TAMIL NADU AGRICULTURAL UNIVERSITY

TAMIL NADU IRRIGATED AGRICULTURE MODERNIZATION PROJECT (TNIAMP) PHASE – III

DETAILED PROJECT REPORT
ON
GUMMIDIPOONDI SUB BASIN

Nodal Office	Centre In charge
Director (WTC) & **Nodal Officer (TNIAMP),** **Water Technology Centre,** **Tamil Nadu Agricultural University,** **Coimbatore – 641 003,**	**Professor and Head** **Rice Research Station (TNAU)** **Tirur, Tiruvallur- 602 025**

Rice Research Station
TAMIL NADU AGRICULTURAL UNIVERSITY
Tirur, Tiruvallur- 602 025

TNAU Component

1. Agricultural scenario of Tamil Nadu

Agriculture continues to be the most predominant sector of the state economy, as 70% of the population is engaged in agriculture and allied activities for their livelihood. The state has an area of 1.3 lakh sq.km with a gross cropped area of around 63 lakh ha. Performance of Tamil Nadu's agricultural sector has been impressive since 1960's when early modern crop varieties were introduced. After the introduction of modern crop varieties, a phenomenal breakthrough in productivity of crops was achieved resulting in higher production of most of the crops. Tamil Nadu has done extremely well in irrigated agriculture particularly in rice, sugarcane and groundnut, which are the major crops in the state.

Now a day, Tamil Nadu agriculture faces various challenges. The continuous reduction in size of holdings, decline in area under cultivation due to competition for land from non – agricultural sectors and water scarcity, excessive dependence on monsoon rains, over exploitation of groundwater, deterioration of the irrigation tanks and lack of maintenance *etc*.

The surface water resources are facing serious challenges due to encroachments, urban and industrial pollution and lack of scientific and need based water use planning. Water use efficiency in most of our surface irrigation projects is low as compared to the developed countries. Therefore, water use efficiency improving methods are to be adopted. Water saving techniques and drought tolerant crop varieties should be evolved.

To moderate the irrigated agriculture and restoration of water resources, the World Bank funded "Irrigated Agriculture Modernization and Water bodied Restoration Management" (IAMWARM) project is implemented in Tamil Nadu. This project was implemented in the last 5 years in 61 sub basins, with an outlay of Rs. 2,543 crores by the department of PWD, agriculture, fisheries and animal husbandry.

In continuation of this project, now the proposed TNIAMP would give special emphasis on enhancing crop production to have better market access, crop diversification, value addition and climate resilient agriculture in the sub basin area.

1.1 About the Station

Rice Research Station is located at Tiruvurkuppam village which lies between Thiruvallur and Chennai in the Chennai- Arakonam rail way route. This is one among the lead

centre for Rice Research for identifying and releasing suitable drought tolerant rice varieties for dry tracts of North Eastern zone of Tamil Nadu. The main mandate of the RRS (Rice Research station) is to undertake basic and strategic research on rice, conducting research on improved crop production technologies like irrigation management, nutrient management, pest and disease management and production of quality seeds in rice.

So for 13 rice varieties released and among them TKM 1, TKM 2, TKM 6, TKM 9, TKM 10, TKM 11 and TKM 12 are famous in the dry tracts of Thiruvallur and Kancheepuram districts of Tamil Nadu. TKM 6 rice is internationally famous for its universal donor for stem borer resistant. TKM 13 is recently released (2015) which replaces BPT 5204 for its quality, yield improvement and pest and disease tolerance.

