I AM WARM PROJECT

ALIYAR SUB BASIN

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EXECUTIVE SUMMARY

Executive Summary

Introduction

The Parambikulam Aliyar Project is an interstate Water Resources Development project carried out jointly by the states of Tamilnadu and Kerala . The objective of the development is harnessing th e waters of the Bharathapuzha, the Chalakudi and the Periyar basins for irrigation and power production in both the states. It accomplishes the diversion and integration of eight west flowing rivers, six in the Anaimalai hills and two in the plains for t he benefit of the drought prone areas in the Coimbatore and Erode districts of Tamilnadu state and Palghat District of Kerala State.

Storage and diversion works on the Eight Rivers with interconnecting tunnels have been constructed to divert the waters impounded to the plains of the Coimbatore and Erode districts of Tamilnadu state and Chittur area of the Kerala State. The Reservoirs lie at various elevations ranging between EL +3800 feet and +1050 feet and this difference in elevations has made it possib le for generation of hydro-power.

RESERVOIRS

The Components of the system comprises one diversion weir, seven storage reservoirs , conveyance system, interconnecting tunnels and wide network of canal distribution system.

The Main components of the syste m are

1.Upper Nirar weir

2.Lower Nirar Dam

3.Sholayar Reservoir

4.Parambikulam Reservoir

5.Thunacadavu Reservoir

6.Peruvaripallam Reservoir

7.Aliyar Reservoir

8.Thiurmoorthy Reservoir

SUB BASIN DETAILS

Parambikulam Aliyar Basin comprises the following three sub basins:

1.Sholayar Sub basin

2.Aliyar sub basin

3.Palar Sub basin

In the above, Sholayar sub basin has no direct ayacut and an extent of 20536 ha is irrigated from the Aliyar Reservoir in Aliyar sub basin and 1,53,965 ha is irrigated from Thirumoorthy Reservoir in Palar sub basin.

Aliyar and Palar are the two sub basins in the Parambikulam Aliyar Project selected for implementing the World Bank aided IAM WARM Project.

ALIYAR SUB BASIN

The Aliyar River has its source in the Anamalai Hills. It flows in a north-westerly direction for about 37 Kms in Tamilnadu and enters into Kerala and finally confluence in Bharathapuzha. Uppar and Palar River are the major tributaries of Aliyar River. This river has got an old ayacut of 2576 ha of wet lands, through a system of five anicuts. The last Anicut in this series is Vadakkalur Anicut and below it there are 4 major anicuts in Kerala State irrigating an area of 8094 ha. The total catchment area at the last Anicut in Kerala State is 419 Sq.Miles of which 366 Sq.Miles lies in Tamilnadu State. The Taluk covered in the sub basin is Pollachi of Coimbatore District. The annual average rainfall of the sub basin is 635 mm.

ALIYAR RESERVOIR

The Aliyar Reservoir was constructed across the River Aliyar having a Latitude 10 ‘ 29 “ N and Longitude 76 ‘ 58 “ E and it has a gross capacity of 3864 Mcft. Two irrigation canals i.e., Vettaikaranpudur and Pollachi Canals take off from this reservoir. This reservoir is also intended to meet the requirements of the old command area in TamilNadu State and

Kerala State . The catchment area at the Aliyar Dam is 76 Sq.Miles. Apart from its own catchments, water can be diverted to this reservoir through the Aliyar Feeder canal and the Contour canal from the Parambikulam gr oup of reservoirs.

CANALS IN THE SUB BASIN

The Aliyar sub basin consists of the following canal systems.

1. Aliyar feeder canal system
2. Sethumadai canal system
3. Vettaikaranpudur canal system
4. Pollachi canal system
5. Old Channel system in Aliyar River

AYACUT DETAILS:

Sl.No.	Name of Canal	Length in Km.	Ayacut in ha		
			A' Zone	B' Zone	Total
	DIRECT AYACUT				
1	Aliyar Feeder Canal	13.40	956	932	1888
2	Sethumadai Canal	8.40	1018	1023	2041
3	Vettaikkaranpudur Canal	17.40	2250	2275	4525
4	Pollachi Canal	48.00	4703	4802	9505
	TOTAL		**8927**	**9032**	**17960**
5	Old Aliyar Channel System				**2576**
	TOTAL				**20536**
	INDIRECT AYACUT				
6	System tank				**247.62**
7	Panchayat Union Tank				**34.82**
	TOTAL				**20818.44**

Though the total registered ayacut und er PWD control is 20536 the average cultivation is only 19029 leaving a gap of 1507 ha. which is approx 9.27% of designed irrigation extent.

Soil type and Crops grown.

The soil types met with are combination of Inceptisol Alfisol and Entisol.

Crops grown in this sub basin area are Coconut, Sugarcane, Banana, Sapota, Mango, Fodder, besides annual crops, such as Paddy, Groundnut, Cotton, Vegetables, Pulses, Fodder, Tomato, Gaurds, Maize as I crop, and Paddy and Ground nut as II crop.

WATER BALANCE.

TOTAL WATER POTENTIAL

Surface Water Potential	-	286.80 Mcm
Ground Water Potential	-	84.90 Mcm
Total	-	371.70 Mcm

TOTAL WATER DEMAND

Domestic	-	5.40 Mcm
Live Stock	-	1.20 Mcm
Industries	-	13.20 Mcm
Export	-	28.90 Mcm
Agricultural	-	110.19 Mcm
Agri. Research Station	-	0.80 Mcm
Kerala	-	205.32 Mcm
Total	-	365.01 Mcm
Surplus	-	6.69 Mcm

In spite of the surplus scenario, the reasons for substantial gap are.

(i) No technical attention is paid to the application of water to the fields.

(ii) Most of the lands are in fragmented condition, consequently, lot of loss of water in field to field irrigation.

(iii) Farmers are not aware of modern techniques, and hybrid – varieties.

(iv) Lack of efficient farm management.

(v) Encroachment on canal banks, and consequently, water is allowed to spread through man made damages prevent inundation to in the upper reaches, (i.e.) the canal sections need redesigning.

(vi) The cross masonry works need repairs.

Stake holders Meeting

In order to improve the system efficiency and productivity of irrigated agriculture, a multi disciplinary approach involving the following departments is attempted.

(i) Agriculture

(ii) Agriculture Engineering

(iii) Horticulture

(iv) Agricultural Marketing

(v) Tamil Nadu Agricultural University

(vi) Fisheries

(vii) Animal Husbandry.

WRO officials with the officials of the above line departments, held meetings with the stakeholders in the sub basin and also had joint walk through survey and the following table shows the constraints as observed by them and countermeasures suggested by the departments.

OVERALL PICTURE

Components	Constraints	Counter Measures
WATER RESOURCES ORGANISATION	Deterioration of Contour Canal arterial conveyor part	Proposed to rehabilitate the Bed and side Lining, Tunnels , approach roads.
	Damages in Canal networks	Proposed to rehabilitate the damaged portions by lining the bed and sides of the main canal, branch canal and distributories upto 25 acres limit
	Dilapidated conditions of the cross masonry structures	Proposed to rehabilitate the cross masonry structures
	Deficiencies in regulating arrangements in the canal sluices	Proposed to replace the wornout wooden paddle shutters by screw gearing steel shutters 2) Repairs to sluices
	Poor condition of the canal bank / inspection track	Proposed to strengthening and standardizing the canal banks
	Lack of modern flow monitoring and controlling devices	Proposed to install Telemetry, SCADA and measurement devices in the reservoir and canal network.
	Over exploitation of Ground Water	Construction of artificial recharging structures like checkdams etc.,
	Lack of environmental awareness	Proposed to create awareness and implementing environmental projects
	Encroachment in the canal area	Demarcation of canal boundary

AGRICULTURAL MARKETING	Production – Glut / Shortage	Linkages with traders on contract farming and on line trading. Off season varieties to be developed by TNAU and cultivated, marketed by FA's. Incase of perishables, agro-processing opportunities to be explored and required facility to be developed.
	Lack of available markets	No such difficulty. For speeding of marketing, formation of marketing sub groups at farmers association and export potential may be tapped.
	Poor post harvest practice	Rural godowons and thrashing floors to be constructed at selected sub groups and Tarpaulins to be distributed. On test basis ready to cook vegetables may either be processed by Farmers' Interest Groups be branded or allowing (FIG's) and the same may be sold through – self help group to enter into their venture of value addition. On realizing the potentials the same will be expanded on large scale through big departmental stores or through vegetable depots at cities. Training with regard to post harvest technology may be imparted to farmers.(TNAU centralized component)
	No collective action	Collective bargaining may be imparted through establishment of FA's / organisation empowering them to establish a retail unit in farmers market operated in nearby town.

	Lack of market information / providing multiple market information	Demand and price forcasting cell of TNAU will provide information to the target groups in liason with personal of Dept. of Agrl. Marketing & Agri. Business on demanding markets, time of sale expected, price advantage etc. It could facilitate the farmers to take decisions on crop diversification on either increasing or decreasing the area under crops.
		The cell positioned in sub basin level will coordinate with the domestic and export market intelligence cell (DEMIC) of TNAU, Coimbatore and periodically will develop the above information to the functionaries at the sub basin level.
	Diversification / Future vision proposed	Farmers interest group will be formed and motivated to do grading standardization and branding of farm produce.
	Transport / Collective Transport	Need based transport arrangement will be provided by out sourcing.
	Processing and Agro Processing	One day interface workshop or stakeholders meet will be arranged with traders, entrepreneurs of CII and selected sub-basin farmers interest group.

	New practice in quality control	The quality norms enunciated in AACCP/Phytosanitary regulation for promotion of exportable produce. Organic certification will also be established to promote organic farming in a highway.
ANIMAL HUSBANDRY DEPARTMENT	Remote villages and villages situated far away from the Government Veterinary Institutions are not getting sufficient veterinary services like veterinary health cover and artificial insemination facilities	The establishment of sub basin veterinary unit will ensure delivery of veterinary services at the farmer's door steps or nearest to the farmer's in remote villages and unserviced villages of the sub basin area. Provision of veterinary health cover and artificial insemination are the main works at the farmer's door steps. The unemployed veterinary graduate will be given an entrepreneurship training to establish a Sub basin veterinary unit in the sub basin area and disseminate best animal husbandry practices for his earnings and to upgrade animal husbandry practices of farmers in the sub basin area.
	Lack of upgraded infrastructure at the Government Institutions leading to constraints in delivery of quality veterinary services.	The Government Veterinary Institutions in the sub basin will be provided with additional essential equipments to deliver quality veterinary services in the sub basin. In addition one veterinary dispensary will be upgraded as referral institution for quick and accurate diagnosis of diseases and help in timely treatment thereby preventing economic loss to the farmers.

	There is a vide gap between the requirement and availability of green fodder needed for the livestock in the sub basin.	To reduce the gap between the requirement and availability of green fodder in the sub basin, it is proposed to cultivate CO3 fodder in 150 hectares of private lands, as a part of cropping plan.
	Main problem affecting the fertility in cross bred cattle is infertility leading to loss of milk production days, ultimately leading to loss to the farmers.	To overcome the infertility problems, infertility cum total health cover camps are proposed. The animals having infertility problems will be identified and treated. In addition, mineral mixture supplement will be given to rectify the defects.
	Lack of adequate know-how about the livestock management practices like feeding, breeding, health care and deworming activities.	The farmers in the sub basin will be given on best livestock management practices in livestock breeding activities like signs of oestrum, correct time of artificial insemination, deworming, feeding schedule and other health care measures. In addition, IEC materials will be distributed to farmers in the sub basin. More over hoardings and wall paintings depicting signs of commonly affecting diseases will be erected in places where people congregate in large numbers. Apart from this, quarterly night meetings will be conducted to disseminate information to the farmers in the sub basin.

	Lack of update knowledge and skills of the veterinarians and para-veterinarians in the project area.	Veterinarians in the project area will be given trainers training at Veterinary Colleges to update and refresh their skills and knowledge. They will inturn train the para-veterinarians.
HORTICULTURE DEPARTMENT	1) Identifying suitable crop / varieties according to agro climatic suit abilities and market limitations	Tissue Culture Banana is a new introduction for the sub-basin with fertigation which has a potential yield and income to the farmers
	2) Increased requirement / production of planting material	Monopoly in supply of Tissue Culture plants is from Spic Bio-Tech which is 50 km. from the basin. Plants can also be obtained from M/s. Sunglow Bio-Tech which subsidized through rehabilitation of Tissue Culture Lab under National Horticulture Mission.
	3) Cost of Tissue Culture plantlets are quite high Much can should be given in the early stage till establishment	Increased income of 60% uniformity in bearing Earliness in crop duration Disease free plantlets are produced Responds well to fertigation
	4) Timely supply of seeds	Seeds will be procured from private agencies and supplied in time by the Department of Horticulture. The Kishi Vigyan Kendra attached to Tamil Nadu Agricultural University will also ensure supply of good quality seeds.

	5) Improving the water the efficancy to cater to the needs of the additional area.	Drip irrigation can be followed for fruit crops and vegetable crops. Micro sprinklers can be used for onion.
	6) Educating farmers on Good Agricultural Practices	• The water user Association can have linkage with the Government officials and Tamil Nadu Agricultural University. • Trainings can be organized for the farmers. • Handouts, folders and Booklet can be printed for the benefit of the farmers. • Promotion of INM/IPM concept by distributing organic manner bio pesticides and Bio fertilizers. It is also implemented under National Horticulture Mission scheme.
	7) Labour demand	Family labour can be utilized.
	8) Credit facilities	Water users Association can be linked to Co-operative banks and Nationalised banks
	9) Additional manpower	For effective implementation and proper monitoring and evaluation a Technical input provider can be appointed for every 200 Ha. Of the extended area.
	10) Protected cultivation – Training to the farmers	New introduction to the basin for increase income.

AGRICULTURE DEPARTMENT	Problem soil	There is no problem soil area. Hence no reclamation is necessary.
	Adverse climatic condition/Drought	On perusing the past rainfall record, drought occurs once in 10 years. Drought tolerant varieties, agronomic practices will be introduced.
	Quality of seeds (Low yielding traditional varieties still prevalent)	High Yielding certified seeds of crops and quality planting materials will be supplied to the farmers through Agrl.Extension Centres, TNAU etc. Low yielding local varieties will be replaced with high yielding varieties during the project period.
	Limited availability and distribution of certified sed from Government source/private and High cost of hybrid seeds	Certified seeds are stocked and distributed in Agricultural Extension Centres as per the SRR prescribed by the Agriculture Department. The private Hybrid seeds costs more and can be utilized. Supply of seeds by NSC and other private sources will also be arranged.
	Improper Irrigation practices (Flood Irrigation)	SRI Technique in paddy crop will be popularized by laying demonstration by TNAU. Drip and sprinkler irrigation is going to be introduced by the Agricultural Engineering Department for all the crops.

	Inadequate extension services	Departmental Extension Workers in all levels are limited in the sub basin. Government extension service is main source. Private extension services like TNAU, Agriculture clinics and Kissan call center can be used.
	Risk aversion	Only a few farmers have known the risk aversion. Many farmers has no idea about this. Farmers will be educated through trainings, and Demonstrations under Centrally Sponsored Schemes Training will impart all improved package of practices to the farmers and demonstrations will act as teaching floor for all farmers.
	Limited Processing Units.	Based on the necessity and demands of the farmers, required units will be set up through private entrepreneurs.
	Availability of labour	To overcome the existing labour problem, required from mechanization like Drips and Fertigation units, can be introduced for cotton sugarcane and all farm implements and equipments can be distributed through subsidy schemes to avail labour unavailability during peak season.

	Adoption of traditional method of cultivation	Introducing new planting method for sugarcane like pit method and paired two method instead of mound planting, Introducing SIR technique for paddy, Bund/inter/mixed cropping for pulses, paired row planting for cotton will be introduced.

Details of Activities of each Department.

WRO

Approach: to rehabilitate the irrigation system made be as below:

1. Thematic Maps on land use, soils, crops, water bodies, and other Agriculture, and demographic attributes are prepared by IWS.

2. The crop water requirements for the crops without project and for the crops with the project are prepared by IWS, with the crops proposed by Agriculture, Horticulture and Agricultural Marketing Department.

3. The Adequacy of the canal system, feeder channels to Tanks , distribution system etc, have been checked by the WRO(both regional and Plan Formulation wing) and the following packages are proposed accordingly.

Sl. No.	Name of Work	Estimate Amount Rs. in Lakhs
	CONTOUR CANAL	
1	Rehabilitation of Contour canal from LS 0/000 km to 30/400 km	1270.00
	ALIYAR FEEDER CANAL	
2	Rehabilitation of Aliyar Feeder canal and its Distributaries	55.00
	VETTAIKARANPUDUR CANAL AND SETHUMADAI CANAL	
3	Rehabilitation of Sethumadai canal , Vettaikaranpudur canal and its Distributaries	524.00
	POLLACHI CANAL	
4	Rehabilitation of Pollachi and its Distributaries from LS 0/000km to 20/000 km	507.00
5	Rehabilitation of Pollachi and its Distributaries from LS 20/000km to 48/000 km	495.00
6	Construction of check dams in Aliyar sub Basin	27.00
7	Rehabilitation of Kolapathu Tank in Aliyar sub basin	25.00
	Total	**2903.00**

The Left out reaches in the canal distribution system, under WRCP Phase I have been proposed for rehabilitation to improve the conveyance efficiency to greater extent. It will facilitate rising of value added and less water intensive crops in vast area by merging the gap and partial irrigated areas.

OUTCOME:

- The irrigation efficiency is expected to improve from the present 50% to 70%.
- The gap area can be bridged and cultivation of crops in more area.
- Accurate monitoring and controlling of Reservoir and canal system.
- Effective water management
- Ensure predictable, equitable and reliable supply to all the areas of the command.

- ❖ Strengthening of PIM activities.
- ❖ Optimization in using the water for Irrigati on.
- ❖ Rainwater harvesting by construction of check dams helps to improve the ground water potential.

TANK COMPONENTS:

The practice of tank irrigation has been prevalent for centuries to store water for lean season and has played a significant role in t he irrigation sector. They not only provide a source for irrigation but also help recharging of ground water under suitable conditions. There is one system tank commanding on Ayacut of 247.62 Ha, It is quite old and is in urgent need of repairs. The irri gation potential of the tank has declined, with poor maintenance of supply channel, sluices, bund and distribution system.

AGRICULTURE DEPARTMENT

The approach to enhance Agriculture production made be as below.

Approaches

- Demo on Vermi- compost preparation
- Demo on Coir pith compost preparation
- Demo on Integrated Pest management in Coconut
- Demo on Integrated Nutrient management in Coconut
- Distn. of MN mixture for coconut
- Distn. of MN mixture for groundnut

Cropping Pattern

The existing cropping patter n and other proposed cropping pattern with the project is shown as two different tables.

CROPPING PATTERN OF ALIYAR RESERVOIR

Sl No.	Crop Details	WITH OUT PROJECT			With Project ha
		Fully Irrigated	Partly Irrigated	Gap/R.F	
		In Ha	In Ha	In Ha	
1	Coconut (W/o Drip)	3711	1840		0
	Coconut (with drip)	8022			8022
	Coconut with Fertigation				6291
	Coconut with intercrop	252			630
2	Paddy (May - Oct)	1690			1270
3	Ground Nut(May-Oct)	50			50
	Ground Nut(sep Jan)	880	180	500	1161
4	Maize (Sep -Jan	100	20		290
5	Cotton (Sep -Jan)	315	150	249	400
6	Sugarcane	400			700
7	Cholam (Sep -Jan)	217	90	438	278
8	Pulses (sep -Jan)	130	154	298	259
9	Fodder (May -oct)	80			230
	VEGETABLES				
10	Tomato (sep -Jan)	60			80
11	Bhendi (Sep -Jan)	20			20
12	Gourds (May - Oct)	20			20
	Gourds (Sep - Jan)	140			220
	FRUITS				
13	Mango	200	120		320
14	Banana	180			120
15	Sappota	30			30
16	TC banana				145
	Total	**16497**	**2554**	**1485**	**20536**
	INTER CROPS				
17	Coco	177			**540**
18	Nutmeg	50			**65**
19	Arecanut	15			15
20	Vennila	10			10
	CROP II				
21	Paddy (Nov -Mar)	1598			1270
22	Groundnut (Nov -Mar)	40			50

Poly green house 12 units 500 Sq.mt / unit

Shade net 19 units 500 sq.mt /unit

It can be seen from the above table, that against the gross cropped area of 20536 Ha, with the cropping intensity of 100 % with reference to the registered Ayacut of 20536 Ha, the gross cropped area is expected to reach 21856 ha with cropping intercity 106 % due to improvements in infrastructure by WRO, and other improved components from other line departments, of course, keeping in check the adequacy of crop water requirements with introduction of micro irrigation and oth er modern Agriculture practices through demos, training etc.

The final outcome can be summaries as below

Outcome

- 10 % of the farmers turn as commercial farmers.
- 10 % to 20 % increase in farm income.
- 20 % to 25 % of the paddy area with SRI technique
- 20 % to 25 % of the paddy area shifted to other commercial crops.
- 40 % to 45 % of coconut area covered under Drip with fertigation.
- 5% of the coconut area proposed for intercrops.

The Agriculture Department components are below

Activities proposed to implement in Aliyar Sub basin of PAP Area

Sl. No.	*Name of the Activity*	*Nos. for 5 years*	*Cost / Unit L.Rs.*	*No / Cost for 1st year*	*No / Cost for 2nd year*	*No / Cost for 3rd year*	*No / Cost for 4th year*	*No / Cost for 5th year*	*Total cost for 5 years L.Rs.*
1.	*Demo on Vermi-compost preparation*	*100*	*0.200*	*10 Nos* *Rs. 2.00*	*30 Nos* *LRs. 6.00*	*20 Nos* *LRs. 4.00*	*20 Nos* *LRs. 4.00*	*20 Nos* *LRs. 4.00*	*100 Nos* *LRs. 20.000*
2.	*Demo on Coir pith compost preparation*	*60*	*0.020*	*5 Nos* *LRs. 0.10*	*10 Nos* *LRs. 0.20*	*15 Nos* *LRs. 0.30*	*15 Nos* *LRs. 0.30*	*15 Nos* *LRs. 0.30*	*60 Nos* *LRs. 1.200*
3.	*Demo on Integrated Pest management in Coconut*	*45*	*0.046*	*5 Nos* *LRs. 0.23*	*10 Nos* *LRs. 0.46*	*10 Nos* *LRs. 0.46*	*10 Nos* *LRs. 0.46*	*10 Nos* *LRs. 0.46*	*45 Nos* *LRs. 2.070*
4.	*Demo on Integrated Nutrient management in Coconut*	*45*	*0.070*	*5 Nos* *LRs. 0.35*	*10 Nos* *LRs. 0.70*	*10 Nos* *LRs. 0.70*	*10 Nos* *LRs. 0.70*	*10 Nos* *LRs. 0.70*	*45 Nos* *LRs. 3.150*
5.	*Distn. of MN mixture for coconut*	*For 2000 Ha. 350 MT*	*Rs. 35/ kg.*	*400 Ha. MT 70 LRs. 24.50*	*400 Ha. MT 70 LRs. 24.50*	*400 Ha. MT 70 LRs. 24.50*	*400 Ha. MT 70 LRs. 24.50*	*400 Ha. MT 70 LRs. 24.50*	*2000 Ha. 350 MT 122.50 LRs.*
6.	*Distn. of MN mixture for groundnut*	*220 Ha.*	*Rs. 34/ kg.*	*44 Ha. LRs. 0.187*	*44 Ha. LRs. 0.187*	*44 Ha. LRs. 0.187*	*44 Ha. LRs. 0.187*	*44 Ha. LRs. 0.187*	*220 Ha. LRs. 0.935*
	TOTAL			***27.367 LRs***	***32.047 LRs***	***30.147 LRs***	***30.147 LRs***	***30.147 LRs***	***149.855 LRs***

The estimated cost is Rs. 149.855 Lakhs

HORTICULTURE DEPARTMENT

The Horticulture department serves with an objective of increasing th e area under horticulture crops substantially with varietals up gradation such as tissue culture and hybrid crops. It also proposed controlled cultivation in shade net and poly green houses. It also proposes to promote inter-cropping. The above are propose d carefully with reference to market linkages especially perishables.

The Approach to achieve these objectives is as follows.

(i) Improving the knowledge of the farmer in better cultivation techniques through demos, training etc.

(ii) Encouraging micro irrigation with fertigation and less water intensive.

(iii) Introduction of maintainable, agro-climatic enterprise, Hybrid Verities of Horticulture crops.

(iv) Promoting inter-cropping and controlled cultivation etc.

The following table shows the horticulture activities proposed in the sub basins with cost details

S. No.	Components	Estimated cost	Financial in lakhs					Total (in lakhs)
			I Year	II Year	III Year	IV Year	V Year	
I.	Area Expansion	.						
A.	**Fruits** TC Banana	0.500	15.00	20.00	12.50	12.50	12.50	**72.50**
1.	**Vegetables**							
B.	Hybrid Tomato	0.300		6.00				**6.00**
1.	Pandal Vegetables	0.500	5.00	5.00	15.00	15.00		**40**
C.	**INTER CROP**							
1.	Cocoa	0.150	7.50	22.50	15.0	9.45		**54.45**
2.	Nutmeg	0.150	-	2.25		-	-	**2.25**
1.	PROTECTED CULTIVATION Shade net (500sq mt)/No Polygreen House (500 sq.mt)No	Rs.650/sq.mt Rs.7000/500 sqmt	6.50 0.63	32.50 0.70	- 	- 	- 	**39.0** **1.33**
	Overall Total		**34.63**	**88.95**	**42.50**	**36.95**	**12.50**	**215.53**
II -1	Extension support @ Rs 8000/ month (84 man months for 5 years)	0.96	0.96	1.92	1.92	0.96	0.96	6.72
2	Advertisement charges	0.24	0.24	0.24	0.24	0.24	0.24	1.20
3	Hiring computers	0.50	0.5	0.50.	0.5	0.5	0.5	2.50
	Total		**1.70**	**2.66**	**2.66**	**1.70**	**1.70**	**10.42**
III	Organic farming	Amount already proposed in area expansion programmes.						
IV	INM /IPM	1000	0.40	0.70	0.55	0.55	0.25	2.45
V	Micro Irrigation	Implemented by Agriculture Engineering Department.						
	Grand Total		**36.73**	**92.31**	**45.71**	**39.20**	**14.45**	**228.40**

The total estimated cost of investment is Rs. 228.4 0 Lakhs and following increased production shall be achieved with the project as outcome.

OUTCOME

SL.NO	DETAILS	WITHOUT PROJECT	WITH PROJECT	% INCREASE
1	Area in Horticulture crops(Ha)	614	1195	194.63
2	Introduction of IPM/INM(Ha)	0	245	245
3	Introduction of Organic Farming(Ha)	0	378	378
4	Average Increase in Production (MT)	82	143	75

The other outcomes shall be saving of water to expand the area of cultivation and to increase productivity and farm income. There will be also an increased non-from employment opportunities through including private sector participation in Agro-processing units to be developments in this sub basin.

AGRICULTURE ENGINEERING DEPARTMENT

With the main objective to bring water directly to root zone of the crop, thus reducing the wastage of water due to flood irrigation, The following are the approaches to achieve these objectives.

Approach:

- Micro Irrigation.
- Precision farming.
- Farm Mechanization
- Pilot Project For Underground PVC Pipe Line Conveyance System With Sump Provision In Canal Command
- Farm ponds with fish culture.
- Check dams
- Percolation ponds.
- Conversion of abounded wells.

The project component shall be as below.

Sl. No.	Components Proposed	Unit	Unit cost (Rs)	Physical (Ha)	Fin (Rs.in Lakhs)
1.	Micro Irrigation				
a.	Drip Irrigation				
	Fruit crops 6m x 6 m (Mango & Sapota)	Ha.	33200	210	69.72
	Banana 2 m x 2 m	Ha.	52800	220	116.16
	Gourds 1.5 m x 1.5 m	Ha.	58000	200	116.00
	Hybrid Tomato 1mx1m	Ha.	60600	50	30.30
	Sugar cane 1.5mx1.5m	Ha.	58000	200	116.00
	Cotton	Ha.	58000	100	58.00
	Coconut with fertigation 8m x 8m	Ha.	22900	3000	687.00
	Coconut with inter crop 8m x 8m	Ha.	8000	500	40.00
	Total			4480	1233.18
b.	Sprinkler Irrigation.				
	Ground Nut	Ha.	15000	300	45.00
	Bendi	Ha.	15000	20	3.00
	Total			320	48.00
II	Precision Farming				
	Drip Irrigation for Hybrid Tomato	Ha	75000	20	15.00
III	PVC buried pipe laying for water conveyance and sprinkler system for 151.56.0 Ha block.				
	Construction of Sump	No.	150000	12	18.00

	Electrification and Pumping machineries	No.	85000	12	10.20
	90 mm 4 ksc PVC pipe laying works	Ha.	15000	152	22.80
	Total			152	51.00
IV	Farm mechanisation with advanced machineries				
a.	Maize Husker Sheller	No.	90000	1	0.90
b.	Tractor operated Ground nut Digger	No.	40000	2	0.80
c.	Power operated Ground nut Stripper.	No.	45000	2	0.90
d.	Coconut Dehusker	No.	30000	24	7.20
	Total			29	9.80
V	OTHERS (Rain Water Harvesting Structures)				
	Farm Ponds.	No.	40000	48	19.20
	Minor Check dam*	No.	100000	19	19.00
	Major Check Dam*	No.	200000	9	18.00
	Percolation Pond*	No.	300000	7	21.00
	Percolation Pond*	No.	500000	5	25.00
	Conversion Abandoned wells	No.	26000	16	4.16
	Total			56	106.36
	GRAND TOTAL				**1463.34**

OUT COME

- Increased area under Hi-tech Irrigation like Drip and Sprinkler Irrigation.
- Precision Farming practices to an extent of 20 ha. for increased income.
- Increased Farm Productivity per unit area and unit quantity of water.
- Diversification of new crops in the gap area.

- Increase in Irrigation efficiency by laying of PVC underground pipe line system in canal command area
- Technology dissemination to the farmers
- Increase in awareness in Farm Mechanisation
- Supplement income generation by diversified farm activities through fisheries(from Farm Ponds),cattle breeding
- Increase in per capita income to the beneficiary farmers
- Increase in the irrigated area due to supplemental well irrigation by providing rainwater harvesting structures.

