Rs.	Budget (Rs. In lakh)
1	IPT Demo. of Ragi	24	0.050	1.200
2	IPT Demo. of Minor Millets(Tenai)	32	0.040	1.280

Unit Cost - Ragi (Finger Millet)

Particulars	Unit Cost (Rs. / Kg)	Amount (Rs.)
1.Cost of soil testing	20	20
2.Seed cost with seed treating components 5 kgs	75	375
3.Fertilizer cost - (60:30:30 kg N P K ha^{-1})		
a) Urea -130 kg	6	780
b) Super phosphate-188 kg	9	1,692
c) Muriate of potash-50 kg	16	800
4.Foliar application of nutrients 2 % DAP-10 kg	29	290
5.Bio-fertilizer-10 packet	20	200
6.IPM - Plant protection charges	1,000	1,000
Total Cost	**Rs. 5,157 (Assistance Restricted to) Rs.5,000**	

Unit Cost-Minor Millets(Tenai)

Sl. No	Particulars	Unit Cost (Rs. / Kg)	Amount (Rs.)
1	Cost of Soil testing	20	20
2	Seed cost with seed treating components 12.5 kgs	85	1,063
3	Fertilizer cost - (44:22:0 kg N P K ha^{-1})		
	i) Urea -96 kg	6	576
	ii) Super phosphate-138 kg	9	1242
4	Foliar application of nutrients 2 % DAP-10 kg	29	290
5	Cost of Bio fertilizer-10 packet	20	200
6	IPM - Plant protection charges		800
	Total Cost	**Rs. 4,191 (Assistance Restricted to) Rs.4,000**	

iii. Promotion of Pulses Production (IPT Demos: 96 Ha.):

There is always huge scope for improving the productivity levels of major pulse crops and the poor seed replacement rate, timely availability of quality seeds, zero mineral nutrition, improper pest management practices, poor post-harvest practices etc., are the major constraints for increasing the productivity. The DoA would intervene the farmers with participatory approach and adoption of improved production technologies viz.

a. Usage of high yielding certified seeds of varieties.
b. Pre soaking of seed- 1 kg of seed in 1 lit. of water for 4 hrs. for increasing germination percentage.
c. Promotion of line sowing for maintaining optimum plant population.
d. Balanced Fertilization(Kg/ha) : N : P :K : S MNMixture
   25:50:25: 10 5
e. Productivity enhancement by mass scale spraying of 2% DAP on 25th and 40th day after sowing.

Sl. No	Technology	Area (ha)	Unit Cost L.Rs.	Budget Rs. In lakh)
1	IPT Demo. of Pulses	96	0.050	4.800

Unit Cost – IPT Pulses (Garden Land):

Sl. No	Particulars	Unit Cost (Rs /Kg)	Amount (Rs.)
1	Cost of Soil testing	20	20
2	Seed cost with seed treatment components - 20 Kg /Ha	150	3,000
3	Pulse Wonder 2 Kg / ha	220	440
4	Fertilizer: i. DAP 25 Kg / Ha	29	725
5	IPM - Plant protection charges	1,000	1,000
	Total Cost	**Rs. 5,185 (Assistance Restricted to) Rs. 5,000**	

iv. Revival of Oilseeds cultivation (IPT Demos: 20 Ha.):

Oilseeds are the next target group to be given special focus in the river sub basins of Tamil Nadu. As they are mostly grown in rainfed situation, the yield levels are far below than the national average and still vast potential untapped to improve the productivity of oilseeds under irrigated conditions. Like pulses, the country being the net importer of oilseeds, and because of increased demand for edible oil consumption by the households in the State, the demand - supply gap is much wider. So, special attention should be envisaged to narrow down this gap. The following interventions are proposed in Oilseeds viz.

a. Usage of high yielding certified seeds of varieties.

b. Promotion of line sowing for maintaining optimum plant population.

c. Application of Gypsum in Groundnut and Manganese Sulphate in Gingelly.

Sl.No	Technology	Area (ha)	Unit Cost L.Rs.	Budget (Rs. In lakh)
1	IPT Demo. of Oilseeds	20	0.050	1.000

Unit Cost : Oilseeds cultivation

Sl. No	Particulars	Unit Cost (Rs. / Kg)	Amount (Rs.)
1	Cost of Soil testing	20	20
2	Cost of fertilizers (17:34:54 NPK + Gypsum 400 Kg / Ha)		
	i. Gypsum 400 Kg / Ha	4	1,600
	ii. Urea - 40Kgs	6	240
	iii. MOP - 90 Kg.	16	1,440
3	Micro nutrient spray (DAP–2.5 Kg, Ammonium sulphate – 1 Kg, Borax – 500 gm and planofix– 375 Ml) @ Rs.250 for 3 sprays.	250	750
4	Bio fertilizers-20 Packet	10	200
5	IPM - Plant protection charges	1,000	1,000
	Total Cost	**Rs. 5,250 /- (Assistance Restricted to) Rs.5,000**	

AGRICULTURAL IMPLEMENTS:

CONO WEEDING OPERATION IN SRI PADDY CULTIVATION:

- Conoweeder is used two times at the stage of 15th and 25th days of planting SRI.
- The weeds are incorporated into the field by this way it is utilized as nutrients in the same field itself.
- Old roots are removed and new roots have been proliferated by using the conoweeder. Since number of tillers will be increased. It leads to increase in yield (300-400 kg/acre). Hence farmers got more income compared to conventional cultivation
- It reduces labour shortage.
- In this project Conoweeding operation will be done by using the self-help groups Amma farm women groups and Farmers Interest group and farmers themselves. By this way womens will be benefited.
- The cono weeding may be done either by manual or mechanical according to the soil status and growth of the crop.
- Back ended subsidy will be given to the beneficiaries by ensuring the operation with proper Geo tagging of the intervention.

Sl. No	Technology	Area (ha)	Unit Cost L.Rs.	Budget (Rs. In lakh)
1	Cono weeding operation	90	0.01250	1.125

Unit Cost for Cono weeding:

Sl. No.	Particulars	Unit Cost (Rs. / Ha)	Amount (Rs.)
1	Cost of two times of Cono weeding on 15th and 25 th days after planting	1250	1250

OTHER CROP BASED COMPONENTS:

1. FARMERS FIELD SCHOOL:

- Farm Schools would be operationalized at Block level in sub basins
- These FFS would be set up in the field of outstanding or achiever farmers.
- “Trainee farmers” would also have the responsibility of providing extension support to other farmers in the respective village or neighbouring villages.

Sl.No	Technology	Nos.	Unit Cost L.Rs.	Budget (Rs. In lakh)
1	Farm Schools	15	0.200	3.000

Farmers Field School Unit Cost:

Sl.No.	Operationalizing Farmers Field School	Cost Norms in Rs.
1	Frontline demonstration at Farm School on a maximum area of 2 Ha. at same rates as approved under the Guidelines of National Food Security Mission for the crops.	7,500
2	Grant towards logistics support to Farm School	1,000
3	Contingency	2,000
4	Details of interactions / training at Farm School	
a.	*Honorarium for maximum two external trainer for maximum 6 visit @ maximum of Rs.250 per visit per trainer*	3,000
b.	*Travel expenses for maximum two external trainer for maximum 6 visits @ maximum of Rs.150 per trainer per visit*	1,800
c.	*Food expenses for 28 participants @ Rs.30 per participant per day for 6 events.*	5,040
d.	*Printed literature @ Rs.50 per participant for 28 participants and trainers*	1,400
	Total	**21,740**
	Grand Total:	**Rs.21,740 (Assistance Restricted to)Rs.20,000**

2. a. IPM–INTEGRATED PEST MANAGEMENT VILLAGES:

- The Project aims at transfer of an elite, novel, low cost and eco-friendly pest management technology like Ecological Engineering, Agro-Eco System analysis (AESA) based Plant Health Management.
- To promote the "On farm Production" techniques especially for bio control agents.
- The Bio-control agents are excellent alternatives for chemical pesticides besides being eco friendly and farmers friendly.
- On farm production and augmentation of *Trichoderma viride and Trichogramma* sp will be taken up by selected Farmers group / clusters.

Sl.No	Technology	Nos.	Unit Cost L.Rs.	Budget (Rs. In lakh)
1	Integrated Pest Management Villages	2	1.000	2.000

Integrated Pest Management Villages Unit Cost

Sl. No.	Name of the content	Production Cost/Unit. (Rs.)
1	On farm Production of *Trichoderma viridi* / fruit fly trap / Vermi composting (heap method)	58,700
2	On farm Production of *Trichogramma* sp.	14,000
3	Adoption of Ecological Engineering based PHM and AESA based IPM	18,550
4	Group Farmers training (with in district)	5,000
5	Elite Farmers training at STAMIN	11,250
	Total	**1,07,500(Restricted to) Rs.1,00,000**

2. b. INM–VERMI COMPOST (SILPAULIN) UNITS @ 5 NOS. / VILLAGE [DOVETAILING WITH IPM VILLAGES]:

- The farmers in the IPM Villages are to be demonstrated by growing green manure crops and
- Also with the production of Vermi compost with 5 units./ Village, so as to make them trained for production of organic manures for their use
- As well as other needy farmers also, spreading the concept.

Sl.No	Technology	Nos.	Unit Cost L.Rs.	Budget (Rs. In lakh)
1	Vermi compost (Silpaulin) Units	10	0.060	0.600

Unit Cost:- Vermi compost

Sl. No	Particulars	Unit Cost (Rs. / Kg)	Amount (Rs.)
1	Capital cost - Vermi bag (12’ x 4’ x 3’)	2,000	2,000
2	Cost of earth worms -10 Kg	150	1,500
3	Cost of Poles (60’ length with 1½” Dia) and Shade net (60 Sq.ft.)	750	750
4	Cost of FYM (1.5 MT)	1,170	1,750
5	Capacity Building activities	1,000	1,000
	Total Cost	**Rs. 7,000 (Restricted to) Rs.6,000**	

3. SEED VILLAGE PROGRAMME FOR PULSES, GROUNDNUT &GREEN MANURE SEEDS:

- The farmers may be encouraged to produce the seeds required for their villages on their own especially for the crops viz., Pulses, Oilseeds and Green manure seeds by provision of assistance to the farmers.

- Groups are formed for the production of required seeds for the Farmers in the Village itself.
- The Group Members are given Seed Village Concept and Farm management Training (Rs.4,400 / group) and also for the Group upliftment, provided revolving fund (Rs.50,000 / Group) with Bank tie-up.

Sl.No	Technology	Nos.	Unit Cost L.Rs.	Budget (Rs. In lakh)
1	Pulses	4	0.544	2.176
2	Groundnut	4	0.544	2.176
3	Green manure	2	0.544	1.088
	TOTAL	**10**	**0.544**	**5.440**

4. INSTITUTIONAL STRENGTHENING – IEC & CAPACITY BUILDING ACTIVITIES:

The Capacity building and Change management training are given to the Agricultural Labourers, Farmers and Extensional Personnel viz., Assistant Director of Agriculture, Agricultural Officers, Deputy Agricultural Officers, Assistant Seed Officers and Assistant Agricultural Officers which are impacted by the reputed Capacity building and Change management Training organizations.

Sl.No	IEC & Capacity Building – Change Management Trainings	Nos.	Unit Cost L.Rs.	Budget (Rs. In lakh)
1	Trainings for SRI skills to 50 No. of Agriculture labours for 2 days	1	0.185	0.185
2	Farmers training-50 Nos. for 1 day	2	0.210	0.420
3	Extensional Personnel training-30 Nos. for 2 days	1	0.275	0.275
	Total	**4**		**0.880**

5. IEC/CB ACTIVITIES [FIELD SUPPORT, SUSTAINABILITY, DOCUMENTATION CHARGES ETC.,):

In the sub-basins, the total Crop based demonstrations to be conducted are 392Ha, As these crop demonstrations are conducted on FFS mode, the Village meetings, Seminars, Village Melas, other Publicity & Propaganda activities, POL, Printing of Leaflets / Pamphlets, Posters, Banners, Relevant Materials for the functions and fields, Documentation Charges etc., are to be imparted in the proposed Crop based demonstrations to be conducted with the allotted amount of .Rs. 2.648 Lakh.

Sl.No	IEC & Capacity Building – Change Management Trainings	Nos.	Unit Cost L.Rs.	Budget (Rs. In lakh)
1	IEC/CB activities [Field support, Sustainability etc., IEC & CB for the Crop Demos Conducted	392	0.0065	2.548
2	Documentation Charges for the Sub-basins	1	0.100	0.100
				2.648

EXPECTED OUTCOME OF THE PROJECT:

1. Entire sub basin area is expected to be brought under irrigated condition with effective usage of water with diversified cropping pattern.
2. Soil health will be enhanced with balanced usage of fertilizers, bio – fertilizers and green manure seeds along with reduction in cost of cultivation and enhanced productivity. Crop residue management not only helps us to rebuild soil fertility but also to reduce pollution.
3. Ecological balance will be sustained which will reduce pest incidences and pesticide usage.
4. Crop diversification will pave way for climate resilient agriculture and also avoids market glut and price reduction
5. Reduced labour usage by adopting farm mechanization will help farmers to reduce cost of cultivation, timely operation and to increase the income level.
6. Value addition with multiple processing machines will help farmers to improve the product value and there by income. Value addition enhances shelf life of products and there by farmers can store and sell the products based on demand to get maximum possible price.
7. Capacity building trainings to extension functionaries, farmers and farm labourers will improve water productivity.