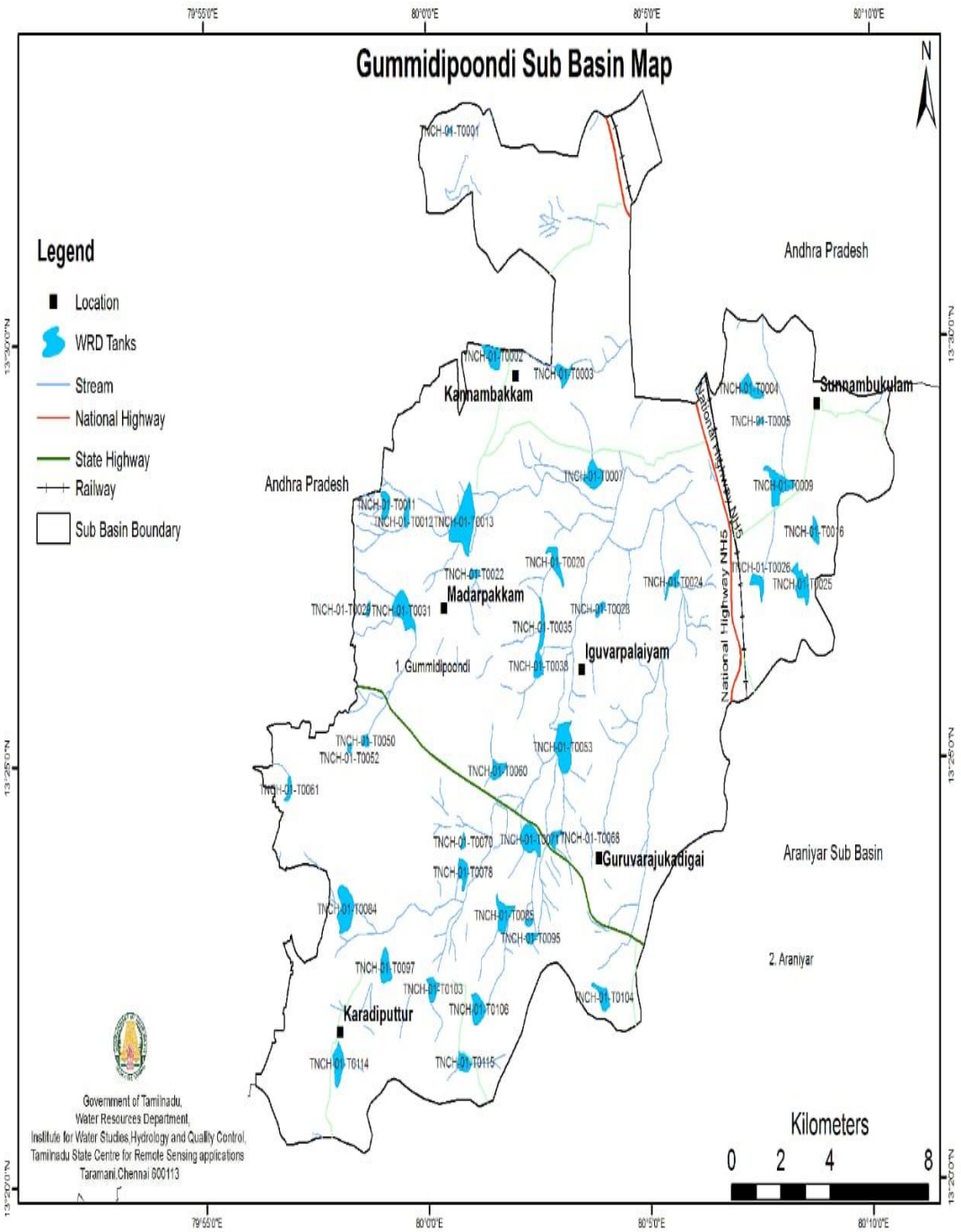
Scientists involved

- Dr. M. Bhaskaran — Professor and Head
- Dr. Dr.S.Malathi — Asst. Professor (Plant Pathology)

2. About Gummidipoondi sub basin

Gummidipoondi sub basin covers an area of 331.11 sq.km numerous small streams originate from Sathiavedu hills at about an altitude of 261m and a few streams originate from Tamil Nadu and drain most of the plain areas of Gummidipoondi. These streams flow in the North, Northeast direction filling up several tanks flow in the North, Northeast direction filling up several tanks in Pallavada, Periyaopalapuram, Thanipoondi, Sirupulalpettai and Siruvadur. Finally to the West of Elavur, the streams join with the Pulicat Lake in Andra Pradesh. It is one of the sub basin in Chennai basin which is located in the Northern part of Chennai basin and Pulicat Lake. The Gummidipoondi sub basin is located between latitude of 13 35 to 13 54 and longitude of 79.94 to 80.14.

Gummidipoondi Sub Basin Map



2.1. Anicuts

There are four Anicuts constructed across Gummidipoondi sub basin in Tamil Nadu.

1. Panchalai Maduvu anicut
2. Sedhipackam anicut
3. Ralla kalvoy anicut
4. Sanaputhur anicut

2.2 LIST OF BLOCKS, TALUKS AND DISTRICT COVERED IN GUMMIDIPOONDI SUB BASIN

DISTRICT	TALUK	BLOCK
Thriruvallur	Gummidipoondi	Gummidipoondi

2.3. IRRIGATION POTENTIAL OF THE SUB BASIN

Category	Gummidipoondi
Fully irrigated area (ha)	888.06
Partially irrigated area (ha)	240.56
Gap (ha)	250.37
Total ayacut area (ha)	**1379.01**

WALK THROUGH SURVEY (WTS)

3.1. Details of walk through survey - Gummidipoondi Sub Basin

1. Walk Through Survey in Gummidipoondi Sub Basin conducted during : 08.05.2020

2. No. of Villages covered - : 15 villages
3. Category of Villagers participated :
   - i. No. of farmers/ WUA Members participated : 30
   - ii. No. of Women Self Help Group Members participated : 5
   - iii. No. of representatives from NGO's : ---
   - iv. No. of Landless farmers : 5
   - v. Panchayat Representatives Participation:
     - a) President -No

b) Secretary - No
c) Members - No

4. Feed Back (Mention the chapter in DPR where the WTS feedback is recorded):

i. WRD Works:

Tanks (No's)	Anicuts (No's)	Supply Channel/Canal (km)
22	4	

ii. Agri. Related (Agriculture/Horticulture/TNAU/AED):

Soil Type	Existing Cropping Pattern	Major Crops	Major Issues	Farm Ponds	Others
Sandy loam soil	**Perennial crops:** Mango **Annual Crop:** Sugarcane, **Seasonal crops:** Paddy, Pulses, Groundnut, Brinjal, Chillies	Perennial crops like mango Annual crop like Sugarcane and Seasonal crops like paddy, Pulses and Brinjal	1.Prevailing gap in irrigation 2.Water scarcity 3.Poor agricultural management practices 4.Less yield 5.Reduced soil fertility 6. Necessity for increased usage of Pesticides 7. Disposal of farm waste 8. Labour scarcity during harvest times 9. Non adoption of multicut fodder crops.	To sustain water for crops by introducing farm ponds were requested by farmers and 15 locations were identified for Farm ponds	

The officials of all the line departments' *viz*., Public works department, Agriculture, Horticulture, Animal husbandry, Fisheries, Agriculture Engineering, Agricultural Marketing and TNAU participated in the walk through survey as per the programme detailed above. The following observations were made during the survey.