Thus a sum of Rs 1463.34 Lakhs is proposed to be invested by this Department in this sub-basin, to help farmers association to effect substantial saving in water and to help them go in for mechanisation in their farms. 48 numbers of farm ponds, Minor Check dams -19 nos, Major check dams – 9 nos, Percolation pond -16 nos are proposed to augment water resources through rain water harvesting and good recharging of ground water.

TAMIL NADU AGRICULTURE UNIVERSITY

The following table shows the details of demonstration and inputs proposed by TNAU under the Project and Mission mode. The total investment works out Rs. 904.36 Lakhs.

The approach to enhance usefulness of document under be as below.

Approaches:

- Demonstration of drip fertigation component technology in, Coconut in an area of 1500 ha.
- System rice intensification in 300 ha.
- Quality control seedling production.
- Demonstration of organic farming and IFS modal in Model villages
- On-farm demonstration training to farmers.

The outcome of new constructs made be.

Outcome:

- At the end of 5th year, nearly 50% Coconut area will be under drip fertigation with 10 to 15% increased productivity and 20% water saving.

- 20 % to 25 % of rice area will be under SRI in the post project period. 15% increase in productivity and 20% water saving could be achieved by this technology adoption.

Sl.No	Particulars	Physical	Financial (in lakhs)
I	Activities		
1	Precision farming in Banana	50 ha	59.7
2	Production technology for groundnut	300 ha	18.0
3	Drip fertigation – Coconut	1500 ha	433.50
4	SRI in rice	300 ha	30.00
5	Quality coconut seedling production	3 lakhs Nos.	15.00
6	Demonstration of organic farming and IFS modal in Model villages	20 ha	1.00
7	OFD and skill development	-	3.20
	Sub Total		*560.4*
II	Out Sourcing for technical assistance		
1	20 nos for first 3 years, 6 nos for 4th and 5th year	9000 Salary + 1000 FTA per Month	86.40
	Sub Total		*86.40*
III	Contingencies		
	a. Vehicle hire charge for Scientists @ Rs.60000/yr		3.00
	b. Documentation and Reporting		2.00
	c. Stationeries and publicity etc.,		2.50
	Sub Total		*7.50*
IV	Equipments Computer, Printer, Scanner, LCD, Copier		3.00
	Sub Total		*3.00*
	Total		657.30
	Incentive 1% of the total cost		6.57
	Total		663.87
V	Agri business and Farm advisory cell		177.40
	Total		841.27
	Institutional charges @ 7.5 %		63.09
	Grand Total		**904.36**

Under project mode, transfer of technologies in major crops, and demonstration of labour saving implements high yielding varieties, scientific irrigation management and high harvesting technologies are proposed.

Under mission mode, large scale implementation of specific technologies of SRI in 300 ha, will be attempted.

These will enhance productivity by 15% and water saving of 20% besides improved soil health and farm income.

AGRICULTURE MARKETING

In the background of stakeholders demand for identifying markets for new and diversified crops, improving existing markets utilization, improving access to market by better collective transport, specialised storages as per crop needs, the following components are the approach.

The table below shows the project component in the below.

Approaches:

- Strengthening the infrastructural facilities. ie. Rural godowns, Drying yards and Agri business centre.
- IT based market information network. ie. Expanding TNAU based DEMIC.
- Contract farming / MOU arrangements. ie. Maize produce with poultry feed manufactures.
- Collective bargaining through FIG, Farmers Commodity Groups.
  ie. Gourds cultivators in Aliyar Sub basin.
- Capacity building / IEC. ie. Centralized programme.
- Private – Public participation. ie. Interface Workshop of Cultivators / producers by CeII.

Sl.No.	**Items**	**No.**	**Cost in Lacs**
1.	Rural godowns	2	10.00
2.	Drying yard	2	5.00
3.	Plastic tarpaulins	20	1.00
4.	Dunnages	100	2.00
5.	Weighing scales	2	0.40
6	**Agri business Centre**	1	11.00
Total			**29.40**

Thus the investment of Rs. 29.40 Lakhs, will propel agricultural growth from production front to the marketing front thus making the Agriculture sector more profitable and vibrant to face competition both at national and international scene.

Outcome

- Percentage of increase in farm gate sale price.
  ie. > 10% increase over 2006-07 level]
- Extent of use of marketing Kiosk.
  ie. 10-15% of stakeholders per year.
- Percentage of output taken for agro processing.
  ie. 5% increase over 2006-07 level.
- Percentage of diversified crops marketed.
  ie. 33% of the produce during 1st year.

FISHERIES

The sub basin with the Aliyar Reservoir and one major (System) tank offer good scope for inland fisheries development. Aquaculture is currently done by the Tamil Nadu Fisheries Development Corporation in Aliyar reservoir. For the last decades the fish production in this reservoir has been good when compared to the other reservoir in Tamil Nadu and it is about 100kg/ha/year. Judicious stocking, manage and capture is the strategy followed. The fishery constitute mostly the cultured carps. Which are fast growing and has good market. To increase the unit productivity of fish "Farming of fish in floating cages" is been piloted in the reservoir by the TNFDC. A fresh water aquaria has been established in this sub basin at Aliyar which acts as source of attraction for tourist. As far as tanks are concerned there is only one major irrigation tank where in aquaculture is done by Fisherman co-op society.

The sub basin located with one fish seed farm at Aliyar Dam which is operated by TNFDC is functioning effectively and meets more than the needs of the sub basin. All the three Indian major carps are produced in this farm.

There is no governmental fisheries extension officer in this basin. The quality of water of this basin is found to be suitable for aquaculture. There are no private ornamental fish farms in this sub basin.

The fresh water fishes produced in this basin are mostly marketed in Pollachi and Coimbatore. There are no hurdles or lack of infrastructure facilities found in this sub basin. Mostly fishes are marketed fresh and also preserved by proper hygienic method.

The following proposals is made under IAM WARM project as fisheries component

AQUACULTURE IN FARM PONDS :

Farm ponds are been proposed to be excavated in the sub-basin by the Agriculture Engineering departments, primarily as rain water harvesting and stor age tanks in the farmers field with a water spread area of 1000 m^2. Aquaculture will be promoted in these farm ponds as an integrated component. Some alteration shall be made in the pond by providing a layer of clay on the pond bottom to prolong the retention of water at least for 4 months.

The members of the water users association were consulted extensively and 48 of them have expressed their willingness to take up aquaculture. Considering their genuine demand and also to promote a type of integrated a quaculture, inputs for 48 farms ponds are proposed. The bottom line is that the aquaculture activity is not going to consume any water which is in harmony with the concept of the IAM WARM project (i.e.) saving water and the activity will not interfere with the irrigation activity. The aquaculture input is for one time and the farmer shall take up the activity in the ensuing years. Stocking density of one stock size fish (50 gm) per metre square is proposed and a net revenue of about 10000/- per pond is envisage. This shall be an additional income for the agriculture farmer.

ORNAMENTAL FISH CULTURE

The Water Quality of the Sub Basin is suitable for ornamental fish rearing. Marketing potential is also available. Hence to promote commercial ornamental fish culture two units shall be established in this basin on pilot basis.

Like cash crop of Agriculture ornamental fish culture is a fast growing business venture in the field of fisheries. Aquarium keeping is a healthy hobby recommended by doctors to avoid stress and to have peace of mind.

In Aliyar Dam the TNFDC is running successfully an aquarium for public and a culture unit attached to it. The Climatic condition and water quality are suitable for aquarium fish rearing.

The pilot unit proposed shall have 4 nos of rearing ponds (4000 Sq.mt) each. The pond is a earthen one apart from rain water harvesting , to support continuous maintenance of water level a 6 " dia borewell with motor will be provided.

Young once of ornamental fishes (1- 2 cm) will be purchased from TNFDC farmers and grown upto marketable size of about 6 -10 cm depending on the species.

An investment of 1.27 lacs per unit and an operational cost of 0.93 lacs per 3 cycles is proposed.Net return of about 1 lacs per year is envisaged.

TRAINING AND CAPACITY BUILDING

IAMWARM projects target groups are primarily WUA whose members are agriculture farmers with little knowledge on aquaculture .Hence training and capacity building on fresh water aquaculture and ornamental fish culture etc. , is highly essential. The IAMWARM project training component shall lay emphasis on planning the aquaculture training.

- For monitoring the aquaculture activities vehicle hire charges of 1.20 lakhs and documentation charges of 0.30 lakhs are provided.

OUTCOME EXPECTED/ ANNUALS

Slno	Description	Fish fingerings (nos in Lakhs)	Fish production (Tonnes)	Net Revenue (Rs. In lakhs)
1	Aquaculture in Farm ponds (48 Nos)	Nil	28.80	4.80
2	Ornamental Fish culture (2 units)	0.84	Nil	2.34

ABSTRACT

1.	Input cost for 48 farm ponds (48 X 16,500)=		7.92 Lakhs
2.	Ornamental fish culture (2x 2.20)	=	4.40 Lakhs
3.	Vehicle hire charges	=	1 .20 Lakhs
4.	Documentation	=	0.30 Lakhs
	TOTAL	**=**	**13.82 Lakhs**

Outcome:

(i) Timely availability of crop fish seeds

(ii) Additional income Rs. 10000/- per crop farmer and fish production.

(iii) Hygienic time meeting with better transport facilities for increase price for fish.

(iv) Increases fish catch efficiency.

The total cost works out to Rs. 13.12 Lakhs.

Animal Husbandry

Improved delivery of Veterinary services, Fodder availability with increased extent of 250 ha, capacity building of farmers on Veterinary health care camps, Artificial insemination techniques, and Human resources developments by way of training to farmers and in-service officials etc, are the main areas of concentration of A.H. Development in the sub basin. The following table shows the components and their cost.

	Components	Physical	Financial (In Lakhs)
1	**Productivity enhancement by improving d elivery of veterinary services**		
	a. Establishment of Sub basin Veterinary Units (SBVU) @ Rs.5,72,720/- per unit	1	5.73
	b. Improving the essential infrastructure in the Government institutions (graduate institutions) @ Rs.33,000/-unit	6	1.98
	c. Improving the essential infrastructure in the Government institutions(subcentres) @ Rs.20,000/ -unit	10	2.00
	d. Strengthening the diagnostic facilities in the sub basin by providing special diagnostic tools to sub basin referral institutions @ Rs.3,00,000/- per unit	1	3.00
2	**Increasing availability of green fodder in private lands (in acres) - Co3 - 250 hac.**	250	9.00
3	**Out reach programmes.**		
	a. Infertility cum Total Veterinary Health Care camps @ Rs.6,000 per camp per month for each SBVU	60	3.60
	b. Distribution of mineral mixture @ Rs.1,82,500 per SBVU	1	1.83
	c. Information, education and communications campaigns	7	3.85
4	**Enhancing the knowledge level of human resource**		
	a. Training of Farmers	2000	8.00
	b. Enterpruneship training to 31 unemployed veterinary graduates to be placed as Sub basin Veterinary Extension Officer @ Rs.50,000/- per person	2	1.00
	b. Orientation Training for Sub basin Veterinary Extension Officers @ Rs.1,350/- trainee	1	0.01
	c. In-service Training for Veterinarians @ Rs.2,000/ - per person	6	0.12
			40.12

The Approach to achieve these area

(i) Productivity enhancement by improving delivery of Veterinary services in the project area of the Governme nt and private level (WUA.)

(ii) Increasing the availability of green fodder for sustainable growth of livestock.

(iii) Improving the infrastructure and diagnostic facilities in the project area.

(iv) Improving the knowledge level of the farmers about the livestock activities through various outreaches programmers, training etc.

Animal Husbandry can nature a better quality of life for the rural farmer by not only providing sustainable employment of their location --- but can also act as assets or rural currencies.

The outcome of these intervention are

- Bridged improvements in the project area
- Improvement in health and productivity status of livestock in the project area
- In area in Milk production and there by increase the economic status.

ECONOMIC ANALYSIS

The project focus on improving water resources management and service delivery to maximize productivity in 20536 Ha of net irrigated area in the project. Only 80% of the area currently full irrigation per year. Water sector related institutional reforms and scheme impro vements based on physical interventions in association with Agriculture intensification and diversification will maximize farm profitability and economically sustain the productivity in the project area. The Economic Rate of return works out to % much ab ove the opportunity cost of 12%. This will yield a net of profit of Rs million during the project cycle of 25 years at 2006 prices. The incremental benefit in the project area is derived from increased irrigation coverage and effici ency, dependable water supplies to high yielding variety of crops and input to other agriculture components of horticulture livestock fisheries etc. besides sustainable environmental benefits.

Project benefits and poverty Alleviation Impeachment

Area Expansion Shifts:

The project shall help maximizing water productivity in its entire 20536 ha. Nearly 55% of the farmers of marginal and small categories shall be fully benefited with increased food production and farm income. The present irrigation intensity of 100 % shall increase to 106 %.

Enhanced irrigation coverage and service delivery with scheme productivity improvements intervention in the scheme is expected to increase the annual production of major crop such as Coconut with out drip from 5551 ha to 6291 ha of Drip with fertigation, Groundnut from 1060 ha to 1161 ha, Maize from 120 ha to 290 ha, sugar cane from 400 ha to 700 ha, intercrops from 252 ha to 630 ha and vegetables 240 ha to 340 ha .The existing cropping intensity of 100% shall improve to106 % . Diversification with increased area in Coconut with fertigation, Sugarcane, Maize, Groundnut, and fodder which are added with micro -irrigation technologies for substantial saving of water for such area expansion activities.

Technologies Impacts

Drip with fertigation for coconut crops, SRI techniques for Paddy , and Micro irrigation for Horticulture crops and Sugarcanes are purposed. These not only increase water savings, but also increase the productivity of crops.

This intervention represents at 80% increase in record farm employment above the existing level of labour strength as most of the increased demand would be made from hired labours impact on employment and income would be more then the above estimate in view of off farm employment opp ortunity in marketing and Agro processing through diversified forming activities as envisaged in the project. Implementation of the project involving civil works shall further add temporary employment opportunities during project implementation.

CHAPTER – I

INTRODUCTION

INTRODUCTION

1.1 GENERAL:

In continuation of the WRCP Programme funded by the World Bank, the follow on project proposed by the Government of Tamilnadu to a tune of Rs.3900/- crores covering 111 sub basins, has been fully considered by the World Bank in order to extent its financial assistance to fund the Irrigated Agricultural Modernisation and Water Resources Management (IAM WARM) Project with an integrated approach.

This project has been proposed based on the experiences gained through the implementation of WRCP in Tamilnadu as well as the recorded information on pilot project implemented in the Hanumanathi sub basin. It also involves the participation of various line departments and the water using stake holders with a multi disciplinary approach and with a principal objective of improving the water use efficiency, overall system efficiency and increasing the agricultural productivity, along with additional benefits to the farming community.

1.2 PARAMBIKULAM ALIYAR BASIN:

The Parambikulam – Aliyar Project (PAP) is an interstate Water Resources Development project carried out jointly by the states of Tamilnadu and Kerala . The objective of the development is harnessing the waters of the Bharathapuzha, the Chalakudi and the Periyar basins for irrigation and power production in both the states. It accomplishes the diversion and integration of eight west flowing rivers six in the Anaimalai hills and two in the plains for the benefit of the drought prone areas in the Coimbatore and Erode districts of Tamilnadu state. The six rivers are

- Anaimalaiyar
- Nirar
- Sholayar
- Parambikulam
- Thunacadavu
- Peruvaripallam and

The Two Rivers on the plains are

- Aliyar
- Palar

Storage and diversion works on the Eight Rivers with interconnecting tunnels have been constructed. The conveyance canals and tunnels divert the waters impounded in the upstream reservoirs to the plains of the Coimbatore and Erode districts of Tamilnadu state and Chittur area of the Kerala State. The Reservoirs lie at various elevations ranging between EL 1146 M (+3760 feet) and 320 M (+1050 feet) and this difference in elevations has made it possible to utilize the drop between them for the generation of hydro-power.

1.2.3 RESERVOIRS

The Components of the system include one diversion weir, seven storage reservoirs , conveyance system, interconnecting tunnels and wide network of canal distribution system.

The Main components of the system are

1.Upper Nirar weir

2.Lower Nirar Dam

3.Sholayar Reservoir

4.Parambikulam Reservoir

5.Thunacadavu Reservoir

6.Peruvaripallam Reservoir

7.Aliyar Reservoir

8.Thiurmoorthy Reservoir

1.2.4 SUB BASIN

Parambikulam Aliyar Basin comprises the following three sub basins:

1.Sholayar Sub basin

2.Aliyar sub basin

3.Palar Sub basin

In the above, Sholayar sub basin has no direct ayacut and an extent of 20558 ha is irrigated from the Aliyar dam in Aliyar sub basin and 1,53,998 ha is irrigated from Thirumoorthy dam in Palar sub basin. Aliyar and Palar are the two sub ba sins in the Parambikulam Aliyar Project selected for the IAM WARM Project

1.3 ALIYAR SUB BASIN

Aliyar is a tributary of Bharathapuzha River which empties in to the Arabian sea. Aliyar reservoir is one among the main component in PAP and formed in the plains across the river with a gross storage capacity of 109.35 Mcm. Apart from its own catchment, water can be diverted to this reservoir through the Aliyar Feeder canal and the Contour canal from the Parambikulam group of reservoirs.

The Aliyar sub basin consists of the following canal systems.

1. Aliyar feeder canal system
2 Sethumadai canal system
3 Vettaikaranpudur canal system
4 Pollachi canal system
5 Old system in Aliyar River.

The command area of the old system is 2,5 74 ha. which is of double crop lands whereas the total new command area under the above four canals are 17,96 2 ha which is of single crop. The entire new ayacut is divided into two zones i.e., 'A' and 'B' and each zone gets water once in two years under alternate sluice irrigation pattern. Apart from this, water is also being given to Kerala state for irrigating 8,094 ha of old command. As per the inter state agreement, it ensures annually 7.25 TMC of water at Manacadavu weir for the benefit of the old ayacut in Kerala state based on the periodical demand of supplies made by Kerala state.

5.2 RESERVOIR – ALIYAR RESERVOIR

The Aliyar River has its source in the Anamalai Hills. It flows in a north -westerly direction for about 14 miles before it enters the plains. It Is joined by Uppar River on its left and Palar River on its right. This river has got an old ayacut of 2588 ha of wet lands, through a system of five anicuts. The last Anicut in this series is Vadakkalur

Anicut and below it there are 4 major anicuts in Kerala State irrigating an area of 8155 ha. The total catchment area at the last Anicut in Kerala State is 419 Sq.Miles of which 366 Sq.Miles lies in Tamilnadu State.

The Aliyar Reservoir was formed by construction of a dam across the River Aliyar and it has a gross capacity of 3864 Mcft. Two ir rigation canals i.e., Vettaikaranpudur and Pollachi Canals take off from this reservoir. This reservoir is also intended to meet the requirements of the existing command area in Tamil Nadu State and Kerala State . The catchment area at the Aliyar Dam is 76 Sq.Miles.

5.3 CANALS IN THE SUB BASIN

The Aliyar sub basin consists of the following canal systems.

1. Aliyar feeder canal
2. Sethumadai canal
3. Vettaikaranpudur canal
4. Pollachi canal
5. Old Aliyar Channels

a. VILLAGES BENEFITED UNDER REVENUE ADMINISTRATIVE SETUP

S.No.	Name of district	Name of Taluk	Name of block	Name of Village	Area in Hectare
1	Coimbatore	Pollachi	Anaimalai	Vettaikaranpudur	3230.38.5
				Kottur	1470.96.5
				Kaliyapuram	1389.49.0
				Odayakulam	1461.12.0
				Anaimalai	260.28.0
				Marchinaickenpalayam	754.42.5
				Periapodu	771.43.5
				Angalakurichi	283.34.0
				Thensangampalayam	251.80.5
				Somandurai	331.29.5
				Thenchittur	195.48.5
				Pethanaickanur	892.05.0
				Thoraiyur	415.69.5

				Jallypatty	255.70.5
				Arthanaripalayam	10.76.0
				kambalapatty	285.96.5
				Aathupollachi	163.7.0
				Total	**12424.00**
2			Pollachi-South	Ambarampalayam	167.81.0
				Singanallur	378.54.5
				Kariyanchettipalayam	247.63.5
				Pilchinnampalayam	251.96.0
				Samathur	462.88.0
				S.Ponnapuram	75.48.5
				Kottampatty	538.59.5
				Naickenpalayam	319.02.0
				Vakkampalayam	276.39.0
				Uthukuzhi	362.20.0
			Total		**3080.00**
3			Pollachi-North	Bodipalayam	482.21.0
				Kulathur	21.07.5
				Servakaranpalayam	107.80.0
				Nalluthukuzhi	198.07.5
				Rasichettipalayam	37.95.0
				Muthur	7.14.5
				Ayyampalayam	207.93.5
				Ramapattinam	446.41.00
				Thimmankuthu	744.75.0
				Mannur	166.69.0
				Kumarapalayam	37.07.5
			Total		**5054.00**
			GRAND Total		**20536.00**

CHAPTER – II

SCOPE OF THE PROJECT

PRESENT STATUS OF THE SYSTEM

2.1 GENERAL

The deficiencies in the structure and functions of Irrigation network causes the inefficient functioning of the Parambikulam Aliyar Project system and creates hardship to the farming community.

2.2 SYSTEM DEFICIENCY

Due to long run and age and also due to inadequate maintenance owing to the paucity of funds, the farm gate efficiency of the canal system was reduced to an average of 60%.

In order to improve the system efficiency, necessary proposals were formulated under WRCP phase I based on the walk through survey conducted with farmers during the year 1995 under which partial rehabilitation works were carried out at various vulnerable and critical stretches through which the structural and conveyance efficiency of the system was improved to some extent.

At present, as the left out portions of the canal system network have been further deteriorated and damaged, it is now observed that the conveyance efficiency gets reduced to certain extent in supplying equitable and assured quantum of water especially to the tailend reaches.

The other major problems being experienced in the Aliyar sub basin are as follows.

1. Lack of efficiency on farm water management.
2. Poor infrastructure facilities.
3. Non-adoption of modern micro irrigation methods and new agricultural practices.
4. Depleting ground water.
5. Inadequate farm machinisation.
6. Inadequate coordination among rural agencies, Government departments and other financial institutions etc.
7. Lower crop yield.

8. Encroachments of canal banks.
9. Low field application efficiency
10. Traditional method of farming.
11. Excess use of chemical fertilizers and pesticides.
12. Inadequate post harvest management facilities.

SCOPE OF THE PROJECT

Rehabilitating system in coordination with line departments and water using stake holders for improving the overall system efficiency and maximize agricultural productivity along with additional benefits.

2.3 WATER RESOURCES ORGANISATION

To improve the conveyance and operational efficiency it is now proposed to improve and modernize the structural components as follows

- Rehabilitation of controlling structures.
- Rehabilitation of cross masonry structures.
- Construction of inlets.
- Standardizing canal bank and service roads.
- Lining the bed and sides of the canal network.
- Installation of Telemetry, SCADA and Flow Measurement System in the Reservoirs and Canal Network
- Providing Artificial Recharge Structures.
- Provision for environmental monitoring of River basins, creating awareness and implementing environmental projects.
- Demarcation of Canal boundaries

2.4 AGRICULTURAL ENGINEERING DEPARTMENT

Agricultural Engineering Department proposes to implement the following activities to improve the conveyance and field application efficiency as below.

i. Reducing the conveyance and distribution losses at on farm (Farm Gate) and thereby improving the conveyance efficiency from 70% to 90% by carrying out required lining up to the tail end.

ii. Increasing the application efficiency by adopting high t ech micro irrigation systems in well irrigated area.

iii. Recharging the ground water through rain water harvesting by providing percolation ponds and check dams.

2.5 AGRICULTURAL MARKETING AND AGRI BUSINESS DEPARTMENT

The existing cropping pattern is dominated b y coconut followed by Millets, Groundnut and Vegetables. It is likely that, the area under vegetables will be increased besides fruit crops. Hence the marketing activities are to be strengthened towards facilitating the post harvest management activities.

2.6 AGRICULTURAL DEPARTMENT

Out of 20536 Ha of registered ayacut area, Major area is under coconut cultivation. Hence the department gives more importance for the improvement of coconut yield from the present level of 90 nuts/tree/annum to 120 nuts/tree/an num. In consultation with the WUA, the following components are suggested. The coconut farmers of the sub basin are in the habit of applying excess quantity of fertilizers. To create the awareness and educate the farmers suitably, the INM and IPM demonstrations are suggested under this project.

Similar to fertilizers, the farmers are also in the habit of using excess plant protection chemicals. Hence, IPM demonstrations are suggested to minimize the plant protection cost and to educate farmers to go in for plant protection chemicals only as a last resort. Coir pith demonstration and Vermi compost demonstration are suggested to encourage organic farming concept. An amount Rs. 149.855 Lakhs is proposed under this project.

a) Maximize multipurpose benefits from surface and ground water land and other resources

b) Evolving a cropping pattern for devising an optimum benefit per unit of water.

c) Intensification of Agricultural Productivity and income.

2.7 ANIMAL HUSBANDARY DEPARTMENT

Aliyar sub basin lands are mostly under Coconut cultivation. Hence there is a definite shortage of adequate green and dry fodder. As the command area gets water once in two years the period of non-irrigation months shall be utilized by concentrating on the Animal Husbandry activities for increasing the additional income to the farmers.

The following proposals are made in this project.

- Mobile unit with artificial insemination facilities.
- Entrepreneurship development programme for unemployed BVSc Graduates.
- Green fodder development.

2.8 TAMIL NADU AGRICULTURAL UNIVERSITY

To create an awareness among farmers in adopting latest techniques, and for increasing WUE, Profit and reducing labour requirement the Tamil Nadu Agricultural University has proposed the following programmes.

- Adoptive Research Trial (ART)
- Front Line Demonstration (FLD)
- Integrated farming System
- Improving the existing coconut nursery complexes
- Improving training to the farmers and line department personnel. The demonstration pockets will also acts as a treasure house for the need based inputs to the WUA or to the farmers so as to impart immediate implementation and follow up.

2.9 HORTICULTURAL DEPARTMENT

Enhancing the farm income with available water resources, introducing high yielding vegetables, tissue culture banana, pandal gourds, poly green house and shade net cultivation are proposed. Horticulture Department is also aiming to supply critical inputs which are needed for the production activities while giving demonstration.

2.10 FISHERIES DEPARTMENT

Aliyar belts have the tradition of farm ponds for storage purposes. During the period of storage, for putting into effective usage, Aquaculture in farm ponds is proposed for providing additional income to the farmers.

CHAPTER - III

HYDROLOGY

HYDROLOGY

3.1 GENERAL

Aliyar River is a tributary of Bharathapuzha River System. Aliyar River originates on the Eastern slopes of the Western ghats in Anaimalai hills in Pollachi Taluk of Coimbatore District.

Aliyar River traverses about 35 km in Tamil Nadu and enters into Kerala State. Aliyar reservoir is one among in PAP and formed the River Aliyar.

3.2 LOCACTION

The River Aliyar ranging from latitude 10^{o} 15 ' 0 " N to 11^{o} 05 ' 30 " N and 76^{o} 46 ' 30 " E to 77^{o} 45 ' 15 " E longitude in Anaimalai Hills of Pollachi taluk. Th ere are one reservoir and five old anicuts across the Aliyar River all along its 35 km length of travel. The basin area comprises of Anaimalai, Pollachi North and Pollachi South Blocks.

3.3 CATCHMENT AREA OF ALIYAR SUB-BASIN

The Aliyar Sub Basin has a typical climate, owing to the extensive catchment area in the western ghats. Aliyar enjoys the benefits of two monsoons.

3.4 HYDRO METEOROLOGY

The Hydro Meteorology parameters includes rainfall, temperature, humidity, wind velocity, evaporation and duration of sun shine which determine the climate of the basin.

3.5 RAIN FALL

Average annual rainfall of gauging station influencing this sub basin are as follows.

Slno	Name of Rain gauge Station	South west monsoon mm	North East Monsoon mm	Winter mm	Summer mm	Annual mm
1.	Aliyar Nagar	271	361	21	157	810
2.	Vettaikaranpudur	247	242	41	105	635
3.	Pollachi	383	303	17	158	861
	Average mm	300.33	302.00	26.33	140.00	768.67

3.6 TEMPERATURE

For the measurement of Hydrometeorological parameters in the basin area, there are three weather stations viz 1. Sundakampalaym maintained by Ground Water Wing of Public Works Department, 2. Coimbatore Airport maintained by IMD and 3. Aliyar Nagar. Since the Weather Station at Coimbatore is a full pledged one, its data is taken for the study.

Sl. No	**Climatological Parameters**	**South West**	**North West**	**Winter**	**Summer**
1	Temperature max/min in C-deg	24.2/24.7	24.5/22.1	25.9/23.7	29.9/23.1
2	Avg. Temperature in C-deg	25.95	23.23	24.80	26.83
3.	Avg. Relative humidity in %	74.50	85.70	87.50	75.00
4	Avg.Wind velocity Km/hr	2.28	0.69	0.95	1.02
5	Avg.Pan Evaporation	------140 mm per month -----			
6	Avg. Sunshine hours/day	5.63	4.20	7.85	8.97

3.7 HUMIDITY & WIND

Month	Relative Humidity		Evaporation Loss
	Morning	Evening	
January	85.28	52.64	8.16
February	86.72	46.37	5.30
March	84.33	43.47	5.60
April	87.64	45.18	4.50
May	82.68	48.01	5.60
June	80.83	59.64	4.80
July	82.11	64.48	4.30
August	83.13	64.10	4.70
September	82.00	58.73	5.40
October	85.59	61.31	4.46
November	88.86	63.13	3.73
December	88.98	58.40	3.92

3.8 SOIL

In this sub basin , due to different stages, weathering of parent material , the soil types are met with in combination of Inceptisol, Alfisol and Entisol. More prominent type is Inceptisol.