TN IAMP- PHASE III- DETAILED PROJECT REPORT
COMPONENT WISE PHYSICAL AND FINANCIAL REQUIREMENT

Name of the Sub Basin: MANIMUKTHANADHI **District: KALLAKURICHY**

Sl. No	Name of the component	Unit	Unit Cost L.Rs.	Project Activities				Financial in Lakh Rs			
				I Year	II Year	III Year	Total	I Year	II Year	III Year	Total
I. A. Increasing Crop Productivity by Best Management Practices & Innovations (IPT Demos): [Involving more Women Farmers & addressing Climate Resilient Issues]											
1	Green Manure Crop	Ha.	0.02	60	60	60	180	1.2	1.2	1.2	**3.6**
2	SRI	Ha.	0.06	60	60	60	180	3.6	3.6	3.6	**10.8**
3	Rice Fallow Pulses	Ha.	0.02	60	60	60	180	1.2	1.2	1.2	**3.6**
4	Maize	Ha.	0.1	20	10	10	40	2	1	1	**4**
5	Ragi	Ha.	0.05	14	5	5	24	0.7	0.25	0.25	**1.2**
6	Cholam	Ha.	0.05	0	0	0	0	0	0	0	**0**
7	Minor Millets	Ha.	0.04	26	6	0	32	1.04	0.24	0	**1.28**
8	Pulses	Ha.	0.05	40	36	20	96	2	1.8	1	**4.8**
9	Oilseeds	Ha.	0.05	10	5	5	20	0.5	0.25	0.25	**1**
	IPT Demo. Total	-	-	**170**	**122**	**100**	**392**	**12.24**	**9.54**	**8.5**	**30.28**
B. Other Crop based Components [Involving more Women Farmers & addressing Climate Resilient Issues] :											
1	Farmers Field Schools (FFS)	Nos.	0.2	0	10	5	15	0	2	1	**3**
2	Promotion of IPM										
	a) IPM Villages	Nos.	1	0	2	0	2	0	2	0	**2**
	b)INM-Vermicompost (Silpaulin)	Nos.	0.06	0	10	0	10	0	0.6	0	**0.6**
9	Seed Village - a. Pulses	Nos.	0.544	0	4	0	4	0	2.176	0	**2.176**
	b.Groundnut	Nos.	0.544	0	4	0	4	0	2.176	0	**2.176**
	c.Green Manure	Nos.	0.544	0	2	0	2	0	1.088	0	**1.088**
	Other Crop based Components Total	-						**0**	**10.04**	**1**	**11.04**

C. Agricultural Implements:											
10	SRI-Conoweeder operation	Nos.	0.0125	30	30	30	090	0.375	0.375	0.375	**1.125**
	Agri. Implements Total	**-**	**-**					**0.375**	**0.375**	**0.375**	**1.125**
I	**Agri. Crop Based Components Total (A+B+C)**	**-**	**-**					**12.62**	**19.955**	**9.875**	**42.45**
II. Institutional Strengthening - IEC & Capacity Building Trainings: [Encouraging More Women Farmers & addressing Climate Resilient Issues											
11	Trainings for SRI skills to 50 No. of Agriculture labours for 2 day Total cost : Rs.18,500/- x 1 Training	Nos.	0.185	1	0	0	1	0.185	0	0	0.185
12	Farmers training-50 Nos. for 1 day Total cost : Rs.21,000/- x 2 Trainings	Nos.	0.21	2	0	0	2	0.42	0	0	0.42
13	Extensional Personnel training-30 Nos. for 2 days Total cost : Rs.27,500/- x 1 Training	Nos.	0.275	1	0	0	1	0.275	0	0	0.275
14	IEC/CB activities [Field support, Sustainability etc., IEC & CB for the Crop Demos Conducted	Ha	0.0065	170	122	100	392	1.105	0.793	0.65	2.548
15	Documentation Charges for the Sub- basins	Nos.	0.1	1	0	0	1	0.1	0	0	0.1
II	**IEC & CB Trainings Total**	**-**	**-**					**2.085**	**0.793**	**0.65**	**3.528**
	Grand Total							**14.7**	**20.748**	**10.525**	**45.97**

DEPARTMENT OF HORTICULTURE

INTERVENTIONS FINALIZED:

CROP DEMONSTRATION:

Demonstrations in Bhendi, Brinjal, chillies, Water melon, Gourds, Tapioca and Moringa under vegetable crops, micro irrigation and usage of bio pesticides etc are finalized.

JUSTIFICATION FOR THE INTERVENTIONS FINALIZED:

Manimukthanathi Sub basin farmers are usually cultivating Agriculture Crops mostly like Pulses, Maize, Sugarcane and Paddy. Now by introducing Horticulture crops like vegetables crops under the project definitely increase the income and in turn the status of the farmers.

DETAILS OF CROP DIVERSIFICATION:

By implementing this project the farmers will switch over from Agriculture crops like Sugarcane and Paddy to Horticulture crop like vegetables. This will be achieved by convincing the farmers through awareness Campaigns, meetings and other IEC/CB activities.

INTERVENTIONS WISE TENTATIVE BREAK UP DETAILS OF COST NORMS:

BHENDI

S.No	Interventions	Total Area	Unit Cost Rs/ha	Budget Rs in lakhs
1	Bhendi	78 ha	20000	15.600

Bhendi : Rs.20000 (Cost break up)

Sl. No.	Name of the Input	Unit	Qty.	Rate (Rs.)	Amount (Rs.)
1	Bhendi Hybrid Seed	Kg	1.5	3086.00	4630
2	Vermicompost	Kg	67	10.00	670
3	Beauveriabassiana	Lit	1	400.00	400
4	Verticilliumleacani	Lit	1	400.00	400
5	DAP	Kg	100	22.00	2200
6	MOP	Kg	100	11.00	1100
7	Urea	Kg	100	6.00	600
	Total crop Demonstration				**10000**
8	***Bhendi**upscaling for another 4 ha		4 ha	2500	**10000**
	Subsidy				**20000**

- Each Bhendi demonstration will be **up scaled** to another 4 **ha by adopting back ended subsidy method** @ Rs.2500/ha towards purchase of the seeds. The seed cost will be reimbursed by the farmer by submission of seed bill, photos of crop inspection and other documents *viz.*,adangal, e-adangal and Geo tagging.

BRINJAL

S.No	Interventions	Total Area	Unit Cost Rs/ha	Budget Rs in lakhs
1	Brinjal	15 ha	20000	3.000

Brinjal: Rs. 20000 (Cost break up)

S.No.	Name of the Input	Unit	Qty.	Rate (Rs.)	Amount (Rs.)
1	Brinjal Seedlings	Kg	18700	1.00	18700
2	Vermicompost	Kg	50	10	500
3	Beauveriabassiana	Lit	1	400.00	400
4	Verticilliumleacani	Lit	1	400.00	400
5	DAP	Kg	0	0.00	0
6	MOP	Kg	0	11.60	0
7	Urea	Kg	0	5.90	0
	Total				**20000**
	Subsidy				**20000**

GREEN CHILLIES

S.No	Interventions	Total Area	Unit Cost Rs/ha	Budget Rs in lakhs
1	Green chillies	50 ha	20000	10.000

Green chillies (Cost break up)

Sl. No.	Name of the Input	Unit	Qty.	Rate (Rs.)	Amount (Rs.)
1	Chillies seedlings	No	29000	1	29000
	Total				**29000 ***
	Total eligible subsidy				**20000**

***The farmer will bear the seedlings cost over and above the eligible subsidy.**

SMALL ONION

S.No	Interventions	Total Area	Unit Cost Rs/ha	Budget Rs in lakhs
1	**Small Onion**	15 ha	20000	3.000

Small Onion: Rs.20000 (Cost break up)

Sl. No.	Name of the Input	Unit	Qty.	Rate (Rs.)	Amount (Rs.)
1	Onion seed	Kg	1.5	3000	4500
2	MOP	Kg	100	11	1100
3	Urea	Kg	100	6	600
4	DAP	Kg	100	22	2200
5	Vermicompost	Kg	80	10	800
6	Beauveriabassiana	Lit	1	400	400
7	Verticilliumleacani	Lit	1	400	400

	Total crop Demonstration				**10000**
8	***small onion** upscaling for another 4 ha		4 ha	2500	**10000**
	Subsidy				**20000**

- Each small onion demonstration will be **up scaled** to another 4 ha **by adopting back ended subsidy method** @ Rs.2500/ha towards purchase of the seeds. The seed cost will be reimbursed by the farmer by submission of seed bill, photos of crop inspection and other documents *viz.*,adangal, e-adangal and Geo tagging.

TAPIOCA

S.No	Interventions	Total Area	Unit Cost Rs/ha	Budget Rs in lakhs
1	Tapioca	41ha	20000	8.200

Tapioca: Rs.20000 (Cost break up)

Sl. No.	Name of the Input	Unit	Qty.	Rate (Rs.)	Amount (Rs.)
1	Tapioca setts	No	1500	2.00	3000
2	Vermicompost	Kg	120	10.00	1200
3	Beauveriabassiana	Lit	1	400.00	400
4	Verticilliumleacani	Lit	1	400.00	400
5	Tricodermaviridii	Kg	0	0.00	0
6	DAP	Kg	150	22.00	3300
7	MOP	Kg	100	11.00	1100
8	Urea	Kg	100	6.00	600
	Total crop Demonstration				**10000**
9	***Tapioca** upscaling for another 4 ha		4 ha	2500	**10000**
	Subsidy				**20000**

- Each Tapioca demonstration will be **up scaled** to another 4 ha **by adopting back ended subsidy method** @ Rs.2500/ha towards purchase of Tapioca setts. The setts cost will be reimbursed by the farmer by submission of setts bill, photos of crop inspection and other documents *viz.*,adangal, e-adangal and Geo tagging.

BITTER GOURD

S.No	Interventions	Total Area	Unit Cost Rs/ha	Budget Rs in lakhs
1	Bitter gourd	6 ha	20000	1.200

Bitter gourd: Rs. 20000 (Cost break up)

Sl. No.	Name of the Input	Unit	Qty.	Rate (Rs.)	Amount (Rs.)
1	seeds (Bitter gourd)	Kg	1.5	3000.00	4500
2	Vermicompost	Kg	80	10.00	800
3	Beauveriabassiana	Lit	1	400.00	400
4	Verticilliumleacani	Lit	1	400.00	400
5	DAP	Kg	100	22.00	2200
6	MOP	Kg	100	11.00	1100
7	Urea	Kg	100	6.00	600
	Total crop Demonstration				**10000**
8	***Bitter gourd** upscaling for another 4 ha		4 ha	2500	**10000**
	Subsidy				**20000**

- Each Bitter gourds demonstration will be **up scaled** to another 4 ha **by adopting back ended subsidy method** @ Rs.2500/ha towards purchase of the seeds. The seed cost will be reimbursed by the farmer by submission of seed bill, photos of crop inspection and other documents *viz.*,adangal, e-adangal and Geo tagging.

SNAKE GOURD

S.No	Interventions	Total Area	Unit Cost Rs/ha	Budget Rs in lakhs
1	Snake gourd	6 ha	10000	1.200

Snake gourd:Rs.20000 (Cost break up)

Sl. No.	Name of the Input	Unit	Qty.	Rate (Rs.)	Amount (Rs.)
1	seeds (Bitter gourd)	Kg	1.5	3000.00	4500
2	Vermicompost	Kg	80	10.00	800
3	Beauveriabassiana	Lit	1	400.00	400
4	Verticilliumleacani	Lit	1	400.00	400
5	DAP	Kg	100	22.00	2200
6	MOP	Kg	100	11.00	1100
7	Urea	Kg	100	6.00	600
	Total crop Demontration				**10000**
8	***Snake gourd** upscaling for another 4 ha		4 ha	2500	**10000**
	Subsidy				**20000**

- Each Snakegourds demonstration will be **up scaled** to another 4 ha **by adopting back ended subsidy method** @ Rs.2500/ha towards purchase of the seeds. The seed cost will be reimbursed by the farmer by submission of seed bill, photos of crop inspection and other documents *viz.*,adangal, e-adangal and Geo tagging.

MORINGA

S.No	Interventions	Total Area	Unit Cost Rs/ha	Budget Rs in lakhs
1	Moringa	79 ha	20000	15.800

Moringa:Rs. 20000 (Cost break up)

Sl. No.	Name of the Input	Unit	Qty.	Rate (Rs.)	Amount (Rs.)
1	Seeds (PKM1)	Kg	1	3000	**3000**
2	Beauveriabassiana	Lit	1	400	**400**
3	Verticilliumleacani	Lit	1	400	**400**
4	TrichodermaViridi	Kg	4	45	**180**
5	Pseudomonas	Kg	4	45	**180**
6	MOP	Kg	0	11.60	**0**
7	Urea	Kg	0	5.90	**0**
8	DAP	Kg	0	21.52	**0**
9	Vermicompost	Kg	584	10	**5840**
	Total for Demonstration				**10000**
10	***** Moringa upscaling for another 4 ha	ha	4 ha	2500	**10000**
	Grand total				**20000**

- Each Moringa demonstration will be **up scaled** to another 4 ha **by adopting back ended subsidy method** @ Rs.2500/ha towards purchase of the seeds. The seed cost will be reimbursed by the farmer by submission of seed bill, photos of crop inspection and other documents *viz.*,adangal, e-adangal and Geo tagging.

BIO VILLAGE (IPM):

- To avoid the pesticide residue in vegetables and encourage the importance of organic farming, the project farmers will be encouraged to use Biocides instead of chemical pesticides. Required awareness will be created among the farming community through various IEC/CB methods. This component will be implemented in the IPM villages selected by the Department of Agriculture. Under the project, selected farmers groups especially women farmers are encouraged by Agriculture Department through financial assistance in the project, to produce such selected biocides in their villages itself for their own use and also to supply to the other fellow farmers in the nearby villages. The vegetables produced using biocides have good demand and fetches premium price in the market. This practice also improves soil health.

BIO VILLAGE

S.No	Interventions	Total Area	Unit Cost Rs/ha	Budget Rs in lakhs
1	Bio village	10 ha	0.012	0.120

IPM (Encouraging to use Bio Pesticides)-Rs.1200/

Sl. No.	Name of the Input	Qty. (kgs / Nos./lit)	Rate (Rs.)	Amount (Rs.)
1	Beauveriabassiana	1lit	400/lit	400
2	Verticilliumleacani	1lit	400/lit	400
3	TrichodermaViridi	4kgs	50 / kg	200
4	Pseudomonas	4kgs	50 / kg	200
	Total			**1200**
	Subsidy			**1200**

MICRO IRRIGATION

In order to save and minimize the irrigation water, it is programmed to cover about one fourth of vegetable demonstrations under micro irrigation with fertigation. MI saves about 30 % of the irrigation water. The saved water will be utilized to cover more area under irrigation crops. Micro irrigation will be installed in cluster villages cultivating vegetables mainly. The department of horticulture has list of approved MI firms. The farmers will choose the firm for installation and the payment will be release to the MI firms by back ended subsidy method by strictly following the quality standards, procedures and guidelines framed for the same.

MICRO IRRIGATION

S.No	Interventions	Total Area	Unit Cost Rs/ha	Budget Rs in lakhs
1	Micro iirigation	234 ha	1.13	264.000

CONVERGENCE WITH THE AM & AB DEPARTMENT:

The list of farmers / commodity groups taken up various Horticulture crop demonstrations in the sub basins will be shared with the concerned agriculture marketing and agri business department officials crop wise, area wise village wise and block wise so as to jointly plan and arrange for marketing the products in time to get the better price in the market.

OUTCOME OF THE PROJECT:

Area under Horticulture crops will be increased to about 20 to 25% of ayacut area by the end of the project period, besides increasing the productivity of the Horticulture crops and farmers income. Through Micro irrigation, about 30 % irrigation water will be saved and the saved water will be utilized to increase the area under irrigation.