- Strengthening of the tank bunds
- Desilting of the tank and supply channel
- Repair works in the sluice and weir
- Lining of field channel
- The soil type is red loam, black loam, sandy loam, clayey and swampy
- Major agricultural crops cultivated are Paddy, Sugarcane, groundnut and horticultural crop like Mango are grown
- Vegetable cultivation is a constraint due to water logging condition
- More emphasis on livestock management

4.2. Cropping Pattern

	Cropping pattern								
Name of the sub Basin		**: Gummidipoondi**				**Fully Irrigated : 888.06 Ha**				
Nodal District		**: Tiruvallur**				**Partially Irrigate : 240.58 Ha**				
Registered Ayacut Area :		:1379.01 ha				**Gap : 250.37 Ha**				
No. of WUAs		**:**				**Total Ayacut Area :1379.01 Ha**				
		Without Project(Ha)				**With Project(Ha)**				
S.No.	**Crop**	**FI**	**PI**	**RF/G**	**TOTAL**	**FI**	**PI**	**RF/G**	**TOTAL**	**Increase**
I	**Perennial crop**									
1	Coconut									
2	Mango	40	0	0	40	40	0	0	40	0
	Total	40	0	0	40	40	0	0	40	0
II	**Annual Crop**									
1	Sugarcane	25	0	0	25	25	0	0	25	0
2	Banana	0	0	0	0	0	0	0	0	0
3	Fodder Agathi	0	0	0	0	0	0	0	0	0
	Total	25	0	0	25	25	0	0	25	0
III	**1st crop**									
1. a	Paddy	440	0	0	440	530	0	0	530	90
b	Paddy SRI	10	0	0	0	10	0	0	10	0
2	Ragi	0	0	0	0	0	0	0	0	0
3	Cumbu	0	0	0	0	0	0	0	0	0
4	Red Gram	0	0	0	0	0	0	0	0	0
5	Black Gram	10	0	0	10	10	0	0	10	0
6	Groundnut	0	640	0	640	0	730	0	730	90
7	Gingelly	0	0	0	0	0	0	0	0	0
8	Brinjal	12	0	0	12	12	0	0	12	0
9	Bhendi	16	0	0	16	16	0	0	16	0
10	Chillies	8	0	0	8	8	0	0	8	0
11	Colocassia Esculanta	0	0	0	0	0	0	0	0	0
12	Greens	15	0	0	15	15	0	0	15	0
13	Flowers	25	0	0	25	25	0	0	25	0
14	Non Agrl. Purposes	0	0	0	0	0	0	0	0	0
16	Fallow			305	305	0	0	105	105	-200
17	Fodder Sorghum	0	0	0	0	0	0	0	0	0
18	Fodder Cowpea	0	0	0	0	0	0	0	0	0
	Total	536	640	305	1471	626	730	0	1461	-20
	G. Total (I+II+III)	601	640	305	1536	691	730	0	1526	-20
IV	**2nd crop**									
1. a	Paddy	540	1190	0	1730	630	1190	0	1820	90
b	Paddy SRI	15	10	0	25	15	10	0	25	0
2	Ragi	0	0	0	0	0	0	0	0	0
3	Maize	0	0	0	0	0	0	0	0	0
4	Minor Millets	0	0	0	0	0	0	0	0	0
5	Black Gram	0	0	0	0	0	0	0	0	0

6	Green Gram	0	0	0	0	0	0	0	0	0
7	Groundnut	0	0	0	0	0	0	0	0	0
8	Brinjal	10	0	0	10	10	0	0	10	0
9	Bhendi	12	0	0	12	12	0	0	12	0
10	Chillies	5	0	0	5	5	0	0	5	0
11	Fodder Cholam	0	0	0	0	0	0	0	0	0
12	Fodder Cowpea	0	0	0	0	0	0	0	0	0
	Total	582	1200	0	1782	672	1200	0	1872	90
V	**3rd crop**									
1. a	Paddy	0	0	0	0	0	0	0	0	0
b	Paddy SRI	0	0	0	0	0	0	0	0	0
2	Black Gram	0	0	0	0	0	0	0	0	0
	Total									
	Grand Total	**1183**	**1840**	**305**	**3318.03**	**1363**	**1930**	**0**	**3398**	**270**
	Cropping Intensity				**216 %**				**222.67 %**	

WALK THROUGH SURVEY (WTS)

1. Walk through survey in Gummidipoondi Sub Basin conducted during: 08.05.2020
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   - vi. No. of farmers/ WUA Members participated : 30
   - vii. No. of Women Self Help Group Members participated : 5
   - viii. No. of representatives from NGO's :
   - ix. No. of Landless farmers : 5
   - x. Panchayat Representatives Participation:
     - d) President -No
     - e) Secretary -No
     - f) Members -No
4. Feed Back (Mention the chapter in DPR where the WTS feedback is recorded):

iii. WRD Works:

Tanks (No's)	Anicuts (No's)	Supply Channel/Canal (km)
22	4	

iv. Agri. Related (Agriculture/Horticulture/TNAU/AED):

Soil Type	Existing Cropping Pattern	Major Crops	Major Issues	Farm Ponds	Others
Sandy loam soil	**Perennial crops:** Coconut, Mango, **Annual Crop:** Sugarcane, Banana, **Seasonal crops:** Paddy, Pulses, Groundnut, Brinjal, Bhendi	Mango Paddy, Pulses, Brinjal, Groundnut	1.Prevailing gap in irrigation 2.Water scarcity 3.Poor agricultural management practices 4.Less yield 5.Reduced soil fertility 6. Necessity for increased usage of	To sustain water for crops by introducing farm ponds were requested by farmers and 15 locations were identified for	

			Pesticides 7. Disposal of farm waste 8. Labour scarcity during harvest times 9. Non adoption of multicut fodder crops.	Farm ponds	

v. Livelihood related (Animal Husbandry/Fisheries):

Veterinary Services (Artificial Insemination, Deworming, Infertility, Disease Surveillance& Prevention, Fodder Development)	**Fisheries Activity(Aquaculture in Farm Ponds and Irrigation Tanks)**	**Others**
Not applicable		

5. Special Features of the sub basin:
   i. Ecologically sensitive area if any - nil
   ii. Sensitive Crops :
      a) Water guzzling nil
      b) Less Water : nil
      c) Others:
6. Gender Strategy:
   i. Percentage of Women expected to involve in
      WRD Activities - Not applicable
      a) Agri. related Activities - 30%
      b) Livelihood related - 25%

Environmental Interventions proposed based on Observations: Not applicable

7. For agricultural based activities,

Educating the farmers through Capacity building programme for practicing on-farm green manure production from their own, farm generated organic solid wastes.