Inceptisol	Red or brown or grey soil with surface horizon more developed than sub surface. They are developing soils, moderately deep, coarse loamy to loam moderately drained to well drained.	Suited for commonly grown crops with exceptions
Alfisol & Entisol	The red or brown soils having accumulation of illuviated clay in sub surface horizon, it is well drained, poor water and nutrient holding capacity.	Annual crops with shallow root systems come up well

3.9 LAND HOLDINGS

The details of agriculturist (farmers) based on the land hol dings of Aliyar basin is given below :

Category	Size of holdings	Numbers	Ayacut	Percentage
Marginal	Below 1.00 Ha	2085	3667.55	17.84%
Small	1.00 – 2.00 Ha	4636	8153.30	39.66 %
Medium	2.00 – 4.00 Ha	3229	5680.17	27.63 %
Big	4.0 ha & above	1738	3056.98	14.87 %
Total		11688	20558	14.87 %

3.10 DEMOGRAPHY

Sl. No.	Name Of Taluk	Total No. Of Blocks	Total No. Of Villages	Population			Type Of workers			
				Male	Female	Total	Agri. Labours	Cultivators	Industrial Workers	Others
Coimbatore District										
1	Pollachi	3	43	113558	113194	226752	47222	11271	3735	164524

3.11 GROUND WATER POTENTIAL

(a) LIST OF BLOCKS AND STAGE OF GROUND WATER EXPLOITATION

Slno	Name of district	Name of Block	Category
1	Coimbatore	Pollachi North	Over Exploited
2	Coimbatore	Pollachi South	Over Exploited
3	Coimbatore	Anaimalai	Semi Critical

(b) WELLS IN THE COMMAND AREA

District	Taluk	Wells	
		Energised	Diesel
Coimbatore	Pollachi	7200	265

(c) BLOCK - WISE AVAILABILITY OF GROUND WATER

Sl. No.	Name Of District	Name Of Blocks	Net ground Water Available In M cum	Ground water Availability in command area In M cum
1	Coimbatore	Pollachi- North	58.1892	11.6378
2	Coimbatore	Pollachi- South	28.6852	4.3028
3	Coimbatore	Anaimalai	123.3005	123.3005
TOTAL			**210.1749**	**139.2411**
	Potential Available in the 50% of the Command Area			**69.62** M cum.

3.12 SURFACE WATER POTENTIAL OF ALIYAR RESERVOIR

a. Quantity received from own catchment : 238.35 Mcm

b. Quantity received through
Aliyar Feeder Canal and Contour Canal : 54.40 Mcm

c. Evaporation Loss in Aliyar Reservoir : (-) 1.39 Mcm

Total available Surface Water Potential: 291.36 Mcm

3.13 CROPPING PATTERN OF ALIYAR BASIN (For 1 Year)

Sl No.	Crop Details	WITH OUT PROJECT			With Project ha
		Fully Irrigated	Partly Irrigated	Gap/R.F	
		In Ha	In Ha	In Ha	
1	Coconut (W/o Drip)	2739	920	-	0
	Coconut (with drip)	3000			3000
	Coconutwith Fertigation				4020
	Coconut with intercrop	252			630
2	Paddy (May - Oct)	1690			1270
3	Ground Nut(May-Oct)	50			50
	Ground Nut(sep Jan)	440	69	182	610
4	Maize (Sep -Jan	65	10	-	245
5	Cotton (Sep -Jan)	55	75	130	130
6	Sugarcane	400	-	-	700
7	Cholam (Sep -Jan)	41	45	309	39
8	Pulses (sep -Jan)	64	98	525	100
9	Fodder (May -oct)	35	-	-	185
	VEGETABLES				
10	Tomato (sep -Jan)	30			50
11	Bhendi (Sep -Jan)	10			10
12	Gourds (May - Oct)	10			10
	Gourds (Sep - Jan)	30			110
	FRUITS				
13	Mango	117	60	-	177
14	Banana	90	-	-	60
15	Sappota	15	-	-	15
16	TC banana				145
	Total	**9133**	**1277**	**1146**	**11556**
	INTER CROPS				
17	Coco	177	-	-	**540**
18	Nutmeg	50	-	-	**65**
19	Arecanut	15	-	-	15
20	Vennila	10	-	-	10
	CROP II				
21	Paddy (Nov -Mar)	1598			1270
22	Groundnut (Nov -Mar)	40			50

Poly green house 12 units 500 Sq.mt / unit

Shade net 19 units 500 sq.mt /unit

CROPPING PATTERN OF ALIYAR RESERVOIR (For 2 Years)

Sl No.	Crop Details	WITH OUT PROJECT			With Project ha
		Fully Irrigated	Partly Irrigated	Gap/R.F	
		In Ha	In Ha	In Ha	
1	Coconut (W/o Drip)	3711	1840		0
	Coconut (with drip)	8022			8022
	Coconut with Fertigation				6291
	Coconut with intercrop	252			630
2	Paddy (May - Oct)	1690			1270
3	Ground Nut(May-Oct)	50			50
	Ground Nut(sep Jan)	880	180	500	1161
4	Maize (Sep -Jan	100	20		290
5	Cotton (Sep -Jan)	315	150	249	400
6	Sugarcane	400			700
7	Cholam (Sep -Jan)	217	90	438	278
8	Pulses (sep -Jan)	130	154	298	259
9	Fodder (May -oct)	80			230
	VEGETABLES				
10	Tomato (sep -Jan)	60			80
11	Bhendi (Sep -Jan)	20			20
12	Gourds (May - Oct)	20			20
	Gourds (Sep - Jan)	140			220
	FRUITS				
13	Mango	200	120		320
14	Banana	180			120
15	Sappota	30			30
16	TC banana				145
	Total	**16497**	**2554**	**1485**	**20536**
	INTER CROPS				
17	Coco	177			**540**
18	Nutmeg	50			**65**
19	Arecanut	15			15
20	Vennila	10			10
	CROP II				
21	Paddy (Nov -Mar)	1598			1270
22	Groundnut (Nov -Mar)	40			50

Poly green house 12 units 500 Sq.mt / unit

Shade net 19 units 500 sq.mt /unit

3.14 CROP WATER REQUIREMENT

Sl		WITH OUT PROJECT							With Project		
No.	Crop Details	Fully Irrigated In Ha	water requirement in MM	Net water requirement in MCM	Partly Irrigated In Ha	Net water requirement in MCM	Gap/R.F In Ha	Total water requirement in MCM	Ayacut in ha	water requirement in mm	Net water requirement in MCM
1	Coconut (W/o Drip)	2739	1469	67.06	920	15.77	-	82.83	0	0	0.00
	Coconut (with drip)	3000	514	25.70		0.00		25.70	3000	514	19.28
	Coconut with Fertigation			0.00		0.00		0.00	4020	514	25.83
	Coconut with intercrop	252	617	2.59		0.00		2.59	630	617	4.86
2	Paddy (May - Oct)	1690	807	22.73		0.00		22.73	1270	807	12.81
3	Ground Nut(May-Oct)	50	529	0.44		0.00		0.44	50	529	0.33
	Ground Nut(sep Jan)	440	529	3.88	69	0.43	182	4.31	610	529	4.03
4	Maize (Sep -Jan	65	313	0.34	10	0.04	-	0.38	245	313	0.96
5	Cotton (Sep -Jan)	55	448	0.41	75	0.39	130	0.80	130	448	0.73
6	Sugarcane	400	1889	12.59	-		-	12.59	700	1889	16.53
7	Cholam (Sep -Jan)	41	426	0.29	45	0.22	320	0.51	50	426	0.27
8	Pulses (sep -Jan)	64	261	0.28	98	0.30	525	0.58	100	261	0.33
9	Fodder (May -oct)	35	1293	0.75	-		-	0.75	185	1293	2.99

	VEGETABLES										
10	Tomato (sep -Jan)	30	578	0.29		0.00		0.29	50	578	0.36
11	Bhendi (Sep -Jan)	10	578	0.10		0.00		0.10	10	578	0.07
12	Gourds (May - Oct)	10	578	0.10		0.00		0.10	10	578	0.07
	Gourds (Sep - Jan)	30	578	0.29		0.00		0.29	110	578	0.79
	FRUITS					0.00					
13	Mango	117	220	0.43	60	0.15	-	0.58	177	220	0.49
14	Banana	90	1940	2.91	-		-	2.91	60	1940	1.46
15	Sappota	15	220	0.06	-		-	0.06	15	220	0.04
16	TC banana			0.00		0.00		0.00	145	970	1.76
	Total	**9133**			**1277**	0.00	**1157**		**11567**		0.00
	INTER CROPS					0.00					
17	Cocoa	177	261	0.77	-		-	0.77	**540**	261	1.76
18	Nutmeg	50	261	0.22	-		-	0.22	**65**	261	0.21
19	Arecanut	15	261	0.07	-		-	0.07	15	261	0.05
20	Vennila	10	261	0.04	-		-	0.04	10	261	0.03
	CROP II										
21	Paddy (Nov -Mar)	1598	871	23.20		0.00		23.20	1270	871	13.83
22	Groundnut (Nov - Mar)	40	529	0.35		0.00		0.35	50	529	0.33
				165.88		**17.30**		**183.18**			**110.19**

Details	W/o project	With Project
DOM	5.40	5.40
LIV	1.20	1.20
IND	13.20	13.20
EXP	28.90	28.90
AGRD	183.18	110.19
AGRS	0.80	0.80
To Kerala	205.32	205.32
	438.00	365.01
Surface	372	372
Deficit	-66.00	6.99

CHAPTER IV

HYDRAULICS OF THE COMPONENTS

HYDRAULICS OF THE COMPONENTS

4.1 GENERAL

Aliyar Reservoir is a tributary of Bharathapuzha River System. Aliyar River originates on the Eastern slopes of the western ghats in Anaimalai hills in Pollachi Taluk of Coimbatore District.

Aliyar River traverses about 35 km in Tamilnadu and enters into Kerala State. Aliyar reservoir is one among in PAP and formed across the River Aliyar.

RESERVOIR

SALIENT FEATURES OF THE ALIYAR DAM

a. Hydrology

1. Catchment Area	-	76 Sq.Miles
2. Maximum Designed Discharge	-	41,000 C/S
3. Discharge Capacity provided	-	41,000 C/S
4. Mean Annual rainfall in catchment	-	45” to 125”

b. Reservoir

1. Maximum and full reservoir level	-	+1050 Feet
2. Deepest sill of the supply sluice	-	+930 Feet
3. Capacity at FRL	-	3864 Mcft
4. Water Spread area at FRL	-	2.32 Sq.Miles

c. Masonry Dam

1. Deepest Foundation level for non spillway sec.	-	+914.00
2. Deepest Foundation level for spillway section	-	+1020.00
3. Maximum Height of dam	-	+120 Feet
4. Width at top of Dam	-	14 Feet
5. Maximum width of base	-	67 Feet
6. Elevation at Top of Dam	-	+1059.00
7. Length of Masonry Dam	-	2810 Feet

d. Outlet works

1. No & Size of Sluice (River Sluice)	-	2 Nos 5’0” X 6’0”
2. Sill of Sluice	-	+930.00

3. Discharge at FRL	-	4165 C/S
4. No. & Size of Sluice (Vettaikaranpudur Canal)	-	1 No 5’0”X 6’0”
5. Sill of Sluice	-	+980
6. Discharge at FRL	-	1576 C/S
7. No. & Size of Sluice (Pollachi Canal)	-	2 Nos 5’0”X 6’0”
8. Sill of Sluice	-	+980
9. Discharge at FRL	-	3152 C/S

e. Spill Way

1. Clear waterway at crest	-	330 Feet
2. Crest Level	-	+1040
3. Maximum Discharge @ FRL	-	41000 C/S
4. No. & Size of Spill Way Gate	-	11 Nos 30’0” X 10.38’0” Radial Gates

f. Earth Dam

1. Maximum Height of Dam	-	144.50 Feet
2. Width @ Top	-	25 Feet
3. Elevation at top of Dam	-	+1059
4. Total length of earth dam	-	7240 Feet

4.2 CANALS

a. Vettaikaranpudur Canal

The Hydraulic Particulars of the Vettaikaranpudur Canal as follows

Sl. No.	Chainage	Bed Width	FSD	Free Board	Bed Fall	Velocity	Side Slope	Design Dis.
1	0–17.400 km	6’0”	3.7’0”	1’0”	1.25’ /mile	2.67’ /Sec.	1:1	95 C/S

b. Pollachi Canal

The Hydraulic Particulars of the Pollachi Canal are as follows

Sl. No	From	To	Bed Width	FSD	Free Board	Bed Fall	Velocity	Side Slope	Discharge
1	0.000	14.120	6.50	6.50	1.00	1.5feet/Mile	3.538	1:1	298.90
2	14.120	22.939	6.50	5.00	1.00	1.5feet/Mile	3.100	1:1	178.20
3	22.939	27.768	6.50	4.25	1.00	1.5feet/Mile	2.859	1:1	130.60
4	27.768	32.220	6.00	4.25	1.00	1.5feet/Mile	2.820	1:1	122.80
5	32.220	35.079	5.00	4.25	1.00	1.5feet/Mile	2.736	1:1	107.50
6	35.079	37.007	4.00	3.50	1.00	3.5feet/Mile	3.655	1:1	95.92
7	37.007	39.774	4.00	3.50	1.00	2.5feet/Mile	3.133	1:1	85.72
8	39.774	42.000	4.00	3.25	1.00	3feet/Mile	3.260	1:1	76.61
9	42.000	44.201	3.00	3.00	1.00	3feet/Mile	2.989	1:1	53.81
10	44.201	47.118	3.00	2.25	1.00	3feet/Mile	2.586	1:1	30.50
11	47.118	47.772	2.00	1.75	1.00	3feet/Mile	2.130	1:1	13.97
12	47.772	48.000	1.50	1.25	1.00	3feet/Mile	1.980	1:1	6.81

c. Sethumadai Canal

The Hydraulic Particulars of the Setumadai Canal are as follows

Sl. No.	Chainage	Bed Width	FSD	Free Board	Bed Fall	Velocity	Side Slope	Design Dis.
1	0–5.600 km	4’0”	3’0”	0’9”	1.5’ /mile	2.62’ /Sec.	1:1	60 C/S
2	5.600–8.400 km	3’0”	3’3”	0’9”	1.5’ /mile	2.34’ /Sec.	1:1	35 C/S

d. Aliyar Feeder Canal

The Hydraulic Particulars of the Aliyar feeder Canal are as follows

Sl. No.	Chainage	Bed Width	FSD	Free Board	Bed Fall	Velocity	Side Slope
1	0–1.800 km	10’0”	5’0”	1’0”	1.55’ /mile	3.813’ /Sec.	1:1
2	1.800–13.400 km	6’0”	5’0”	1’0”	2.50’ /mile	1.413’ /Sec.	1:1

e. Old Aliyar Channels

1. Pallivilangal Channel

Length of Anicut	-	163 Metre
No. of Sandvent in Anicut	-	1 No
Length of Leading Channel	-	913 Metre
Oulets in the Leading Channel	-	5 Nos
No. of Head Sluice	-	1 No
Length of Channel	-	10175 Metre
No. of Sluices	-	75 Nos.

Sl. No.	Chainage	Bed Width	FSD	Bed Fall	Velocity	Side Slope	Design Dis.
1	0.00 to 6,495 m	8'.0"	2'.6"	1 in 7040	0.96	1 ½ : 1	22.10
2	6495 to 8,882 m	5'.0"	2'.3"	1 in 5280	0.94	1 ½ : 1	12.95
3	8882 to 10,175 m	3'.0"	1'.9"	1 in 3520	0.90	1 ½ : 1	6.12

2. Ariyapuram Channel

Length of Anicut	-	106.70 Metre
No. of Sandvent in Anicut	-	1 No
Length of Leading Channel	-	349 Metre
Oulets in the Leading Channel	-	3 Nos
No. of Head Sluice	-	1 No
Length of Channel	-	13640 Metre
No. of Sluices	-	90 Nos.

Sl.No	Reach	Bed Width	F.S.L.	Side Slope	Bed Fall	Velocity Feet / Sec	Discharge Cusecs
	MAIN CHANNEL						
1	0.000 to 4,176 m	15'.6"	2'.0"	$1^{1/2}$ to 1	1 in 5000	1.14	41.18
2	4176 to 8,705 m	12'.6"	2'.0"	$1^{1/2}$ to 1	1 in 5500	1.03	31.93
	8705 to 12,585 m	10'.0"	2'.0"	$1^{1/2}$ to 1	1 in 5500	0.99	25.74
4	12585 to 13,052 m	6'.6"	2'.0"	$1^{1/2}$ to 1	1 in 4000	1.07	20.35
5	13052 to 13,640 m	4".6"	2'.0"	$1^{1/2}$ to 1	1 in 4000	1.01	15.15

3. Karaipatti Channel

Length of Anicut	-	50.30 Metre
No. of Sandvent in Anicut	-	1 No
Length of Leading Channel	-	357 Metre
Oulets in the Leading Channel	-	3 Nos
No. of Head Sluice	-	1 No
Length of Channel	-	11220 Metre
No. of Sluices	-	45 Nos.

Sl. No	Reach	Bed Width	F.S.L.	Side Slope	Bed Fall	Velocity Feet / Sec	Disc. Cusecs
1	0.000 to 4,264 m	8'.0"	2'.0"	$1^{1/2}$ to 1	1 in 5333	1.25	23.41
2	4264 to 6,812 m	7'.0"	2'.0"	$1^{1/2}$ to 1	1 in 5333	1.10	20.48
3	6812 to 8,010 m	5'.0"	2'.0"	$1^{1/2}$ to 1	1 in 3000	1.34	16.97
4	8010 to 9,450 m	3'.6"	1'.6"	$1^{1/2}$ to 1	1 in 1000	1.68	11.36
5	9450 to 10,374 m	2'.6"	1'.6"	$1^{1/2}$ to 1	1 in 1000	1.20	8.12
6	10374 to 10,613 m	2'.6"	1'.6"	$1^{1/2}$ to 1	1 in 500	1.92	8.56
7	10613 to 11,220 m and tail end reaches	2'.6"	1'.0"	$1^{1/2}$ to 1	1 in 500	1.63	4.68

4. Periyanai Channel

Length of Anicut	-	160.30 Metre
No. of Sandvent in Anicut	-	2 No
Length of Leading Channel	-	291 Metre
Oulets in the Leading Channel	-	2 Nos
No. of Head Sluice	-	1 No
Length of Channel	-	17900 Metre
No. of Sluices	-	124 Nos.

Sl.No	Reach	Bed Width	F.S.L.	Side Slope	Bed Fall	Velocity Feet / Sec	Dis. Cusecs
1	0.000 to 3,748 m	12'.0"	3'.0"	$1^{1/2}$ to 1	1 in 5280	1.34	56.28
2	3,748 to 7,108 m	11'.0"	3'.0"	$1^{1/2}$ to 1	1 in 5280	1.31	49.13
3	7,108 to 9,150 m	10'.0"	2'.6"	$1^{1/2}$ to 1	1 in 3520	1.43	40.21
4	9,150 to 9,477 m	8'.0"	2'.6"	$1^{1/2}$ to 1	1 in 2640	1.59	36.76
5	9,477 to 12,104 m	6'.0"	2'.6"	$1^{1/2}$ to 1	1 in 2640	1.50	27.18
6	12,104 to 12.724 m	4'.0"	2'.0"	$1^{1/2}$ to 1	1 in 1760	1.48	14.80
7	12.724 to 12.966 m	4'.0"	2'.0"	$1^{1/2}$ to 1	1 in 1760	1.48	14.80
8	12966 to 13,137 m	4'.0"	1'.9"	$1^{1/2}$ to 1	1 in 1760	1.38	11.77
9	13137 to 13,481 m	4'.0"	1'.9"	$1^{1/2}$ to 1	1 in 1760	1.38	11.77
10	13481 to 13,740 m	4'.0"	1'.9"	$1^{1/2}$ to 1	1 in 1760	1.38	11.77
11	13740 to 14.356 m	4'.0"	1'.6"	$1^{1/2}$ to 1	1 in 1760	1.28	9.11
12	14356 to 14,697 m	4'.0"	1'.6"	$1^{1/2}$ to 1	1 in 1760	1.28	9.11

13	12697 to 15,091 m	4'.0"	1'.6"	$1^{1/2}$ to 1	1 in 1760	1.28	9.11
14	15091 to 15,476 m	4'.0"	1'.6"	$1^{1/2}$ to 1	1 in 1760	1.28	9.11
15	15476 to 16,042 m	4'.0"	1'.6"	$1^{1/2}$ to 1	1 in 1760	1.28	9.11
16	16042 to 16,858 m	4'.0"	1'.6"	$1^{1/2}$ to 1	1 in 1760	1.28	9.11
17	16858 to 17,432 m	4'.0"	1'.6"	$1^{1/2}$ to 1	1 in 1760	1.28	9.11
18	17432 to 17,900 m	4'.0"	1'.6"	$1^{1/2}$ to 1	1 in 1760	1.28	9.11

5. Vadakkalur Channel

Length of Anicut	-	513.28 Metre
No. of Sandvent in Anicut	-	2 No
Length of Leading Channel	-	149.35 Metre
Oulets in the Leading Channel	-	3 Nos
No. of Head Sluice	-	1 No
Length of Channel	-	10750 Metre
No. of Sluices	-	64 Nos.

Sl. No	Reach	Bed Width	F.S.L.	Side Slope	Bed Fall	Velocity Feet / Sec	Discharge Cusecs
1	0.000 to 3,834 m	11'.9"	3'.0"	1 to 1	1 in 5680	1.30	57.39
2	3834 to 7,071 m	8'.6"	2'.6"	1 to 1	1 in 2005	1.91	52.41
3	7071 to 7,967 m	8'.6"	2'.0"	1 to 1	1 in 2290	1.43	27.20
4	7967 to 8,540 m	4'.6"	2'.0"	1 to 1	1 in 1310	1.79	23.27
5	8540 to 8,669 m	3'.6"	1'.6"	1 to 1	1 in 860	1.82	13.65

6	8669 to 9,002 m	3'.6"	1'.6"	1 to 1	1 in 845	1.82	13.65
7	9002 to 9,589 m	4'.0"	1'.6"	1 to 1	1 in 1240	1.92	12.57
8	9589 to 10,474 m	3'.0"	1'.6"	1 to 1	1 in 1385	1.43	9.65
9	10474 to 10,750 m	4'.0"	1'.6"	1 to 1	1 in 2495	0.57	4.74

4.3 TANKS

1. Name of Tank	-	Kolappathu Tank
2. Total irrigated ayacut	-	311.15 Acres
3. Area of free basin	-	0.27 Sq.Miles
4. Combined Catchment Area	-	0.27 Sq.Miles
5. Area of water spread at FTL	-	0.06 Sq.Miles
6. Capacity of Tank at FTL	-	30.50 Mcft
7. MWL of Bund	-	+ 872.18 Feet
8. FTL	-	+ 871.18 Feet
9. Top width of bund	-	10.00 feet
10. Side Slope	-	1 ½ : 1
11. Top level of bund	-	+ 876.68 Feet
12. Length of bund	-	4510 Feet
13. Maximum Flood Discharge from combined catchment area	-	125 C/S
14. Surplus Weir effective length		121 Feet
15. Discharge	-	363 C/S
16. Sill of Sluice No. 1	-	853.76 Feet
17. Sill of Sluice No. 2	-	851.90 Feet
18. Length of Anicut	-	277 Feet
19. Length of Channel	-	10000 Feet
20. Discharge of Channel Head sluice	-	196 C/S

CHAPTER - V

COMMAND AREA AND

WATER USERS ASSOCIATION

COMMAND AREA AND WATER USERS ASSOCIATION

5.1 COMMAND AREA DETAILS

NEW AYACUT

Sl.No.	Name of Canal	Length in Km.	Ayacut in ha		
			A' Zone	B' Zone	Total
1	Aliyar Feeder Canal	13.40	957	932	1889
2	Sethumadai Canal	8.40	1018	1024	2042
3	Vettaikkaranpudur Canal	17.40	2250	2277	4526
4	Pollachi Canal	48.00	4703	4806	9505
	TOTAL		**8927**	**9039**	**17962**

OLD AYACUT

Slno	Name of Anaicut	Distance from Reservoir in Km	Length in Km	Ayacut in Ha
1	Pallivilangal	0.901	10.20	265.62
2	Ariyapuram	1.481	13.65	504.34
3.	Karaipatty	4.281	11.22	316.45
4.	Perianai	5.794	17.90	770.36
5.	Vadakkalur	14.838	10.75	734.23
	Total			**2574.00**

DISTRICT / TALUK WISE AYACUT :

COIMBATORE DISTRICT (in Ha)
Pollachi Taluk
20536

5.2 WATER USERS ASSOCIATION

5.1.1. GENERAL

Water is the most essential commodity for all the human beings. Agricultural Development is mainly depending on the availability of water. Water potential is available in two forms namely surface water and ground water. The need of water for the fast growing population is increasing day by day whereas the availability of useful water is decreasing rapidly. The application of modern Technique and the efficient way of using the water alone will help to manage the critical situation. The Government is trying various ways and means to improve the water usage. The formation of Water Users Association is one among them.

5.1.2 AGRICULTURAL PRACTICES

Water received from rain is either directly used or taken through conveyance system comprising river, channels and tanks. At present the Government is distributing the water to the farmers through Water Resources Organisation. Due to inadequate cooperation among the farmers, the tail end farmers are often suffering from either non receipt of water or untimely receipt. Moreover the conjunctive use of ground and surface water is not effectively done. In order to overcome such difficulties and create integrative and involvement of farmers in the best management and use of water, the Government has introduced the system of distribution of water by themselves, by forming Water Users Association.

5.1.3 ROLE OF WATER USERS ASSOCIATION

The Government has taken many projects to increase the food production and thereby improve the related industries for the development of the nation. The role of the Water Resources Organisation in the irrigation sector is

- Development of new irrigation projects
- Operation and maintenance of irrigation systems
- Distribution of water from storages
- Improving the efficiencies of irrigation systems
- Rehabilitation of irrigation system
- Prevention of flood damages

- Population control in the irrigation system
- Eviction of encroachments in the irrigation system
- Distribution of water to other essential requirements, such as drinking water, industries etc.,

5.1.4 TAMILNADU FARMERS MANAGEMENT OF IRRIGATION SYSTEM ACT, 2000 (Tamilnadu Act 7 of 2001)

The Government of Tamilnadu has formulated "Tamilnadu farmers Management of Irrigation System Act, 2000 (TNFMIS Act) to get more involvement of farmers in the irrigation management, integrity of farmers by forming associations and delegating powers required for the management of irrigation system. The act is applicable for all the irrigation systems under the control of Water Resources Organisation of Public Works Department. This act is having 7 chapters and 50 sections. Accordingly number of water users association has been formed in Tamilnadu for the projects implemented by Water Resources Organisation with the World Bank aid, as first stage.

The Water Users Association is formed for each main canal of the system. This comprises of one president and even number of members representing territorial constituency having about 40 Ha. of command. Both the President and Members are elected through public election. The term of the Water Users Association, is for five years. The election and responsibilities of the water users association is as below.

- Preparation of irrigation schedule
- Distribution of water to distributories from supply channel
- Rotational water supply during water deficit period
- Distribution of water to the sluices
- Maintenance and improvements of the Distribution system
- Optimum use of water
- Assisting the revenue department in collection of water taxes
- Settlement of disputes among the members
- Maintenance of accounts and records.
- Finance management including planning and collection of revenue from members

The section 27 of the TNFMIS Act, 2000 provides sources for income to the association as follows.

- Share in the water taxes
- Membership fee, service charges
- Government aid, subsidy etc
- Income from the assets in the command area
- Loans
- Income from services etc.,

The accounts are to be maintained properly and submitted for auditing

5.1.5 WATER USERS ASSOCIATION UNDER ALIYAR SUB BASIN

Total Command : 20,536 Ha

Number of WUAs : 16 Nos

Date of Election (Based on TNFMIS Act) : 07.02.2004

Presidents Elected : 16 Nos

Vacancies : 1 No.

TC Members Elected : 70

Vacancies : 3 Nos

O & M Responsibilities Handed over on : 11.02.2004

Slno	Code No	Name of the WUA	Extent in Ha
1	CBE 86	Sethumadai Canal Vettaikaranpudur village water users association	2042.10.0
2	CBE 87	Vettaikaranpudur Canal Kailyapuram village water users association	1354.38.0
3	CBE 88	Vettaikaranpudur Canal Marchinaickenpalayam village water users association	1240.19.0
4	CBE 89	Vettaikaranpudur Canal Odayakulam village water users association	1931.17.5
5	CBE 90	Pollachi Canal Kottur village No 1 water users association	255.78.5
6	CBE 91	Pollachi Canal Kottur village No 2 water users association	1183.05.5

7	CBE 92	Pollachi Canal Pethanaickanur village water users association	1002.16.0
8	CBE 93	Pollachi Canal Angalakurichi village water users association	644.77.0
9	CBE 94	Pollachi Canal Thoraiyur village water users association	516.45.5
10	CBE 95	Pollachi Canal Kambalapatty village water users association	691.77.0
11	CBE 96	Pollachi Canal Samathur village water users association	509.43.0
12	CBE 97	Pollachi Canal Naickenpalayam village water users association	1256.51.0
13	CBE 98	Pollachi Canal Uthukuzhi village water users association	1198.72.0
14	CBE 99	Pollachi Canal Mannur village water users association	1113.03.0
15	CBE 100	Pollachi Canal Thimmankuthu village water users association	1137.77.5
16	CBE 101	Aliyar feeder Canal Vettaikaranpudur village water users association	1888.59.0
17		Pallivilangal Anicut Pasana Vivasayegal Sangam	265.62
18		Ariyapurm Anicut Pasana Vivasayegal Sangam	504.34
19		Karipatti Anicut Pasana Vivasayegal Sangam	316.45
20		Periyani Anicut Pasana Vivasayegal Sangam	770.36
21		Vadakkalur Anicut Pasana Vivasayegal Sangam	734.23

CHAPTER - VI

DESIGNS

DESIGNS

POLLACHI CANAL SECTION AT L.S. 0.500KM

Required Discharge = 193 C/s

Bed width = 6.50'

Side slope = 1:1

Bed fall = 1.50'

= 5280'

Assuming Depth of flow 'h' = 6.50'

Assuming co-efficient of rugosity to be 0.016 for lined channel

Manning's Formula

Velocity $V = \frac{1.486}{0.016} \times R^{2/3} \times S^{1/2}$

$R = \frac{A}{P}$

Area A $= \frac{(19.50 + 6.50)}{2} \times 6.00$

$= 78.00$ Sq.ft.