INTERVENTIONS PROPOSED FOR 3 YEARS (PHYSICAL & FINANCIAL) – COST TABLE (CONSOLIDATED) VILLUPURAM (MANIMUMUKTHANATHI)

S. No	Interventions	Demo cost	Physical in ha				Financial (Rs. in Lakhs)			
			2020 - 21	2021-22	2022-23	Total	2020 - 21	2021-22	2022-23	Total
1	Bhendi	0.2	5	35	38	78	1	7	7.6	15.6
2	Brinjal	0.2	5	5	5	15	1	1	1	3
3	Chillies	0.2	20	20	10	50	4	4	2	10
5	Water melon	0.2	20	20	30	70	4	4	6	14
6	Small Onion	0.2	5	5	5	15	1	1	1	3
7	Bitter gourd	0.2	2	2	2	6	0.4	0.4	0.4	1.2
8	Snake gourd	0.2	2	2	2	6	0.4	0.4	0.4	1.2
9	Tapioca	0.2	15.5	15.5	10	41	3.1	3.1	2	8.2
10	Moringa	0.2	47	17	15	79	9.4	3.4	3	15.8
	Total vegtables		**121.5**	**121.5**	**117**	**360**	**24.3**	**24.3**	**23.4**	**72**
11	Bio Village	0.012	10	0	0	10	0.12	0	0	0.12
12	Micro irrigation ***	1.13133	78	78	78	234	88	88	88	264
			209.5	**199.5**	**195**	**604**	**112.42**	**112.3**	**111.4**	**336.12**

TAMIL NADU AGRICULTURAL UNIVERSITY

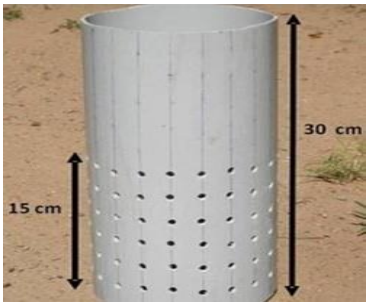
FIELD INTERVENTIONS

1.1. WATER MANAGEMENT FOR SUSTAINABLE RICE PRODUCTION THROUGH AWDI:

Use of water saving technologies *viz.,* Alternate Wetting and Drying Irrigation (AWDI) method of irrigation up to panicle initiation stage to increase Water Use Efficiency (WUE) and grain yield.

HOW TO IMPLEMENT AWDI?

A practical way to implement AWDI safely is by using a 'Field Water Tube' ('Pani Pipe') to monitor the water depth on the field. The field water tube will be placed @ 3 per hectare since most of the paddy field in this ayacut are fragmented. After disappearance of water, the water level in the pipe up to 15 cm, irrigation water can be applied



Field Water Tube made up of PVC. Note the holes on all sides upto 15 cm height.

OUTCOME:

- The Alternate Wetting and Drying Irrigation (AWDI) will be an appropriate technology for water saving in rice. This technology saves up to 30 percent of irrigation water without any yield penalty 4-5 irrigations will be reduced under AWDI when compared to conventional method.

S. No.	Technology	Total area (ha)	Unit Cost (Rs.)	Total Cost (in lakhs)
1	Water management for sustainable paddy production through AWDI	100	7000	7.00

Details of Unit cost split up for Rice AWDI:

S. No.	Particular	Unit Cost (Rs.)	Amount (Rs.)	TNAU Cost (Rs/ha)
1	Cost of Soil testing	20	20	20
2	Seed cost - 10 Kg / Ha	30	300	300
3	Cost of nursery raising		600	-
4	Cost of fertilizers (150:50:50 Kg NPK / Ha)			

	Urea - 300 Kg	6	1800	1800
	Muriate of Potash – 80 Kg	16	1280	1280
	$ZnSO_4$ 25 Kg	76	1300	1000
5	Bio fertilizer & Bio inoculants		1600	1600
	Total	**6900**		**6300**

Details of unit cost split up for AWDI

Sl. No	Particular	Unit Cost (Rs.)	Amount (Rs.)	TNAU Cost (Rs/ha)
1	Field water tube 3 Nos/ ha		700	700
	Total		**700**	**700**

Details of unit cost split up for Rice

S. No.	Particular	Unit Cost (Rs.)	Amount (Rs.)	TNAU Cost (Rs/ha)
1.	Seed cost - 10 Kg / ha	30	300	300
2.	Cost of fertilizers (150:50:50 Kg NPK / ha)			
	Urea - 300 Kg	6	1,800	1,800
	Muriate of Potash – 80 Kg	16	1,280	1,280
	$ZnSO_4$ 25 Kg /ha	40	1,000	1,000
3.	Bio fertilizer & Bio inoculants	-	1,170	1,170
4.	PPFM Spray (3 times/ha.) @500ml/ha	Rs.300/lt.	450	450
	Total		**6,000**	**6,000**

1.2. INTRODUCTION OF DROUGHT RESISTANT/ FLOOD TOLERANT/ SALT TOLERANT RICE CULTIVARS:

a. Drought resistant rice varieties -Anna R-4/ADT 45/ CB MAS 14065/ CB MAS 14110/ CB MAS 14142

The yield reduction in rice crop is being observed in many areas due to the non-availability of water at critical stages. The farmers of these rice growing areas are often experiencing crop loss. In order to overcome the abiotic stress, the drought tolerant rice variety is being introduced in these areas. It will be of greater use in enhancing the yield and farmers income.

b. Introduction of Salt Tolerant High Yielding Rice Variety - TRY 3/IWP Saltol

In areas of soil having salinity problems, rice crop often experiencing poor yield. In order to overcome the salinity problem, introduction of salt tolerant rice variety is one of the option. The rice variety TRY-3 may be benefitted to the farmers realize good crop yield.

TRY 1 is a high yielding medium duration rice variety released from AnbilDharmalingam Agricultural College and Research Institute, Trichy for commercial cultivation. It is a derivative of the cross combination ADT 43 and Jeeragasamba. It matures in 135 days with an average yield potential of 5833 Kg/ha. It possesses white coloured medium and bold sized grains and is moderately resistant to major pests and diseases.

S.	Technology	Total area (ha)	Unit cost	Total cost

No.			(Rs.)	(in lakhs)
1	Drought/saline tolerant rice variety	59	6000	3.54

1.3. Area expansion and productivity enhancement of pulses under crop diversification in gap areas

Area under pulses in this basin area is very low. Since the pulses are drought tolerant and can grow with minimum inputs area under pulses need to expand.

Farmers are not adopting the latest crop production technologies like use of improved high yielding varieties in pulses. Hence it is proposed to conduct demonstration involving improved technologies in pulses viz., use of seed so high yielding varieties, balanced nutrition and scientific water management. Under this cost of critical inputs like seeds and nutrients are included.

S.No.	Technology	Total area (ha)	Unit Cost (Rs.)	Total cost (in lakhs)
1	Area expansion and productivity enhancement of pulses	80	5000	4.00

Details of unit cost split up for Pulses (Garden Land)

S. No.	Particular	Unit Cost (Rs.)	Amount(Rs/ha)
1	Seed cost– 20 Kg / ha	150	3000
2	DAP 25 Kg / ha	22.50	560
3	Pulse Wonder 2 Kg/ha	220	440
4	Bio fertilizers and Bio inoculants		1000
	Total		**5000**

1.4. Fall Army Worm technology capsule to enhance the Productivity of Maize

The Fall Army Worm (FAW), *Spodopterafrugiperda* after invading maize fields in Tamil Nadu during 2018 has caused crop loss substantially. It occurs at all stages of Maize. Being a major crop of Tamil Nadu efforts are being taken to tackle the invaded pest. TNAU has developed a technology capsule to combat the invasion of FAW. It includes general organic practices, IPM capsule encompassing seed treatment, cropping system approach, FAW monitoring and mass trapping. Chemical control at early whorl stages (15-20 DAS), late whorl stage (40-45 DAS) and tasseling and cob formation stage (60-65 DAS).

This technology will result in the control of invasive pest and enhance the yield of maize crop in maize growing areas.

S.No.	Technology	Total area (ha)	Unit cost (Rs.)	Total cost (in lakhs)
1	Fall Army Worm technology capsule to enhance the Productivity of Maize	45	10000	4.50

Details of unit cost split up for Maize

S.No.	Particular	Unit Cost (Rs.)	Amount (Rs.)	TNAU Cost (Rs/ha)
1	Seed Cost @ 15 kg/ha	320	4800	4800
2	Seed treatment with *Beauveriabassiana*10g / kg of seed	200 g/ha	75	75
3	Raising border crops either sun flower or cowpea or Sesame (2-3 rows around Maize)		500	500
4	Monitoring with Pheromone trap (@12 Nos/ha and@ 36 sex lures /ha (at monthly interval)	Rs.750/ 12 Nos Rs.1000/ha	1750	1750
5	1st spray with azadirachtin 1% @ 1000ml/ha on 20 days after sowing		1700	1700
6	2nd spray with *Metarhiziumanisopliae* @4kg/ha on 40 days after sowing	400	1600	1600
	Total			**10425**
				(Restricted to 10000/-)

1.5. Demonstration of improved production techniques with various oil seed crops with prime focus on improving productivity, encouraging crop diversification

Crop: Groundnut

Low productivity in groundnut is mainly due to poor nutrient availability in the soil, inadequate plant population per unit area and higher percentage of shrive led kernels.

Intervention:

- Sowing by seeddrill
- Microsprinkler
- Decorticator
- Stripper
- Trap crop of castor/red gram
- IPT for groundnut

S. No.	Technology	Total area (ha)	Unit Cost (Rs.)	Total cost (in lakhs)
1	Improved production technologies in groundnut	20	5000	1.00

Details of unit cost split up for Oil Seeds-Groundnut

S. No.	Particular	Unit Cost (Rs.)	Amount (Rs.)	TNAU Cost(Rs/ha)
1	Gypsum 400 kg / ha	5	2000	2000
2	Fertilizers cost	-	1500	1500
3	Pheromone trap and lure for *Spodopteralitura*	-	750	750
4	Micronutrientspray (DAP–2.5Kg, Ammoniumsulphate–1Kg, Borax – 500gm and planofix–375 Ml) @ Rs.250 for 3sprays.	250	750	750
	Total		**5000**	**5000**

1.6. Sustainable Sugarcane Initiative (SSI)

The Sustainable Sugarcane Initiative (SSI) aims at providing practical options to the farmers in improving the productivity of land, water and labour, all at the same time. SSI is also expected to reduce the overall pressure on water resources and contribute to recovery of ecosystems. Sustainable Sugarcane Initiative is an innovative method of sugarcane production using less seeds, less water and optimum utilization of fertilizers and land to achieve more yields.

The productivity of water is inter-dependent relationship between the amount of water used and the economic yield realized which is also termed as Water Use Efficiency (WUE) at different levels. The productivity of water could be increased in field level either by reducing the water requirement without detrimental effect on yield or by increasing the production per unit water by controlling loss of water through conveyance, distribution, application, seepage, percolation etc., Micro irrigation techniques like drip irrigation in sugarcane improves the Water Use Efficiency (WUE).

S. No.	Technology	Total area (ha)	Unit cost (Rs.)	Total Cost (in lakhs)
1	SSI in Sugarcane	5	100000	5.00

Details of unit cost split up for Sugarcane

S. No.	Particular	Unit Cost (Rs.)	Amount (Rs.)	TNAU Cost (Rs/ha)
1	Drip cost as per the Govt. norms **@100 %Subsidy.**	72500	72500	72500
2	Cost of Seedlings / ha (15000 Nos./ha)	1.5	22500	22500
3	Water Soluble fertilizer			
	12:61:00 – 50 Kg	100	5000	5000
	Total		**100000**	**100000**

S. No	Particular	Unit Cost (Rs.)	Amount (Rs.)	TNAU Cost (Rs/ha)
1	Drip cost as per the Govt. norms **@ 75% Subsidy**	72500	72500	54400
2	Cost of Seedlings/Ha (15000 Nos./Ha)	1.5	22500	22500
3	12:61:00 – 75 Kg	100	7500	7500
	00:00:50 – 208 Kg	75	15600	15600
	Total		**118100**	**100000**

1.7. Production of Tapioca under precision farming mode by adopting of IPM concept for CMV and Mealy bug:

- Low productivity in tapioca.
- Water shortage in critical period and high consumption of water and wastage in conventional irrigation.
- Improper nutrient management and other intercultural operation leads to staggered maturity and MN deficiency which affects tuber size and numbers.

Interventions

- Planting of quality sets.
- Proper plant protection treatment for CMV and Mealy bug.
- Applications of fertigation through drip.

Production of Tapioca under Precision Farming mode

S. No	Technology	Total area (ha)	Unit Cost (Rs.)	Amount (Rs. in lakh)
1.	Precision Farming in tapioca	5	120000	6.00

Details of unit cost split up for Tapioca under Precision Farming

S. No	Particular	Unit Cost (Rs.)	Amount (Rs.)	TNAU Cost (Rs/ha)
1.	Drip cost as per the Govt. norms **(100 % Subsidy)**	101100	101100	101100
2.	Cost of setts (1250 stem)	3.0	3750	3750
3.	Cost of bio control agent (egg parasitoids)	870	870	870
3.	Water Soluble fertilizers			
	Urea - 200 kg	6	1200	1200
	MAP-100 kg	90	9000	9000
	Potash-240 kg	17	4080	4080
	Total		**120000**	**120000**

S. No	Particular	Unit Cost (Rs.)	Amount (Rs.)	TNAU Cost (Rs./ha)
1.	Drip cost as per the Govt. norms **(75% subsidy)**	75900	75900	75900
2.	Cost of setts (1250 stem)	3.0	3750	3750
3.	Cost of bio control agent (egg parasitoids), trap & trap crop	3500	3500	3500
4.	Water Soluble fertilizers			
	Urea - 200 kg	6	1200	1200
	MAP-150 kg	90	13500	13500
	Potash-250 kg	17	4250	4250
5.	Bio-fungicide-Neem kernel powder -250 kg	50	12500	12500
6.	MN mixture (micro food) -7.5kg	200	1500	1500
7.	Bio-pesticide (Neem oil) -10.0 litre	250	2500	2500
8.	Bio-inoculants /bio-fertilizers		1400	1400

	Total	**120000**	**120000**

1.8. CAPACITY BUILDING & INFORMATION, EDUCATION & COMMUNICATION

1.8.1. Capacity building

a. Training to stakeholders

Under this activity, imparting training to all the beneficiaries either as off-campus or as on-campus is planned.

b. Exposure visit

In-order to have practical knowledge on various improved farming practices prevailing across the District and State, it has been proposed to expose the stakeholders by organizing educational tours for having better cross learning.

1.9. IEC INCLUDING AWARENESS CREATION, DOCUMENTATION AND IEC EQUIPMENT

1.9.1. Organize awareness campaign

Informal meetings with Farmers / Water Users Association through PRA methods – focus group discussion and transect walk.

- Organizing informal meetings in sub basin villages
- Message on AIR / local cable TV
- Ensure transparency
- Explain about the scheme – organization objectives, activities, project contribution and farmers share
- Emphasis the role of stake holders in the project
- Project the expected benefit

1.9.2. Documentation

- Maintenance of records and registers
- Field note for each activity
- Daily memorandum sheet
- Receipt and issue of inputs
- Technical observations on soil, water and crop
- Printing books, booklet, leaflet and pamphlets about the technologies and scheme.
- Wall paintings

1.9.3. IEC Equipment's for Documentation

1.9.4. Out sourcing charges on vehicles

- Expenditure on TA /DA for the purpose of TN-IAM Project
- Fuel bill of university vehicle utilized for the project purposes
- Hiring charges for university vehicle utilized for the project activities.

1.10. Management Cost

1.10.1. Outsourcing of technical staff

Outsourcing of technical staff is included in TNAU sub basin plan to carry out the field activities.