Checklist

1. Walk through survey form attached : Yes
2. Environmental and Social Management Plan (ESMP) and Screening Checklist for packages costing more than Rs. 6.00 Crore and individual tank costing more than Rs. 4.00 Crore :

No. of Packages/Tanks		
Total	Applicable	Not Applicable
Not Applicable		

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: Not Applicable

FORMAT -A

Details of WRD Tanks proposed under Phase III of TNIAMP

Name of Sub Basin

Sl. No.	Name of Tank	Unicode	Villages	Blocks	Taluks	District	Ayacut in Ha			
							Fully Irrigated	Partially Irrigated	Gap	Total
Package I										
1	Amarambedu Parikkeri	TNCH-01-T0070	Amarambedu	Gummidipoondi	Gummidipoondi	Thiruvallur	26.18	6.560	7.920	40.660
2	Amarambedu Tank	TNCH-01-T0078	Amarambedu	Gummidipoondi	Gummidipoondi	Thiruvallur	43.89	12.840	10.850	67.580
3	Amirthamangalam tank	TNCH-01-T0068	Amirthamangalam	Gummidipoondi	Gummidipoondi	Thiruvallur	29.52	7.380	9.240	46.140
4	Aramani Tank	TNCH-01-T0115	Aramani	Gummidipoondi	Gummidipoondi	Thiruvallur	31.05	7.760	9.410	48.220
5	Budur Anicut Thangal	TNCH-01-T0061	Budur	Gummidipoondi	Gummidipoondi	Thiruvallur	48.9	13.100	13.270	75.270
6	Chinna Bommanjikulam Tank	TNCH-01-T0052	Bommanjikulam	Gummidipoondi	Gummidipoondi	Thiruvallur	29.73	7.450	9.170	46.350
7	Kanalur Pedu Eri	TNCH-01-T0104	Kanalur	Gummidipoondi	Gummidipoondi	Thiruvallur	38.59	9.640	12.070	60.300
8	Periya Bommanjikulam Tank	TNCH-01-T0050	Periya Bommanjikulam	Gummidipoondi	Gummidipoondi	Thiruvallur	40.07	10.020	12.140	62.230
9	Pondavakkam PuduTank	TNCH-01-T0012	Pondavakkam	Gummidipoondi	Gummidipoondi	Thiruvallur	32.58	9.140	8.870	50.590
10	Sedilpakkam Tank	TNCH-01-T0029	Sedilpakkam	Gummidipoondi	Gummidipoondi	Thiruvallur	28.91	7.220	8.770	44.900
11	Edur Tank	TNCH-01-T0007	Edur	Gummidipoondi	Gummidipoondi	Thiruvallur	32.2	8.050	9.750	50.000
12	Thervoy Kandigai Chitteri	TNCH-01-T0103	Thervoy Kandigai	Gummidipoondi	Gummidipoondi	Thiruvallur	29.23	7.300	9.150	45.680
13	Vanamalli Tank	TNCH-01-T0060	Vanamalli	Gummidipoondi	Gummidipoondi	Thiruvallur	40.47	10.080	12.300	62.850
14	Elavoor Hissa Kattu Thangal	TNCH-01-T0004	Elavoor	Gummidipoondi	Gummidipoondi	Thiruvallur	51.52	13.880	14.600	80.000
15	Elavoor Katteri Tank	TNCH-01-T0005	Elavoor	Gummidipoondi	Gummidipoondi	Thiruvallur	47.68	11.920	14.450	74.050
16	Elavur Large Tank	TNCH-01-T0009	Elavur	Gummidipoondi	Gummidipoondi	Thiruvallur	92.84	29.220	22.110	144.170
17	Eguvarpalayam Odaperi	TNCH-01-T0053	Eguvarpalayam	Gummidipoondi	Gummidipoondi	Thiruvallur	64.41	18.120	17.500	100.030
18	Narasingapuram Tank	TNCH-01-T0026	Narasingapuram	Gummidipoondi	Gummidipoondi	Thiruvallur	25.24	6.120	7.840	39.200
19	Peria Natham Thattan Tank	TNCH-01-T0025	Peria Natham	Gummidipoondi	Gummidipoondi	Thiruvallur	44.43	13.120	11.450	69.000
20	Melapakkam Pettai Cheruvu	TNCH-01-T0028	Melapakkam	Gummidipoondi	Gummidipoondi	Thiruvallur	27.37	7.850	7.280	42.500
21	Poovalai Large Tank	TNCH-01-T0003	Poovalai	Gummidipoondi	Gummidipoondi	Thiruvallur	51.77	14.940	13.680	80.390
22	Thervali Thamarai Tank	TNCH-01-T0044	Thervali	Gummidipoondi	Gummidipoondi	Thiruvallur	31.48	8.870	8.550	48.900