P $= 2 \times 6.50 \times 1.414 + 6.50$

$= 24.88$

$R = \frac{A}{P} = \frac{78.00}{24.88} = 3.135$

Velocity $V = \frac{1.486}{0.016} \times 3.135^{2/3} \times \left(\frac{1.50}{5280}\right)^{1/2}$

$= 3.379$ ft / Sec

Discharge $= A \times V = 78.00 \times 3.379$

$= 263.56$ C/s

Hence OK

SETHUMADAI CANAL SECTION AT L.S. 5.483KM

Discharge at the Section 'Q' = 40.36 C/s

Bed width 'b' = 3.00'

Side slope = 1:1

Bed fall 'S' = 1.50'

= 5280'

Assuming Depth of flow 'h' = 2.12'

Assuming co-efficient of rugosity to be 0.016 for lined channe l

Manning's Formula

Velocity $V = \frac{1.486}{0.016} \times R^{2/3} \times S^{1/2}$

$R = \frac{A}{P}$

Area $A = h^2 \times bh$

$= (3.08)^2 + (3.00 \times 3.08)$

$=$ 18.73 sqft.

$P = 2 \times 4.35 + 3.00$

$=$ 11.71 ft.

Velocity $V = \frac{1.486}{0.016} \times \left(\frac{18.73}{11.71}\right)^{2/3} \times \left(\frac{1.50}{5280}\right)^{1/2}$

$=$ 2.15 ft / Sec

Discharge $Q = A \times V$

$= 2.15 \times 18.73$

$=$ 40.32 C/s

Hence OK

VETTAIKARANPUDUR CANAL SECTION AT L.S. 0.000KM

Desiged discharge = 65.77 C/s

Bed width ‘b’ = 6’0”

Side slope = 1:1

Bed fall = 1.25’

= 5280’

Assuming Depth of flow ‘h’ = 3.70’

Assuming co-efficient of rugosity to be 0.016 for lined channel

Manning’s Formula

Velocity $V = \frac{1.486}{0.016} \times R^{2/3} \times S^{1/2}$

$R = \frac{A}{P}$

Area $A = \frac{(6.00 + 6.00 + 3.70 + 3.70)}{2} \times 3.70$

$= 35.89$ sqft.

$P = 2 \times 3.70 \times 1.414 + 6.00$

$= 16.46$ ft.

$R = \frac{A}{P} = \frac{35.89}{16.46} = 2.18$

Velocity $V = \frac{1.486}{0.016} \times \left(2.18\right)^{2/3} \times \left(\frac{1.25}{5280}\right)^{1/2}$

$= 2.34$ ft / Sec

Discharge $Q = A \times V$

$= 34.56 \times 2.34$

$= 80.87$ C/s

Hence OK

PROJECT PROPOSAL

ALIYAR SUB BASIN - PROJECT PROPOSAL
WATER RESOURCES ORGANISATION (PWD)

1.1 IRRIGATION SYSTEM

The Aliyar sub Basin area of 205 36 ha including old command is irrigated through four canals. The entire command area have been divided into two zones viz. A & B and each zone gets irrigation for a period of 135 days (4 ½ months) once in two years.

1.2 IRRIGATION PRACTICES

The Zoning pattern of irrigation is followed in the Aliyar Sub basin command area. From the year 2000 onwards based on the requisition of farmers to enable to recharge the ground water alternate sluice irrigation pattern is followed in this sub basin.

In this sub basin the water is being supplied based on average duty. The water has been drawn from the reservoir at 120 duty and delivered in the farm gates at 60 duty adopting on and off system for irrigating the dry crops.

1.3 PARTICIPATORY IRRIGATION MANAGEMENT (PIM)

In this sub basin 16 water user associations have been formed ba sed on the TNFMIS Act 2000 and the operation & maintenance responsibilities of the distribution network have been turned over to Water User Association. In respect of Old Command five association have been formed and registered under society act at 1975. T he Associations are functioning effectively in water management activities.

1.4 GROUND REALITIES

Due to ageing continuous usage of the distribution system and paucity of maintenance grant the efficiency have been reduced gradually and considerably, which deprived the tail end farmers in getting their due share.

The Condition of the various components of the distribution system network are as follows.

Contour Canal :

The Contour Canal has been designed to take the tailrace water from Sarkarpathy Power House and formed on the slope of rocky mountains by cutting on one side and forming inner excavated material. It runs for a length of 45.900 km mostly in dense forest area.

This Canal Transmit the impounded water of Parambikulam Group of Reservoir to Aliyar and Thirumoorthy Reservoirs. Since the canal is subjected to natural damages such as rock slide, root wedging, Algae growth etc., and the condition have been seriously deteriorated and this conveyance loss exceeds its allowable limit.

In WRCP Phase – I Programme part of the vulnerable and critical reaches only have been rehabilitated and left out reaches further determined and conveyance efficiency has been reduced to greater extent.

DISTRIBUTION OF NETWORK :

Due to continuous usage and ageing , the condition of the canal networks has been badly damaged and heavy losses are observed and thereby resulting inadequate supply to the tailend areas. Also the most of the cross masonry structures such as syphons, aqueduct, under tunnel, drops, sluices and pipe points are in dilapidated condition, consequently the distribution and efficient management of irrigation management supply could not be attained.

SUPPLY BASED SYSTEM

Since the available water resource is not adequate to meet the growing demand of the various water using sectors in the basin, the annually available water has been being supplied without the crop requirement.

Even though the project has been designed for irrigated seasonal dry crops, the most of the farmers in the sub basin has slowly switched over to perennial crops such as coconut (More than 60%) mainly due to non availability of farm labour and easy management compared to seasonal crops.

Since the water is supplied once in two years for 4 ½ months the farmers are mainly depending upon the ground water to irrigate the perennial crops. Due to this the ground water have been over exploited in this sub basin.

CONSTRAINTS / CHALLENGES – COUNTER MEASURES

S.No	CONSTRAINTS / CHALLENGES	COUNTER MEASURES
1	Deterioration of Contour Canal arterial conveyor part	Proposed to rehabilitate the Bed and side Lining, Tunnels , approach roads.
2	Damages in Canal networks	Proposed to rehabilitate the damaged portions by lining the bed and sides of the main canal, branch canal and distributories upto 25 acres limit
3	Dilapidated conditions of the cross masonry structures	Proposed to rehabilitate the cross masonry structures
4	Deficiencies in regulating arrangements in the canal sluices	Proposed to replace the wornout wooden paddle shutters by screw gearing steel shutters 2) Repairs to sluices
5	Poor condition of the canal bank / inspection track	Proposed to strengthening and standardizing the canal banks
6	Lack of modern flow monitoring and controlling devices	Proposed to install Telemetry, SCADA and measurement devices in the reservoir and canal network.
7	Over exploitation of Ground Water	Construction of artificial recharging structures like checkdams etc.,
8	Lack of environmental awareness	Proposed to create awareness and implementing environmental projects
9	Encroachment in the canal area	Demarcation of canal boundary

CHALLENGES THROWN UP BY REHABILITATION

- Ensure predictable, equitable and reliable supply to all areas of the command
- Improve the conveyance efficiency in the canal system
- Effective water management
- Accurate monitoring and controlling of reservoir and canal system
- Strengthening of PIM Activities
- Optimizing of irrigation water in the sub basin

GENERAL ABSTRACT

Sl. No.	Name of Work	Estimate Amount Rs. in Lakhs
	CONTOUR CANAL	
1	Rehabilitation of Contour canal from LS 0/000 km to 30/400 km	1270.00
	ALIYAR FEEDER CANAL	
2	Rehabilitation of Aliyar Feeder canal and its Distributaries	55.00
	VETTAIKARANPUDUR CANAL AND SETHUMADAI CANAL	
3	Rehabilitation of Sethumadai canal , Vettaikaranpudur canal and its Distributaries	524.00
	POLLACHI CANAL	
4	Rehabilitation of Pollachi and its Distributaries from LS 0/000km to 20/000 km	507.00
5	Rehabilitation of Pollachi and its Distributaries from LS 20/000km to 48/000 km	495.00
6	Construction of check dams in Aliyar sub Basin	27.00
7	Rehabilitation of Kolapathu Tank in Aliyar sub basin	25.00
	Total	**2903.00**

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PROPOSAL FOR PROVIDING GROUND WATER RECHARGE STRUCTURE - HYDROLOGY

In Coimbatore District the Aliyar sub basin covers part of Anamalai Block and Parts of the Pollachi North and Pollachi South blocks. The Anamalai block comes under semicritical block and Pollachi South and North comes under over exploited blocks.

In all the villages covered by Aliyar sub basin there are several artificial ground water recharge structures like check dames, percolation ponds and etc , have been constructed by difference agencies like Agricultural Engineering , TWARD Board and more over by the concerned Panchayat Unions, under different schemes like Samburana Village development – Special components scheme and Rajiv Gandhi Self Finance Scheme etc., In addition to siltation of existing ponds , Further, these Percolation ponds, have been constructed at wherever sites wherever available in the streams and odais by contributing certain percentage of amount by the farmers and the rest by the concerned Panchayat unions.

It is observed during field study in the sub basin area that in all the streams or odais form its origin to the confluence point of Aliyar river , large number of structures like check dames, percolation ponds etc., have already been constructed with a closer distance between two adjoining structures i.e., even below 500 mts in all the villages.

Hence as per the guidelines given in the reference cited, and considering the various parameters such as feasibility of the area, Location of the existing structures, distance between the existing structures to the proposed selected location, along with the representation of the local people etc., 3locations have been selected in total for the

artificial recharge structure under IAMWARM project proposal. In all the sites it has been proposed to construct CHECKDAMS across the stream / odai. The details of the s elected sites are given in the enclosed prescribed format. Preliminary Estimates (Tentative) given in the enclosed prescribed format. The detailed estimate and other required details will be prepared and submitted after finalizing of sites.

Sl. No.	Proposal site Village	Block	Sub-basin	Proposed Structure	Estimate (Approximate)
1	Marchi nayakkanpalayam	Anamalai	Aliyar	CHECKDAM	12.00 Lakhs
2	Kottur	Anamalai	Aliyar	CHECKDAM	6.00 Lakhs
3	Angalakuruchi	Anamalai	Aliyar	CHECKDAM	9.00 Lakhs

FORMAT FOR PRELIMINARY ESTIMATES FOR ARTIFICIAL RECHARGE SCHEMES IN IAMWARM PROJECT

Sl.No	CRITERIA	DESCRIPTION
1	Circle	Thanjavur
2	Division	Hydrology Division Pollachi
3	Sub Basin	Aliyar
4	District	Coimbatore
5	Taluk / Block	Pollachi / Anaimalai
6	Village	Marchinayakkanpalayam
7	Name of Project	IAMWARM Project
8	Nature of the project	Construction of check dam across the stream near Marchinayakkanpalayam Village
9	Latitude/Longitude of the site	Latitude : 10’37’52 Longitude : 76’53’12
10	General lithology of the site	GL-3.0M top soil 3.0m-8.0m Weathered rock Below 8.0m fissured & fractured rock
11	Name of the stream	--
12	Estimate value (Rs)	12.00 Lakhs
13	Technical brief	Length of the Check dam : 15.00 m Height of the Check dam : 2.00 m

Sl.No	CRITERIA	DESCRIPTION
1	Circle	Thanjavur
2	Division	Hydrology Division Pollachi
3	Sub Basin	Aliyar
4	District	Coimbatore
5	Taluk / Block	Pollachi / Anaimalai
6	Village	Kottur
7	Name of Project	IAMWARM Project
8	Nature of the project	Construction of a check dam across the Parayan pallam odai in south Kottur village
9	Latitude/Longitude of the site	Latitude : 10’30’14 Longitude : 76’56’53
10	General lithology of the site	GL-2.50M top soil 2.5m-6.0m Weathered rock Below 6.0m fissured & fissured rock
11	Name of the stream	Parayanpallam
12	Estimate value (Rs)	6.00 Lakhs
13	Technical brief	Length of the Check dam : 12.00 m Height of the Check dam : 1.00 m

Sl.No	CRITERIA	DESCRIPTION
1	Circle	Thanjavur
2	Division	Hydrology Division Pollachi
3	Sub Basin	Aliyar
4	District	Coimbatore
5	Taluk / Block	Pollachi / Anaimalai
6	Village	Angalakurchi
7	Name of Project	IAMWARM Project
8	Nature of the project	Construction of check dam across the Maadethi Pallam odai near Angalakururchi Village
9	Latitude/Longitude of the site	Latitude : 10’31’45 Longitude : 77’00’09
10	General lithology of the site	GL-3.0M top soil 2.5m-9.0m Weathered rock Below 9.0m fissured rock Maadethi Pallam
11	Name of the stream	Maadethi Pallam
12	Estimate value (Rs)	9.00 Lakhs
13	Technical brief	Length of the Check dam : 16.00 m Height of the Check dam : 1.50 m

AGRICULTURAL ENGINEERING DEPARTMENT

AGRICULTURAL ENGINEERING DEPARTMENT

1.1 Implements and equipments usage

In the Aliyar sub-basin area there are 350 tractors,40 Power tillers owned by the farmers as well as private owners for agricultural operations. Hence the availability of tractors is more than sufficient to meet the demand of agricultural operatio ns. The availability of modernized farm implements for preparatory cultivation to post harvest operations is very limited in the aliyar sub basin command. Hence the popularisation of agricultural machinery is absolutely necessary in the aliyar sub basin ar ea where the shortage of labour is in the increasing trend,

1.2 Water:

A.Irrigation Practices:

The farmers in the aliyar basin is following flood irrigation methods at the time of Canal irrigation period. In the non.irrigation period they use well water for irrigating their crops as supplemental irrigation and for the coconut crops they follow check basin method which is the major crop in the sub basin. Due to non-availability of irrigation water and over exploitation of well water farmers a dopted high-tech micro irrigation methods from the year 1992 onwards 8772ha area has been covered under micro irrigation for all crops in which 8022ha is under coconut crops. The big farmers has adopted micro irrigation system.

B. On Farm Development:

The basic objective of On Farm Development work can be defined as the effective utilization of available water for maximum water use efficiency and maximum crop production. On Farm Development works aims at creating necessary infrastructure facilities in the form of open channels/underground pipe lining system with water control and distribution structures etc in well defined micro blocks with in the outlet command. In the aliyar sub basin lining of field channels had been executed to ensure proper deli very of irrigation water to individual land holdings from the year 1986 onwrds. Almost entire area has been covered with 20% lining and during the year on Farm development works are being done in the aliyar old ayacut area and it will be completed during the current year.

C. Level of Mechanisation:

The preparatory cultivation is being done with available tractors in the sub basin areas. The level of mechanisation in respect of preparatory cultivation,sowing,post harvest technology is very poor. In this area there is shortage in the availability of labour due to mobilization of industries in the surrounding areas so that Farm Mechanisation is s must for the sub basin area. The awarness for the farmers as well as the WUAs regarding the coconut digger,maize dehusker farm machineries is very limited and popularisation of these machineries is necessary in this sub basin.

D,Labour:

The agricultural labour available in the sub basin is 20% of the total population. In view of heavy industrilisation in the sub basin area the labour availability in the sub basin area is very acute. The labour force prefers to go industries due to higher income as compared to farming operations. Migratiion of agricultural labour to urban areas is on the increasing trend due to dicontiued agricultural operations.

E.Farm Practices –Ground realities

Even though the farmers are adopting drip irrigation they are not adopting fertigation in the sub basin area. The farmers are finding difficulty to market the harve sted produces and availabilitry of transport facilites is also not sufficient.

2.CONSTRAINTS OBSERVED;

The Line departments P..W.D,.,Agriculture Department,Agricultural Engineering Department conducted discussions along with WUAs at various places regar ding the present scenario and constraints in the sub basin. The WUAs also conducted individual meeting along with their members . After detailed discussions and also detailed walkthrough survey along with the PWD officials the following constraints are w idely observed.

- Deficit of water for irrigation
- Availability of water to a particular zone for 135days only once in two years.
- Wastage of water due to flood irrigation
- Lack of equity in distribution between head reach and tail end farmers
- Non-availability of labour for all agricultural practices
- Over Exploitation of ground water

- Non-adoption of modern high-tech irrigation techniques such as drip irrigation, Sprinkler Irrigation to a larger extent
- Low field application efficiency
- Non availability of ground water during the critical period of crop growth
- Not harvesting the excess rainwater in the sub basin ayacut area
- No correlation between available water and cropping pattern
- Inadequate Farm Mechanization
- Non adoption of fertigation through drip
- Traditional method of farming
- Inadequate post harvest management facilities

3. DIVERSIFICATION /FUTURE VISION PROPOSED

Water saving technologies and appropriate cropping pattern should be followed in order to achieve the maximum profitability per unit of water available by implementing the work components proposed by the P.W.D., Agricultural Department, Agricultural Engineering Department, Horticulture, Animal Husbandry Departments. Thus integrated development approach is essential to attain the desired results.

In order to address the problems/grievances by the farming community the following features are incorporated in the project for the entire development of the aliyar sub basin.

1. Assured supply of water at 3R(Right quantity, Right time and Right place)
2. Promotion of conjunctive use of surface and ground water and on Farm development works.
3. Devising water saving technologies
4. Introduction of high-tech Micro Irrigation system especially for the coconut crops left over for the gap areas under Agri/Hort crops proposed by the respective departments and also providing drip irrigation with fertigation to coconut crops.
5. Adoption of optimim cropping pattern and high income cash crops to achieve maximum cropping intensity.
6. Promotion of Farm Mechanization for effective farming operations.
7. Providing Farm Ponds in the individual farmers field with provision of additional income through Fish culture.
8. Providing rain water harvesting structures such as Check dam, Percolation Pond, Conversion of abandoned wells.

9. Providing PVC conveyance Buried pipe line system for effective water conveyance at the time of Canal Irrigatiion.
10. Promotion and popularisation of precision Farming for hybrid Tomato.
11. Providing Sprinkler Irrigation to maize,onion and other vegetable crops .
12. Providing high tech drip irrigation for hybrid tissue culture banana, intercroppin g with coco,, Sugarcane, Turmeric, Tapiaco

4. CHALLENGES THROWN UP BY DIVERSIFICATION /AREA EXPANSION

In order to meet the challenges, the WUAs and Farmers shou ld be trained and educated . The innovative farmers of Aliyar sub basin will readily adopt new innovative technologies in all areas if there are trained properly. The following issues in which the farmers are to be trained:

1. Equity distribution of Irrigatio n water from upper reaches to tail end areas by adopting proper rotational water supply system.
2. Significance of Micro Irrigation system i.e drip with fertigation to all crops especially to predominant coconut crops.
3. Significance of Sprinkler Irrigation sys tem to vegetable crops.
4. Popularisation of advanced user friendly agricultural implements.
5. Consolidation of fragmented land holdings.
6. Significance of rain water harvesting in order to store maximum run off available in the sub basin areas.
7. Training the farmers to have added income though Aquaculture in Farm Pond.
8. Significance of Community based water sharing in the canal command area through providing P.V.C under ground pipe line system.
9. Significance of usage of high tech drip and sprinkler system even at the time of Canal Irrigation period.
10. SOLUTIONS AND RECOMMENDATIONS

To redress the problems/constraints explained by the sub -basin ayacut farmers, the solutions should be arrived. For this, active participation of Ayacut farmers ,the solutions should be ar rived. The water users Association has been formed since 2004 and the operation and maintenance of canal system upto sluice level has been handed over since 2004. The WUAs are effectively functioning in the Aliyar Sub basin.Based on the active discussion and readiness to adopt modern innovative technologies the work components are arrived to implement the project.

1. Suitable cropping pattern has to be evolved based on the available water for agricultural/horticultural crops. High-tech Drip and Sprinkler Irrigation system has been proposed to be implemented to improve the field application efficiency and to fetch more productivity.
2. Drip Irrigation is to be provided for coconut crops with fertigation in order to improve fertilizer application efficiency and to reduce the cost of fertilizer.
3. Providing underground PVC Pipe line system from the canal command and construction of a sump in the sluices for community based irrigation for canal irrigation as well as for Sprinkler/Drip irrigation during non-irrigation period.
4. Demonstration and supply of advanced user friendly Farm Machineries and Equipments like Maize husker sheller, Ground nut digger, Ground nut stripper, Coconut Dehusker.
5. Construction of Farm ponds with Fish culture to supplement additional income to the farmers.
6. Construction of Check Dams(Stream Augumentation),Percolation ponds for rain water harvesting and recharging system for Farmstead in the sub basin.
7. Farm Ponds ,Percolation ponds, Check dams are rainwater harvesting structures which would facilitate supplemental irrigation to the crops in the aliyar sub basin Areas which is getting irrigation water once in 2 years for a period of 18 months.

5. DETAILS OF DEVELOPMENT COMPONENTS PROPOSED

In the IAMWARM project, the following work components are proposed in the sub basins on the basis of needs and requirements of Water Users Association in view of achieveing the project objectives and uplifting the socio economic status of the farmers of the Aliyar Sub.basin.

5.1 MICRO IRRIGATIION

The Micro Irrigation System components are proposed in accordance with the cropping pattern proposed by the Agriculture and Horticulture Departments in their DPR(with project) and minimum 60% to maximum of 100% of the crop area in respect of coconut,Mango,T.C.Banana ,sappota,intercrop. In respect of crops like gourds,cotton,ground nut.bendi minimum 25% to max 100% subject to the availabilityand improvement of well water or wells and effective diversification of cropping pattern.The remaining farmers would be motivated and will definetely

come forward for micro irrigation before the completion of the project after seeing the benefits from the nearby farmers.. The benefits of precision farming components will also be witnessed by the other farmers after the implementati on in the first year. The benefits of Micro Irrigation are

- In the cropped area only 40 to 50% is moisture which reduces conveyance
- Losses, evaporation losses which saves about 40 to 50%
- Requirement of water for micro irrigation and ordinary floo d irrigation is in the Ratio of 1:3 based on irrigation requirement
- Labour savings upto 25 to 30%
- The fertilizer can be applied directly to the root zone there by reducing the
- Cost as well as application efficiency

By implementation of micro irrigation system more area will be brought under irrigation with the available water. The MIS will be implemented with 50% project investment from World Bank and 50% assistance by state or central Government. The beneficiaries will contribute 10% of the total cost of MIS and will be deposited as corpus fund for maintenance.TNAU has proposed MIS with fertigation for 1500ha under coconut as project mode and 25 ha under Sugar Cane.

Agricultural Engineering Department

CROPWISE PROPOSED AREA FOR MICRO IRRIGATION SYSTEM IN ALIYAR SUB BASIN

Ayacut Area 20558 Ha.

Sl. No.	Name of Crop	With project area in Ha	Existing area under Drip/Spr	Area Proposed by TNAU (Ha)	Balance area available (Ha)	Proposed by AED		% of area covred
						Drip	Sprinkler	
1	2	3	4	5	6	7	8	
1	Mango	320	120	0	200	180	0	90
2	Sapota	30	0	0	30	30	0	100
3	Banana	265	0	0	265	220	0	83
4	Coconut	14313	8022	1500	4791	3000	0	63
5	Coconut intercrop	630	630 ☆	0	0	510	0	81
6	Sugarcane	700	0	25	675	200	0	30
7	Tomato	80	0	0	80	70 ✧	0	88
8	Gourds	240	0	0	240	200	0	83
9	Cotton	400	0	0	400	100	0	25
10	Groundnut	1211	0	0	1211	0	300	25
11	Bendi	20	0	0	20	0	20	100
12	Paddy	1270	0	0	1270	0	0	NP
13	Cholam	300	0	0	300	0	0	NP
14	Pulses	259	0	0	259	0	0	NP
15	Maize	290	0	0	290	0	0	NP
16	Fodder crop	230	0	0	230	0	0	NP
	Total	20558	8772	1525	10261	4510	320	

☆ Drip for inter crop alone to be provided

✧ Drip - 50
Precision farming - 20

a. Drip Irrigation system

Drip irrigation with fertigation for the coconut crops in the Aliyar sub basin are proposed over an area of 3000ha for predominant coconut crop, For other crops like Mango, Sappota, Banana ,Sugar cane ,Hybrid tomato, gourds, cotton, intercropping an area of 1510ha has been proposed and a total extent of 4510ha under Drip system. Already an existing area of 8772 ha under Drip Irrigation system in the Aliyar Sub basin area. There will be possibility of covering 100% area under Drip system especially for the coconut crop at the end of the project.

The yield of the coconut crop will increase considerably by providing drip with fertigation. To minimize the utilization of canal irrigation water as well as ground water and also to save labour costs the innovative farmers will readily come for ward for adoption of drip irrigation system

b. Sprinkler Irrigation system

Sprinkler Irrigation system component is proposed for Ground nut,Bendi to the extent of 320 ha for economic usage of irrigation water to attain the field capacity for effective growth of the plants. The conveyance and application efficiency will be enhanced and also the pest will be effectively controlled by adoption of sprinkler Irrigation system.

5.2 PRECISION FARMING

Precision farming is a farm practice in which all the inputs such as water, seed ,nutrients, fertilizers, plant protection chemicals, other innovative production technologies are supplied in optimum quantity at the right time in right manner to get the highest possible yield,20 ha has been proposed for tomato crop under precision farming in which all inputs will be given to the farmers at 100% funded from the project cost.. The beneficiary contribution will be 10% of the total cost and deposited in the corpus fund for the maintenance of precision farming. The other innov ative farmers will come forward to adopt precision farming after seeing the results from the proposed area. The WUAs wise proposed area are furnished in the annexure.

5.3 FARM MECHANISATION:

To promote and demonstrate the advanced farm machinery and farm impl ements

introduced by the TNAU among the WUA, the implements shall be distributed to the Water Users Associations (100% Funding) to attain more productivity. These implements proposed to be given to the WUAs on popularisation mode. These Implements shall be hired out to the beneficiaries by the WUA and hire charges will be prescribed by the WUA. The collected hire charges will be utilized for maintenance.

Tractor drawn Groundnut digger, Power operated Ground nut stripper, Maize husk sheller would be useful for irrigated dry crop. For the predominant crop coconut, coconut dehusker would be very useful. Due to this the farming operation shall be carried out effectively. Farm mechanisation is the only solution for the shortage of labour due to urbanization in the sub basin area. The innovative and progressive farmers of this sub basin will definitely switch over to Farm mechanisation in large scale at the end of the project.

5.4 PILOT PROJECT FOR UNDERGROUND PVC PIPE LINE CONVEYANCE SYSTEM WITH SUMP PROVISIOIN IN CANAL COMMAND

Adopting the new pattern of irrigation and the experiences gained in the executed Hanumanadhi sub-basin project i.e providing underground PVC pipe line system from the pipe outlets and construction of sump to store the canal water at the time of canal irrigation. The individual farmers will be given outlets in their field through PVC pipe line system. The wells of the farmers also will be interconnected with the system. From the farmers outlet the installation of drip or sprinkler system is possible. Provision is also made for electrification and pumping machineries.

The laying of PVC pipe line system, sump cost, Pumping Machinery ,Electrification cost will be carried out with farmers contribution of 10% cost of estimate and deposited in the corpus fund . The recurring expenditure will be met out from the water charges collected from the collection of amount on hour basis from the beneficiary and non recurring expenditure will be met out from the corpus fund. The experimental implementation of the above project will yield good results for more farm productivity for each drop of water. On evaluation of the above community based system the same will be extended to other sub basin areas in large scale.

5.5 FARM PONDS WITH FISH CULTURE:

The Farm ponds are the ideal water harvesting structures proposed in the sub basin areas. The excess run off from the individual farmers field will be stored in the

pond. During the critical stage of the crop period the water stored in the Farm Pond will be utilized as life saving irrigation.

The Farm Ponds will be constructed in the dimension of 30M X 30M X 1.50M and the capacity of the farm pond will be 1350 Cubic Metre. With the help of 13.5 lakhs liters of water an extent of 2.7 ha under dry irrigated cro ps can be irrigated and stabilized. The Farm Pond will have 4 to 6 fillings of rain water during one year period in all monsoon rains.

For instance if maize crop is raised to an extent of 2.70 ha with the life irrigation from Farm ponds an yield of 9.45 M .T. will be obtained (3.5 M.T/ha) which could fetch Rs 56,700/- to the farmer @ 6000/ M.T. with project. The farmer could get nominal profit of Rs.11,000/ ha after deduction of cultivation cost of Rs.10,000/ - which exceeds the unit cost of Farm pond of Rs .40,000/- over a period of 4 years.

Besides this the Farm ponds will act as Fish ponds for Fish production. The fisheries Department has proposed in all 48 Farm ponds proposed by the Department the Fish culture which would yield income of Rs.10,000/ - .The contribution @10% of the total cost of the estimate will be collected from the farmers for the work component.

5.6 CHECK DAMS

Ephemeral streams in the sub basin offer a good opportunity for storing water in the sub basin by constructing check dam s.Check dams are constructed across small steams for stream augmentation to collect and impound surface run off from the catchments of streams during the monsoon seasons. The structures are useful in augmenting the ground water in the surrounding areas. Th e wells in the D/S side are reported to have good yield of water. On an average 5 wells will be benefited.

For instance if maize crop is raised from the 5 wells 7.5 ha. With supplemental irrigation from the recharge of wells which could fetch 26.25 M.T(3. 5 M.T./ha) with an income of Rs.1,57,,500/- to 5 farmers @Rs.6000/M.T with the project. The farmers could get nominal profit of Rs11,000/- per ha. after deducting the cost of Rs.10,000/- ha of cultivation cost which exceeds the unit cost of check dam ov er a period of 3 years.

About 19 nos. of Minor Check Dams (Rs1,00,000/ -) and 9 nos. of Major Check Dams(Rs2,00,000/-) are proposed. The Farmers contribution will be 5% of the total estimated cost for the work component and the farmers would be motivated f or drip and sprinkler system .

5.7 PERCOLATION POND:

Percolation ponds are the tanks constructed across natural water courses ,gullies, drainage points of water shed etc. in the sub basin to impound run off water and retain it for a longer time for effecting percolation in the sub surface both laterally and vertically. The purpose of the percolation pond is to raise the ground water table in the downstream of the tank so as to improve the yield in the surrounding wells.6 to 10 wells in the surrounding areas will be benefited in the zone of influence 450 m to 900m and the ground water salinity will be reduced.