YEAR WISE BUDGET

P –Physical in ha F – Financial in lakhs

S. No.	Particular	Unit Cost (Rs/ha)	I Year		II Year		III Year		Total	
			P	F	P	F	P	F	P	F
I	**A. Field interventions**									
1	Water management for sustainable paddy production through AWDI	7000	20	1.40	40	2.80	40	2.80	100	7.00
2	Drought Resistant/ Flood Tolerant /Salt Tolerant high yielding rice variety	6000	19	1.14	20	1.20	20	1.20	59	3.54
3	Area Expansion and productivity enhancement of pulses under crop diversification	5000	20	1.00	30	1.50	30	1.50	80	4.00
4	Fall Army Worm technology capsule to enhance the Productivity of Maize	10000	5	0.50	20	2.00	20	2.00	45	4.50
5	Demonstration of improved production techniques with various oil seed crops with prime focus on improving productivity, encouraging crop diversification – Groundnut	5000	0	0.00	10	0.50	10	0.50	20.0	1.00
6	Sustainable Sugarcane Initiative	100000	0	0.00	5	5.00	0	0.00	5.0	5.00
7	Production of Tapioca under precision farming mode	120000	0	0.00	5	6.00	0	0.00	5.0	6.00
	Sub-Total (I)		**64.0**	**4.04**	**130**	**19.00**	**120**	**8.00**	**314**	**31.04**
II	**IEC & CB**									
1	**Capacity Building**									
	a. Training to Stakeholders			0.50		0.50		0.40		**1.40**
	b. Exposure visit			0.30		0.30		0.20		**0.80**
2	**IEC**									
	a. Awareness creation			0.20		0.15		0.15		**0.50**
	b. Documentation			0.40		0.30		0.32		**1.02**
	c.IECequipments			0.70		0.00		0.00		**0.70**
	d. Out sourcing charges on vehicles			0.65		0.65		0.65		**1.95**
	Sub-Total (II)			**2.75**		**1.9**		**2.25**		**6.37**
III	**Management cost**									
1	Out sourcing of technical staff			**1.6**		**1.8**		**1.7**		**5.10**
	Grand Total (I +II+III)			**8.39**		**22.7**		**11.95**		**42.51**

DEPARTMENT OF AGRICULTURAL MARKETING AND AGRI BUSINESS

FORMATION OF FARMERS PRODUCE COMPANY

The collectivization of producers, specifically marginal and small farm holders into producers' organizations is emerging as the effective possible pathway to address improved access to investments, technologies, knowledge support, inputs and markets. The Government of Tamil Nadu TN IAMP has identified Farmer Producer Organizations (FPOs) as the appropriate institutional form around which farmers would be mobilized and their collective capacity of production and marketing can be leveraged by strengthening their capacities.

A Farmer Producer Organization (FPO) is typically a society/company consisting of only practicing farmers who are also actual producers of specified commodity/ commodities, and is formed under as a Farmers Producer Company (FPC) under the Companies Act 2013. These organizations are created at the cluster, block, district or state level depending upon the needs of the producers considering the demand potential to adopt value chain approach to enhance farmers'/producers' economic and social benefits.

- The main aim of FPO is to ensure better income for the producers through an organization of their own.
- Small producers do not have the volume individually (both inputs and produce) to get the benefit of economies of scale.
- Through aggregation, the primary producers can avail the benefit of economies of scale.
- They will also have better bargaining power vis-à-vis the bulk buyers of produce and bulk suppliers of inputs.

Important activities of FPO

The primary producers have skill and expertise in producing. However, they generally need support for marketing of what they produce. The FPO will basically bridge this gap. The FPO will take over the responsibility of any one or more activities in the value chain of the produce right from procurement of raw material to delivery of the final product at the ultimate consumers' doorstep. In brief, the FPO could undertake the following activities:

1. Procurement of inputs
2. Disseminating market information
3. Dissemination of technology and innovations
4. Facilitating finance for inputs
5. Aggregation and storage of produce
6. Primary processing like drying, cleaning and grading Brand building, Packaging, Labeling and Standardization Quality control
7. Marketing to institutional buyers
8. Participation in commodity exchanges
9. Export

A FPO will support the members in getting more income by undertaking any/many/all of the activities listed under point above. By aggregating the demand for inputs, the FPO can buy in bulk, thus procuring at cheaper price compared to individual purchase. Besides, by

transporting in bulk, cost of transportation is reduced. Thus reducing the overall cost of production. Similarly, the FPO may aggregate the produce of all members and market in bulk, thus, fetching better price per unit of produce. The FPO can also provide market information to the producers to enable them hold on to their produce till the market price become favourable. All these interventions will result in more income to the primary producers.

UTILIZATION OF TNIAMP GRANTS.

1. Startup Grant for administrative and contingent expenses

The Project will support for newly formed FPOs with a bridge funding to meet out the initial expenditure involved in engagement of technical manpower, purchase of office equipments and to meet out the other contingencies immediately after registration of new FPOs through start up grant. This grant will be utilized by the FPC from registration to business take off. Registered FPCs supported by TNIAMP will be eligible. The consultancy firm will prepare proposal to get start up grant from the project and it will be sent to Commissioner of Agricultural Marketing and Agri Business through Deputy Directors of Agriculture (Agri Business). The proposal will be scrutinized by ABPF Cell and it will be approved by TNIAMP Cell. It will be released as grant in aid by Deputy Directors of Agriculture (Agri Business) through ECS to FPCs to meet out the following expenditure:

1. Honorarium to CEO
2. Honorarium to accountant
3. Purchase of furniture and computer
4. To meet out the initial office rent of the FPO immediately after FPO formation
5. To meet out the contingencies like electricity bill and stationery.

An amount to meet out the above expenditure is Rs. 10.00 Lakh (Rs.5 Lakh/year) for 2 years period after completion of registration.

2. Productive/Capital Investment for New FPC on matching grant basis (80:20)

It is proposed to create Farmer Common Service Centre (FCSC) which will provide the facilities like cleaning, grading, packing and input marketing to FPCs with the main objective of aggregation of agricultural produce. The business plan of the FPC with a maximum ceiling amount of Rs. 60.00 Lakh will be supported through this intervention. An FPO formed under TNIAMP fund by following the procedure laid down in the TNIAMP and a business plan scrutinized and approved by ABPF Cell will be eligible for getting matching grant. The business plan prepared by the Consultancy firm will be sent to TNIAMP Cell and the business plan will further be scrutinized by the ABPF Cell and sent to TNIAMP Cell for approval with their objective in assessment and recommendations.

It is proposed to create Farmer Common Service Centre (FCSC) which will provide the facilities like cleaning, grading, packing and input marketing to FPCs with the main objectives of aggregation of agricultural produce and distribution of Seeds and fertilizers. Approved FPCs may avail the grant by contributing 20% and project will release 80% subject to a ceiling of Rs. 20 Lakh.

Those farmers having demonstration of various crops, the produce will be aggregated and will be sold through FPCs and those farmers will be added as shareholder of the FPC.

Business summary of seed facilitation

Sl.No	Particulars	Y1	Y2	Y3	Y4	Y5
1	No. of Members	500	525	550	575	600
	Area in Ha					
	Pulses	50	55	60	65	70
	Groundnut	50	55	60	65	70
	maize	50	55	60	65	70
	Seed Quantity (in KG)					
	Pulses-20Kgs/Ha	1000	1100	1200	1300	1400
	Groundnut-140Kgs/Ha	7000	7700	8400	9100	9800
	Maize. 20Kgs/Ha	1000	1100	1200	1300	1400
2	**Seed Value (in Rs.)**					
	Pulses. 60/kg	60000	66000	72000	78000	84000
	Groundnut.80/kg	560000	616000	672000	728000	784000
	Maize.16/kg	16000	17600	19200	20800	22400
	TOTAL	**636000**	**699600**	**763200**	**826800**	**890400**
3	**Seed Revenue (in Rs.)**					
	Pulses.80/kg	80000	88000	96000	104000	112000
	Groundnut.100/kg	700000	770000	840000	910000	980000
	Maize.20/kg	20000	22000	24000	26000	28000
	TOTAL	**800000**	**880000**	**960000**	**1040000**	**1120000**
	Profit					
	Pulses	20000	22000	24000	26000	28000
	Groundnut	140000	154000	168000	182000	196000
	Maize	4000	4400	4800	5200	5600
	TOTAL	**164000**	**180400**	**196800**	**213200**	**229600**

Business Summary – Fertilizer

Sr. No.	Particular	Y1	Y2	Y3	Y4	Y5
1	Fertilizer Quantity (in KG)					
	DAP	16	17	18	19	20
	Urea	13.5	14	15	16	17
	MoP	8.75	9	10	11	12
2	Fertilizer purchase Value (in Rs.)					
	DAP	384000	403200	423360	444528	466754.4
	Urea	79947	83944	88141	92548	97175
	MoP	140000	147000	154350	162067.5	170171
	TOTAL					
3	Fertilizer sale Revenue (in Rs.)					
	DAP	395520	415296	436061	457864	480757
	Urea	82309.5	86425	90746	95283	100047
	MoP	144200	151410	158981	166930	175277
	TOTAL					
4	Fertilizer Profit					
	DAP	11520	12096	12701	13336	14003
	Urea	2363	2481	2605	2735	2872
	MoP	4200	4410	4631	4863	5105
	TOTAL	**18082.5**	**18987.13**	**19936**	**20934**	**21980**

Activity-2 (Facilitation of Aggregation and Sale of Surplus Produce)

Need of the proposed business activity

Farmers of this cluster undertake individual sale of their produce. They sell their produce to traders in the local mandis only. They've limited exposure to other markets or sales channels. They have inadequate knowledge of business terms & conditions of other procurers like processors, traders of terminal markets, direct license holders etc. They submit to the dictates of the local traders due the inability to scout and link with other potential buyers and suffer from unfavourable trading terms.

Around 50% of the famers in this cluster go for distress sale of their produce in order to service credit availed for agro-input purchase and domestic requirements. This becomes more pressing after khariff due to the need for reinvesting on agro-inputs for rabi cropping.

The PC members decided to explore other markets with assistance from the FCSC service provider and line department officials to help the farmers expand their market in search for better prices and trade terms. They also decided to facilitate aggregated sale of produce.

Business summary of Aggregation of produce

Sl.No	Particulars	Y1	Y2	Y3	Y4	Y5
1	No. of Members	500	525	550	575	600
	Area in Ha					
	Pulses	50	55	60	65	70
	Groundnut	50	55	60	65	70
	Maize	50	55	60	65	70
	Production					
	Pulses-0.6	30	33	36	39	42
	Groundnut-Kernal. 1.977	99	109	119	129	138
	Maize.6.2	310	341	372	403	434
2	**20% of produce**					
	Pulses.	6	7	7	8	8
	Groundnut.	20	22	24	26	28
	Maize	62	68	74	81	87
3	**Purchase price**					
	Pulses.60000/Mt	360000	396000	432000	468000	504000
	Groundnut.80000/Mt	1600000	1760000	1920000	2080000	2240000
	Maize.16000/Mt	992000	1088000	1184000	1296000	1392000
	TOTAL	**2952000**	**3244000**	**3536000**	**3844000**	**4136000**
4	**20% of purchase value**					
	Pulses	72000	79200	86400	93600	100800
	Groundnut	320000	352000	384000	416000	448000
	Maize	198400	217600	236800	259200	278400
	TOTAL	**590400**	**648800**	**707200**	**768800**	**827200**
	Selling value					
	Pulses.80000/Mt	480000	528000	576000	624000	672000
	Groundnut. 100000	1977000	2174700	2372400	2570100	2767800
	Maize.20000	1240000	1364000	1488000	1612000	1736000
	Total	3697000	4066700	4436400	4806100	5175800
	Profit					
	Pulses	**120000**	**132000**	**144000**	**156000**	**168000**
	Groundnut	**377000**	**414700**	**452400**	**490100**	**527800**
	Maize	**248000**	**276000**	**304000**	**316000**	**344000**
	Total	**745000**	**822700**	**900400**	**962100**	**1039800**

II. Business Expansion grant for new FPC (75:25)

The project will also support for expansion of business. FPCs who successfully utilized the start up and matching grant released from the project will be eligible for availing business expansion grant of up to Rs. 30.00 Lakh. The business plan for expansion grant can either be a part of and a progress of the (1) original business plan prepared for availing matching grant or (2) it may be fresh business expansion plan in addition to or (3) in deviation of the original Business Plan. The business plan prepared by the Consultancy firm will be sent to TNIAMP Cell and the business plan will further be scrutinized by the ABPF Cell and sent to TNIAMP Cell for approval with their objective in assessment and recommendations.

Approved FPCs may avail the grant by contributing 25% in a Joint Account after which the project would release 75% subject to a ceiling of Rs. 30.00 Lakh to FPCs account through ECS. MoU would be signed between FPCs and the Department for release of project grant to FPCs. Funds will be released in three instalments @ 50%, 30% and 20% based on performance appraisal by ABPF. Deputy Directors of Agriculture (Agri Business) will monitor the performance on regular basis and report to TNIAMP Cell in Head quarter. The new business like hiring of Farm Implements will be encouraged as detailed below as a business.

The project funding will be sanctioned only after ascertaining the farmer contribution is fully invested.

CUSTOM HIRING MACHINE

Sl. No	Name of the Machine	Nos required	Cost per unit	Total Cost	No of days in operation	Profit per day after all expenses	Total profit (6*7)
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
	Paddy Thrasher	1	125000	125000	200	250/hr*8 hrs	400000
	Paddy Combined Harvester	1	2000000	2000000	200	1100/hr*8	1760000
	Weighing machine 100 Kg capacity	2	15000	30000			
	Gunny bag stitching	2	5000	10000			
	Groundnut Decardicator	1	700000	700000	150	200/ hr*8	240000
	TOTAL			**2865000**			**2400000**

MAN POWER REQUIRMENT

Sl.No	Man Power	Total requirement	Monthly salary	Annual financial requirement
1	Supervisor cum Store keeper -For value addition & Farm Machinieries	1	15000	180000
2	Skilled labour	2	12000	288000
3	Unskilled labour	3	8000	288000
4	Postage			5000
5	Travel expenses			100000
6	Other Mis expenses			100000
	Total			**961000**

ABSTRACT:

Sl.No	Purpose	Project Cost	TNIAMP Grant	FPC Share/Individual share	Profit
I	**Productive Investment for New FPC (80:20)**				
1	Seed supply	636000			164000
2	Fertilizer supply	603947			18082
3	Produce Aggregation (20% of 8523000)	590400			745000
4	FCSC	884000			
5	Production of Certified seeds	76150			120000
	TOTAL	**2790497**	**2000000**	**790497**	**1047082**
II	**Business Expansion grant for new FPC (75:25)**				
	Custom Hiring machineries	2865000			2400000
	Value added Pulses	948000			1700000
	Man power	961000			
	TOTAL	**4774000**	**3000000**	**1774000**	**5100000**
	Net profit				

Grant for existing FPO for expansion of business plan (75:25):

- The project will also support for expansion of business. FPCs who successfully utilized the start up and matching grant released from the project will be eligible for availing business expansion grant of up to Rs. 30.00 Lakh. The business plan for expansion grant can either be a part of and a progress of the original business plan prepared for availing matching grant or it may be fresh business expansion plan in addition to or in deviation of the original Business Plan.
- Approved FPCs may avail the grant by contributing 25% in a Joint Account after which the project would release 75% subject to a ceiling of Rs. 30.00 Lakh to FPCs account through ECS. MoU would be signed between FPCs and the Department for release of project grant to FPCs.

e-Negotiable warehouse receipt financing.