FORMAT -A

Details of WRD Tanks proposed under Phase III of TNIAMP

Name of Sub Basin

Sl. No.	Name of Tank	Unicode	Villages	Blocks	Taluks	District	Ayacut in Ha			
							Fully Irrigated	Partially Irrigated	Gap	Total
Package I										
1	Amarambedu Parikkeri	TNCH-01-T0070	Amarambedu	Gummidipoondi	Gummidipoondi	Thiruvallur	26.18	6.560	7.920	40.660
2	Amarambedu Tank	TNCH-01-T0078	Amarambedu	Gummidipoondi	Gummidipoondi	Thiruvallur	43.89	12.840	10.850	67.580
3	Amirthamangalam tank	TNCH-01-T0068	Amirthamangalam	Gummidipoondi	Gummidipoondi	Thiruvallur	29.52	7.380	9.240	46.140
4	Aramani Tank	TNCH-01-T0115	Aramani	Gummidipoondi	Gummidipoondi	Thiruvallur	31.05	7.760	9.410	48.220
5	Budur Anicut Thangal	TNCH-01-T0061	Budur	Gummidipoondi	Gummidipoondi	Thiruvallur	48.9	13.100	13.270	75.270
6	Chinna Bommanjikulam Tank	TNCH-01-T0052	Bommanjikulam	Gummidipoondi	Gummidipoondi	Thiruvallur	29.73	7.450	9.170	46.350
7	Kanalur Pedu Eri	TNCH-01-T0104	Kanalur	Gummidipoondi	Gummidipoondi	Thiruvallur	38.59	9.640	12.070	60.300
8	Periya Bommanjikulam Tank	TNCH-01-T0050	Periya Bommanjikulam	Gummidipoondi	Gummidipoondi	Thiruvallur	40.07	10.020	12.140	62.230
9	Pondavakkam PuduTank	TNCH-01-T0012	Pondavakkam	Gummidipoondi	Gummidipoondi	Thiruvallur	32.58	9.140	8.870	50.590
10	Sedilpakkam Tank	TNCH-01-T0029	Sedilpakkam	Gummidipoondi	Gummidipoondi	Thiruvallur	28.91	7.220	8.770	44.900
11	Edur Tank	TNCH-01-T0007	Edur	Gummidipoondi	Gummidipoondi	Thiruvallur	32.2	8.050	9.750	50.000
12	Thervoy Kandigai Chitteri	TNCH-01-T0103	Thervoy Kandigai	Gummidipoondi	Gummidipoondi	Thiruvallur	29.23	7.300	9.150	45.680
13	Vanamalli Tank	TNCH-01-T0060	Vanamalli	Gummidipoondi	Gummidipoondi	Thiruvallur	40.47	10.080	12.300	62.850
14	Elavoor Hissa Kattu Thangal	TNCH-01-T0004	Elavoor	Gummidipoondi	Gummidipoondi	Thiruvallur	51.52	13.880	14.600	80.000
15	Elavoor Katteri Tank	TNCH-01-T0005	Elavoor	Gummidipoondi	Gummidipoondi	Thiruvallur	47.68	11.920	14.450	74.050
16	Elavur Large Tank	TNCH-01-T0009	Elavur	Gummidipoondi	Gummidipoondi	Thiruvallur	92.84	29.220	22.110	144.170
17	Eguvarpalayam Odaperi	TNCH-01-T0053	Eguvarpalayam	Gummidipoondi	Gummidipoondi	Thiruvallur	64.41	18.120	17.500	100.030
18	Narasingapuram Tank	TNCH-01-T0026	Narasingapuram	Gummidipoondi	Gummidipoondi	Thiruvallur	25.24	6.120	7.840	39.200
19	Peria Natham Thattan Tank	TNCH-01-T0025	Peria Natham	Gummidipoondi	Gummidipoondi	Thiruvallur	44.43	13.120	11.450	69.000
20	Melapakkam Pettai Cheruvu	TNCH-01-T0028	Melapakkam	Gummidipoondi	Gummidipoondi	Thiruvallur	27.37	7.850	7.280	42.500
21	Poovalai Large Tank	TNCH-01-T0003	Poovalai	Gummidipoondi	Gummidipoondi	Thiruvallur	51.77	14.940	13.680	80.390
22	Thervali Thamarai Tank	TNCH-01-T0044	Thervali	Gummidipoondi	Gummidipoondi	Thiruvallur	31.48	8.870	8.550	48.900

FORMAT -B

Details of WRD Anicuts proposed under Phase III of TNIAMP

Name of Sub Basin

Sl. No.	Name of Anicut	Villages	Blocks	Taluks	District	Ayacut in Ha			
						Fully Irrigated	Partially Irrigated	Gap	Total
Package I									
1	Panchalai Maduvu Anicut	Poovalambedu	Gummidipoondi	Gummidipoondi	Thiruvallur	65.170	16.280	19.72	101.170
2	Sedhilpackam Anicut	Sedhilpackam	Gummidipoondi	Gummidipoondi	Thiruvallur	38.940	9.730	12.03	60.700
3	Ralla Kalvoy Anicut	Pondavakkam	Gummidipoondi	Gummidipoondi	Thiruvallur	32.650	8.170	9.88	50.700
4	Sanaputhur Anicut	Sanputhur	Gummidipoondi	Gummidipoondi	Thiruvallur	51.800	14.970	13.68	80.450

5. Constraints identified in the Tiruvallur District (Gummidipoondi sub basin)

An analysis of the area, production and yield of rice during the period between 1996-97 and 2012-13 shows that the area under paddy was above one lakh ha upto the year 1999-2000 and then slightly declined during 2004-05 and then started fluctuating between 70,000 and 97,000 ha up to 2012-13. Rice production in the district was hovering between 2 lakhs and 4 lakhs tonnes during the periods between 1996-97 and 2012-13. Yield data shows the same pattern as that of production up to 2008-09 and after that shows a different pattern (upper trend), above the production pattern. Hence yield gap analysis revealed that average potential yield of all the varieties was calculated as 5526.67 kg/ha and the average yield of all varieties at the farm level was calculated as 4801 kg/ha. Over all yield gap was calculated as 5526.67 – 4801 = 1086.83 kg/ha.