For instance if maize crop is raised from the 8 wells(avg.), 12 ha. will be benefited (1.5 ha/well) With supplemental irrigation from the recharge of wells which could fetch 42 M.T(3.5 M.T./ha) with an income of Rs.2,52,000/- to 8 farmers @Rs.6000/M.T with the project. The farmers could get nominal profit of Rs11,000/- per ha. after deducting the cost of Rs.10,000/- ha of cultivation cost which exceeds the unit cost of Percolation pond over a period of 4 years.

It is proposed to construct 7nos of Percolation Pond(Rs3,00,000/-) and 5 nos of Percolation pond(Rs.5,00,000/-) in the Aliyar sub basin with 5% contribution from the farmers to the total cost of the work component and these farmers will be motivated for drip and sprinkler system.

5.8 CONVERSION OF ABANDONED WELLS:

In the PAP sub Basin there are number of wells which are in abandoned condition due to scanty rainfall in the region and also non recharge of ground water to large extent. .A pilot study has been taken up in this project to utilize the wells into rainwater storing structure in the farmers field.The rain water comes as a run off in the farmers field that is run off water is guided through an earthern channel to the recharge pit dug in front of the well. The recharge pit are constructed generally 1 to 2mwide and 1 to 2m deep. Before using the well as recharge structure the bottom of the well should be cleaned and all the debris and fine deposits should be removed. The recharge water collected is salt free.

16 nos. of abandoned wells are proposed in the Aliyar sub basin@Rs.26000/-. The contribution @ 10% of the total estimated cost will be collected from the beneficiaries for the work component.

ABSTRACT OF WORKS (ALIYAR BASIN)

Sl.No.	Components Proposed	Unit	Unit cost (Rs)	Physical (Ha)	Fin (Rs.in Lakhs)
I	Micro Irrigation				
a.	Drip Irrigation				
	Fruit crops 6m x 6 m (Mango & Sapota)	Ha.	33200	210	69.72
	Banana 2 m x 2 m	Ha.	52800	220	116.16
	Gourds 1.5 m x 1.5 m	Ha.	58000	200	116.00
	Hybrid Tomato 1mx1m	Ha.	60600	50	30.30
	Sugar cane 1.5mx1.5m	Ha.	58000	200	116.00
	Cotton	Ha.	58000	100	58.00
	Coconut with fertigation 8m x 8m	Ha.	22900	3000	687.00
	Coconut with inter crop 8m x 8m	Ha.	8000	500	40.00
	Total			4480	1233.18
b.	Sprinkler Irrigation.				
	Ground Nut	Ha.	15000	300	45.00
	Bendi	Ha.	15000	20	3.00
	Total			320	48.00
II	Precision Farming				
	Drip Irrigation for Hybrid Tomato	Ha	75000	20	15.00
III	PVC buried pipe laying for water conveyance and sprinkler system for 151.56.0 Ha block.				
	Construction of Sump	No.	150000	12	18.00
	Electrification and Pumping machineries	No.	85000	12	10.20
	90 mm 4 ksc PVC pipe laying works	Ha.	15000	152	22.80
	Total			152	51.00
IV	Farm mechanisation with advanced machineries				
a.	Maize Husker Sheller	No.	90000	1	0.90
b.	Tractor operated Ground nut Digger	No.	40000	2	0.80
c.	Power operated Ground nut Stripper.	No.	45000	2	0.90
d.	Coconut Dehusker	No.	30000	24	7.20
	Total			29	9.80
V	OTHERS (Rain Water Harvesting Structures)				
	Farm Ponds.	No.	40000	48	19.20
	Minor Check dam*	No.	100000	19	19.00
	Major Check Dam*	No.	200000	9	18.00
	Percolation Pond*	No.	300000	7	21.00
	Percolation Pond*	No.	500000	5	25.00
	Conversion Abandoned wells	No.	26000	16	4.16
	Total			56	106.36
	GRAND TOTAL				1463.34

- These are community works

Ayacut Area	20536 Ha.
Porject Proposals Rs. in Lakhs.	1463.34
Cost per Ha. in Rs.	7118

6. BENEFITS ANTICIPATED:

The following benefits will be derived from the ayacut area development works under IAMWARM Project

1. Improved irrigation efficiency resulting in enhanced productivity per unit of Irrigation water.
2. The Gap area is bridged.
3. Sustained farm income to the farming community.
4. The farm productivity per unit area is increased.
5. Increase in cropping intensity.
6. Improvement in socio-economic status of the farmers.

CONTRIBUTION BY THE BENEFICIARIES:

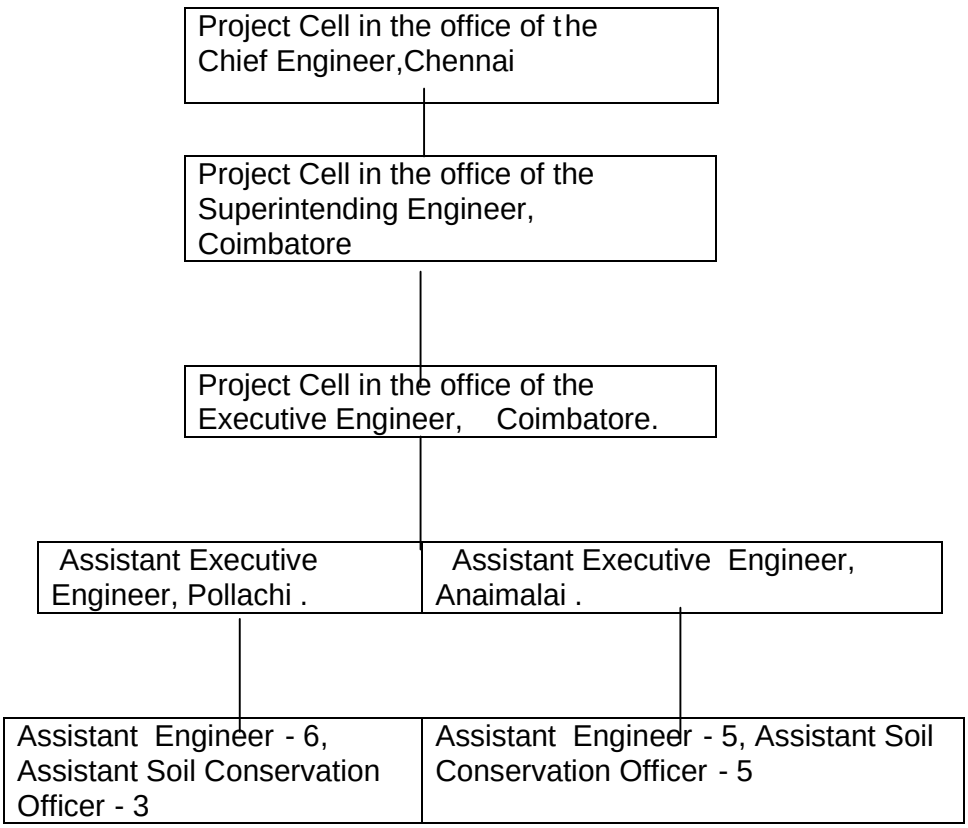
The beneficiaries are motivated to contribute for the works component proposed for their effective participation in the project. The work components like drip and sprinkler system are individual oriented benefit schemes and as per the present norms farmers are insisted to contribute 50%. But in this sub basin only small and marginal farmers has not gone to micro irrigation system due to financial constraint for initial investment. The farmers expressed that they can contribute only upto 10% of the total cost. Hence the beneficiary contribution may be fixed to 10% in respect of micro irrigation system, Farm ponds and Conversion of abandoned wells. For community based works like check dams, percolation ponds 5% of the total cost of the work component

7. IMPLEMENTATION STRATEGY:

The project cell for IAMWARM project has been created in the office of Chief Engineer(AE),Chennai-35 comprising Superintending Engineer(AE),Executive Engineer(AE),Assistant Executive Engineers(AE) and Assistant Engineers to formulate the project proposals, to carry out procurement plans to co-ordinate with the line departments and to monitor the performance of the district level officers.

The District Level Project cell for IAMWARM project has been formed comprising the Executive Engineer(AE),Asst.Exe.Engineer(AE) and Assistant Engineer (AE) to finalise the DPR to co-ordinate with the district level line department and to monitor the performance of the field personnel.

The Flow chart showing the HR pattern and the sanctioned strength of the available field personnel for implementation of IAMWARM project is furnished below:



The Work components like underground PVC pipe line sy stem,Farm ponds, Check Dams, Percolation Ponds, Abandoned wells shall be executed through concerned beneficiaries/WUA

In respect of Farm Mechnisation,the Farm Implements will be procured by the Agricultural Engineering Department from the approved suppliers and distributed to the concerned WUA.

The Work Components like Micro Irrigation,Precision Farming will be executed by National Shopping, adopting procurement procedures.

8. OUTCOME INDICATORS :

1.Increased area under Hi-tech Irrigation like Drip and Sprinkler Irrigation.

2. Precision Farming practices to an extent of 20 ha. for increased income.

3. Increased Farm Productivity per unit area and unit quantity of water.

4.Diversification of new crops in the gap area.

5.Increase in Irrigation efficiency by laying of PVC underground pipe line system in canal command area

6. Technology dissemination to the farmers

7. Increase in awareness in Farm Mechanisation

8. Supplement income generation by diversified farm activities through fisheries(from Farm Ponds),cattle breeding

9. Increase in per capita income to the beneficiary farmers

10. Increase in the irrigated area due to supplemental well irrigation by providing rainwater harvesting structures.

AGRICULTURAL MARKETING AND AGRI BUSINESS

DEPARTMENT OF AGRICULTURAL MARKETING & AGRI BUSINESS

ALIYAR SUB BASIN – PROJECT PROPOSAL

The Parambikulam aliyar Project (PAP) is an interstate Water Resource Development carried out jointly by the states of Tamil Nadu and Kerala.The objective of the development is harnessing the waters of the Bharathpuzha, the Chalakkudi and the Periyar basins for irrigation and power production in both the states. It accomplishes the diversion and integration of eight west flowing rivers. Six in the anaimalai hills and two in the plains for the drought prone areas in the Coimbatore and Erode districts of Tamil Nadu state.

WATER USER ASSOCIATION – DETAILS

Total Command : 20,536 Ha

Number of WUAs : 16 Nos

Sl.No	Code No	Name of the WUA	Extent in Ha
1	CBE 86	Sethumadai canal Vettaikaranpudur village water users association	2042.10.0
2	CBE 87	Vettaikaranpudur canal Kaliyapuram village water users association	1354.38.0
3	CBE 88	Vettaikaranpudur canal Marchinaikenpalayam village water users association	1240.19.0
4	CBE 89	Vettaikaranpudur canal Odayakulam village water users association	1931.17.5
5	CBE 90	Pollachi canal village No 1 village water users association	255.78.5
6	CBE 91	Pollachi canal village No 2 village water users association	1183.05.5
7	CBE 92	Pollachi canal Pethanaickanur village village water users association	1002.16.0

8	CBE 93	Pollachi canal Angalakkurichi village water users association	644.77.0
9	CBE 94	Pollachi canal Thoraiur village village water users association	516.45.5
10	CBE 95	Pollachi canal Kambalapatty village water users association	691.77.0
11	CBE 96	Pollachi canal samathur village water users association	509.43.0
12	CBE 97	Pollachi canal Naickenpalayam village water users association	1256.51.0
13	CBE 98	Pollachi canal Uthukkuzhi village water users association	1198.72.0
14	CBE 99	Pollachi canal Mannur village water users association	1113.03.0
15	CBE 100	Pollachi canal Thimmankuthu village water users association	1137.77.5
16	CBE 101	Aliyar feeder Canal Vettaikaranpudur village water users association	1888.59.0

HYDROLOGY

Location of the basin

- Lattitude 10 º 15'00' N to 11º 05'30' N
- Longitude 76º 46' 30'' E to 77º 45' 15" E
- Total Basin area 3462 Sq.Km
- Hilly area 1480 Sq.Km
- Districts covered Coimbatore
- Taluk Pollachi
- Block Pollachi North,Pollachi South,Anaimalai
- Command area 20536 Ha

Irrigation season

- New command 1st September to January 15 th
- Old Command 15th May to 31st March

aliyar Sub Basin Existing Cropping Scenario

CROPPING PATTERN OF ALIYAR RESERVOIR

Sl No.	Crop Details	WITH OUT PROJECT			With Project ha
		Fully Irrigated	Partly Irrigated	Gap/R.F	
		In Ha	In Ha	In Ha	
1	Coconut (W/o Drip)	3711	1840		
	Coconut (with drip)	5022			8022
	Coconut with Fertigation				6291
	Coconut with intercrop	252			630
2	Paddy (May - Oct)	1690			1270
3	Ground Nut(May-Oct)	50			50
	Ground Nut(sep Jan)	880	180	500	1161
4	Maize (Sep –Jan	100	20		290
5	Cotton (Sep -Jan)	315	150	249	400
6	Sugarcane	400			700
7	Cholam (Sep -Jan)	217	90	438	278
8	Pulses (sep -Jan)	130	154	298	259
9	Fodder (May -oct)	80			230
	VEGETABLES				
10	Tomato (sep -Jan)	60			80
11	Bhendi (Sep -Jan)	20			20
12	Gourds (May - Oct)	20			20
	Gourds (Sep - Jan)	140			220
	FRUITS				
13	Mango	200	120		320
14	Banana	180			180
15	Sappota	30			30
16	TC banana				145
	Total	**16497**	**2554**	**1485**	**20536**
	INTER CROPS				
17	Cocoa	177			**540**
18	Nutmeg	50			**65**
19	Arecanut	15			15
20	Vennila	10			10
	CROP II				
21	Paddy (Nov -Mar)	1598			1270
22	Groundnut (Nov -Mar)	40			50

Poly green house 12 units 500 Sq.mt / unit

Shade net 19 units 500 sq.mt /unit

Existing marketing scenario

1.Infrastructure:

S.No	Location	Capacity M.T	Utilized for what
	State ware housing corporation		
1	Pollachi	9000	Fertilizer& maize from Karnataka

There is no cold storage facility available in this basin area

2.MARKETS:SPECIALISED/GENERAL MARKET

S.NO	LOCATION	PRODUCES DEALT	VOLUME OF QTY.TRANSACTED
	SHANDIES NACHIPALAYAM KINATHUKKADAVU SUNDARPURAM	**TOMATO**	**360 TON**

2. INFRASTRUCTURE AVAILABLE OUTSIDE THE REGULATED MARKET

Drying yard at Vettaikaranpudur and Eripatti are constructed by Coimbatore Market Committee for the welfare of farming community at free of cost. There is no cold storage facility available in the basin area. Apart from the above infrastructure, some farmers are using small sized locally constructed threshing floors for their own use.

regulated markets

S.NO	R.M.LOCATION	GODOWNS	DRYING YARD	NOTIFIED CROPS	RECEIPTS&EXPENDITURE(LAKHS)			
					2004-2005		2005-2006	
		M.T	NO.		RECEIPTS	EXPENDITURE	RECEIPTS	EXPENDITURE
1	ANAIMALAI	3350	5	16	12.26	4.78	13.90	5.84
2	POLLACHI	750	1	16	69.19	8.80	74.60	9.75

AVERAGE MARKET PRICE PREVAILED:

S.NO	COMMODITY	GLUT SEASON PRICE RS/QTL	GLUT MONTH	SCARCITY SEASON PRICE RS/QTL	SCARCITY MONTH
1	PADDY	425	JAN-MAR	600	AUG-SEP
2	MAIZE	540	JAN-MAR	720	JULY-AUG
3	COCONUT	450	JAN-MAR	675	AUG-OCT
4	GROUNDNUT	800	AUG-SEP	1100	MAR-APRIL
5	TOMATO	3100	MAY-JUNE	9200	AUG-SEP

ALIYAR SUB BASIN CROP DIVERSIFICATION

S.no.	CROP DETAILS	With project In Ha	PRODUCTIVITY MT/Ha	PRODUCTION MT/Ha	**M.S.%**	M.SURPLUS MT
1	Coconut	14943	9227Nuts	13.78Cr.nut	94%	13 Cr.nut
2	Paddy	2540	5.26	13365	80.65	10779
3	Groundnut	1261	1.79	2257	96	2166
4	Maize	290	1.125	326	98	316
5	Cotton	400	1.089	436	100	436
6	Sugarcane	700	1161	812700	100	812700
7	Cholam	300	0.840	252	92	232
8	Pulses	259	0.5	130	83	115
9	Fodder	230	0	0	0	0
10	Tomato	80	11.9	952	100	952
11	Bhendi	20	8.56	171	99.1	170
12	Gourds	240	12	2880	99.3	2860
13	Mango	320	2.89	925	100	925
14	Banana	180	29.28	5270	96	5060
15	Sapota	30	25	750	96	720
16	T.C.Banana	145	35	5075	100	5075
17	Cocoa	540	0	0	0	0
18	Nutmeg	65	0	0	0	0
19	Arecanut	15	0	0	0	0
20	Vennila	10	0	0	0	0
	TOTAL	13517		32789		29803

TOTAL EXCLUDES COCONUT AND SUGARCANE.

Capacity Utilization

Total Production - 20233 mt and 6.37 crore nuts

(Excluding sugarcane,cotton ,tomato, fruits,coconut&fodder)

Marketable surplus - 16739 mt and 5.98 crore nuts

Existing capacity

Regulated Market - 4100Mt

Sate Ware Housing Corporation - 9000Mt

Total - 13100.

3. MARKETS

Regulated Markets are available at Pollachi and Anaimalai in the subbasin area. The regulated markets are functioning under Tamilnadu S tate Agriculture Marketing (Regulation) Produce Act 1987. The above markets are dealing only notified Agricultural Commodities such as Cotton, Maize, Coconut, Paddy etc. Closed tender system is followed in the Regulated market yard premises. Further,the above Regulated Markets are equiped with computer network under the AGMARK NET system by the NIC to enable the RM to update the daily market rate mechanism. However, the system is restricted to RM price structure and deals only with notified agricultural pr oduces.

Further many private mundies are functioning for marketing of all major agricultural produce and the prices are negotiated between trader and farmer according to the market trend.

For vegetables especially for Tomato at present there are two ma rkets at Nachipalayam and Kinathukkadavu areas though it is not coming with in the basin area.

In the basin area ,Gourds are grown under contract system. A group of 60 farmers formed an association at Odayakulam area and the prices were fixed by the grower and purchaser on a monthly basis and are supplied to Coimbatore Hotels, Pazhamuthir Nilayam and to the Palakkad Dt. of Kerala state. This example of **commodity group** can be extended to other corps.

Apart from this, Uzhavar Sandhais are functioning at Pollachi, Udumalpet and Coimbatore where farmers can directly sell their produce to the consumers without the intervention of the middlemen. Daily markets are also functioning at Pollachi on commission sale.

For Maize M/s. Suguna, Pioneer, Shanthi and MBS Hatcheries and other poultry feed manufactures purchase the entire quantity,at the prevalent market rates.Around 150mt of maize is produced and sold to these manufacturers which is negligible.

Coconut is being the major crop in the basin as well as the diversified crop to the tune of 739 Ha increase in addition to the existing area.The tender coconut in this belt is the most likely desire of the traders where they purchase and send the consignment to Chennai and Madurai regularly. They even procure up to RS.6/tender coconut in the farm itself.Rest is taken for raw consumption and some is diverted for making copras which is an value added product. For Copra, which is mostly sold at Negamam, Avalpoondurai and Kangeyam regulated market where major oil producers Shanthi, VVD and Parachute purchase their raw material. NAFED is also procuring Copra at minimum support price ie. Rs.35.70/kg at present.

For Cocoa, M/s. Cadburry has roped up with farmers to improve the production by way of supplying seedlings and other inputs and purchases the entire quantity at buy back arrangement. At present M/s.Cadburry industry has the capacity of 14000mt and our likely hood presence is to the tune of 6000mt and a gap of 8000mt is there. So there seems to be a gap where the intercrop of cocoa has been suggested by Horticulture Dept. to cover 500Ha in the diversification of crop as an intercrop.

3. PRACTICES (PRE-HARVEST AND POST HARVEST)

a. Grading

No scientific method is adopted at present for grading except for cotton where the staple length of the lint determine the quality as well as price of the produce. Vegetables are graded by size, appearance, freshness and maturity. For notified Agricultural produce grading is done at regulated market premises itself. At private mundies grading is done by sieving for grains only. For packed items like ghee, pulses etc. Grading and quality checkup are done at the Agmark lab situated at Coimbatore and Palladam.Commercial grading is done to an extent for cotton,maize,paddy and groundnut.

b. Transportation

With regard to transportation, no specific difficulty is experienced. The producers are managing themselves to transport generally by private vans, lorries and mini auto rickshaws. At present there is no refrigerated trucks available to transport perishable goods to longer distances. When area under perishable like floriculture increase especially for export purposes such facility will be created.

c. Linkage with industry

Existing along with increased area under coconut will be benefited by IT-KIOSK proposed under this project.

The increase in sugarcane area will be absorbed by the M/s Bannariamman sugar mill which has been verified with sugar mill authorities. For Maize, the poultry feed manufacturers ie, M/s Suguna , M/s Pioneer etc., have huge requirement of Maize and the extra quantity now produced will be procured by them. For Cocoa with M/s. Cadburry, have been agreed for tie up and is being implemented.

The intercropping technology which is advocated by University has been benefited by market support ie, Cocoa. The post harvest technology for storage, drying, threshing etc is being supported through rural godowns and threshing floors. The drudgery in transporting produce over considerable distance from farm to the market is also reduced.

d. Source of market information

Local dailies and other multimedia channels are the source of market information as it is. There is noe-chaupal arrangement except DEMIC at TNAU, Coimbatore. At RM level **"AGMARKNET**" is there to know the prices of notified agricultural commodities only.

III. CONSTRAINTS

a. Production : Glut / Shortage

Fruits and vegetables are harvested during a particular season while the consumption of as well as demand for th ese commodities are spread throughout the year. In view of these, there is considerable mismatch between demand for and supply of these commodities. During January – February month is at the time of harvesting of maize the prices were between Rs.500 -560/qtl and raised to Rs. 800 – 900/qtl during August – September month ie. off season. In case of Tomato there are two peaks ie. during May – June and November – December month its prices goes upto Rs.15/Kg and during the rest of the month it fell down even upto Rs.1/kg. For coconut also its prices were down during February – May when the production is on higher sale. During the past three years due to the attack of "Eriophyte mite" the size of the nut got reduced as well as the appearance which are the ma in grading standard as for as coconut is concerned. This poses a great difficulty to the dehusking of the affected nuts. This affected nut also gets lower prices compared to un-affected one.

b. Lack of available market

Though there is market available generally for all crops to an extent, farmers are willing to sell their produce at their farm gate itself. There is no organized marketing except Regulated market. Mostly middle man exploit farmers due to inadequate market linkage. Traders and intermed iaries take advantage of farmers on the weight of the produce, on the comparative quality of the produce and by inaccurately representing the state of market. However markets are available for certain specific produces like vegetables, maize etc.

c. Poor Post – harvest practices

Farmers are doing their post harvest practices at farm itself. They pack their produce immediately after harvest in certain products like fruits while for other the produces are packed in gunny bags. Absence of cleaning, gr ading and proper packing among farmers led to the exploitation by traders.

Grading is done for tomato and brinjal to a leaser extent by means of appearance and size only and is transported to the markets by basket.

Short term storage is mainly used to provide flexibility in marketing. When the produce is with drawn form storage point it has to compete in the market against much fresher produce. For fruits and vegetables agro processing industry may be a solution but the industry will not operate d uring off season where the availability of the raw material is less.

No collective action - Individual Farmers go to Market / Whole salers

Individual farmers are willing to sell their produce at their premises itself. Around 20% of the farmers alone se ll their produce through Regulated markets except for, Turmeric where 90% of the farmers sell it at the R.M. It is to be recognized that farmers at large have no collective bargaining power and are individually at the mercy of intermediaries.

e. Lack of market information

At present market information is known through local dailies, radio and to an extent by phones. There is no connected network to provide market information at regional level. Progressively, R.M's are being computerized for issue of market informations to the ready farmers.

IV. Diversification / Future Vision Proposed

1. Diversification and Approximate location of the diversified crops

The location will be decided in consultation with Agriculture / Horticulture departments. However at present the locations are linked to the presence of WUAs. Since the maintenance of these units will be handed over to these WUAs. It is shown in the following tables

ALIYAR SUB BASIN

PROPOSED NEW / DIVERSIFIED AREA

DISTRICT : COIMBATORE **TALUK : POLLACHI**

Sl no	Name of crop	New CROP area in ha	Increased crop area in ha	Total	BLOCKS				
					Anaimalai			Pollachi North	Pollachi South
					FIRKKA			FIRKKA	FIRKKA
					Anaimalai Area in ha	Kottur Area in ha	MN Palayam Area in ha	Rama pattinam Area in ha	Pollachi South Area in ha
1	Coconut with Fertigation		740	6291*	1490	900	1700	1015	1186
2	Coconut with intercrop		378	378	318	10	10	20	20
3	Ground Nut(sep Jan)		101	101		35		36	30
4	Maize (Sep -Jan		170	170		40		60	70
5	Sugarcane		300	300	200	75	25		
6	Fodder (May -oct)		150	150	45	20	25	30	30
	VEGETABLES								
7	Tomato (sep -Jan)		20	20				10	10
8	Gourds (Sep - Jan)		80	80			80		
	FRUITS								
9	TC banana	145		145	145				
	Total	**145**	**1939**	**1344**	**1878**	**715**	**1440**	**706**	**625**
	INTER CROPS								
10	Cocoa		363		303	10	10	20	20
11	Nutmeg		15		15				

*** It incuding existing coconut area proposed to convert to drip with fertigation.**

CHALLENGES THROWN UP BY DIVERSIFICATION / AREA EXPANSION

1. Identifying new market for new crop

Since fruits and vegetables are perishable in nature and are season bound in order to have year round supply staggered showing and off season varieties should be introduced.

For produces such as maize contract farming / forward trading may be developed between FAs' and M/s. Suguna, M/s. Pioneer and M/s. Shanthi poultry feed manufactures to get a favourable price.

For cotton also contract farming may be arranged between FIG's and M/s. Appachi cotton company, M/s. Shanthalakshmi Mills, M/s. Super Spinning Mills etc.

Likewise for produces like Cocoa, Vegetables, Coconut etc strong market linkages along with supply of inputs, TOT, Storages etc will be developed.

2.Improving existing market utilization

At present there is 13100 mt of produce can be stored at the existing infrastructure and for improving the market utilization in the interior places, the following infrastructure facilities are suggested.

Construction 2Rural godowns 2dryi ng yard and supply of 100nos. of dunnages, 20 nos. of plastic tarpaulins and 2 nos. weighing scale and an agribusiness centre to the following WUA/FA.

1. Kottur - Kottur Firka
2. Pethanaickanur – Anamalai Firka
3. Marchinaickenpalayam – Vegetable-Agri Business Centre

3. Providing multiple market information

Further the existing IT network with TNAU ie. DEMIC need to be strengthened and expanded to cover maximum number of WUAs.

4. Ensuring Collective Marketing / Bargain

At present it is absent. But a sub group of FA is to be formed for this purpose to improve the access to market by collective transport, sale etc.FIG”s already existing also will be utilized.

5. Specialised Storage (Cold Storage / Godowns)

For cereals and pulses it can be stored at godowns at local level and can be released during off season. We can also arrange pledge loans to the FIG's through the proposed rural godowns.

6. Processing / Agro processing

With regard to fruits and vegetables agro processing industry may be a solution during peak harvest season, but the industry will not operate during off season due to non availability of raw material during off season.

However an interface one day workshop, between sub-basin farmers and entrepreneurs will be arranged with the help of CII of Coimbatore Sub Center and the demand will be assessed.

7. New practices – Product handling, grading, packing on farm process and quality control

Collection centres cum godowns are suggested through which products like vegetables will be collected, cleaned, graded, packed and transported to wholesale point with plastic crates without causing any physical injury to the produce. The quality control aspects will be taken in to consideration through capacity building exercises to be conducted.

VI. SOLUTIONS AND RECOMMENDATION

a. Consultative process undertaken in the sub-basin

Farmers' Association meetings were conducted and walk through survey on 21.07.2006, 24.07.2006, 27.07.2006, 9.8.2006, 10.8.2006 and 22.8.2006.

During the walk through, the cross section of sub-basin has been contacted through walking and the farmers demands were studied. Along with this the topography of the area, cropping pattern, water availability, transport also observed. This background facilitated in understanding the state holders problems and the solutions suggested.

b. Stake holders demand

The stake holders in different parts of the sub basin requested the following infrastructure.

a) **Storage sheds**: Farmers are of the opinion that storage godowns and threshing floors are necessary for the following reasons.

1. At many places the RM"s&other markets are situated 20 -30 Km from the place of production.
2. If the produces are transported and sale has not been effected due to p rice differences, the produce could not be returned.
3. Pledge loan facility is not available in the villages where godowns are not available.
4. Without storage, the produces are likely to reduce in quality.

Due to the above reasons, the stake holders demanded storage sheds and threshing floor cum Drying yard at interior villages.

b) **Threshing floor / drying yard**

c) **Dunnages**

d) **Plastic tarpaulins**

e**) Weighing scale**

f) **AGRI BUSINESS CENTRE**

Location :Marchinaickanpalayam – Anaimalai Block

Crop : vegetables

It is proposed to setup one Agri business centre at Marchinaickanpalayam at Anaimalai Block of Aliyar sub basin where vegetables are grown an area of 180 Ha.This village site is situated 22 Km away from Anaimalai Regulated Market and 35 Km from Pollachi Regulated Market.

The annual production of vegetable is expected around 210 M.T. since the distance from regulated Market is more than 20K.m.,it is proposed to have a farmers federation to have a collective bargaining as far as marketing is concerned. The Agri business center will help in cleaning, grading and packing of vegetables to the market.

c. Marketing intervention proposed

Software components

- Linkages with traders/manufacturers on contract farming /MOU t erms to be explored along with legal coverage.
- FIG"s at WUA level and commodity Groups.
- Capacity building in pre and post harvest techniqu es-the training to be conducted among Fas to gain more market access. -Centralised proposal by TNAU.
- Diversification of crop from paddy to coconut, sugarcane since paddy is more water required to less water required in order to maximize the water use efficiency

Hard Ware Component

- Demand and price forecasting system to be developed at the Sub B asin level in liason with TNAU DEMIC and NIC to provide necessary market information at the targeted groups to go for controlled planting as well as the marketing of the produce.