- The department will pilot e-Negotiable Warehouse Receipt Financing (e-NWR) for mitigating price risk to farmers on tripartite agreement between beneficiaries, private and public sector banks and Collateral Management Agencies.

Promoting Agri Enterprises.

Agricultura and Horticulture Department has planned for intensification of crop production activities, which leads to increased crop production. In this context, absence of local entrepreneurship, the opportunities in agriculture are exploited by outsiders , particularly the urban businessmen and traders, leading to exploitation and deprivation of employment for the farmers. Considering the growing unemployment in rural areas and slow growth of the agricultural sector, it is necessary to tap the opportunities for promoting entrepreneurship in agriculture, which in turn can address the present problems related to agricultural production and profitability. The intervention proposed are

1. Facilitating PPP Mechanism

It is proposed to conduct interface workshops, seminars, consultative meeting and conferences at State and District level for market linkages with stake holders and banks.

2. **Facilitation workshop**
   The workshop for lead farmers, existing entrepreneurs, new entrepreneurs, etc will be conducted.

3. **Training for Entrepreneurship**
   Selected farmers/individuals/entrepreneurs through workshop will be trained as Agri Entrepreneurs.

4. **Business Plan Development**
   Business plan of small scale enterprises with project cost of Rs. 5.000 Lakh will be supported and Rs. 1.000 Lakh will be given to entrepreneur for facilitating credit support.

5. **Credit facilitation and business execution support**
   The Agri Business specialist will facilitate necessary credit support through bank for agri entrepreneurship business plan to take up business activities. If the annual turnover exceeds Rs. 2.000 Lakh, an amount of Rs. 1.000 Lakhs will be given to the beneficiary as back ended subsidy.

6. **Matching grant for Entrepreneurs**
   The project will promote agro entrepreneurship by entrepreneur in the area of value addition, food processing and other agri related activities. If the business plan project cost is Rs. 10.000 Lakhs, an amount of Rs.5.000 Lakhs will be given to the beneficiary as back ended subsidy.

Convergence of Agri, Horti and TNAU activities

Those demonstration farmers of Agri, Horti and TNAU will be treated as a share holder of the Farmers Producer Company and the produce of those farmers will be facilitated by new way of marketing to get higher income.

BUDGET OUTLAY FOR 3 YEARS

S.No	Name of the Interventions	ManimukthaNadhi Sub basin Kallakurichi						Total Financial (L.Rs.)
		2020-21		2021-22		2022-23		
		Physical (nos)	Fiancial (L.Rs.)	Physical (nos)	Fiancial (L.Rs.)	Physical (nos)	Fiancial (L.Rs.)	
I	**Improving Farmer Access to Markets**							
A	**Support for new Farmer Producer Company**							
1	Consultancy charges for Formation of FPCs for first year and Business plan development and execution for next 2 years (i.e totally for 3 years)	1	1.920		5.940		5.940	13.800
2	1 MTS (Mobilisation Training Specialist) and 2 FOs (Field Organizers) for first year only		4.680					4.680
3	.FPCs formation and registration (Awareness Campiagn, meetings with CGs, Registration Cost)		3.800					3.800
4	Start up grant for administrative and contingent expenses		-		5.000		5.000	10.000
5	Productive Investments for FPCs (Matching grant basis on the basis of Approved Business Plans). This could include support for investment on processing, grading/ sorting, mechanization, storage, packacing, value addition, input sale to members, branding and promotional activities etc) 80% Grant : 20 % farmer contribution				20.000			20.000
6	Business expansion Matching Grant : (75% Grant - 25 % Farmer contribution)						30.00	30.000
	Sub-total		**10.40**	**0.00**	**30.94**	**0.00**	**40.94**	**82.280**

CLUSTER WISE INTERVENTIONS

S. No	Name of the Interventions	MushkundaNadhi Sub basin Kallakurichi						Total Financial (L.Rs.)
		2020-21		2021-22		2022-23		
		Physical (nos)	Fiancial (L.Rs.)	Physical (nos)	Fiancial (L.Rs.)	Physical (nos)	Fiancial (L.Rs.)	
B	**Supporting Existing Farmer Producer Companies**							
	1. Consulting support for Business Expansion (2 years)		12.00					12.000
	2. Business expansion Matching grant (75% Grant - 25 % Farmer contribution)	1	30.000	0	0.00	0	0.00	30.000
	Sub Total	**1**	**52.400**	**0.00**	**30.94**	**0**	**40.94**	**42.000**
C.	**e-Negotiable Warehouse Receipt Financing**							
	1. Pilot Investment in 4 selected godowns	0	0.000	0	0.000	0	0.000	0.000
	Grand Total (A+B+C)	**-**	**52.400**	**0.00**	**30.940**	**0**	**40.940**	**124.280**
II	**Promoting Agri Enterprises**							
A	**Facilitating PPP Mechanism**							
	Interface Workshops/ Seminars/ Conferences at State and District level	1	3.000	0	0.000	0	0.000	3.000
B.	**Supporting Agro-enterprenuers to provide services to farmers**							
1	Facilitation workshop (50participants per workshop)	1	0.750	0	0.000	0	0.000	0.750
2	Training for Entreprenuership (30 participants/batch) for 2 days	1	1.000	0	0.000	0	000	1.000
3	Business Plan development routed through ABPF	10	10.000	0	0	0	0	10.000
4	Credit facilitation and business execution support through service providers routed through ABPF	10	10.000	0	0.000	0	0.000	10.000
5	Matching grant for women individual agri-entrepreneur as back ended subsidy through bank on pilot basis (Agro Processing, Value Addition)	1	5.000	0	0.000	0	0.000	5.000
	Sub-total	**-**	**29.750**		**0.000**	**-**	**0.000**	**29.750**
	Grand Total (I+II)	**-**	**82.150**	**-**	**30.940**	**-**	**40.940**	**154.030**

EXPECTED OUTPUT

1. Increase in area under production and productivity.
2. Diversification from food grains into high value agriculture.
3. Improved marketing, postharvest management and value addition.
4. Establishing CGs and FPOs and facilitating PPPs will lead to increased incomes of beneficiaries.
5. Higher price through better aggregation and new market channels.

6. Dissemination of improved market information.
7. Reduced input prices resulting from procurement by FPOs in bulk.
8. Increased value addition.

DEPARTMENT OF AGRICULTURAL ENGINEERING

CONCEPT OF FARMPOND:

Farm Ponds are constructed to harvest rain water from smaller catchments of about 2.5 to 5 hectares, which forms the land holding of a single farmer and to provide supplemental irrigation at critical stages of crop growth mainly as a 'life saving irrigation' to save the crop without wilting during the terminal stress period . Since, the Farm Pond are constructed in the Farmer's lands, the conveyance loss is minimized due to localized irrigation and thus improving the water use efficiency. The size depends on the catchment area and quantity of runoff water in principle. But most important factor is the willingness of the farmer to part the portion of his land for the construction of Farm Pond. If soil conditions permit, the depth can be increased to accommodate more water storage. Constructing a farm pond depends on soil condition, topography, drainage capacity, infiltration, rainfall of the area in which the farm land is situated.

Besides, Aquaculture is proposed to be promoted through Fisheries Department in selected Farm Ponds as an additional source of income, wherever the impounded water is available for four months and above.

SELECTIONCRITERIA:

The site selection should have high potential for the construction of Farm Ponds with clay/alluvium soil which holds water for a longer time and has less seepage and percolation losses. As far as possible, Farm Ponds should be selected as clusters in the sub basin area, not as isolated ones, so as to evaluate the impact of this intervention. The beneficiary for the construction of Farm Pond is selected based on the willingness of the land owning farmers with preference to small Farmers. The topography of the land should be such that there is sufficient catchment area for the Farm pond to harvest rain water.

1. Farm pond will be constructed at the lowest portion of the farmer's land to received maximum run off water during rainy days
2. The pond should be formed with side slope of 1:1. The side slope will enhance the soil stability and allow the pond to maintain its size for a long period.
3. Inlet and Outlet or inlet cum outlet with head wall arrangements may be provided to regulate the inflow and to dispose the excess water safely.
4. The soil should be non porous such that, there is not much seepage and percolation losses and thus rain water can be stored for longer days for making use of it during critical stages of the crop period. In case of porous soil, clay lining / polythene sheet lining can be suggested.
5. A uniform berm width of 1 m must be maintained all around the pond. Vegetative measures should be taken up along the berm width to prevent erosion and sliding of earth. The berm width area can also be utilized to raise homestead garden for additional income.
6. Larger size with shallow depth increase evaporation losses and wastage of cultivable land area. Greater depth reduces evaporation but it increases the seepage losses due to the hydrostatic pressure which is however beneficial for ground water recharge.

7. The farmers opting for Farm Pond may also be motivated for adopting Drip/Sprinkler Irrigation systems to economize water usage.

UNIT COST OF FARMPOND:

Unit cost of Farm pond as approved by the World Bank as given bellow,

A) 21.50 m X 21.50 m with 3.00 m depth with 2 step berms at every 1 m interval, for soils having sufficient depth(or)

B) 28.00 m X 28.00 m with 1.50 m depth with single berm, for soils having limited depth, both for an unit cost of Rs.75,000/- per Farm pond as project cost, to be adopted from Phase II onwards, with a capacity to hold about 1,100 cubic meters.

C) Based on the field condition, actual Farm pond size, shape and cost can be decided, but it should be on pro – rata basis of volume of storage.

The total cost for the above mentioned two models of Farm ponds, work out to Rs. 1,00,000/- per Farm pond , i.e., Rs.75,000/- per Farm pond for works (project cost) and Rs. 25,000/- per Farm pond as Farmer's contribution for disposal/Transportation of excess soil, for all category of farmers at their cost.

BENEFITS OF CREATION OF FARM PONDS

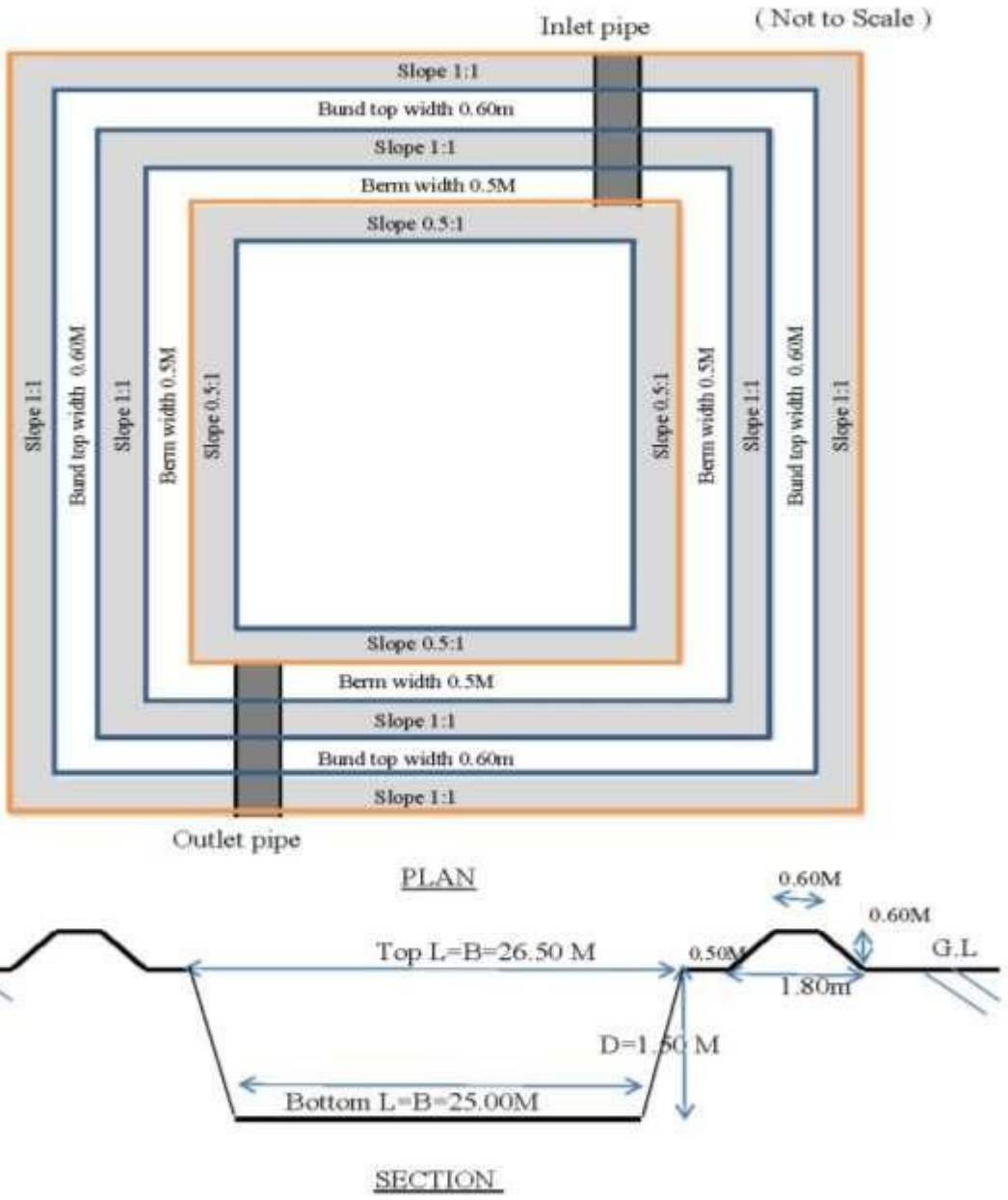
i. Currently available irrigation facility does not cover the entire cultivable land. In most cases, it is not the lack of water but lack of proper water management that causes water shortage. Improved modern methods of rain water harvesting like construction of farm ponds are a viable solution. It can help in providing supplemental irrigation, Farm ponds can retain water for 4-5 months of the year; thus farmers could enhance cropping intensity and crop diversification within and across seasons.

ii. With very low maintenance cost and no requirement of intensive technology, farm ponds can provide extra income to farmers not only through better crops but also through other methods like aquaculture, Horticulture and fishery in farm ponds.

Today 90% farmers want processing unit and cold storage facility in the villages, especially for vegetables and fruits. The farmers to acquire new skills to reduce the dependence, So that farmers will get proper marketing & rates. This will reduce middlemen exploitation.