Possible constraints to achieve the potential yield levels may be attributed to factors related to urbanization, crop diversification, industrialization etc., Hence, any intervention proposed to improve paddy, rice fallow pulses, oil seeds and horticultural crops in the district by addressing these constraints provides good scope to enhance the crop yield up to 20 percent.

5.1. Objectives

- To promote water saving technologies (AWDI/Precision farming) in agricultural and horticultural crops for large scale adoption.
- To enhance crop and water productivity.
- To increase the cropped area by diversification.
- To converge with WRO and other line departments in overall improvement in total farm income.

5.2. Issues

Rice

- Reduction in rainfall and availability of irrigation water
- Poor Water Use Efficiency in predominantly paddy cultivated area
- Need for introduction of water saving technologies in Paddy
- More Pest and disease incidence in the predominantly cultivated variety

Groundnut

- Low yield due to low fertilizer use efficiency, poor management practices followed in cultivation of the crop
- Need for value addition and formation of commodity based groups

6. Activities/ Field Intervention

6.1. Green manure – Rice (AWDI) - Pulses

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

Outcome:

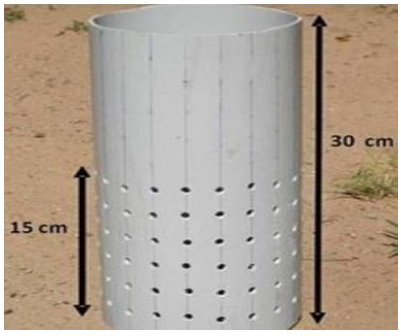
- The Alternate Wetting and Drying Irrigation (AWDI) will be an appropriate technology for water saving in rice. This technology saves up to 30 percent of irrigation water without any yield penalty
- 4-5 irrigations will be reduced under AWDI when compared to conventional method.

Green Manure

Green manure application is a must to maintain the organic carbon content and humus in soil so that soil problems like salinity can be prevented; soil nutrient availability is enhanced; activity of beneficial macro and microbial organisms is favored. Hence this technology is to be popularized before raising rice crop to show because the farmers on the merits of maintaining the soil health for better crop bio-environment.

How to implement AWD?

A practical way to implement AWD 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.



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

Pulses

Pulses cultivation followed by Rice cultivation is essential for crop rotation and to maintain soil fertility. It also promotes crop diversification and brings additional area under pulse cultivation. These rice fallow areas offer a huge potential niche for short season pulse crops. It enhances the soil fertility status for the next crops due to nitrogen fixation.

S. No	Technology	Area (ha)	Unit Cost (Rs./ ha)	Budget (Rs. in lakh)
1	Green manure – Rice (AWDI) - Pulses	60	11000	6.60

a) Details of unit cost split up for Green Manure

S. No	Particulars	Unit cost (Rs.)	Amount (Rs.)	TNAU Cost (Rs./ha)
1	Green manure Seed cost-40kg/ha	50	2000	2000
	Total		2000	2000

b) Details of unit cost split up for Rice

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	1300
5	Bio fertilizer & Bio inoculants		1600	1600
	Total		**6900**	~~6300~~**6000**

c) Details of unit cost split up for AWDI

S. No.	Particular	Amount (Rs.)	TNAU Cost (Rs./ha)
1	Field water tubes ~~34~~ Nos./ha	1000~~700~~	1000~~700~~
	Total		~~700~~**1000**

d) Details of unit cost split up for Rice fallow pulses

S. No.	Particular	Unit cost (Rs.)	Amount (Rs.)	TNAU Cost (Rs./ha)

1	Pulses Seed cost- 20kg/ha	100	2000	2000
	Total		**2000**	**2000**

6.2. Introduction of drought resistant/ Flood Tolerant/ Salt tolerant Rice Cultivars

In Tiruvallur district, soil is having salinity problem, rice grown in these areas often experience poor yield. In order to overcome the salinity problem introduction of high yielding salinity tolerant rice variety is necessary.

S. No.	Technology	Area (ha)	Unit Cost (Rs./ ha)	Budget (Rs. In lakh)
1	Introduction of drought resistant/ Flood Tolerant/ Salt tolerant Rice Cultivars	80	6000	4.80

S. No.	Particulars	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**

6.3. Revival of Oil seed cultivation through IPT

In Tiruvallur district, groundnut cultivated in large area. The yield of groundnut is minimum due to lack improved production technologies. In order to overcome the problem introduction of IPT technologies to groundnut for higher yield.

S. No	Technology	Area (ha)	Unit Cost (Rs./ ha)	Budget (Rs. In lakh)
1	Revival of Oil seed cultivation through IPT (Groundnut)	70	5000	3.50

S. No	Particulars	Unit Cost (Rs.)	Amount (Rs.)	TNAU Cost (Rs/ha)
1	Gypsum 400 Kg / Ha	5	2,000	2,000
2	Fertilizer cost	-	1,500	1,500
3	Pheromone trap and lure for *Spodoptera litura*	-	750	750

4	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	750
	Total		**5,000**	**5,000**

6.4. YEAR WISE ACTIVITIES

S. No.	Particulars	Area(ha)		
		I year	II year	Total
1.	Green Manure - Water Management for Sustainable Paddy Production through AWDI –Rice Fallow Pulses	40	50	**90**
2	Introduction of drought resistant/ Flood Tolerant/ Salt tolerant Rice Cultivars	40	50	**90**
3.	Oilseeds	40	50	**90**

6.5. Special Features of the sub basin:

There are no special features in respect of Gummidipoondi sub basin

7. Environmental and Social Management

This chapter envisages the mitigation of environmental impacts by assessing and effectively managing the potential environmental impacts due to the interventions under TNIAMP in Gummidipoondi sub basin. The primary aim is to manage the impacts by suggesting suitable mitigation measures and monitoring its implementation. Further, Gender participation strategy and Grievance Redressal Mechanism will be devised and implemented suitably for all the sub-projects pertaining to TNIAMP.