- Collection cum Storage Godowns are to be constructed at selective FA's field itself to make provision for collection ,cleaning and grading of the Produce as well as Packing and storage .As for as grains are concerned besides storage sheds,Threshing Floors cum Drying Yards are constructed to minimise the losses during the post har vest operation.

Marketing interventions proposed with reference to identified constraints

Crop	Constraints / Challenges	Counter Measures
Vegetables & Cereals	Production – Glut / Shortage	Linkages with traders on contract farming and on line trading. Off season varieties to be developed by TNAU and cultivated, marketed by FA's. Incase of perishables, agro-processing opportunities to be explored and required facility to be developed.
	Lack of available markets	No such difficulty. For speeding of marketing, formation of marketing sub groups at farmers association and export potential may be tapped.
	Poor post harvest practice	Rural godowons and thrashing floors to be constructed at selected sub groups and Tarpaulins to be distributed. On test basis ready to cook vegetables may either be processed by Farmers' Interest Groups be branded or allowing (FIG's) and the same may be sold through – self help group to enter into their venture of value addition. On realizing the potentials the same will be expanded on large scale through big departmental stores or through vegetable depots at cities. Training with regard to post harvest technology may be imparted to farmers.(TNAU centralized component)
	No collective action	Collective bargaining may be imparted through establishment of FA's / organisation empowering them to establish a retail unit in farmers market operated in nearby town.

	Lack of market information / providing multiple market information	Demand and price forcasting cell of TNAU will provide information to the target groups in liason with personal of Dept. of Agrl. Marketing & Agri. Business on demanding markets, time of sale expected, price advantage etc. It could facilitate the farmers to take decisions on crop diversification on either increasing or decreasing the area under crops.
		The cell positioned in sub basin level will coordinate with the domestic and export market intelligence cell (DEMIC) of TNAU, Coimbatore and periodically will develop the above information to the functionaries at the sub basin level.
	Diversification / Future vision proposed	Farmers interest group will be formed and motivated to do grading standardization and branding of farm produce.
	Transport / Collective Transport	Need based transport arrangement will be provided by out sourcing.
	Processing and Agro Processing	One day interface workshop or stakeholders meet will be arranged with traders, entrepreneurs of CII and selected sub-basin farmers interest group.
	New practice in quality control	The quality norms enunciated in AACCP/Phytosanitary regulation for promotion of exportable produce. Organic certification will also be established to promote organic farming in a highway.

Agriculture is the back bone of Indian economy. Aliyar basin under PAP ayacut area is dominated by coconut, mango, pulses, groundnut and vegetables. By improving the water use efficiency, we an improve the cropping pattern to an extent.

The marketing infrastructure consists of 2 Regulated markets besides number of private mundies. The transportation is by means of private channels. Grading and quality control are limited. Specialised storage godown, market information system and agrobased industry are absent in this basin area.

The marketing strategy is based on the following 3 items.

1. Surrey of existing cropping / marketing scenario
2. Stake holders consultation
3. Deciding on suitable marketing components based on gap area.

Cropping and diversification

Thus the following components were decided and included in the project.

Sl.No.	Items	No.	Cost in Lacs
1.	Rural godowns	2	10.00
2.	Drying yard	2	5.00
3.	Plastic tarpaulins	20	1.00
4.	Dunnages	100	2.00
5.	Weighing scales	2	0.40
6	**Agri business Centre**	1	11.00
Total			**29.40**

Enthusiastic participation by stake holders during the field visit, indicates the success of the programme during implementation.

Phasing of Expenditure

The expenditure will be phased out as follows:

Sl. No.		I	II	III	IV	V	Total	Amount In lakhs
1	Threshing floor/ Drying yard		1	1			2	5.00
2	Storage shed and accessories			1		1	2	13.40
3	Agri Business centre					1	1	11.00
	Total							29.40

AGRI BUSINESSCENTRE

S.No	**Details**	**Cost in lakhs**
1.	Lab cum administrative Building	1.00
2.	Grading cum Storage shed 70'X 12'	5.00
3.	Electricity and Water Supply	1.50
4.	Drying yard	2.20
Equipments		
5.	Moisturemetre and weighing scale	0.30
6.	Dunnage (Rs.2000 each) 30 Nos.	0.60
7.	Tarpaulins (Rs.5000/- each)2.No.	0.10
8.	Recurring expenditure	0.30
	Total cost	11.00

NAME OF THE WORK: CONSTRUCTION OF DRYING YARD

ABSTRACT ESTIMATE

Sl. No	Qty.	Description	Rate	per	Amount
1	55.00Cu.M	Earth excavation for foundation in all soils and sub soils except in hard rock requiring blasting but including shoting, shuttering and balling out water wherever necessary, refilling the sides of the foundation with excavated sand/soil etc.,as directed by the departmental officers.	44.22	Cu.M	2432
2	134.00 Cu.M	Supplying and filling in foundation of basement with filling sand in layers of not more than 15cm thick etc., complete	213.00	Cu.M	28542
3	53.00 Cu.M	Cement Concrete 1:5:10(one cement and five sand and ten aggregates)using 40MM Broken jelly for foundation and base concrete for flooring	1079.50	Cu.M	57214
4	33.00 Cu.M	Random Rubble masonry in CM 1:5(One cement and five sand) using best rough stone for foundation and basement with simultaneous pointing including curing etc.,complete	1045.20	Cu.M	34492
5	4.50 Cu.M	Reinforcement concrete 1:2:4(One cement, two sand four HBS jelly) using 20mm gauge HBS jelly for all RCC works.	1979.00	Cu.M	8906
6	45.50 Sq.M	Providing Form work for centering shuttering with all cross bracings including strutting to the required height for plinth beam, column footing, stair case steps etc.,	173.46	Sq.M	7892
7	2.20 Qtt	Supplying fabricating and placing in position of steel rods for reinforcement for RCC works including cost of steel, binding wire and labour charges for straightening, cutting, bending, cranking and tying grills in position etc.,	3201.00	Qtt	7042

8	29.00 Cu.M	Plain Cement concrete 1:2:4:,using 20mm gauge HBS jelly for flooring including curing etc.,complete	1760.90	Cu.M	51066
9	55.00 Sq.M	Plastering withCM 1:3,10mm thick for exposed surface of RCC item.	50.60	Sq.M	2783
10	9.00 Sq.M	Supplying and fixing of Mastic pad for expansion joint of flooring etc.	332.30	Sq.M	2991
11	75.00 Sq.M	Colour washing two coats using best shell llme and colouring pigments etc., complete	7.95	Sq.M	596
12	LS	Provisions for Labour Benefit fund @ 0.30%			203958 600
13	LS	Provisions for Unforeseen items and variation of quantities			5444
14	LS	Provisions for petty supervision charges and contingencies @ 2.5%			5000
15	LS	Provisions for variations of Rates			5000
				Total	220000

NAME OF THE WORK : MODEL ESTIMATE FOR THE CONSTRUCTION OF DRYING YARD

DETAILED ESTIMATE

Sl.No	Description	Nos	L	B	D	Contents
1	Earth work excavation for foundation in all soils and sub soils except in hard rock requiring blasting etc., For Drying Yard Retaining Walls alround Add Sundries	1 x 1	78.48	0.80	0.80	50.23 4.77
	Total					55.00
2	Supplying and filling in foundation of basement with filling sand in layers of not more than 15 cm. thick including well rammed and consolidated etc. For Drying Yard Retaining Walls alround Add Sundries	1x1	19.54	19.54	0.35	133.63 0.37
	Total					134.00
3	Cement Concrete 1:5:10 (One Cement 5 Sand and 10 Aggregates) using 40 mm broken jelly for foundation and base concrete for flooring etc. For Drying Yard retaining wall alround For Drying Yard Basement Add Sundries	1x1 1x1	78.48 19.54	0.80 19.54	0.23 0.10	14.44 38.18 0.38
	Total					53.00
4	Random rubble masonry in cm 1:5 One cement and five sand using best rough stone for foundation and basement etc. For Drying Yard retaining walls Ist footing IInd footing IIIrd footing Add sundries	1x1 1x1 1x1	78.48 78.48 78.48	0.60 0.45 0.38	0.23 0.23 0.46	10.83 8.12 13.72 0.33
	Total					33.00

5	Reinforcement concrete 1:2:4 (one cement two sand four HBS jelly) using 20 mm gauge HBS jelly for all RCC works For drying Yard Parapet Add Sundries	 1x1	 79.08	 0.23	 0.23	 4.18 0.32
	Total					4.50
6	Providing Form work for centering shuttering with all cross bracing including for all RCC works etc. For drying yard parapet - inner alround For drying yard parapet - outer alround For expansion joints length wise and width wise Add Sundries	 1x1 1x1 1x3x2	 78.16 80.00 19.54	 -- -- --	 0.23 0.23 0.075	 17.98 18.40 8.79 0.33
	Total					46.60
7	supplying fabricating and placing in position of steel rods upto 16mm dia including cost of binding wire and labour charges for straightening, cutting,bending and cranking etc. For Parapet wall 8mm RTS Top&Bottom Add Laps	 2x2 1x30	 79.08 0.32	 -- --	 --- ---	 316.32 9.60
					Total	325.92
	6mm stirrups	1x4x133	0.72	--	--	383.04
	8mm RTS 6mm MS Rods Add Sundries	325.92m x 0.39 kg/m 383.04m x 0.22 kg/m				127.11 84.27 8.62
		Total kgs.				220.00
		Total Qty.			---	2.20
8	supplying and fixing of Mastic pad for expansion joint of flooring etc. For Expansion joints Add Sundries	 2x 3	 19.54	 ---	 0.075	 8.79 0.21
	Total				Kgs.	9.00

9	plain cement concrete 1:2:4, using 20mm gauge HBS jelly for flooring including curing etc., complete For Drying Yard Basement Add Sundries	1x1	19.54	19.54	0.075	28.64 0.36
	Total					29.00
10	Finishing the exposed surfaces in CM 1:3 (one cement, three sand) 10mm thick etc., For Drying yard parapet – inner alround For Drying Yard parapet – Top alround For Drying Yard Parapet – Outer alround Add Sundries	1x1 1x1 1x1	79.08 79.08 79.08	0.23 0.23 0.23	-- -- --	18.19 18.19 18.19 0.43
	Total					55.00
11	Colour wasting two coats using best shell llme, including cost of gum,kanjee,water colouring plgments etc., Qty as per plastering For DryingYard RR Masonry – Outer alround Add Sundries	1x1	80.00	---	0.23	55.00 18.40 1.60
	Total					75.00
12	Provisions for Labour benefit fund @ 0.30%					LS
13	Provisions for unforeseen items					LS
14	Provisions for petty supervisions charges					LS

Name of work: Construction of Storage Shed (20 M X 5M)

DETAILED ESTIMATE

Sl.No	Description	No.	L.	B.	D.	Quantity
1.	Clearing the scrub jungle and destroying the same effectively as directed by the Departmental Officer.					
	Building area	1x1	30.00	15.00	-	450.00m2
2.	Earth work excavation for foundation in all soils and sub soils except in hard rock requiring blasting etc.,					
	For foundation	1x1	50.92	0.90	1.00	45.83m3
	Add extra for steps					4.17m3
						50.00m3
3.	Supplying and filling in foundation of basement with filling gravel in layers of not more than15cm thick including well rammed and consolidation etc.,					
	For basement	1x1	20.00	5.00	0.45	45.00m3
4.	Supplying and filling in foundation of basement with filling gravel in layers of not more than 15 cm thick including well rammed and consolidation etc.,					
	For basement	1x1	20.00	5.00	0.15	15.00m3
5.	Plain Cement Concrete 1:5:10 mix using 40mm hauage hard granite broken stone jelly for foundation including dewatering if foundation necessary and laid in layers of not more than 15cm thick well rammed and consolidated complying with standard specification.					
	For foundation	1x1	50.92	0.90	0.15	6.87m3
	For flooring for basement	1x1	20.00	5.00	0.10	10.00m3
						0.13m3
						17.00m3
6.	Random rubble masonry in cement mortar 1:5mix (One cement and five sand) using hard granite rough stones and bond stones for foundation and basement etc.,					
	Ist footing	1x1	50.92	0.75	0.23	8.78m3
	IInd footing	1x1	50.92	0.60	0.23	7.03m3
	IIIrd footing	1x1	50.92	0.45	0.92	21.08m3
	Add extra					0.11m3
						37.00m3
7.	Brick work in Cement Mortar 1:5 mix (one cement and five sand) using country bricks of size 8 ¾"x 4 ½" x2" of the following including curing etc., complete complying with standard specification.					
	a) Upto basement					

	Wall alround	1x1	50.92	0.45	0.12	2.75m3
	Add for steps 1	1x2	1.20	1.20	0.30	0.86m3
	" 2	1x2	1.20	0.90	0.15	0.32m3
	" 3	1x2	1.20	0.60	0.15	0.22m3
	" 4	1x2	1.20	0.30	0.15	0.11m3
	Add etc					0.24m3
						4.50m3
7.	b) Above basement					
	Length wise wall	1x6x2	2.95	0.23	3.00	24.43m3
	Width wise wall	1X2X2	2.275	0.23	3.00	6.28M3
	For brick pillar	1x5x2	0.45	0.45	3.00	6.08m3
	Corner pillar	1x2x2	0.45	0.45	3.00	2.43m3
	Cable pillar	1x2	0.45	0.45	5.10	2.07m3
	Roof border	1x2x2	3.50	0.23	0.15	0.48m3
	Cable wall	1x2	5.46	0.23	2.10/2	2.64m3
	Deduct Rolling shutter RS	1x2	1.50	0.23	2.10	(-)1.45m3
	Deduct Window W	1x10	1.50	0.23	1.30	(-)4.49m3
						0.53m3
						39.00m3
8.	Reinforced Cement Concrete 1:2:4 mix (One cement two sand and four aggregate) using 20mm HBGS jelly for all RCC works etc., completed.					
	For plinth beam	1x1	50.92	0.45	0.15	3.44m3
	For lintel alround	1x1	50.92	0.23	0.15	1.76m3
	Add pillar portion	1x9x2	0.45	0.22	0.15	0.27m3
	Sunshade for Rolling shutter	1x2	1.96	0.60	0.075 +0.05/ 2	0.15m3
	Sunshade for window	1x10	1.96	0.60	0.075 +0.05/ 2	0.74m3
						0.64m3
						7.00m3
9.	Providing form work for centering shuttering with all cross bracings including for all RCC works.					
	For plinth beam sides	1x2	50.92	-	0.15	15.28m2

	For lintel alround	1x2	50.92	-	0.15	15.28m2
	Rolling shutter bottom	1x2	1.50	0.23	-	0.69m2
	Window bottom	1x2	1.50	0,23	-	3.45m2
	Sunshade for window & R.Shutter	1x12	1.96	0.60	-	14.11m2
	" for sides	1x12x 2	0.60	-	0.075+ 0.05/2	0.90m2
	" for front sides	1x12	1.96	-	0.05	1.18m2
	Add etc					0.11m2
						51.00m2
10.	Supplying fabrication and placing in position steel reinforcement using mild steel or ribbed tar steel for all RCC works as per the design given including cost of steel and binding wire also in all floors steel and binding wire also in all floors steel and binding wire shall be supplied by the contractors somplying with standard specifications. Up to 16mm dia					
	Quantity as per items No.10 Qty. 7.00m3 x 100.00Kg/m3 = 700.00kg					7.00Qtl.
11.	Plain Cement Concrete 1:2:4 mix (One cement two sand and four aggregate) using 20mm HGBS jelly for plain cement concrete and top ribbed smooth etc., complete complying with standard specification.					
	For flooring	1x1	20.00	5.00	0.05	5.00m3
12.	Plastering with cement mortar 1:5 mix(One cement and five sand) using 12mm thick in all floors and complete complying with standard specification.					
	For wall inner alround	1x1	50.00	-	3.00	150.00m 2
	Cable wall	1x2	5.00	-	2.10/2	10.50m2
	Outer wall alround	1x1	53.60	-	3.00	160.80m 2
	Cable wall	1x2	5.90	-	2.10/2	12.39m2
	Roof border	2x2	3.50	-	0.55	7.70m2
	Deduct Rolling shutter	1x2x2	1.50	-	2.10	-10.08m2
	Deduct windows	1x10x 2	1.50	-	1.30	-39.00m2
	For pillar sides	5x2x2	0.22	-	3.00	18.48m2
	For cable pillar	1x2x2	0.22	-	5.10	4.49m2
	Add etc					4.72m2
						320.00m2

13.	Plastering with Cement Mortar 1:3 mix (one cement and three sand) using 10mm thick in all RCC works etc.,					
	Sunshade for R.S and window	1x12x2	1.96	0.60	-	28.22m2
	" for sides	1x2x12	0.60	-	0.075+0.05/2	0.90m2
	" for front sides	1x12	1.96	-	0.05	1.18m2
						4.70m2
						35.00m2
14.	White washing two coat freshly burnt shall lime with in colour in all floors. Fevicol type gum glue and adequate of a pproved blue powder should be added in the preparation of white wash. Thereafter shall be inclusive of lime and other materials bushes scaffoloding charges etc., complete.					
	For inner wall alround	1x1	50.00	-	3.00	150.00m2
	Cable wall	1x2	5.00	-	2.10/2	10.50m2
	Sunshade bottom	1x12	1.96	-	0.60	14.11m2
	Deduct Rolling shutter	1x2	1.50	-	2.10	(-)6.30m2
	Deduct Window	1x10	1.50	-	1.30	-19.50m2
	For AC Sheet bottom	1x2	20.00	4.00	-	160.00m2
						11.19m2
						320.00m2

15.	Colour washing two coats with freshly burnt shell lime in all floors using best quality and approved variety of colour pigments including cost of all materials brushes and scrolling charges in all floors etc., complete complying with standard specifications. Mineral colour not affecte d by lime should be added to the white wash solution.					
	Outer wall alround	1x1	53.60	-	3.00	160.80m2
	Cable wall	1x2	5.90	-	2.10/2	12.39m2
	Roof border	1x2x2	3.50	-	0.55	7.70m2
	For basement	1x1	53.60	-	0.75	40.20m2
	Sunshade top	1x12	1.96	-	0.65	15.29m2
	Sunshade sides	1x12x2	0.60	-	0.075+ 0.05/2	0.90m2
	Deduct Rolling shutter	1x2	1.50	-	2.10	-6.30m2
	Deduct window	1x10	1.50	-	1.30	-19.50m2
						8.52m2
						220.00 m^2
16.	White washing one coat freshly burnt shall lime with in colour in all f loors. Fevicol type gum glue and adequate of approved blue powder should be added in the preparation of white wash. Thereafter shall be inclusive of lime and other materials bushes scaffoloding charges etc., complete.					
	Quantity as per item No. 16 Qty. 220.00m2					220.00m 2
17.	Supplying and fixing of steel rolling shutter of 1.50x2.10m size of ISI market with lath section 20 gauge side rail 10 gauge of size top plate 6mm angle for top plate spring for as pully 'v' clamp bottom plate and bolts nuts, loc king arrangements one coat of primer and transporting charges etc., complete and as directed by the departmental officers.					
	Rolling shutter	1x2	1.50	-	2.10	6.30m2
18.	Supplying and fixing steel window size 1.50mx1.30m with outer frame 40x40x6mm 'L' angle alround and 'T' angle of size 40x20x3mm as a vertical members and inside 20x6mm MS(12mm) as grill with 18 gauge sheet outer frame including cost of materials and furniture fittiings transporting and labour charges including one coat of red oxide primer a nd fixing the window in pointing etc., complete and as directed by their departmental officers during execution.					
	Steel window	1x10	1.50	-	1.30	19.50m2
19.	Painting two coats with new iron work for doors and windows etc., without priming coat etc. complete					
	Rolling shutter	1x2	1.50	2x1.10	2.10	13.86 m^2

	Hood cover	1x2	1.50	1x1.10	1.00	3.30 m^2
	Steel window	1x10	1.50	2x1.10	1.30	42.90 m^2
	Add extra for truss painting					54.94 m^2
						115.00 m^2
20.	Supplying and laying of Asbestos cement fully corru gated sheet 6mm thick of approved auality for roofing with necessary U or J bolts and nuts bitumen GI washers etc complete complying with standard specification.					
	For ACC Sheet	1x2	20.23	4.00	-	161.84m^2
						3.16 m^2
						165.00 m^2
21.	Supplying and fixing Asbestos Cement Adjustable Ridge of approved quality with necessary 'U' or bolts and nuts and bitumen washers etc.,					
	For Ridge piece	1x1	20.23	-	-	20.23Rm
22.	Fabricating and supplying and erecting the required umbers of trusses with structural steel members like angle iron MS plate for all truss members including cleats to receive the purlins all cutting drilling holes welding and fixing of members with necessary bolts and nuts anchor bolt of approved quality hoisitn aligning and glazing the trus ses inposition as peer plan. The rate should binclede the cost painting the members with one coat of red oxide primer and zinc chromate etc., complete complying with standard specification and as directed by the departmental officers.					
a)	60x60x6mm 'L'angle					
	Principle rafters 2L	5x2x2	3.50	-	-	70.00Rm
	Bottom Tie angle 2L	5x2	5.45	-	-	54.50Rm
						124.50Rm
	124.50Rm x 5.40Kg/Rm = 672.30Kg					
b)	50x50x6mm					
	Sag Tie	1x5	1.80	-	-	9.00Rm
	Strut S1	5x2	2.00	-	-	20.00Rm
	Strut S2	5x2	1.80	-	-	18.00Rm
	Strut S3	5x2	1.00	-	-	10.00Rm
	Dummy rafter	1x4	2.00	-	-	8.00Rm
						65.00Rm

	65.00Rm x 4.50kg/Rm = 295.50Kg					
c)	Sleve angle (2L) 60x60x6mm	2x2x5	0.30	-	-	6.00Rm
	6.00Rm x 5.40Kg/Rm = 32.40Kg					
d)	MS Bed plate 12 mm thick	5x2	0.40	0.40	-	1.60m2
	1.60m2 x 94.20Kg/m2 = 150.72Kg					
e)	20 mm dia anchor bolt	5x2x2	0.45	-	-	9.00Rm
	9.00Rm x 2.47 Kg/Rm = 22.23Kg					
f)	Spice plate 6 mm thick	5x11	0.06	0.06	-	0.20m2
	0.20m2 x 47.10Kg/m2 = 9.42Kg					
g)	6mm guesset plate					
	Ridge plate	5x1	0.60	0.40	-	1.20m2
	Eves plate	5x2	0.40	0.30	-	1.20m2
	Strut plate	5x6	0.80	0.09	-	2.16m2
	Runner plate	5x2	0.60	0.10	-	0.60m2
	Anchor plate	5x2	0.95	0.35	-	3.33m2
						8.49m2
	8.49m2 x 47.10Kg/m2 = 399.88Kg					
h)	Bolts and nbuts 50x6mm	5x150	-	-	-	750 Nos.
	750.00Nos x 0.12Kg/No.= 90.00Kg					
i)	60x60x6mm cleat	3x5x2	0.25	-	-	7.50Rm
	Purlins	3x2	20.23	-	-	121.38Rm
	Bottom purlins	1x2	20.23	-	-	40.46Rm
						169.34Rm
	169.34 x 5.40 Kg/Rm = 914.44Kg					
	Total weight : 627.30+ 295.50 + 32.40 + 150.72 + 22.23 + 9.42 + 399.88 + 90.00 + 914.44 = 2541.89Kg + 208.11Kg = 2750.00Kg					2.75MT
23.	Provision for Electrical arrangements					L.S.
24.	Provision for Labour benefit fund					L.S
25.	Provision for variation in rates					L.S
26.	Provision for PS and contingencies charges					L.S
27.	Provision for unforseen items					L.S

Name of work: Construction of Storage shed

ABSTRACT

Sl.No.	Quantity	Description	Rate	Per	Amount
1.	450.00m2	Clearing the scrub jungle and destroying the same effectively as directed by the Departmental Officer.	1.30	m2	585
2.	50.00m3	Earth work excavation for foundation in all soils and sub soils except in hard rock requiring blasting etc.,	44.43	m3	2222
3.	45.00m3	Supplying and filling in foundation of basement with filling gravel in layers of not more than15cm thick including well rammed and consolidation etc.,	135.35	m3	6091
4.	15.00m3	Supplying and filling in foundation of basement with filling gravel in layers of not more than 15 cm thick including well rammed and consolidation etc.,	351.80	m3	5277
5.	17.00m3	Plain Cement Concrete 1:5:10 mix using 40mm hauage hard granite broken stone jelly for foundation including dewatering if foundation necessary and laid in layers of not more than 15cm thick well rammed and consolidated complying with standard specification.	1184.30	m3	20133
6.	37.00m3	Random rubble masonry in cement mortar 1:5mix (One cement and five sand) using hard granite rough stones and bond stones for foundation and basement etc.,	1154.70	m3	42724

7.		Brick work in Cement Mortar 1:5 mix (one cement and five sand) using country bricks of size 8 ¾"x 4 ½" x2" of the following including curing etc., complete complying with standard specification.			
a)	4.50m3	Up to basement	1569.10	m3	7061
b)	39.00m3	Above basement	1586.70	m3	61881
8.	7.00m3	Reinforced Cement Concrete 1:2:4 mix (One cement two sand and four aggregate) using 20mm HBGS jelly for all RCC works etc., completed.	2144.35		15010
9.	51.00m2	Providing form work for centering shuttering with all cross bracings including for all RCC works.	210.00	M2	10710
10.	7.00Qtl	Supplying fabrication and placing in position steel reinforcement using mild steel or ribbed tar steel for all RCC works as per the design given including cost of steel and binding wire also in all floors steel and binding wire also in all floors steel and binding wire shall be supplied by the contractors somplying with standard specifications. Up to 16mm dia	3202.75	Qtl	22419
11.	5.00m3	Plain Cement Concrete 1:2:4 mix (One cement two sand and four aggregate) using 20mm HGBS jelly for plain cement concrete and top ribbed smooth etc., complete complying with standard specification	1858.00	m3	9290

12.	320.00m2	Plastering with cement mortar 1:5 mix(One cement and five sand) using 12mm thick in all floors and complete complying with standard specification.	46.80	m2	14976
13.	35.00m2	Plastering with Cement Mortar 1:3 mix (one cement and three sand) using 10mm thick in all RCC works etc.,	52.60	m2	1841
14.	320.00m2	White washing two coat freshly burnt shall lime with in colour in all floors. Fevicol type gum glue and adequate of approved blue powder should be added in the preparation of white wash. Thereafter shall be inclusive of lime and other materials bushes scaffoloding charges etc., complete.	5.30	m2	1696
15.	220.00m2	Colour washing two coats with freshly burnt shell lime in all floors using best quality and approved variety of colour pigments including cost of all materials brushes and scrolling charges in all floors etc., complete complying with standard specifications. Mineral colour not affected by lime should be added to the white wash solution	7.95	m2	1749
16.	220.00m2	White washing one coat freshly burnt shall lime with in colour in all floors. Fevicol type gum glue and adequate of approved blue powder should be added in the preparation of white wash. Thereafter shall be inclusive of lime and other materials bushes scaffoloding charges etc., complete.	3.70	m2	814

17.	6.30m2	Supplying and fixing of steel rolling shutter of 1.50x2.10m size of ISI market with lath section 20 gauge side rail 10 gauge of size top plate 6mm angle for top plate spring for as pully 'v' clamp bottom plate and bolts nuts, locking arrangements one coat of primer and transporting charges etc., complete and as directed by the departmental officers	2193.50	m2	13819
18.	19.50m2	Supplying and fixing steel window size 1.50mx1.30m with outer frame 40x40x6mm 'L' angle alround and 'T' angle of size 40x20x3mm as a vertical members and inside 20x6mm MS(12mm) as grill with 18 gauge sheet outer frame including cost of materials and furniture fittiings transporting and labour charges including one coat of red oxide primer and fixing the window in pointing etc., complete and as directed by their departmental officers during execution.	1995.30	m2	38908
19.	115.00m2	Painting two coats with new iron work for doors and windows etc., without priming coat etc. complete	46.00	m2	5290
20	165.00m2	Supplying and laying of Asbestos cement fully corrugated sheet 6mm thick of approved auality for roofing with necessary U or J bolts and nuts bitumen GI washers etc complete complying with standard specification.	207.80	m2	34287

21.	20.23Rm	Supplying and fixing Asbestos Cement Adjustable Ridge of approved quality with necessary 'U' or bolts and nuts and bitumen washers etc.,	185.00	Rm	3743
22.	2.75MT	Fabricating and supplying and erecting the required umbers of trusses with structural steel members like angle iron MS plate for all truss members including cleats to receive the purlins all cutting drilling holes welding and fixing of members with necessary bolts and nuts anchor bolt of approved quality hoisitn aligning and glazing the trusses inposition as peer plan. The rate should binclede the cost painting the members with one coat of red oxide primer and zinc chromate etc., complete complying with standard specification and as directed by the departmental officers.	44580.00	MT	122595
23.	L.S.	Provision for Electrical arrangements		L.S.	20000
24.	L.S.	Provision for Labour benefit fund		L.S.	1500
25.	L.S.	Provision for variation in rates		L.S.	10000
26.	L.S.	Provision for petty supervision and contingencies charges		L.S.	15000
27.	L.S.	Provision for unforseen items		L.S.	10299
		TOTAL			**500000**

AGRICULTURAL DEPARTMENT

AGRICULTURAL DEPARTMENT

Policies on Water – Agriculture Department.

a) Maximise multi purpose benefits from surface and ground water, land and other resources.

b) Evolving a cropping pattern for devising the optimal benefit per unit of water.

c) Itensification of Agricultural Productivity and income.

BASIC FOR INCREASING AGRICULTURAL PRODUCTION :

1. long term growth in Agriculture depends in large part on increasing efficiency of use of water.

2. Involving water users Association and consulting them for any project proposal.

3. Where investment is made for the activity in the farmers field, a portion of investment will be in the form of the contribution by the farmer towards it.

4. Based on the soil type, climatic factors and water availability, promoting agricultural activities for higher yield and income.