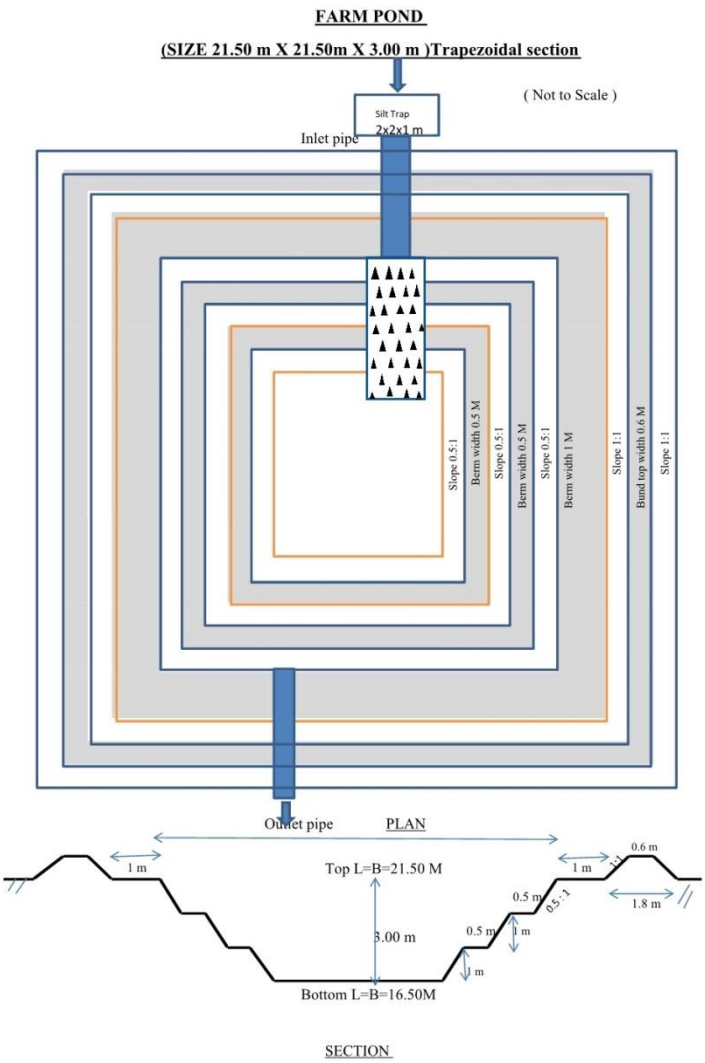
FARM POND

(SIZE 26.50 m X 26.50 m X 1.50 m)-Trapezoidal section



PLAN

SECTION



PHYSICAL AND FINANCIALPROPOSALS

Based on the joint walk through survey along with all line Departments, Awareness meetings in the village clusters in the sub basin area, Wide publicity given by issue of notices/pamphlets, Announcements in Farmer's grievance day meetings in District Collectorates, Communication in GramaSabha meetings, DPR has been finalized.

During implementation of the intervention, the Environmental and Social Safeguards aspects will be followed. Grievance Redressal Mechanism will be adhered.

Grievance Redressal Mechanism will be adhered.

COST ESTIMATE

PROPOSALS IN MANIMUKTHANATHI SUB BASIN

S. No.	Component				Total	
		Cluster II	Cluster III	Cluster IV	Physical in No.	Financial in Rs. Lakh
1	Farm Pond	4	3	3	10	7.500

	Grand Total	**4**	**3**	**3**	**10**	**7.500**

DEPARTMENT OF FISHERIES

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 MANIMUKTHANADHISUB 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 ManimukthaNadhisub 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 ManimukthaNadhi 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.	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	VadakkanaendalKalleri tank	Vadakkanaendal	Kallakuruchi	100.00	50.00

(iv) PERIOD

The fish culture activities in 'Long Seasonal Irrigation Tanks' in ManimukthaNadhi 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 ManimukthaNadhi 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	**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**

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	PalayaSiruvangurPeriyaEri	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	VadaThorasalur Tank	VadaThorasalur	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 ManimukthaNadhi 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.

(iv) PERIOD

The fish culture activities in 'Short Seasonal Irrigation Tanks' of ManimukthaNadhisub-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 ManimukthaNadhi 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 ManimukthaNadhiSub basin of Kallakuruchi district for the supply of fishing implements.

(iv) PERIOD

Supply of fishing implementsinKallakuruchi district of ManimukthaNadhisub-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 pondsexcavated in ManimukthaNadhi 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 ManimukthaNadhiSub-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 ManimukthaNadhiSub-basin in Kallakuruchi District under TN IAM Project.

(iv) PERIOD

The intervention in ManimukthaNadhisub 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.

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 ManimukthaNadhiSub-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 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 ManimukthaNadhi sub basin.

(iv) PERIOD

The intervention in ManimukthaNadhisub 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 inManimukthaNadhisub 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:

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)
		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**

ANIMAL HUSBANDRY DEPARTMENT

I. INTRODUCTION

Livestock production, in particular dairy sector contributes significantly to the livelihoods and income generation for millions of small and marginal farming communities in the sub basin by way of producing high value products. Dairy sector provide employment opportunity throughout its value chain starting from inputs, service delivery, aggregation, processing and marketing. Dairy production is highly gender and nutrition sensitive as two-thirds of dairy production depends on women labour and the nutritional benefits of milk is a well-known fact. Therefore, additional investments in this sector will provide an opportunity to increase milk production, leading to positive impacts in the overall socio-economic-nutritional status of smallholder farmers in the project sub-basin.

II. LIVESTOCK SECTOR PROFILE OF THE SUB BASIN

Total livestock in the sub basin area: 41232 crossbred cattle, 6185 Non-descript cattle, 557 buffaloes, 3873 sheep and 16091 goats. Around 60% of the cattle and buffalo population constitutes breedable population. Presence of 90% crossbred cattle population provides an opportunity for investments aimed at improving milk productivity in the project area. Average per day milk production in different type of animals: Crossbred cow- 5.25 lit, Non-descript cow – 1.60 lit, Buffalo- 5.00 lit. The sub basin base line details is furnished in Annexure II. Fodder requirement in the sub-basin is met through production of cropped fodder, grass and weeds from common lands and crop residues as dry fodder from cereal and leguminous crops. In addition, the concentrate feed requirement is met through pre-formulated feed supplement available through commercial agencies and cooperatives. The cropped fodder and dry fodder are fed as fresh and farmers hardly preserve the fodder for future use, except drying.

Veterinary and breeding services are provided through 14 Veterinary Institutions located across the sub basin. The cooperative and private dairy sector also involved in provision of breeding and veterinary inputs to the farmers. The project area contains one Animal Disease Intelligence Unit providing animal health, diagnostic and epidemiologic services. This unit is equipped with preliminary diagnostic infrastructures and receives minimum operational assistance. The milk collection, storage and processing in the sub-basin is being carried out both by the cooperative and private dairy processors. The processing and marketing is being carried out by Tamilnadu Cooperative Milk Producers Union and Private Companies. There is still scope for improving the milk collection and chilling facilities in the sub-basin.

III. DETAILED ACTIVITY DESCRIPTION

a. DAIRY INTEREST GROUPS

Farmer training, demonstrations, exposure visits, field days and extension program will be implemented through organizing Dairy Interest Groups (DIG) in conjunctions with the activities of Water User Associations. Farmers' Field School approach will be used to demonstrate the new technologies. Sub basin will have 1 DIG and the group will consist of 25 members, of which 30% will be women. Organizing the group will follow consultative meetings in each of the group village followed by one day training and one day exposure visit. In year two and three, the groups will be followed by one group meetings every year.

Besides, continuous interaction will be ensured in DIGs by way of fodder, calf management, mastitis management and infertility management demonstrations. This activity is expected to demonstrate better dairy farming practices to large number of farmers resulting in sustained adoption and improvements in milk productivity. Each farmer of the DIG in turn is expected to horizontally disseminate the advantages of better animal husbandry practices to other farmers in their village. It is expected that at least 100 farmers in total will acquire and adopt improved animal husbandry practices through the project intervention.

Table 1 - Cost break up for DIG organization

Sl. No	Activity description	Amount (Rs)
	Expenditure per group	
1	Group organization meeting (3 meetings @ Rs.1000 / meeting)	3000
2	One day training expenses	8250
3	One day exposure visit	15250
4	Follow up group meeting in year 2	1000
5	Follow up group meeting in year 3	1000
	Total cost per group on DIG organization & training	**28500**

1. DEMOS THROUGH DAIRY INTEREST GROUPS

2. a. CALF MANAGEMENT DEMONSTRATIONS

Farmers' hardly pay attention to the younger female animals and invest very little, which results in delayed age at first calving, non-availability of replacement heifers in sufficient numbers and poor economic returns. To demonstrate the impacts of better calf management, the genetically improved female calves born through AI program will be followed through heifer stage by means of regular deworming and mineral supplementation. Since deworming and growth follow up requires constant monitoring, one of the female members of the dairy interest group will be trained in regular deworming and growth monitoring of the female calves. Around 75 calves are targeted per year per DIG for three years period under this activity.

Table 2 - Cost break up for calf management demos per group

Sl. No	Activity description	Amount (Rs)
1	Number of targeted calves per DIG / year	75
2	Deworming and mineral supplementation expenses per DIG / year	39000
	Total cost for calf management demo / DIG	**39000**

2. b. MASTITIS MANAGEMENT DEMONSTRATIONS

Next to infertility, mastitis is the major issue affecting the economics of dairy animal production. The mastitis incidence in the sub basin is around 30%. The project aims to

reduce this incidence to 5% levels by way of implementing mastitis control program. A mix of control measures using teat dips and sub clinical mastitis detection kits along with use of modern traditional medicinal systems will be demonstrated to the farmers that could result in effective control of mastitis, and improving milk quality and reduction of antibiotic residues in milk. Around 90 animals are targeted per DIG in a year for three years period under this activity.

Table 3 - Cost break up for Mastitis Management Demonstrations

Sl. No	Activity description	Amount (Rs)
1	Number of milking animals targeted per DIG / year	90
2	Mastitis management kit cost per DIG / year	23400
	Total cost for mastitis management demo / DIG / year	23400

2. c. INFERTILITY MANAGEMENT PROGRAMS

Around 30% of the breedable animals face some kind of infertility or sub fertility which directly affects the milk yield, productive life cycle and number of calves born. The project aims to reduce the level to 15%. The expected reduction in days in inter-calving period due to correction of infertility problem would be 60 days, which is expected to bring in savings of Rs.3,000 per animal in terms of avoiding feeding during long dry period due to infertility.

Under this intervention, special camps (Fertility cum Health Care Camps) and 3 follow up visits will be organized at a cost of Rs.14,000 and focused fertility treatment will be carried out. Every group will receive 12 infertility camps in a year for four years period. Ten animals will be covered under estrous synchronization per infertility camp to demonstrate the impacts of controlled breeding and also to reduce the calving interval, thereby bringing better economic returns to the farmers and the estimated cost saving is around Rs.4,000 per animal.

Table 4 - Cost break up for one infertility management campaign

Sl. No	Activity description	Amount (Rs)
1	Number of milking animals targeted per DIG	50
2	Cost for one infertility campaign(including 3 follow up visits)	14000
3	Number of animals targeted for estrous synchronization per camp	10
4	Cost of estrous synchronization for 10 animals (including logistics)	14500
	Total Cost of one infertility campaign	**28500**

2. d. FODDER CULTIVATION DEMONSTRATIONS

Fodder deficit in the sub basin villages is to the tune of 30-40%. The shortfall need to be addressed by increasing the fodder bio mass by providing improved varieties and technology dissemination through Dairy Interest Groups. For every DIG, AHD proposes to undertake fodder development as per the cropping pattern with a combination of seasonal fodder crops.

Tree fodder cultivation will be demonstrated in about 1.2 ha per group. Efforts will be made to demonstrate the importance of fodder conservation by exposing them to practices

adopted by nearby progressive farmers in the village. To fill the short fall, there is a need to invest heavily in this activity, but the TNIAMP fodder demo is expected to act as a stimulating factor to adopt extensive fodder development initiatives of the Government. TNIAMP fodder initiatives are expected to reduce the fodder gap by around 2% in the project villages.

Table 5 - Cost break up for Fodder Development Demonstrations

Fodder crop variety	Cost per Hectare (In Rs.)
Fodder Cholam seeds	2500
Agathi seeds	4100
Transport charges for seeds	200

3. STRENGTHENING MOBILE ARTIFICIAL INSEMINATION NETWORK

Animal Husbandry Department has veterinary and breeding institutions in the sub-basin villages which are mainly stationary centres. Farmers have to bring the animal to the institutions to carry out the artificial insemination and they find great difficulties in souring the man power to bring the animals for artificial insemination. Further, in some areas farmers have to bring the animals from long distances. All the above factors have a negative effect on the success of AI program and farmers prefer to have their animals inseminated at their door steps as this not only saves their man hours but also increases the success rate. On technical ground, timing of AI contributes greatly to the success.

To circumvent the issues of mobility and round the clock AI services, AHD is planning to convert the existing AI centres into mobile AI centres by providing mobile AI infrastructures (AI gun, mobile 1.5 litres liquid nitrogen containers, semen straws, AI accessories), mobility charges to meet the mobility costs and capacity building for the existing staff on good AI techniques. Further, he will be permitted to collect a maximum of Rs.50 as professional charges or at rates fixed by the Government from time to time from the farmer. The input requirement such as liquid nitrogen will be made available through regular AHD supply.

Presently AI coverage in the sub-basin villages is around 60% of the breedable population, and this project aims to improve the AI coverage by an additional 15%. Over a period of three years, TNIAMP will perform an additional 2500 artificial insemination per year on mobile in this sub basin. On a pilot basis, the project will validate the results of sexed semen in limited AI centres of the AHD. 200 doses will be procured in year one and will be used in the sub basin AI centres.

Dam's yield or the parental average is the few parameters considered while selecting good quality semen for performing artificial insemination in the current conventional method of selection. In practice, it is noticed that many inseminators don't even bother about dam's yield and they expect only the cow to get conceived. This results in low quality heifers with lesser milk production capacity from the calf born; poor udder resulting in higher incidence of mastitis; poor legs and feet resulting in hoof issues, poor fertility resulting in longer inter-calving period, dystocia and retention of placenta, etc. Moreover, the reliability of a selected bull ultimately transmitting the milk production trait to its offspring is less than 20%. All these may lead to higher cost of milk production resulting in economic loss to the farmers.

These problems can be greatly reduced by the usage of genomic semen. Genomic selection can have a major impact on animal breeding programs, especially where traits that are important in the breeding objective are hard to select. It provides more accurate estimates for breeding value earlier in the life of breeding animals, giving more selection accuracy and allowing lower generation intervals. It has a greater reliability of 75% of transmitting the traits like milk volume, fat percent, SNF, somatic cell score, good legs and feet, fertility, calving ease, low mastitis and udder improvement. The use of genomic straw may lead to lower cost of milk production as more milk can be produced from less number of cows resulting in economic profit to the farmers. Over a period of three years, TNIAMP will perform 400 artificial inseminations per year on mobile in this sub basin using genomic semen straws.