7.1. Summary of walk through survey

Walkthrough surveys were conducted through in Gummidipoondi sub basin of Thiruvallur and officials from Water Resources Department (WRD), Agriculture Department, Horticulture Department, Tamil Nadu Agriculture University (TNAU), Agriculture Engineering Department (AED), Animal Husbandry and Fisheries Department jointly conducted the survey. Around 30 public people from farming and allied sector participated and shared their views and expectations.

It was inferred that the Gummidipoondi sub basin constitutes sandy loam and sandy clay loam type of soil *viz* sandy loam type is dominantly prevailing across the sub basin. Due to the soil

suitability, Paddy is widely cultivated along the sub basin. Perennial crops such as Mango, Annual crops such as Paddy, black gram, Green gram, Ground nut and Sugar cane are also grown here. Paddy is the major seasonal crop which is grown in areas where irrigation facility is available. Paddy is repeated as second crop in areas where well irrigation facility is available. Vegetable crops such as Bhendi, Chillies and Brinjal are also cultivated as first crop in this sub basin. When water is available, paddy is cultivated as second crop followed by pulses as third crop. It was inferred, that farmers are interested in water harvesting structures to prolong the water availability to their crops.

7.2. Summary of Feedback along with planned activities

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

TNAU related

It was inferred that the farmers are mostly relying on conventional farm methodologies and following same cropping pattern and do not follow any water conservation measures. Hence to make them adopting new methodologies, the following activities are proposed.

Farmers will be introduced to TNAU interventions *viz*., introduction of high yielding alternate crop varieties in paddy and pulses, water conservation technology in paddy through Alternate wetting and drying coupled with green manure and rice fallow pulse production, Revival of oilseeds through IPT technology. Awareness meeting will be organized in the sub basin in Convergent mode involving Agri/Horti/Animal Husbandry/WRD officials and interested small and marginal farmers will be randomly selected in sub basin villages for implementation of the interventions. Department Trainings on latest technologies and exposure field visits will be arranged to motivate farmers adopt TNAU interventions.

7.3. Gender Strategy

Gender mainstreaming plays a vital role in water management and agriculture allied activities. To enhance women participation in the project, women farmers will be informed and made aware of their role in operation and maintenance of water management activities, decision making in the agriculture, labour opportunities in agriculture, encourage their participation in WUA, involvement in livelihood activities *etc*. Specific capacity building programs like exposure visits could be organized for WUA representatives, women in Farmer Producer Organizations(FPO), Farmer Producer Companies (FPC), Pulse Commodity Groups, Dairy Interest Groups (DIG),etc. Team involvement of women in organized groups such as Self Helping Groups will be encouraged. Small and marginal women farmers will be included in the beneficiaries selected in the sub basin. In

anticipation, the percentage of women expected to involve in agri related activities are 30% and livelihood related activities are 25% and overall women participation shall be 50%.

7.4. Grievance Redress Mechanism and Schedule for Establishment

Grievance Redress Mechanism (GRM) is an essential component of any project implementation, particularly if the project involves the local communities with diverse socio economic backgrounds as the major stakeholders. The grievance redressal 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. The GRM will have multi-level structures and processes. At the district level the committee is made up of respective Joint Director of Agriculture, Tiruvallur on weekly basis. This committee will look after the grievances related to irrigation and water management. At the next level the Collector heads the committee and convenes the meetings monthly once. The Collectors will take care of the other grievances related to the project activities. The next level is the HODs at the state level (Director and Nodal Officer of TNIAMP, WTC, TNAU, Coimbatore) they contact remotely monthly once and organize meetings at every redress; he calls for a meeting once in six months and annually. For every six months report is prepared at all levels and send to the Secretary. Secretary occupies the next level in the structure and in charge of overall appeals and supervision of grievance at all levels.

In the project information boards provided at the Demonstration sites, along with the details of the demonstration, the contact address along with official email and contact numbers of the officer to whom the Grievances has to be addressed shall be displayed. Further OK cards system will be used for transparency.

Efforts 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 implementation of GRM will operate by the Grievance Redress Cell (GRC) at the Block and District level .The grievances received should be entered in the GRM Register comprising of (a) Serial Number; (b) Case Number; (c) Name of the Grieved/Complainant; (d) Name of Father/Husband; (e) Gender (f) Age; (g) Full Address; (h) Brief details of grievance/complaint; (i) List of documents, if any, attached; (j) Details of previous grievance/complaint, if any; (k) Date of receipt of grievance/complaint and (l) Date of

acknowledgement of grievance/complaint.The GRC will acknowledge receipt of all grievances/complaints, by registered post, within 7 days of receipt and will communicate its decisions/redress in writing to the complainants within 4 weeks depending on the nature of complaints andWhen 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.

Contact Person:

Name and Address	Contact No.	E-mail ID
The Programme Coordinator, Rice Research Station, Thirur - 602 025 Tiruvallur	044 - 27620233	**arstirur@tnau.ac.in**

7.5. 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 report (Annexure-I). 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. Environmental Social Management Plan (ESMP) not applicable for Agriculture activities.