Recommended proposals for the Project :

1. Crops suggested based on Agro climatic suitability / local needs / market driven / crop adoptability.
2. Adoption of INM and IPM techniques.

3. Transfer of Technology for increased productivity.

    - by Trainings / Farmers Field School
    - by Demonstration
    - by Trials.

4. Sustainability of soil health.

    - by Vermi composting.
    - by coir pith composting
    - by organic farming.

5. Sustainability of critical inputs availability

    - Bio – fertilizers.
    - Micronutrient mixtures.

ALIYAR SUB BASIN – CROPWISE PRODUCTION AND INCOME INCREASE

S. No	Crops	Area (Ha)			Productivity (MT/Ha)			Production (MT)			Income (Lakhs)		
		Wop	Wp	IN CRS	Wop	Wp	IN CRS	Wop	Wp	IN CRS	Wop	Wp	IN CRS
1	Coconut	13825	14943	(+) 1118	13125	17500	4375	1.815	2.615	(+)0.80	9.07	13.08	(+) 4.01
2	Paddy	1690	1270	(-) 420	5.00	6.00	1.00	8450	7620	(-)830	507.00	457.20	(-) 49.8
3	Ground nut	1610	1211	(-) 399	1.50	2.00	0.50	2415	2422	(+)7	483.00	484.40	(+) 3.60
4	Maize	120	290	(+) 170	2.50	3.25	0.75	300	943	(+) 643	15.00	47.15	(+) 32.15
5	Cotton	714	400	(+) 314	1.80	2.00	0.20	1285	800	(-)485	321.25	200.00	(-) 121.25
6	Sugar cane	400	700	(+) 300	100.00	125.00	25.00	40000	87500	(+)47500	400.00	875.00	(+) 475
7	Cholam (Fodder)	767	300	(-) 467	25.00	35.00	10.00	19175	10500	(-)8675	57.53	105.00	(+) 47.47
8	Pulses	582	259	(-) 323	0.50	0.60	0.100	291	155	(-)136	87.30	46.50	(-) 40.80
9	Fodder	80	230	(+) 150									
10	Vegeta-bles	240	340	(+) 100									
11	Fruits	530	615	(+)85									
	TOTAL;	20558	20558										

Agriculture in Aliyar Sub basin – Present Scenario.

Major area under Coconut (70% of the total area):

By best using the water availability from Aliyar irrigation project and from wells, coconut is being grown as a major commercial crop in this sub basin. Water is released from this project only for limited period in an year and for the other period substituted from the Wells and borewells.

Non availability of labour forced the farmers to cultivate coconut. Irrigation once in a week or 10 days and fertilizer application an d plant protection measures once / twice a year is sufficient for coconut. But for seasonal crops like Paddy, Pulses, Groundnut and Sugarcane, day to day farm operations are more when compared to coconut.

Lesser cost of cultivation and more returns are unitque feature in coconut cultivation. Sugarcane area and Groundnut also likely to increase to have a balanced profit. Paddy and Sugarcane area almost remains the same because the black soil in Aliyar sub basin area more suitable for Paddy, and in redsoil areas coconut and Groundnut are mainly grown. With the available water, two crops of paddy (Kuruvai and Samba seasons is also possible.

Integrated Nutrient Management (INM): -

Balanced fertilizer application based on the Soil test results for coconut, paddy and other crops is being following by many farmers. Farm Yard Manure, Biofertilizers and Micronutrients are the major components of Integrated Nutrient Management. The cost of availability of the above inputs and awareness about the benefits of INM practices decides the adoption.

Now a days Farm Yard Manure availability is scarce due to limited cattle population. INM also leads to Soil Health which farms the basis for healthy crop which in turn boosting yield. Excessive use of inorg anic fertilizers is the present trend, and an awareness is required to avoid the soil, air and water pollution. Balanced fertilizer application also helps coconut trees to withstand the attack of Eriophyid Mite.

Integrated Pest Management (INM) :

Several pests and diseases attack coconut, but Eriophyid Mite infestation is a major problem resulting in reduced yield. To control Eriophyid Mite, balanced nutrition and application of neem cake is recommended which is adopted only by 20% of the farmers due to unawareness. The pheremone trap installation for the control of the regular pests like Rhinoceros beetle and Red palm weevil is also under limited practice. To popularize the plant protection practices IPM Demnstration is the appropriate tool to save crop from pest and diseases and to get more yield and income.

Water use Efficiency: -

Water is released from the Dam for a period of 135 days only. Farmers have to take a successful crop with the available water. This is possible only with the judicious use of water as per the crop requirement without wastage.

With the introduction of System of Rice Intensification (SRI) in Paddy. limited water use, weed control using conoweeder and application of fertilizer in critical stages are recommended. Action is being taken to lay SRI Demonstrastions to educate the farmers about the concept of water usage. With the introduction of Drip Irrigation system to Coconut, most of the coconut farmers are able to save their crop even during water deficit periods.

Crop Diversification:

Crop diversification is Aliyar subbasin is least possible because,major area is under coconut, a perennial crop. Paddy cultivation is only in two seasons because of the water release is only in particular seasons. Sugarcane and Groundnut are commercial crop gaining importance

Agricultural Implements and Sprayers:

These are being distributed under Centrally Sponsored Schemes with subsidy. (Agricultural mechanization).

Soil reclamation :

There is no problem soil in sub-basin. It needs only minor correction like adding major and minor and minor nutrients and organic manure. Farmers are motivated by the Field functionaries of Agriculture Department to take up cultivation with new improved varieties in Paddy and Sugarcane to get higher yields. The crops now grown are Coconut, Paddy, Sugarcane, Groundnut, Pulses and others which are suitable to the prevailing Agro climatic conditions and Soil conditions.

PROPOSAL FOR THE IAMWARM PROJECT IN ALIYAR SUBBASIN

AREA & PRODUCTIVITY – ALIYAR BASIN

Vermi compostin

Sl.No.	Major Crops	Area (Ha)		Yield	
		Present	Projected	Present	Projected
1	Coconut	13825	14943	90 Nuts/tree/ annum	120 Nuts/tree/ annum
2	Paddy (I + II)	3288	2540	6500 Kgs/Ha	7000 Kgs/Ha.
3	Groundnut	930	1211	1500 Kgs/Ha	1700 Kgs/Ha.
4	Sugarcane	400	700	100 MT/ Ha.	125 MT/Ha.

Coconut being a perennial crop and paddy as a customary crop, crop diversification is least possible in this sub basin. Groundnut is being grown as a commercial crop in diversified areas of this ayacut. Since there is a market demand both for coconut Paddy and groundnut .

Details of Developmental components and activities proposed, INM and IPM Demonstration.

Department of Agriculture is implementing, INM and IPM Demonstrat ions, Bio-fertilizer Distribution, Micro Nutrient mixture Distribution Schemes under Centrally Sponsored Programmes with subsidy, which is ;not adequate to meet the demands of all farmers.. Hence to have widespread adoption of these technologies, now the proposals in this project laying the Demonstrations under INM and IPM are provided.

Paddy is cultivated as mono-cropping in this ayacut area, in two subsequent seasons viz. Kuruvai (June-July) and Samba (August-September).

As water inundation depletes all micronutrients in paddy fields, yield will be reduced considerably. To avoid the yield loss, substitute of micronutrients Mixture to soil is important.

Vermi compositing and Coirpith Composting demonstrations are required to overcome the shortage of Farm Yard manure. Promoting organic manuring to restore the soil health is the prim e objective of this component. These demonstrations acts as a production unit for farmers use in their fields. These units will also become a commercial unit slowly to hav e an additional income to the farmers.

Bio-fertilizer application

Incorporation of biofertilizers to soil helps to improve Soil qualities and also helps to avoid soil pollution due to excess use of inorganic fertilizers.

Transfer of Technology

The Demonstrations being programmed in farmers field is the Teaching Floor for the farmers of that area with a concept of "***Seeing is believing***". With the guidance and activities of field functionaries of Department of Agriculture, the technical know how of crop production technologies are being taught to the farmers through Trainings, Demonstrations and Group approach methodologies. The demonstrations laid in a cluster approach acts as Model plots in adopting the recommended practices and getting higher yields. Nearby farmers will be motivated to take up this practices and try to get higher yields.

Input Supply

The critical inputs like Seed, bio fertilizers and Micronutrient Mixtures, Plant Protection inputs are being distributed to the farmers under subsidized cost through Centrally Sponsored Schemes by the Department of Agriculture.

CONSTRAINTS AND COUNTER MEASURES.

Sl. No.	Constraints and Challenges	Counter measures
1	Problem soil	There is no problem soil area. Hence no reclamation is necessary.
2	Adverse climatic condition/Drought	On perusing the past rainfall record, drought occurs once in 10 years. Drought tolerant varieties, agronomic practices will be introduced.

3	Quality of seeds (Low yielding traditional varieties still prevalent)	High Yielding certified seeds of crops and quality planting materials will be supplied to the farmers through Agrl.Extension Centres, TNAU etc. Low yielding local varieties will be replaced with high yielding varieties during the project period.
4	Limited availability and distribution of certified sed from Government source/private and High cost of hybrid seeds	Certified seeds are stocked and distributed in Agricultural Extension Centres as per the SRR prescribed by the Agriculture Department. The private Hybrid seeds costs more and can be utilized. Supply of seeds by NSC and other private sources will also be arranged.
5	Improper Irrigation practices (Flood Irrigation)	SRI Technique in paddy crop will be popularized by laying demonstration by TNAU. Drip and sprinkler irrigation is going to be introduced by the Agricultural Engineering Department for all the crops.
6	**Inadequate extension services**	Departmental Extension Workers in all levels are limited in the sub basin. Government extension service is main source. Private extension services like TNAU, Agriculture clinics and Kissan call center can be used.
7	Risk aversion	Only a few farmers have known the risk aversion. Many farmers has no idea about this. Farmers will be educated through trainings, and Demonstrations under Centrally Sponsored Schemes Training will impart all improved package of practices to the farmers and demonstrations will act as teaching floor for all farmers.
8	Limited Processing Units.	Based on the necessity and demands of the farmers, required units will be set up through private entrepreneurs.

9	Availability of labour	To overcome the existing labour problem, required from mechanization like Dripn and Fertigation units, can be introduced for cotton sugarcane and all farm implemnts and equipments can be distributed through subsidy schemes to avail labour unavailability during peak season.
10	Adoption of traditional method of cultivation	Introducing new planting method for sugarcane like pit method and paired two method instead of mound planting, Introducing SIR technique for paddy, Bund/inter/mixed cropping for pulses, paired row planting for cotton will be introduced.

Activities proposed to implement in Aliyar Sub basin of PAP Area

Sl. No.	Name of the Activity	Nos. for 5 years	Cost / Unit L.Rs.	No / Cost for 1st year	No / Cost for 2nd year	No / Cost for 3rd year	No / Cost for 4th year	No / Cost for 5th year	Total cost for 5 years L.Rs.
1.	Demo on Vermi-compost preparation	100	0.200	10 Nos Rs. 2.00	30 Nos LRs. 6.00	20 Nos LRs. 4.00	20 Nos LRs. 4.00	20 Nos LRs. 4.00	100 Nos LRs. 20.000
2.	Demo on Coir pith compost preparation	60	0.020	5 Nos LRs. 0.10	10 Nos LRs. 0.20	15 Nos LRs. 0.30	15 Nos LRs. 0.30	15 Nos LRs. 0.30	60 Nos LRs. 1.200
3.	Demo on Integrated Pest management in Coconut	45	0.046	5 Nos LRs. 0.23	10 Nos LRs. 0.46	10 Nos LRs. 0.46	10 Nos LRs. 0.46	10 Nos LRs. 0.46	45 Nos LRs. 2.070
4.	Demo on Integrated Nutrient management in Coconut	45	0.070	5 Nos LRs. 0.35	10 Nos LRs. 0.70	10 Nos LRs. 0.70	10 Nos LRs. 0.70	10 Nos LRs. 0.70	45 Nos LRs. 3.150
5.	Distn. of MN mixture for coconut	For 2000 Ha. 350 MT	Rs. 35/ kg.	400 Ha. MT 70 LRs. 24.50	400 Ha. MT 70 LRs. 24.50	400 Ha. MT 70 LRs. 24.50	400 Ha. MT 70 LRs. 24.50	400 Ha. MT 70 LRs. 24.50	2000 Ha. 350 MT 122.50 LRs.
6.	Distn. of MN mixture for groundnut	220 Ha.	Rs. 34/ kg.	44 Ha. LRs. 0.187	44 Ha. LRs. 0.187	44 Ha. LRs. 0.187	44 Ha. LRs. 0.187	44 Ha. LRs. 0.187	220 Ha. LRs. 0.935
	TOTAL			**27.367 LRs**	**32.047 LRs**	**30.147 LRs**	**30.147 LRs**	**30.147 LRs**	**149.855 LRs**

DETAILED ESTIMATE FOR EACH ACTIVITY

1) **Demonstration on Vermi compost preparation** :

Vermi composting Demonstration is aimed at educating farmers on organic farming and its technology.

Laying these demonstrations in prominent areas will help to take the technology to a wider range and subsequent adoption.

One unit of vermin composting costs 0.200 LRs.
(detailed estimate for one unit is given below)

Sl.No.	Required Input	Quantity	Rate (Rs.)	Total Cost (Rs.)
1	**To construct shed and beds (Size of bed 6'x3'x3)**	**-**	**-**	**9000**
2	**To purchase sieve**	**1**	**Rs.1000/No.**	**1000**
3	**To purchase pipes**	**2**	**Rs.1000/No.**	**2000**
4	**To prepare Farm Yard Manure**	**10 MT**	**Rs.300/MT**	**3000**
5	**To purchase Earthworms**	**25 kgs**	**Rs.200/ kg**	**5000**
	TOTAL :			**20000**

100% subsidy is proposed in this programme as given in Coconut development board, Cochin

100% subsidy cost will be 20000 LRs.

2) **Demonstration on coirpith compost preparation**

Coir waste is a problem at present for environment and farmers, as it refuses to decay. These demonstrations will educate farmers the know-how of decomposing coir waste and use it as compost for their field.

One unit of coir composting costs 0.020 LRs.

(Detailed estimate for one unit is given below)

Sl.No.	Required Inputs	Quantity	Rate (Rs.)	Total Cost (Rs.)
1	Coconut coir waste	5 MT	Rs.100/MT	500
2	Pleurotus Fungus	25 Bottles	Rs.20 / bottles	500
3	Urea	25 kgs	Rs.5/kg.	125
4	Labour / Transport charges	-	-	875
	TOTAL :			**2000**

100% subsidy is proposed in this programme as given in Coconut development board, Cochin

100% subsidy cost will be 1.200 LRs.

3) Demonstration on Integrated Pest management in Coconut .

Several pests and diseases attack coconut, but Eriophyid Mite infestation is a major problem resulting in reduced yield. To control Eriophyid Mite, balanced nutrition and application of neem cake is recommended which is adopted only by 20% of the farmers due to unawareness. The pher emone trap installation for the control of the regular pests like Rhinoceros beetle and Red palm weevil is also under limited practice. To popularize the plant protection practices IPM Demonstration is the appropriate tool to save crop from pest and disea ses and to get more yield and income.

Unit cost for this programme is 0.046 L.Rs.

Demonstration size : 1 Acre.

a) Pheremone trap for Redpalm Weevil - 1 No. Rs, 250/-

b) Pheremone trap for Rhinocereos Beetle 1 No. Rs. 25 0/-

c) Application of neemcake @ 5 kgs/tree Rs.2695
@ Rs.7.70/kg. (5 kgs. x 7.70 x 70 trees/acre)

d) Application of Trichoderma viride
@ 200 gms./tree.
200 gms x Rs.100/kg.x70 trees / acre Rs.1400

TOTAL : **Rs.4595**

100% subsidy is proposed in this programme as given in Coconut development board, Cochin

100% subsidy cost will be 2.070 LRs.

4) Demonstration on Integrated Nutrient Management in Coconut

Balanced fertilizer application based on the Soil test results for coconut, paddy and other crops is being following by many farmers. Farm Yard Manure, Biofertilizers and Micronutrient are the major components of Integrated Nutrient Management. The cost of availability of the above inputs and awareness about the benefits of INM practices decides the adoption.

Now a days Farm yard manure availability is scarce due to limited catle population. INM also leads to soil health which forms the basis for healthy crop which in turn boosting yield. Excessive use of inorganic fertilizers is the present trend, and an awareness is required to avoid the soil, air and water pollution. Balanced fertilizer application also helps coconut trees to withstand the attack of Eriophyid Mite.

Unit cost for this programme is Rs. 0.70

S.No.	Required Inputs (For one Tree)	Quantity	Rate (Rs.)	Total cost (Rs.)
1	Micronutrient Mixture	1 kg/tree	31.00 /kg	31.00
2	Azospirillum	1 pkt./tree	6.00 /pkt.	6.00
3	Phosphobacteria	1 pkt/tree	6.00 /pkt	6.00
4	Farmyard Manure	50 kgs/tree	0.40 / kg.	20.00
5	Urea	1.2 kgs		27.00
6	Superphosphate	2.0 kgs		
7	Potash	3.5 kgs		
8	Application cost	-	-	10.00
	TOTAL			**100.00**

70 Trees / acre x Rs.100 = Rs.700 0/-

100% subsidy is proposed in this programme as given in Coconut development board, Cochin

100% subsidy cost will be 2.070 LRs.

5) **Distribution of Micronutrient Mixture for coconut**

Micro nutrient deficiency is the major impediment in raising a good coconut crop and harvesting a profitable yield. Such soil deficiency need correction by application of coconut micro-nutrient which is a dedicated problem solver addressing the need directly.

Recommended dose is 1 kg./Tree

Rate of 1 kg. M.N. Mixture = Rs.35.

For one Ha. - 175 trees x Rs.35/ tree = Rs.6125/Ha.

For 2000 Ha. = 2000 x Rs.6125

122.50 L.Rs.

As it is there is no ongoing scheme that gives subsidy for micronutrient distribution. But providing this input with 75% subsidy to th e farmers will encourage its use widely. For the input cost of Rs.6125 per Ha. a subsidy of Rs.3060 may be given.

75% cost (subsidy)	-	91.875 L.Rs.
25% cost (farmer's cont)	-	30.625 L.Rs.
Total cost	**-**	**122.500 L.Rs.**

6) Distribution of Micronutrient Mixture for Groundnut

Deficiency of micro nutrients in many areas of this ayacut results in ill filled pods and pods with poor oil content. Application of micronutrients will solve the problem.

Recommended dose is 12.50 kgs. per Hectare.

Rate of 1 kg. M. N Mixture is Rs.34

For One Ha. 12..50 kgs x Rs.34/kg x 220 Ha.

= **0.935 L.Rs.**

As it is there is no ongoing scheme that gives subsidy for micronutrient distribution. But providing this input with 75% subsidy to the farmers will encourage its use widely. For the input cost of Rs.425 per Ha. a subsidy of Rs.210 may be given.

75% cost (subsidy)	-	0.701 L.Rs.
25% cost (farmer's cont)	-	0.234 L.Rs.
Total cost	**-**	**0.935 L.Rs.**

Firka level programme for proposed demonstrations:

Sl. No.	Developmental components of activities	Nos.	Block				
			Anaimalai			Pollachi (N)	Pollachi (S)
			Firkas				
			Anaimalai	Kottur	M.N. palayam	Rama-pattinam	Pollachi (S)
1.	Demo of vermicompost preparation	100	25	20	15	20	20
2	Demo of coirpith compost preparation	60	15	15	10	10	10
3	Demo of Integrated Pest Management in Coconut	45	20	5	5	8	7
4	Demo of Integrated Nutrient Management in Coconut	45	10	10	10	8	7
5.	Distn. of MN mixture for coconut	2000 Ha.	500	450	450	300	300
6.	Distn. of MN mixture for groundnut	220 Ha.	30	25	15	75	75

TAMIL NADU IAMWARM PROJECT

PAB BASIN - ALIYAR SUB BASIN : INPUT REQUIREMENT

VERMICOMPOST DEMONSTRATION

Sl. No.	Details of Inputs	Ist year				II year					
		MAY		DECEMBER		JUNE		OCTOBER		FEBRUARY	
		Physi-cal	Lakh Rs.	Physi-cal	Lakh Rs.	Physi-cal	Lakh Rs.	Physi-cal	Lakh Rs.	Physi-cal	Lakh Rs.
1	Constructing of shed and beds (Rs.9000/Unit)	5 Nos	0.450	5 Nos	0.450	10 Nos	0.900	10 Nos	0.900	10 Nos	0.900
2	Purchase of Sieves (1 Demonstration) (Rs.1000/Nos.)	5 Nos	0.050	5 Nos.	0.05	10 Nos.	0.100	10 Nos	0.100	10 Nos	0.100
3	Purchase of pipe (2 Demonstration) (Rs.1000/Nos.)	10 Nos.	0.100	10 Nos	0.100	20 Nos.	0.200	20 Nos.	0.200	20 Nos.	0.200

4	Purchase of Farm Yard Manure (10 MT/Demonstration (Rs.300/MT)	50 Mt	0.150	15 MT	0.150	100 MT	0.300	100 MT	0.300	100 MT	0.300
5	Purchase of Earthworms (25 kgs/Demonstration) (Rs.200/kg)	125 kgs.	0.250	125 kgs	0.250	250 kgs.	0.500	250 kgs.	0.500	250 kgs	0.500
		5 Demos.	1.000	5 Demos.	1.000	10 Demos	2.000	10 Demos	2.000	10 Demos	2.000

Sl. No.	Details of Inputs	IIIrd year				IVth year			
		JULY		NOVEMBER		AUGUST		DECEMBER	
		Physi-cal	Lakh Rs.	Physi-cal	Lakh Rs.	Physi-cal	Lakh Rs.	Physi-cal	Lakh Rs.
1	Constructing of shed and beds (Rs.9000/Unit)	10 Nos	0.900	10 Nos	0.900	10 Nos	0.900	10 Nos	0.900
2	Purchase of Sieves (1 Demonstration) (Rs.1000/Nos.)	10 Nos	0.100	10 Nos	0.100	10 Nos	0.100	10 Nos	0.100
3	Purchase of pipe (2 Demonstration) (Rs.1000/Nos.)	20 Nos	0.200	20 Nos	0.200	20 Nos	0.200	20 Nos	0.200
4	Purchase of Farm Yard Manure (10 MT/Demonstration (Rs.300/MT)	100 MT	0.300	100 MT	0.300	100 MT	0.300	100 MT	0.300
5	Purchase of Earthworms (25 kgs/Demonstration) (Rs.200/kg)	250 kgs	0.500	250 kgs	0.500	250 kgs	0.500	250 kgs	0.500
		10 Demos	2.000	10 Demos	2.000	10 Demos	2.000	10 Demos	2.000

Sl. No.	Details of Inputs	V th Year				TOTAL	
		JUNE		NOVEMBER			
		Physi-cal	Lakh Rs.	Physi-cal	Lakh Rs.	Physi-cal	Lakh Rs.
1	Constructing of shed and beds (Rs.9000/Unit)	10 Nos	0.900	10 Nos	0.900	100 Nos	9.000
2	Purchase of Sieves (1 Demonstration) (Rs.1000/Nos.)	10 Nos	0.100	10 Nos	0.100	100 No.	1.000
3	Purchase of pipe (2 Demonstration) (Rs.1000/Nos.)	20 Nos	0.200	20 Nos	0.200	200 Nos.	2.00
4	Purchase of Farm Yard Manure (10 MT/Demonstration (Rs.300/MT)	100 MT	0.300	100 MT	0.300	1000 MT	3.00
5	Purchase of Earthworms (25 kgs/Demonstration) (Rs.200/kg)	250 kgs	0.500	250 kgs	0.500	2500 kgs.	5.00
	TOTAL	10 Demos	2.00	10 Demos	2.00	100 Demos.	20.00

TAMIL NADU IAMWARM PROJECT

PAB BASIN - ALIYAR SUB BASIN : INPUT REQUIREMENT

COIRPITH COMPOSTING DEMONSTRATIONS

Sl. No.	Details of Inputs	Ist year									
		JUNE		AUGUST		OCTOBER		DECEMBER		JANUARY	
		Physi-cal	Lakh Rs.	Physi-cal	Lakh Rs.	Physi-cal	Lakh Rs.	Physi-cal	Lakh Rs.	Physi-cal	Lakh Rs.
1	Coconut Coir waste (5 MT/Demonstration) (Rs.100/MT)	5 MT	0.005	5 MT	0.005	5 MT.	0.005	5 MT.	0.005	5 MT.	0.005
2	Pleurotus Fungus (25 Bottles/Demonstration) (Rs.20/Bottle)	25 Nos.	0.005	25 Nos.	0.005	25 Nos.	0.005	25 Nos.	0.005	25 Nos.	0.005
3	Urea (25 kgs/Demonstration) (Rs.5/kg)	25 kgs.	0.00125	25 kgs.	0.00125`	25 kgs.	0.00125	25 kgs.	0.00125	25kg	0.00125
4	Labour / Transport charges.	-	0.00875	-	0.00875	-	0.00875	-	0.00875	-	0.00875
	TOTAL :	1Demo.	0.020	1 Demo.	0.020	1 Demo.	0.020	1 Demo.	0.020	1Demo.	0.020

Sl. No.	Details of Inputs	IIYear				III Year			
		JUNE		SEPEMBER		MAY		OCTOBER	
		Physi-cal	Lakh Rs.	Physi-cal	Lakh Rs.	Physi-cal	Lakh Rs.	Physi-cal	Lakh Rs.
1	Coconut Coir waste (5 MT/Demonstration) (Rs.100/MT)	25 MT.	0.025	25 MT.	0.025	25 MT	0.025	50MT	0.050
2	Pleurotus Fungus (25 Bottles/Demonstration) (Rs.20/Bottle)	125Nos	0.025	125Nos	0.025	125 Nos	0.025	250Nos	0.050
3	Urea (25 kgs/Demonstration) (Rs.5/kg)	125kgs	0.00625	125kgs	0.00625	125Nos	0.00625	250Kgs	0.0125
4	Labour / Transport charges.	-	0.04375	-	0.04375	-	0.04375	-	0.0875
	TOTAL :	5Demo	0.100	5Demo.	0.100	5Demo.	0.100	10Dem	0.200

Sl. No.	Details of Inputs	IV YEAR				V. YEAR		**TOTAL**	
		JULY		NOVEMBER		SEPTEMBER			
		Physi-cal	Lakh Rs.	Physi-cal	Lakh Rs.	Physi-cal	Lakh Rs.	Physi-cal	Lakh Rs.
1	Coconut Coir waste (5 MT/Demonstration) (Rs.100/MT)	50 MT	0.050	25MT	0.025	75MT.	0.075	300MT	0.300
2	Pleurotus Fungus (25 Bottles/Demonstration) (Rs.20/Bottle)	250Nos	0.050	125Nos	0.025	375Nos	0.075	1500 Nos.	0.300
3	Urea (25 kgs/Demonstration) (Rs.5/kg)	250kgs	0.013	125kg	0.00625	375kgs	0.01875	1500 kgs.	0.075
4	Labour / Transport charges.	-	0.088	-	0.04375	-	0.13125	-	0.525
	TOTAL :	10Dem.	0.200	5Dem.	0.100	15Dem	0.300	60Demos.	1.200

TAMIL NADU IAMWARM PROJECT

PAB BASIN - ALIYAR SUB BASIN : INPUT REQUIREMENT

IPM DEMONSTRATION IN COCONUT (1 Acre Demonstration)

Sl. No.	Details of Inputs	I. Year		II Year				III Year			
		JUNE		JULY		NOVEMBER		JUNE		SEPTEMBER	
		Physical	Lakh Rs.	Physical	Lakh Rs.	Physical	Lakh Rs.	Physical	Lakh Rs.	Physical	Lakh Rs.
1	Pheromone Traps for Redpalm Weevil (1/plot)(Rs.250/N.)	5 Nos.	0.0125	5Nos.	0.0125	5 Nos.	0.0125	5 nos.	0.0125	5 Nos.	0.0125
2	Pheromone Traps for Rhinoceros Beetle (1/plot)(Rs.250/No.)	5 Nos.	0.0125	5 Nos.	0.0125	5 Nos.	0.0125	5 Nos.	0.0125	5 Nos.	0.0125
3	Neem cake (5 kgs/tree) (Rs.7.70kg.)	1750kgs	0.13475	1750kgs.	0.13475	1750kgs.	0.13475	1750kgs	0.13475	1750kgs.	0.13475
4	Trichoderma viride (200 gms/tree) (Rs.100/kg.)	70kgs	0.070	70kgs.	0.070	70kgs.	0.070	70kgs	0.070	70kgs	0.070
	TOTAL :	5Demon.	0.2298	5 Dmn.	0.2298	5 Demn.	0.2298	5 demos	0.2298	5 Demn.	0.2298

Sl. No.	Details of Inputs	IV. Year				V Year				TOTAL	
		OCTOBER		FEBRUARY		MAY		JANUARY			
		Physi-cal	Lakh Rs.	Physi-cal	Lakh Rs.	Physi-cal	Lakh Rs.	Physi-cal	Lakh Rs.	Physi-cal	Lakh Rs.
1	Pheromone Traps for Redpalm Weevil (1/plot)(Rs.250/N.)	5 Nos.	0.0125	5 Nos.	0.0125	5 Nos.	0.0125	5 Nos	0.0125	45 Nos	0.1125
2	Pheromone Traps for Rhinoceros Beetle (1/plot)(Rs.250/No.)	5 Nos.	0.0125	5 nos.	0.0125	5 Nos.	0.0125	5Nos.	0.0125	45Nos	0.1125
3	Neem cake (5 kgs/tree) (Rs.7.70kg.)	1750 kgs.	0.13475	1750kgs.	0.13475	1750kgs	0.13475	1750 kgs	0.13475	15750kgs	1.21275
4	Trichoderma viride (200 gms/tree) (Rs.100/kg.)	70kgs	0.070	70kgs.	0.070	70kgs.	0.070	70kgs.	0.070	630kgs.	0.630
	TOTAL :	5Demos.	0.2298	5 Demos	0.2298	5 Demos	0.2298	5 Demos	0.2298	45Demos	2.06775