Table 6 - Cost and incentive break up for one existing AI centre of AHD

Sl. No	Activity description	Amount (Rs)
1	AI Equipment (AI gun - 3 nos, 1.5 litre LN container, Digital Thawing flask, thermal strip, etc.)	19000
2	Cost of frozen semen (1 straw)	24
3	Gloves (1 glove)	3
4	Mobility charges for AI	20
5	Mobility charges for Pregnancy diagnosis	20
6	Mobility charges for calf born verification	20
7	Miscellaneous (per AI) – towards handling charges of CBFD	3
9	Cost of one Sexed semen straw (including GnRH)	1500
10	Cost of one Genomic semen straw	100

4. IMPROVING THE DELIVERY OF VETERINARY SERVICES THROUGH STRENGTHENING ESSENTIAL INFRASTRUCTURE IN THE VETERINARY INSTITUTIONS AND DIAGNOSTIC CENTRES

4. a. STRENGTHENING OF FIELD VETERINARY INSTITUTIONS

Government institutions like Veterinary Hospitals, Veterinary Dispensaries and Sub-centres provide the delivery of veterinary services and breeding support in the sub basin. Well-equipped infrastructure is the key to provide quality veterinary services and breeding coverage to the livestock in the sub basin. Equipment like sterilizer, refrigerator, milk teat instruments and LN2 transfer devise are essential to carry out the routine functions of the veterinary institution in an efficient, hygienic and environment friendly way. At present some of the veterinary institutions in the sub basin do not have the above equipment or may not be in working condition. The equipment may be beyond repair and needs replacement. Hence, it is proposed to strengthen the essential infrastructure like sterilizer, refrigerator, milk teat instruments and LN2 transfer devise for institutions functioning in the sub basin which do not have it / or not in working condition at present.

Table 7 – Cost break up for Equipment

Equipment	Unit Cost (In Rs.)
Refrigerator	22000

Sterilizer	3500
Milk Teat Instrument Set	1500
LN2 transfer devise	15000

4. b. STRENGTHENING OF ANIMAL DISEASE INTELLIGENCE UNITS (ADIU)

Diagnosing the problems and diseases at an early stage will go a long way in not only improving the health status of livestock in the sub basin but will also help to sustain the animal productivity, thereby improving the profitability through livestock rearing. At present, various readymade kits are available to detect not only multi-various diseases but also to assess the health status of the animal at pre-clinical stage itself. Hence for early and accurate diagnosis, it is proposed to procure various diagnostic kits at a cost of Rs.50,000 per year and make it available to the veterinary institutions and diagnostic centres providing services in the sub basin.

5. DATA CAPTURE ON PROJECT INTERVENTIONS AT FIELD LEVEL

To assess the success or failure of the project interventions carried out under the Project, it is essential to properly and systemically document all the activities carried out under the project. For proper data capture, it is imperative to provide the necessary hard and soft ware. At present the facilities available at the sub basin Nodal offices (Regional Joint Director's office) and implementing offices (Deputy Director's office) for data capture is low. More over reports will be called regularly by the Collectorate, Government, WRO, MDPU and AHD Head quarters. Hence, there is a need to strengthen these offices. It is proposed to strengthen these offices with computer with accessories at a cost of Rs.70,000 per office.

6. DOCUMENTATION OF THE PROJECT ACTIVITIES

For routine documentation of the project activities at the veterinary institution level, it is necessary to print records and registers. A lump sum would be required for printing of health card, fodder distribution register, fertility camp register, follow-up visit register, artificial insemination register, etc. for documentation of the activities under the project. Like wise to maintain records, duplicate vouchers and to carry out miscellaneous and unforeseen expenditure, funds are needed at the Nodal and Implementing Offices level. Hence, it is proposed to provide funds for the above activity. To assess the success or failure of the project interventions carried out under the project, it is essential to properly and systematically document them. Hence, it is proposed to conduct impact studies on the project interventions at the field level. Impact studies will be carried out on milk production through appropriate sampling and validated methodologies.

For the above purpose, veterinarians / para-veterinarians and farmers will be involved. Suitable proformas and guidelines will be developed in consultation with the World Bank. The selected veterinarians / para-veterinarians will be provided training on capturing the data at the field level. Each veterinarian / para-veterinarian will randomly select 10 farmers in their jurisdiction for the above work and they will enlighten the farmers on the methodology to be adopted for recording the data and provide suitable proformas for recording. The farmer will record the needed data once in a month on a specified data for a minimum of 5 months.

The veterinarian / para-veterinarian will make periodical visit to the farmer to assist the farmer in recording the data. After recording the data, the data will be compiled, evaluated and outputs assessed.

The veterinarian / para-veterinarian has to make a minimum of 7 visits per farmer and a cost of Rs.140 would be required per veterinarian / para-veterinarian to make 7 visits per farmer. The farmer to provide the data, they will be provided a onetime lump sum incentive of Rs.100 per individual after successful completion of the data collection. In addition, Rs.100 per veterinarian / para-veterinarian towards data entry at field level and Rs.60 towards data compilation at HO level has been ear marked.

7. CAPACITY BUILDING FOR ANIMAL HUSBANDRY DEPARTMENT OFFICERS

7. a. ORIENTATION TRAINING ON IMPLEMENTATION OF THE PROJECT:

The veterinarians, para-veterinarians and staff working in the sub basin may not be in a position to know the guidelines for implementing the project. In addition, they may not be aware of the demands of the project and for smooth implementation of the project, it is necessary to provide the orientation training on the methodology to be adopted for implementing the project activities. Hence, it is proposed to provide two days orientation training to veterinarians, para-veterinarians and staff working in the sub basin during the afternoon without disturbing the day to day activities of the veterinary institution. In the training, they will be enlightened on the methodology to be adopted for implementing the project activities. Also, information will be shared regarding the registers to be maintained and the documentation to be followed. Further, in the above training programme the office staff of the nodal offices / implementing offices will be explained on the guidelines to be followed during World Bank procurement and filling of MIS report. A cost of Rs.400 per candidate would be required for the orientation training for two days.

7. b. TRAINING TO VETERINARIANS ON TECHNICAL AREAS:

Veterinarians have an overall knowledge on breeding, management, diagnosis and treatment of livestock. With advancing science and technology, the techniques followed may have become obsolete. Moreover, new and simple techniques have evolved in animal husbandry breeding. Hence it is essential to update the knowledge and skills of the veterinarians in the sub basin. The veterinarians in the sub-basin will be given training on various technical aspects like animal feeding, breeding, fertility, animal health, food safety and traditional systems like ethno-veterinary practices. The cost would be Rs.15,000 per training.

7. c. TRAINING TO VETERINARIANS ON DISEASE DIAGNOSIS:

Early accurate pin point diagnosis is the key for not only saving the individual animal, but will also help to improve the overall health status of the livestock maintained in the sub basin, which will help to improve the profitability. Though, veterinarians have an overall knowledge on disease diagnosis, new and re-emerging diseases are emerging challenges to the veterinarians. Hence it is essential to update the knowledge and skills of veterinarians especially involved in disease diagnosis activities in the sub basin. The veterinarians will be given training on morphological, histo-pathological and molecular diagnosis of prevailing, emerging and re-emerging diseases of livestock in various collages / institutes across the country. In addition, they will be permitted to attend important seminars / conferences /

workshops conducted on disease diagnosis across the country. The cost would be Rs.10,000 per training.

Financial Abstract

Table 9

Sl. No	Activity description	Amount (Rs. In Lakh)
1	Dairy Interest Group Formation	0.285
2	Demos through Dairy Interest Groups	13.3986
3	Strengthening mobile Artificial Insemination network	13.911
4	Institutional Strengthening	7.38
5	ICT at Nodal and Implementing Offices	0.70
6	Documentation	0.924
7	Capacity Building	1.256
8	Environmental and Social Management	1.22
	Total	**39.0746**

TAMIL NADU VETERINARY AND ANIMAL SCIENCES UNIVERSITY

SENSITIZING FARMERS ON "NUTRITIONAL SUPPLEMENTAL STRATEGY" DEVELOPED AT TANUVAS TO INCREASE PRODUCTIVITY IN DAIRY CATTLE AND MITIGATE METHANE EMISSION

A. INTRODUCTION:

Dairy cattle and buffalo population in the project area is around 548,839 of which 55% of the cattle and buffalo population constitutes breedable and milch animal population and 76% of them are crossbred which provides an opportunity for investments aimed at improving milk productivity in the project area. Majority of the dairy production in the state is achieved through small holder farms having less than four animals. In general, the feeding practices are unbalanced leading to low milk yield which is less than the genetic potential of the animals reared. Survey on the feeding practice adopted by the owners of these animals indicates that there is a mismatch between energy and protein supply apart from deficiency of other nutrients. Hence, the performance of these animals is limited due to want of critical nutrients, and supplying them as supplement would augment productivity. Besides, dietary manipulations resulting in increased feed intake, digestibility and improved animal productivity would result in reduced enteric methane production per unit of product.

B. CURRENT SCENARIO:

Over the last two decades there has been a major shift in the direction of research in dairy science. Previous research laid focus on altering different aspects of dairy production systems and, such an integrated approach had its merit; however, the main thrust of dairy research today is to improve the efficiency of milk production. This is accomplished by manipulating fundamental biological processes regulating milk yield. The past 20 years have seen tremendous progress in the field of rumen microbiology enabling us to better understand the complex microbial interactions governing efficient nutrient utilization by ruminants. Rumen microbes play an important role in digesting feed and forages consumed by ruminants. In this process the rumen microbes also proliferates and provides protein to host when they are digested in the lower gut. The microbial processes of the rumen confer the ability to convert fibrous feeds and low quality protein, and non-protein nitrogen into valuable nutrients for the ruminant animals. Rumen microbial protein represents a major source of amino acids to the ruminant animal. Microbial protein contributes about two thirds of the amino acids absorbed by ruminants. Increased microbial protein synthesis leads to increased milk production and enteric methane mitigation. Balancing of ration reduced enteric methane emission in terms of g/d and g/kg milk yield by 10.1 ($P<0.01$) and 13.5% ($P<0.05$), respectively, which further reduced the part of dietary gross energy loss as methane by 10.3% ($P<0.01$).

TANUVAS GRAND supplement developed by TANUVAS ameliorates nutritional deficiencies, in low yielders, and increases microbial proliferation resulting in improved milk

production. The acronym for this supplement is GRAND in which G stands for Gruel, R stands for rooted, A stands for Additive, N stands for Nourishment and D stands for Drops. Experiments on the effect of GRAND supplementation have shown that the *in vitro* apparent digestibility of fodder and microbial biomass increases by three fold over non-supplementation group. TANUVAS GRAND supplement is beneficial to nitrogen deficient diet and is more effective when diet contains sufficient energy. TANUVAS GRAND supplement is expected to increases milk production by 500 ml to 700 ml /day/cow and potentially could lead to 20% reduction in methane emission per animal. To demonstrate this impact in the small holder dairy production system, TNIAMP project envisages to pilot and validate the benefits of feeding TANUVAS GRAND to 300 lactating cows in the Manimukthanadhi sub basin project villages. The piloting will be undertaken in tandem with the activities of Animal Husbandry activities and will be implemented through the Dairy Interest Groups (DIGs).

OBJECTIVES:

a. Demonstrating the impacts of critical nutrient supplementation to dairy cattle to increase milk production and mitigate methane production
b. Establishment of mineralized salt lick production units using TANUVAS technology for Dairy Interest Groups.
c. Popularizing the technology for adoption.

C. BROAD ACTIVITIES PROPOSED:

The following activities are proposed

I. Selection of Lactating cattle, Pre-supplementation data collection and interpretation
II. Production and distribution of supplement at free of cost
III. Post supplementation data collection and documentation
IV. Setting up of mineralized salt lick production units in selected farmers dairy groups
    a. Orientation training for farmers
    b. Selection of farmers dairy groups
    c. Technical training to members of selected groups
    d. Setting up of mineralized salt lick production units in selected farmers dairy groups
V. Report preparation and Preparing plant for sustainable production

I. OUTCOME INDICATORS

- Projected increase of 500 ml of milk / animal / day in the animals supplemented with TANUVAS GRAND
- Projected decrease of 20% enteric methane emission per litre of milk increase in the animals supplemented with TANUVAS GRAND
- Enhanced adoption by 150 farmers a balanced feeding regimen to their animals.
- Orientation training on salt lick production to 15 farmers and technical training to 2 farmers.

II. BROAD ACTIVITIES PROPOSED:

The following activities are proposed

I. Selection of Lactating cattle, Pre-supplementation data collection and interpretation

II. Production and distribution of supplement at free of cost

III. Post supplementation data collection and documentation

IV. Setting up of mineralized salt lick production units in selected farmers dairy groups

   a. Orientation training for farmers

   b. Selection of farmers dairy groups

   c. Technical training to members of selected groups

   d. Setting up of mineralized salt lick production units in selected farmers dairy groups

V. Report preparation and Preparing plant for sustainable production

III. COST TABLE FOR MANIMUKTHANADHI SUB BASIN

The Manimukthanadhi sub basin has been identified with one dairy interest group by Animal Husbandry Department according to the bovine population. TANUVAS activity of TANUVAS GRAND feed supplement distribution will be combined with AHD and it covers 300 lactating cattle. The year wise physical and financial targets are presented as follows.

YEAR WISE PHYSICAL AND FINANCIAL TARGETS FOR MANIMUKTHANADHI SUB BASIN

Sl.No	Name of the activity	Unit	Unit cost (Rs in lakhs)	Year I	
				Phy	Fin (in lakhs)
1	Selection of Lactating cattle, Pre-supplementation data collection and interpretation	1	0.00090	300	0.270
2	Production and distribution of supplement at free of cost*	1	0.00180	300	0.540
3	Manpower for supplement production	1	0.00060	300	0.180
4	Post supplementation data collection and documentation	1	0.00060	300	0.180
5	**Setting up of mineralized salt lick production units in selected farmers dairy groups**				
5a	Orientation training for farmers and Selection of farmers dairy groups	1	0.00500	15	0.075
5b	Technical training to members of selected groups	1	0.02500	2	0.050

GRAND TOTAL	**1.295**

*Distribution of TANUVAS GRAND for 3 months

GENERAL GUIDELINE TO ALL LINE DEPARTMENT

1. GENDER PARTICIPATIONPLAN

The focus group discussions with women groups and stakeholders held at different project locations (during walk through survey) by a team to identify gender issues relevant to TN IAMP which are given below:

- Low/ less participation of women in development program.
- Women play significant role in agriculture and other related activities, however these are not recognized by communities.
- Ownership of agricultural land is generally in the name of men.
- Women cultivators have problems in accessing markets particularly because of social and economic constraints in reaching nearby markets.
- Wages to women are generally underpaid and are not at par with male workers for same type of work.

Though it is not realistic to address all issues and concerns of women, a right approach would be to focus on specific issues that could address those that are most relevant to the project outcome. The approach therefore is to formulate specific project interventions focusing on women and supplement them with the existing government programs for the socio-economic benefit of women. Specific measures under the project could include creating required infrastructure (like resting place, clean sanitation facilities etc.) to facilitate women visiting the markets and help them participate in the trading activities. Following this approach, the gender development strategy of the project includes specific activities such as: identifying infrastructure needs and facilities for women members at market, working with women Self Help Groups (SHGs) in the construction activities, organizing training for active participation of women members in the market committees, and ensuring that women members attend all meetings of the market committee or Producer Company

GUIDELINES FOR IMPLEMENTING GENDER STRATEGY.