S.No	Implementing Agencies	Constraints & Challenges	Suggested Mitigation Measures
1.	**Agriculture, TNAU , Horticulture and allied departments** ~~**Agriculture, TNAU and Horticulture**~~	Lack of quality planting materials	Supply of certified seeds of agricultural crops
2		Water shortages	Implementation of SRI in larger area in the sub-basin
3		Pest problems and Endemic outbreak in occasional cases	Use of biocontrol agents and integrated pest management
4		Lack of Community approach in farming and Awareness	Farmer's field school on seed to seed crop production technologies

5	~~Related~~	Residues management and Lack of organized way of management	Supply of vermicompost mobile silpaulin units to on-farm composting
6		Soil health deterioration and Continued usage of inorganic fertilizers at considerable level	Soil test based fertilizer application to crops
7		Environmental pollution and Lack of ecofriendly inputs Pollution due to polymulch disposal	Supply of bio inputs like Pseudomonas, Biofertilizers like Azospirillum, Phosphobacteria, Rhizobium Collection and safe disposal

~~**Include Screening for TNAU**~~

- ~~Pesticides residues is identified as one of the problem – Random samples collected at the before implementation of interventions and gave the suitable recommendation to the farmers.~~
- ~~Environmental and social safeguards: Random samples collected at the harvest time from the vegetables crops from different sub basins and given for residue analysis in the toxicology lab of Dept. of Agricultural Entomology, TNAU, Coimbatore. All the sub basin scientist are instructed to study the methane emission from SRI and Non- SRI method of cultivation.~~

7.6. 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 AWDI to reduce water demand
- ❖ Work with WUAs in encouraging market based non-water intensive crops
- ❖ 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
- ❖ Sustainable Intensification

- ❖ CC resilient Package of Practices
- ❖ 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
- ❖ Bio villages, Support for Production of Bio-pesticides

8. Capacity building (CB) & Information, Education & Communication (IEC)

8.1. Capacity building

8.1.1. Training to stake holders

Under the head of capacity building, imparting training to all the beneficiaries either as ~~off-~~ offcampus or as on-campus and exposure visit to the farmers is planned.

8.1.2. 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 stake holders by organizing educational tours for having better cross learning.

8.2. IEC Measures including Awareness creation, documentation and IEC equipment

Awareness Creation:

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

- 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

8.2.1. Documentation

- Field note for each activity
- Maintenance of records and registers

- Daily memorandum sheet
- Receipt and issue of inputs
- Technical observations on soil, water and crop

8.3 IEC Equipments

- Purchase of Laptop and Camera

8.4. Outsourcing of vehicle

- Expenditure on TA /DA for the purpose of TNIAMP phase II Project
- Fuel bill of university vehicle utilized for the project
- Hire charges of university vehicle utilized for this purpose.

8.5 Management Cost

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

Abstract

P -Physical in ha F - Financial in Rs. In lakh

S. No.	Particular	Unit Cost (Rs./ha)	Total	
			P	F
I	**A. Field intervention**			
1	GM-Rice (AWDI)-Pulses	11000	60	6.60
2	Introduction of drought resistant/ Flood Tolerant/ Salt tolerant Rice Cultivars	6000	80	4.80
3	Revival of Oil seed cultivation through IPT-Ground nut	5000	70	3.50
	Total (I)		**210**	**14.90**
II	**IEC & CB**			
	Capacity Building			
1	a.Training to farmers			0.60
2	b.Exposure Visit			0.30
	IEC			
3	a. Awareness creation			0.16
4	b.Documentation			0.24
5	c.IEC Equipments			0.70
6	d.Outsourcing of vehicles and TA			1.30
	Total (II)			**3.30**
III	**Management Cost**			
1	Outsourcing of Technical staff			2.48
	Total (I+II+III)		**210.00**	**20.68**

Total budget (year wise) for Gummidipoondi Sub Basin

P -Physical in ha F - Financial in Rupees

S. No.	Particulars	Unit Cost(Rs./ha)	I year		II year		Total	
			P	F	P	F	P	F
I	**A. Field intervention**							
1	GM-Rice (AWDI) -Pulses	11000	30	3.30	30	3.30	60	6.60
2	Introduction of drought resistant/ Flood Tolerant/ Salt tolerant Rice Cultivars	6000	40	2.40	40	2.40	80	4.80
3	Revival of Oil seed cultivation through IPT- Ground nut	5000	35	1.75	35	1.75	70	3.50
	Total (I)		**105**	**7.45**	**105**	**7.45**	**210**	**14.90**
II	**IEC & CB**							
	Capacity Building							
1	a.Training to farmers			0.30		0.30		0.60
2	b.Exposure Visit			0.15		0.15		0.30
	IEC							
3	a.Awareness creation			0.08		0.08		0.16
4	b.Documentation			0.12		0.12		0.24
5	c.IEC Equipments			0.70		0.00		0.70
6	d.Outsourcing of vehicles and TA			0.65		0.65		1.30
	Total (II)			**2.00**		**1.30**		**3.30**
III	**Management Cost**							
1	Outsourcing of Technical staff			**0.96**		**1.52**		2.48
	Total (I+II+III)		**105**	**10.41**	**105.00**	**10.27**	**210.00**	**20.68**

~~Annexture~~Annexure- I

ESMF- Half Yearly Reporting (March/September)
TNAU

Sub-basin :									**Total Demonstration Area :**			
1	2	3	4	5	6	7	8	9	10	11	12	13
Activity/Sub component	**Soil Testing (Yes/No)**	**Adoption of soil test report recommendations(Yes/No with Remarks)**	**Use of Organic along with Inorganic Fertilizers (%)**	**Use of only Organic Fertilizers in nutrient management (Ha & %)**	**Use of only Bio-pesticides (Ha)**	**Area under Micro irrigation (Ha)**	**Target farmers***	**No of farmers* benefitted**	**List of recommended Bio-pesticides in use**	**Negative Impacts if any**	**Mitigation Measures / ESMF Arrangements**	**Remarks**