Stage	Process	Activities	Output
Preparation	Identify gender concerns through participatory consultations	List issues and prioritize	Issues identified that need to be addressed if possible under the project
	Inform about the project activities and benefits	Organize meetings with the women farmers	Sensitization of women on project objectives and activities
	Sensitize other stakeholders on gender concerns/issues	Organize workshops on gender sensitization	Sensitization of other stakeholders on the importance of gender
Implement a-tion	Encourage women participation in project activities	Work with women Farmers/groups for active participation in the project activities	Active women participation
	Encourage equal wages		Actual wages paid to women

	for equal work in all project works		
Operation	Encourage women participation in WUA	Organize training for active participation of women in WUA Encourage more women members to attend meetings of WUA	No of training organized No of women attended

2. THE STRATEGY FOR THE INCLUSION OF WOMEN IS GIVEN BELOW:

Stages	Strategy	Planned Activities
Preparation	Inform on project details, identify gender concerns/ issues in relation to the project activities	▪ A stakeholder consultation meeting will be conducted in which the issues related to women will be discussed. ▪ Prelaunch workshop will be organized at APMC for stakeholders including women.
Implementation	Ensure women participation in project activities	▪ Local women workers will be given preference in construction activities to be undertaken under e-Negotiable Warehouse. ▪ Appropriate representation to women is already given and will be ensured further in APMC Managing Committee.
	Ensure equal wages for equal work in all construction related works.	A wage register will be maintained at work site to ensure, check and monitor whether equal wage is paid to equal work involved in construction activities under e-Negotiable Warehouse.
	Ensure no women harassment under the project	▪ An Anti- harassment Cell comprising members at APMC will be formed to discuss the issues related to women harassment. ▪ A complaint register will be maintained at RM to ensure quick redressed of women abuse and related issues.
Operation	Ensure women participation in the working of APMC	▪ The RM will organize need based trainings, meetings etc. ▪ Women representatives will be given opportunities to participate in various outside trainings and workshops. ▪ Participation of women in management of RM will been sured.

	Employment generation for women in sub project activities	Involvement of local women in RM activities will be encouraged and ensured that the RM continue in operation & post operation period.

3. GRIEVANCE REDRESSES MECHANISM

Grievance Redress Mechanism is part and parcel of the machinery of any project. No administration can claim to be accountable, responsive and user-friendly unless it has established an efficient and effective grievance redress mechanism. In fact, the grievance redress mechanism of an organization is the gauge to measure its efficiency and effectiveness as it provides important feedback on the working of the administration.

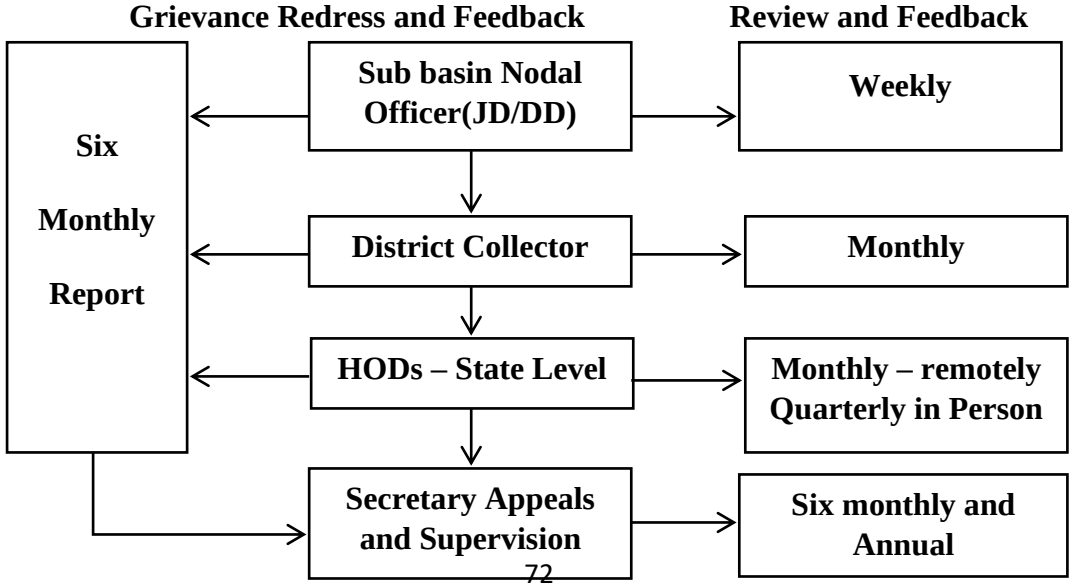
- The grievance redress process will be a continuous, transparent and participatory process that would be an integral part of the project's accountability and governance agenda.
- A project level GRM will be in place for addressing social, environmental and project related grievances.

PROMPT AND EFFECTIVE REDRESS OF GRIEVANCES

a. Grievances should be necessarily acknowledged, with an interim reply within 5 days of receipt and redressed within 1 month of receipt in the Organisation. The same time limit should apply even if co- ordination with subsidiary offices or another Department/Organisation is involved. In such instances special efforts, to be suomoto disclosed when reports are called, should be made.

b. No grievance will be rejected without having been independently examined. At a minimum, this means that an officer superior, to the one who delayed taking the original decision or took the original decision that is cause for grievance, should actually examine the case as well as the reply, intended to be sent to the grievance holder.

GRIEVANCE REDRESS MECHANISM-FLOW CHART



- For every six months report is prepared at all levels and sent to the Secretary.
- Effort will be made to create awareness about GRC mechanism to the beneficiaries through use of flyers and pamphlets at the village, Block and District level.
- The GRC will receive and redress grievances and complaints that are formally brought to the GRC in writing by the persons and/or group of persons who have a grievance because of the Program's adverse impact on him/her and them.
- The grievance would, among others, relate to payment of compensation and involuntary resettlement assistance in accordance with the eligibility criteria as set out in this Resettlement Policy Framework (RPF).

PROCESS OF GRC

- Open House at the Block and District levels.
- The GRC will receive all grievances/complaints and enter them in the Grievance Register;

The GRC will work out a timeframe to redress grievances/complaints if such grievances/complaints are not redressed during the first meeting;

- The GRC will acknowledge receipt of all grievances/complaints, by registered post, within 7 days of receipt;
- The GRC will consider and redress grievances/complaints through public and transparent process in which all those who have lodged their grievances and complaints in order to facilitate transparency and accountability;
- The GRC will communicate its decisions/redress in writing to the complainants within 4 weeks depending on the nature of complaints.

COMPLAINTS/GRIEVANCES REGISTER

a) Serial Number;
b) Case Number;
c) Name of the Grieved/Complainant;
d) Name of Father/Husband;
e) Gender (f) Age;
f) Full Address;
g) Brief details of grievance/complaint;
h) List of documents, if any, attached;
i) Details of previous grievance/complaint, if any;
j) Date of receipt of grievance/complaint and
k) Date of acknowledgement of grievance/complaint

When closing the complaint, agreement should be made with the complainant on remedy, and both parties sign to their approval of the case being closed and outcome accepted. Copies are kept in both hard copy and electronic (please see documentation of Grievance process) by both parties.

The contact details of the officials concerned are included in the individual chapter of Implementing Agencies (IA) and the combined list enclosed in the environmental chapter of the DPR.

ESMF, ESMP & SCREENING CHECK LIST

For the environmental and social impacts (both positive and negative), Environmental and Social Management Framework (ESMF) enumerates a set of measures to minimize the adverse impacts and enhance the positive impacts which are intended to be adopted during the project implementation with half yearly reporting. This will not only ensure that environmental and social safeguard activities are implemented in accordance with the framework and processes but also that there are adequate funds/resources for implementation and supervision of social and environmental management plans. Accounting the nature and scale of environmental and social impacts, specific and reliable departmental Standard Operating Procedures along with suggested mitigation measures will be adopted for environmental and social safeguards. Screening checklists are attached with the individual chapters of Implementing Agencies (IA).

ENVIRONMENTAL SOCIAL MANAGEMENT PLAN (ESMP) NOT APPLICABLE FOR AGRICULTURE ACTIVITIES

PLAN OF ACTIVITIES FOR ENVIRONMENTAL MONITORING AND AWARENESS

- Develop Information, Education and Communication (IEC) material in local language for generating awareness regarding safe use of pesticides
- Promote wide application of safe and bio pesticides, wherever possible
- Promote expansion of System of Rice Intensification (SRI) to reduce water demand
- Work with WUAs in encouraging market based non-water intensive crops where possible and for promoting conjunctive use of water resources
- Demonstrate and scale-up IPM strategy and approach; monitor the adoption rate
- Promote wide use of organic inputs, such as, bio-manure, Farm Yard Manure and bio-fertilizers and provide training on production and use of these alternatives
- Ensure that marginal farmers and poor households are also covered for such demonstrations and training
- Shift to less water intensive crops
- Efficient use of water resources – micro irrigation
- Moderate use of agrochemicals – soil test based fertilizer application
- Pest Management in concurrence with Pest Management Plan (PMP)
- Trainings and demonstrations on restricted pesticides and safe use of pesticides
- Trainings and demonstrations on Integrated Crop Management Practices.
- Specific plans with respect to environmental awareness are listed in the individual chapters of implementing agencies.

GEO TAGGING

As a part of documentation strategy for the interventions proposed to be implemented in this sub basin under the project, it is planned to Geo tag all the field activities using the TN

IAMP APP developed for the purpose. The Geo tagging will be done by the concerned field officers who are in charge of implementation of the interventions.

As the Geo tagging of the project activities ensures /confirms the location of the interventions, required other details such as survey number of the demo plots ,name and address of the stake holder etc., could be assesses easily. Geo tagging technique is useful for validation of components of activities implemented under the project, besides facilitate field visit by higher officers and WB as a valued document.

All the field officers in charge of the interventions will register to log in the APP by using their respective mobile numbers. Each intervention will be Geo tagged at least four times during key operations. Minimum of two photos will be taken during each operation one close to the crop/operations and other photo covering the whole field of execution and uploaded.

ANNEXURE-1

SUMMARY OF WALK THROUGH SURVEY

Sl. No	Walk Through Survey		Farmers request	Technical Solution						
	Date	Location		WRD	Agri	Horti	AED	TNAU	AGMT	AHD	Fisheries
1	2	3	4	5	6	7	8	9	10	11	12
1	01.06.2020	Thandalai	Sluice repair, Tank desilting, Bund strengthening, Removal of vegetation in the tank.	Bund standardisation, Sluice, Weir and Supply channel improvements.	-	-	-	-	-	-	-
2	01.06.2020 ANNEXURE-1	Alathur	Sluice repair, Tank desilting, Bund strengthening, Removal of vegetation in the tank.	Bund standardisation, Sluice, Weir and Supply channel improvements.	-	-	-	-	-	-	-
3	01.06.2020	Peruvangur	Sluice repair, Tank desilting, Bund strengthening, Supply channel , Removal of vegetation in the tank.	Bund standardisation, Sluice, Weir and Supply channel improvements.	-	-	-	-	-	-	-
4	02.06.2020	Thirukka nangur	Sluice repair, Tank desilting, Bund strengthening, Removal of vegetation in the tank.	Bund standardisation, Sluice, Weir and Supply channel improvements.	-	-	-	-	-	-	-
5	02.06.2020	Thiyagai	Sluice repair, Tank desilting, Bund strengthening, Removal of vegetation in the tank.	Bund standardisation, Sluice, Weir and Supply channel improvements.	-	-	-	-	-	-	-
6	02.06.2020	Udhayam ampatu	Sluice repair, Tank desilting, Bund strengthening, Supply channel , Removal of vegetation in the tank.	Bund standardisation, Sluice, Weir and Supply channel improvements.	-	-	-	-	-	-	-

7	02.06.2020	Pallagachery	Sluice repair, Tank desilting, Bund strengthening, Removal of vegetation in the tank.	Bund standardisation, Sluice, Weir and Supply channel improvements.	-	-	-	-	-	-	-
8	05.06.2020	PallagacheryAnicut	Anicut Desilting, bund strengthening, removal of vegitaion,Head sluice repair and Body Wall repair in the anicut.	Skin Wall ,Apron Repair,Flood Bank formation, Head Sluice Repair	-	-	-	-	-	-	-

Proposals in Plan

		WRD	Agri	Horti	AED	TNAU	AGMT	AHD	Fisheries
1	**2**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
1	01.06.2020	Bund standardisation , Sluice, Weir and Supply channel	-	-	-	-	-	-	-
2	01.06.2020	Bund standardisation , Sluice, Weir and Supply channel improvements	-	-	-	-	-	-	-
3	01.06.2020	Bund standardisation , Sluice, Weir and Supply channel improvements	-	-	-	-	-	-	-
4	02.06.2020	Bund standardisation , Sluice, Weir and Supply channel	-	-	-	-	-	-	-
5	02.06.2020	Bund standardisation , Sluice, Weir and Supply channel improvements	-	-	-	-	-	-	-
6	02.06.2020	Bund standardisation , Sluice, Weir and Supply channel improvements	-	-	-	-	-	-	-
7	02.06.2020	Bund standardisation , Sluice, Weir and Supply channel improvements	-	-	-	-	-	-	-
8	05.06.2020	Skin Wall ,Apron Repair, Flood Bank formation, Head Sluice Repair	-	-	-	-	-	-	-

CHECKLIST

1. Walk through survey form attached (check for annexures whether this Walk Through Survey form is attached): **Yes**
2. Environmental and Social Management Framework (ESMF) and Screening Checklist: **Yes**
3. Summary of Walk- Through survey Included : **Yes**
4. Summary of Feed Back along with planned activities Included: **Yes**

5. Special features of the Sub Basin Included: **Yes**
6. Overview of Gender Strategy Included: **Yes**
7. Mechanism & Schedule for establishment of GRM Included: **Yes**
8. Plan of activities for Environmental Monitoring and Awareness Included: **Yes**

SUMMARY OF FEEDBACK ALONG WITH PLANNED ACTIVITIES

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

AGRICULTURAL RELATED

It was inferred that the farmers are mostly relying on conventional farm methodologies and following same cropping pattern. Hence to make them adopting new methodologies, the following activities are proposed. Farmers can be educated through introduction of field demonstration of improved production technology. Farmer's field schools to educate farmers shall be operationalized at block levels followed by capacity building through exposure field visits. During the survey, it was reported by the farmers about reduced soil fertility; hence, it was proposed to encourage the farmers for green manuring by adopting technologies like vermicomposting, practicing rice fallow pulses cropping in order to enhance the soil fertility. Another common problem prevailing in agriculture is water scarcity. Farmers have reported that often they cannot avail water for their crops up to full maturity. For this, it was proposed to switch from conventional paddy cultivation method to System of Rice Intensification (SRI). Through this, they can save appreciable quantity of water and also seed. It was also proposed to divert from high water guzzling crops to less water consuming crops like maize, oil seeds and horticulture crops.

WATER CONSERVATION BY INTRODUCING FARM PONDS

It was reported by farmers that they are facing acute loss due to failure of crops due to want of water whenever there is shortage of rainfall. To address this, it was proposed to introduce farm ponds as a mechanism for harvesting and storing the rain water in the lands of selected farmer's preferably marginal and small farmers in order to supplement their terminal irrigation needs.

SPECIAL FEATURES OF THE SUB BASIN:

There are no special features in respect of Manimukthanadhi sub basin.