PAB BASIN - ALIYAR SUB BASIN : INPUT REQUIREMENT

INM DEMONSTRATION IN COCONUT (1 ACRE DEMONSTRATION

Sl. No.	Details of Inputs	I. Year JUNE		II Year AUGUST		JANUARY		III Year JULY		DECEMBER	
		Physical	Lakh Rs.	Physical	Lakh Rs.	Physical	Lakh Rs.	Physical	Lakh Rs.	Physical	Lakh Rs.
1	M.N.Mixture (1 kg/tree)(Rs.31/kg.)	0.350 MT	0.1085	0.350 MT	0.1085	0.350 MT	0.1085	0.350 MT	0.1085	0.350 MT	0.1085
2	Azospirillem + Phosphobacteria (1+1 Pkt/tree) (Rs.6/plot)	700 Nos.	0.0420	700 Nos.	0.0420	700 Nos.	0.0420	700 Nos.	0.0420	700 Nos.	0.0420
3	Farm Yard Manure (50 kg/tree) (Rs.0.40/kg.)	17.50 MT	0.0700	17.50 MT	0.0700	17.50 MT	0.0700	17.50 MT	0.0700	17.50 MT	0.0700
4	Urea (1.2 kgs/tre)	0.420 MT	0.0945	0.420 MT	0.0945	0.420 MT	0.0945	0.420 MT	0.0945	0.420 MT	0.0945
5	Superphosphate (2.0 kgs/tree)	0.700 MT		0.700 MT		0.700 MT		0.700 MT		0.700 MT	
6	Mureate of Potash (3.5 kgs/tree)	1.225 MT		1.225 MT		1.225 MT		1.225 MT		1.225 MT	
7	Application cost	-	0.0350	-	0.0350	-	0.0350	-	0.0350	-	0.0350
	TOTAL	5 Demonst-rations.	0.350	5 Demonst-rations.	0.350	5 Demonst-rations.	0.350	0.350 Demonst-rations.	0.350	5 Demonst-rations.	0.350

Sl. No.	Details of Inputs	IV. Year				V Year				TOTAL	
		SEPTEMBER		FEBRUARY		JUNE		NOVEMBER			
		Physical	Lakh Rs.	Physical	Lakh Rs.	Physical	Lakh Rs.	Physical	Lakh Rs.	Physical	Lakh Rs.
1	M.N.Mixture (1 kg/tree)(Rs.31/kg.)	0.350 MT	0.1085	0.350 MT	0.1085	0.350 MT	0.1085	0.350 MT	0.1085	3.150	0.9765
2	Azospirillem + Phosphobacteria (1+1 Pkt/tree) (Rs.6/plot)	700 Nos.	0.0420	700 Nos.	0.0420	700 Nos.	0.0420	700 Nos.	0.0420	6300 Nos.	0.378
3	Farm Yard Manure (50 kg/tree) (Rs.0.40/kg.)	17.50 MT	0.0700	17.50 MT	0.0700	17.50 MT	0.0700	17.50 MT	0.0700	157.500	0.630
4	Urea (1.2 kgs/tre)	0.420 MT		0.420 MT		0.420 MT		0.420 MT		3.780 MT	
5	Superphosphate (2.0 kgs/tree)	0.700 MT	0.0945	0.700 MT	0.0945	0.700 MT	0.0945	0.700 MT	0.0945	6.300 MT	0.85
6	Mureate of Potash (3.5 kgs/tree)	1.225 MT		1.225 MT		1.225 MT		1.225 MT		11.025	
7	Application cost	-	0.0350	-	0.0350	-	0.0350	-	0.0350	-	0.3150
	TOTAL	5 Demonst-rations.	0.350	5 Demonst-rations.	0.350	5 Demonst-rations.	0.350	5 Demonst-rations.	0.350	45 Demonst-rations.	3.150

TAMIL NADU IAMWARM PROJECT

PAB BASIN - ALIYAR SUB BASIN : INPUT REQUIREMENT

DISTRIBUTION OF MICONUTRIENT MIXTURE FOR COCONUT

Sl. No.	Details	Year	FEBRUARY		JULY		NOVEMBER		DECEMBER		TOTAL	
			Physi-cal	Lakh Rs.	Physi-cal	Lakh Rs.	Physi-cal	Lakh Rs.	Physi-cal	Lakh Rs.	Physi-cal	Lakh Rs.
1	Coconut MN-Mixture	Ist Year			35 MT	12.25			35 MT	12.25	70 MT	24.50
2	Coconut MN-Mixture	2nd year			35 MT	12.25			35 MT	12.25	70 MT	24.50
3	Coconut MN-Mixture	3rd year			35 MT	12.25			35 MT	12.25	70 MT	24.50
4	Coconut MN-Mixture	4th year			35 MT	12.25			35 MT	12.25	70 MT	24.50
5	Coconut MN-Mixture	5th year			35 MT	12.25			35 MT	12.25	70 MT	24.50
	TOTAL:				175 MT	61.25			175 MT	61.25	375 MT	122.50

TAMILNADU IAMWARM PROJECT

PAP BASIN - ALIYAR SUB BASIN -INPUT REQUIREMENT

DISTRIBUTION OF MICRONUTRIENT FOR GROUNDNUT

Sl. No.	Details	Year	FEBRUARY		NOVEMBER		TOTAL	
			Physi-cal	Lakh Rs.	Physi-cal	Lakh Rs.	Physi-cal	Lakh Rs.
1	Groundnut MN-Mixture	Ist Year	0.250 MT	0.085	0.300 MT	0.102	0.55	0.187
2	Groundnut MN-Mixture	2nd year	0.250 MT	0.085	0.300 MT	0.102	0.55	0.187
3	Groundnut MN-Mixture	3rd year	0.250 MT	0.085	0.300 MT	0.102	0.55	0.187
4	Groundnut MN-Mixture	4th year	0.250 MT	0.085	0.300 MT	0.102	0.55	0.187
5	Groundnut MN-Mixture	5th year	0.250 MT	0.085	0.300 MT	0.102	0.55	0.187
	TOTAL :		1.250 MT	0.425	1.50	0.51	2.75	0.935

ANIMAL HUSBANDRY DEPARTMENT

ANIMAL HUSBANDRY

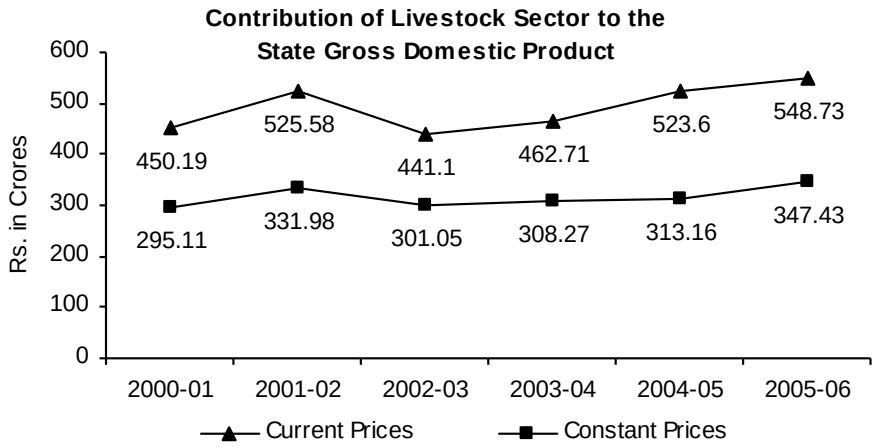
1. INTRODUCTION

1.1 Our State being an agricultural based economy with more than 60% of the people engaged in animal husbandry, agriculture and allied activities, it forms the backbone of the rural economy. Animal husbandry contributes significantly in supplementing the income of small, marginal farmers and landless labourers many of whom are women who play a major role in the care and management of livestock. Livestock is not only an important source of income to the rural poor but also helps them sustain their livelihood in times of drought and famine. Livestock provide a diverse range of output varying from draught power and organic manure for agriculture, self employment throughout the year especially for women as well as direct production of milk, meat and eggs for human food.

1.2 The contribution of livestock sector to the food basket in the form of milk, eggs and meat to the State has been impressive in fulfilling the animal protein requirement of ever growing human population. The estimated milk production which was 37.91 lakh MT during 1995-96 has increased to 54.74 lakh MT during 2005-06. Similarly the egg production during the same period has increased from 3,048 million numbers to 6,223 million numbers. During the same period, the per capita availability of milk per day went up from 185 gms to 234 grms and eggs per annum from 54 numbers to 97 numbers respectively. The average growth rate of milk and egg during the last decade is 4.4% and 10.4% respectively. According to advance estimates (provisional), the contribution of livestock sector to the Gross State Domestic Product has increased from Rs.523.60 crores during 2004-05 to Rs.548.73 crores during 2005-06, an increase of 4.8%.

Year	Current Prices (In crores)						Constant Prices (In crores)					
	Gross State Domestic Product	GSDP for Agriculture & Allied Activities	GSDP for Livestock Sector	%age Share of Agriculture & Allied Activities to GSDP	%age Share of Livestock Sector to GSDP	%age Share of Livestock Sector to Agriculture	Gross State Domestic Product	GSDP for Agriculture & Allied Activities	GSDP for Livestock Sector	%age Share of Agriculture & Allied Activities to GSDP	%age Share of Livestock Sector to GSDP	%age Share of Livestock Sector to Agriculture
2000-01	14109.98	2042.56	450.19	14.48	3.19	22.04	9101.07	1457.73	295.11	16.02	3.24	20.24
2001-02	14355.54	2056.09	525.58	14.32	3.66	25.56	8901.06	1457.22	331.98	16.37	3.73	22.78
2002-03	15509.93	1646.51	441.10	10.62	2.84	26.79	9170.32	1111.75	301.05	12.12	3.28	27.08
2003-04	16845.72	1700.21	462.71	10.09	2.75	27.21	9495.10	1081.96	308.27	11.39	3.25	28.49
2004-05	18892.11	2025.73	523.60	10.72	2.77	25.85	10324.84	1252.74	313.16	12.13	3.03	25.00
2005-06	20750.28	2097.25	548.73	10.11	2.64	26.16	11198.15	1305.98	347.43	11.66	3.10	26.60

2003-04 : Quick estimates *2004-05 : Advance estimates* *2005-06 : Advance estimates(provisional)*



1.3 Animal husbandry having a high potential for growth, its hidden potential needs to be explored as this can provide the much needed gainful employment opportunities to the weaker sections of the society and can contribute significantly in regeneration of the rural economy. Animal husbandry can ensure a better quality of life for the rural farmer by not only providing sustainable employment at their location itself but can also act as assets or rural currencie s. Animal husbandry thus can act as a powerful instrument for the comprehensive socio-economic transformation of the rural people and can act as an engine for growth and trigger the economy by its multiplying effects.

2. PRESENT STATE SCENARIO

2.1 Tamil Nadu is home to 91.41 lakhs head of cattle, 16.58 lakhs buffaloes, 55.93 lakhs sheep, 81.77 lakhs goats besides 3.21 lakhs pigs and 865.91 lakhs poultry as per the 17th livestock and poultry census. The livestock ownership is more evenly distributed among landless labourers, small and marginal farmers and livestock production systems are based on low cost agro-by-products as nutritional inputs.

2.2 Veterinary assistance, health cover and breeding support to the livestock and poultry in the State is provided by 1,323 Government graduate veterinary institutions. The National Commission on Agriculture has suggested one veterinarian for every 5000 cattle units by the year 2000 A.D. whereas the present scenario is one veterinarian for every 10,000 cattle units. In addition 1,799 subcentres provide first aid and breeding support. Feed and fodder are the major limiting factors in enhancing farm animal productivity. But in the State a huge gap of around 47% exists between the requirement and availability of green fodder. Though farmers are well aware of the artificial insemination programme, their awareness level on best and latest animal husbandry practices, know-how on emerging new diseases and their control are not up to the excepted level. More over with changing global scenario, the knowledge level of the veterinarians and para-veterinarians needs to be updated frequently to take the technology instantaneously to the end users - the farmers.

2.3 Though the State is endowed with large livestock population, the breedable age females covered through artificial insemination is only 30-35%. The conception rate under field conditions ranges from 35-40%. This is due to a mixture of various factors like low nutritional status, improper time of insemination and stress due to walking the animals for long distances to the institutions for artificial insemination, shortage of feed and fodder, prevalence of endemic livestock diseases. In the State, the per day average productivity of a non-descript and crossbred cattle is 2.73 kgs.. and 6.27 kgs. respectively and that of a buffalo is 4.16 kgs. which is much below the expected yield. The productivity can be enhanced by adopting good management practices, feeding practices, bio security measures, effective disease prevention measures, etc.

3. SCENARIO IN THE ALIYAR SUB BASIN

Live stock Population

Cattle	Buffalo	Sheep	Goat	Poultry
31628	4954	5923	26106	338209

Breedable age Female Population

Crossbred Cattle	Non Descriptive cattle	Buffalo	Total
14060	287	2705	17052

Infrastructure and Man power in Government Veterinary Institutions

No. of Veterinary Institutions		Veterinary institutions filled up	
Graduate Institutions	Subcentres	Graduate Institutions	Subcentres
6	10	5	9

Average Per Day Milk Yield per anim al

Crossbred Cattle	Non Descriptive cattle	Buffalo
7.162	3.127	4.164

Milk Procurement

Milk cooperative societies	Present milk procurement (LlPD)	Milk Procured by Aavin (LPD)
27	25,500	10,000

4. Constraints, Challenges and Counter measures proposed :

S. No.	Constraints & Challenges	Countermeasures Proposed
1.	Remote villages and villages situated far away from the Government Veterinary Institutions are not getting sufficient veterinary services like veterinary health cover and artificial insemination facilities	The establishment of sub basin veterinary unit will ensure delivery of veterinary services at the farmer's door steps or nearest to the farmer's in remote villages and unserviced villages of the sub basin area. Provision of veterinary health cover and artificial insemination are the main works at the farmer's door steps. The unemployed veterinary graduate will be given an entrepreneurship training to establish a Sub basin veterinary unit (details enclosed vide para 6.1 of page 6) in the sub basin area and disseminate best animal husbandry practices for his earnings and to upgrade animal husbandry practices of farmers in the sub basin area.
2.	Lack of upgraded infrastructure at the Government Institutions leading to constraints in delivery of quality veterinary services.	The Government Veterinary Institutions in the sub basin will be provided with additional essential equipments (details enclosed vide para 6.2.a. & 6.2.b. of page 9 & 10) to deliver quality veterinary services in the sub basin. In addition one veterinary dispensary (details enclosed vide para 6.2.c. of page 10) will be upgraded as referral institution for quick and accurate diagnosis of diseases and help in timely treatment thereby preventing economic loss to the farmers.

S. No.	Constraints & Challenges	Countermeasures Proposed
3.	There is a vide gap between the requirement and availability of green fodder needed for the livestock in the sub basin.	To reduce the gap between the requirement and availability of green fodder in the sub basin, it is proposed to cultivate CO3 fodder in 150 hectares of private lands, (details enclosed vide para 6.3.(d). of page 10) as a part of cropping plan.
4.	Main problem affecting the fertility in cross bred cattle is infertility leading to loss of milk production days, ultimately leading to loss to the farmers.	To overcome the infertility problems, infertility cum total health cover camps (details enclosed vide para 6.4.(b) of page 13) are proposed. The animals having infertility problems will be identified and treated. In addition, mineral mixture supplement (details enclosed vide para 6.4.(c) of page 13) will be given to rectify the defects.
5.	Lack of adequate know-how about the livestock management practices like feeding, breeding, health care and deworming activities.	The farmers in the sub basin will be given training (details enclosed vide para 6.5.a. of page 15) on best livestock management practices in livestock breeding activities like signs of oestrum, correct time of artificial insemination, deworming, feeding schedule and other health care measures. In addition, IEC materials will be distributed to farmers in the sub basin. More over hoardings and wall paintings depicting signs of commonly affecting diseases will be erected in places where people congregate in large numbers. Apart from this, quarterly night meetings will be conducted to disseminate information to the farmers in the sub basin. (details enclosed vide para 6.4.(d) of page 14)

S. No.	Constraints & Challenges	Countermeasures Proposed
6.	Lack of update knowledge and skills of the veterinarians and para-veterinarians in the project area.	Veterinarians in the project area will be given trainers training (details enclosed vide para 6.5.(d) of page 16) at Veterinary Colleges to update and refresh their skills and knowledge. They will inturn train the para-veterinarians.

5. OBJECTIVES OF THE PROJECT

5.1 With this background, the main objective of the Animal Husbandry Department will be to intervene in all possible ways utilising the resources to the maximum to improve the production potentialities of the livestock in the sub basin through multi disciplinary approach.

The main interventions will be:

- Productivity enhancement by improving delivery of veterinary services in the project area at the Government and private level.
- Increasing availability of green fodder and other fodder for s ustenance.
- Conducting various out reach programmes to enhance productivity.
- Enhancing the knowledge level of human resource in the project area.

5.2 With the above interventions, not only the crossbred population in the sub basin is expected to rise but also the disease outbreaks will be kept under control. Moreover systematic and periodical deworming will lead to a 10% increase in weight gain, thereby increasing the total meat yield per animal. More over the various out reach programmes and enhancing th e knowledge level in the sub basin area will lead to better animal husbandry practices. Thus ultimately, the per animal milk yield is expected to increase from 7.16 lts to 8 litres in crossbred, from 3.12 lts to 3.7 litres in indigenous and from 4.16 lts t o 5 litres in buffaloes, leading to increased total farm income.

6. Productivity enhancement by improving delivery of veterinary services in the project area at the Government and private level.

6.1 Establishment of Sub basin Veterinary Units.

6.1.(a) Though there are 6 graduate veterinary institutions and 10 subcentres operating in the project area, there is still large livestock populations uncovered which is mainly due to the geographical terrain and distance these villages are located from the institutions. In this project, the main aim will be to provide effective veterinary cover and breeding support to these villages at their door steps by establishing Sub basin Veterinary Unit. The main criteria for establishing the unit will be livestock po pulation in the unserviced area. Hence to provide effective services in these unserved areas, it is planned to establish a Sub basin Veterinary Unit in the Project area.

6.1.(b) The details of Sub basin Veterinary Unit to be established, their coverage villages with distance and nearest Government Veterinary institution is furnished below.

Name of the Sub basin :			Aliyar Basin	
Total number units in Aliyar basin :			1	
Name of the Sub basin Veterinary Unit :			Arasur	
Sl. No.	Name of Villages to be Covered	Distance from the Unit (In Kms.)	Nearest Govt. Institution	Distance from the village to Govt. inst. (In Kms)
1.	Arasur	0	K.Malayandipattinam	7
2.	Manjanaickanur	2	K.Malayandipattinam	7
3.	Kariyanchettipalayam	2	K.Malayandipattinam	8
4.	Gurusamiyur	4	K.Malayandipattinam	10
5.	Goundappanur	4	K.Malayandipattinam	10
6.	Poovalaparthy	5	K.Malayandipattinam	8
7.	Jallipatty	3	K.Malayandipattinam	8
8.	Vedasandur	4	K.Malayandipattinam	4
9	Thensengampalayam	8	K.Malayandipattinam	4

10	Arthanaripalayam	7	K.Malayandipattinam	4
11	Thensithur	7	K.Malayandipattinam	5
12	Ponnalammanthurai	12	K.Malayandipattinam	6
13	Peddanaickanur	10	K.Malayandipattinam	6
14	Paramadayur	10	K.Malayandipattinam	8
15	Ramanamudalipudur	9	K.Malayandipattinam	7

Villages 1 to 5	Mondays & Thursdays
Villages 6 to 10	Tuesdays & Fridays
Villages 11 to 15	Wednesdays & Saturdays
Sundays will be a reserve day in which IEC campaigns will be conducted. In addition if any villages are left out during the week, it will be covered on t he reserve day.	

Arasur village is about 7 kms from the nearest Veterinary institution namely Veterinary Dispensary, K.Malayandipattinam. There are about 14 villages situated in and around Arasur that are not covered by the Government Veterinary Institution. Further the breedable female population in and around Arasur that is untapped by the Government veterinary institution is around 3,223. Hence Arasur village is fixed as the headquarters of the Sub basin Veterinary Unit.

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6.1.(c) An unemployed Veterinary Graduate who will be designated as Sub basin Veterinary Extension Officer will mann each Unit. He will be given one month entrepreneurship training at renowned national institutions like IRMA / NDDB. On completion of this training, the Animal Husbandry Department will give him 5 days orientation training in the nearest veterinary institution. The orientation training will be an over view of the departmental organisation and structure, duties and role of officers, disease endemicity and farmers know-how in the area.

6.1.(d) On completion of training, the unemployed veterinary graduate selected will be a given a two wheeler. The two wheeler vehicle will be the property of the Water Users Association. He will be located in the Water Users Association building, which will be his headquarters. He will prepare a weekly route map in consultation with Animal Husbandry Department, Water Users Association and

local village panchayats for providing veterinary services. He will visit the villages as per the scheduled programme and provide veterinary services like vaccination, deworming, castration and treatment and breeding support like artificial insemination and pregnancy diagnosis. The route will be reviewed and assessed for intake of the veterinary services by the end users once in 3 months and suitable alterations if necessary will be made. Flexibility will be given to change the tour programme based on need. The unit will be under the technical control of the Animal Husbandry Department. The sub basin veterinary extension officer will computerize all records regarding artificial insemination like date of artificial insemination done, straw used, sire yield, date of follow up for conception, etc.

6.1.(e) To provide breeding support by artificial inseminati on necessary inputs like LN2 containers (a 35 lit. and 3 lit.), artificial insemination guns, thawing flasks and straw cutters (one set) will be provided. The funds for the above inputs (LN2 containers, artificial insemination guns, thawing flasks and str aw cutters) will be sourced from Tamilnadu Livestock Development Agency (TNLDA). The unit will also be provided with other equipments like microscope, centrifuge, etc. for carrying out preliminary disease diagnosis. Other inputs for breeding like LN2 and frozen semen straws will also be provided for carrying out services at the farmers door step. The unit will also be provided with dewormers, essential surgical items like cotton, guage, catguts, intra-uterine infusions, etc., which will be procured from Tamilnadu Medical Services Corporation (TNMSC) for providing veterinary services. In addition a one time revolving fund of Rs.10,000/ - will be provided to the Water Users Association. The above fund will be utilised for stocking of medicines and injectables as per the requirement of the Sub basin Veterinary extension officer. The fund for the above will be sourced from the project. The Animal Husbandry Department will ensure supply of vaccines like Hemorrhagic septicemia, Black quarter, Anthrax, Enterotoxaemi a and Sheep pox free of cost for carrying out vaccination in the unit's service area. The Regional Joint Director of Animal Husbandry will be the facilitator for purchase of the above items from TNMSC and will also ensure prompt supply of vaccines.

6.1.(f) The veterinarian will be allowed to collect fees for the artificial insemination and he will remit Rs.25/- per insemination to the Water Users Association and keep the remaining for himself as service charges. In addition, he can collect a nominal fee of Rs.50/- for minor treatments and Rs.100/- for major treatments as professional charges for himself. The cost of medicines utilised for treatment will be borne by the farmer. However if the farmer prefers, the sub basin veterinary extension officer can utilise the medicines and injectables available with the Water Users Association and collect additional charges for medicines utilised which will be remitted to the Water Users Association. The above amount remitted will be used as revolving fund for purchase of medicines. To ensure a wider coverage with increased conception rate, a performance linked incentive for every calf born out of inseminations done by the Unit will be factored, wherein a sum of Rs.25/- will be given during first year and there after a decrease of Rs.5/- per year. The amount remitted by the unit to the Water Users Association will be kept as seed money for sourcing inputs for sustainably running the unit after withdrawal of funds by the lending agency for the project.

6.1.(g) Each unit will be established at a total cost of Rs.5.73 lakhs for 5 years in which Rs.0.99 lakhs will be non-recurring and Rs.4.74 lakhs will be recurring cost. The financial details and number of units to be established in each river basin is furnished below

FINANCIAL COST FOR ESTABLISHMENT OF ONE SUB BASIN VETERINARY UNIT

(In Rs.)

	NON-RECURRING EXPENDITURE/UNIT	1st yr. Rs.					
1	Cost of one 35 lts and 3 lts LN2 container Rs.18,000/- (will be sourced from TNLDA)	0					
2	Cost of A.I. Gun, thawing flask and straw cutter Rs.1000/- (will be sourced from TNLDA)	0					
3	Purchase of two wheeler and accessories	50000					
4	Cost of other equipments like centrifuge, castrator, etc.	14000					
5	Binocular Microscope	15000					
6	Purchase of furniture, stc	10000					
7	One time revolving fund for purchase of medicines	10000					
	Total	**99000**					

	RECURRING EXPENDITURE/UNIT	I Year	II Year	III Year	IV Year	V Year	Total cost (In Rs.)
1	Cost of straws @ Rs.15/straw at the rate of 2400/1st yr, 2700/2nd yr, 3000/3rd yr, 3360/4th yr & 3840/5th yr.	36000	40500	45000	50400	57600	**229500**
2	LN2 @ 250 Lit/year @ Rs.26/lit for I year and there after an increase of Rs.1/- per year	6500	6750	7000	7250	7500	**35000**
3	Cost of basic medicines, infusions and surgical items @ Rs.20,000/annum	20000	20000	20000	20000	20000	**100000**
4	Incentive for the veterinarian for each calf born @ Rs.25/- yr and there after an decrease of Rs.5/- per year	4000	19600	16500	12240	6880	**59220**
5	Miscellaneous Charges for chemicals, glasswares, etc.	10000	10000	10000	10000	10000	**50000**
	Total	**76500**	**96850**	**98500**	**99890**	**101980**	**473720**
	Recurring Expenditure for 5 years			**473720**			
	Total (Recurring + Non-recurring)			**572720**			

6.1.(g) The above endeavor will ensure that areas hitherto unserviced are covered qualitatively by increased breeding cover via artificial insemination coverage, health cover by timely vaccination, deworming and treatment. This will ensure proper disease control and livestock with better genetic potentialities which will lead to increased productivity per animal thereby ultimately leading to better profits between farmers in the project area.

6.2 Improving the essential infrastructure in the Government in stitutions in the project area.

6.2. (a).1 Graduate Institutions: A good and well-equipped infrastructure is the key to an all round growth and development. There are 6 graduate veterinary institutions and 10 subcentres functioning under the Government f old in the project area. The infrastructure in the graduate veterinary institutions are being strengthened at a cost of Rs.33,000/- per Graduate Institution. The infrastructure that are to be added in each Graduate Institution are Mouth Gag, dentist autoc lave, mastitis detector, etc. The 6 institutions will be strengthened at a cost of Rs.1.98 Lakhs.

6.2.(a).2 Mouth gag will help in better diagnosis, dentist autoclave will be handy which can be carried to field for sterilization of equipments, instrum ents used in routine Veterinary practice while mastitis detector will be useful for detection of sub clinical and clinical mastitis – a disease that causes reduction in milk yield, loss of productive days and prolonged recovery time. The animal does not achieve the peak productivity after Mastitis, the early detection of which will prevent huge economic losses to the farmers. All these measures will help in effective delivery of Veterinary services and early diagnosis and facilitate quality and timely treatment of ailments for the livestock in the sub basin area.

6.2.(b) Sub-centres: The infrastructure presently available to subcentres was provided 30 years back are old and needs replacement. It is proposed to provide essential equipments like castrators (large and small), dressing tray, scissors, forceps, wash basin, etc. to each sub centre in the project area at a cost of Rs.20,000/- per sub centre. Totally 10 subcentres in the project area will be provided with essential equipments at a total cost of Rs .2.00 lakhs.

6.2.(c) Strengthening Diagnostic Facilities in Sub -basin Referral Institution:

Strengthening the diagnostic facilities in the sub basin by providing special diagnostic tools to one sub basin veterinary institution at cost of Rs.3.00 lakhs, is also a part of the project. The institution will be designated as Referral Institution for the sub basin. The Veterinary Dispensary at Samathur will be

upgraded as the referral institution. In the identified referral institution, semi auto analyzer and accessories will be provided for ensuring complete timely blood analysis.

6.2.(d) Infrastructure improvement in the project area will enhance the quality of delivery in veterinary services and diagnostic facilities contributing to reduction in the incidences of animal diseases, thereby increasing the overall productivity, which can contribute significantly in increasing the farm income of the farmers.

6.3. Increasing availability of green fodder .

6.3.(a) Feed and fodder are the major limiting factors in enhancing farm animal productivity. In our country, fodder production is still deemed ancillary to agricultural production. The green fodder resources for livestock are mainly derived from grazing in grasslands and pastures, fodder crops from cropped lands, weeds, bund grasses, tree leaves and mixed forages. Crop residues mainly sorghum and paddy straws which are poor in nutritive value constitute the major fodder for livestock. The economic viability of livestock husbandry depends on sources of feed and fodder, as feeding cost constitutes 65-70% of the total cost of livestock farming. The availability of green fodder is restricted to selected areas and seasons. Green fodder should be fed throughout the year not only to maintain milk production but also for improving the conception rate. Moreover adequate availability of green fodder will reduce the dependence of farmers on concentrates.

6.3.(b) Generally small ruminants like sheep and goats are not stall-fed. They are allowed for grazing. Hence for calculation of green fodder, only the bovines are taken into account. In the project area a considerable gap exists between requirement and availability of green fodder.

6.3.(c) The requirement, availability and shortage of green fodder for the bovine population in the project area is furnished below.

	Sub basin	Bovine Population	Requirement (In MT)	Availability (In MT)	Shortage (In MT)	%age of Shortage
1	Aliyar	36582	115499	14750	100749	87

Hence to reduce the green fodder shortage, around 1 50 hectares of additional land will be brought under fodder cultivation in the sub basin area.

6.3.(d) Around 150 hectares of land earmarked for fodder cultivation in the private lands in the project area will be taken up for cultivation of Co3. The far mers will be supplied inputs like seeds and slips. The cost of cultivation will be borne by the farmer. The Animal Husbandry Department will ensure supply of quality slips. The yield rate and cost of inputs is furnished below.

Sl. No.	Name of fodder	Avg. Yield per ha per year (In tonnes)	Cost of inputs Per Hectare
1.	Co3	250	6,000

Villagewise CO-3 fodder cultivation area proposed (In Hac.)

1. Jallipatti	5
2. Kambalapatti	5
3. Arthanaripalayam	5
4. Karianchettipalayam	5
5. Kaliyapuram	5
6. Vettaikarnpudur	5
7. Thensangampalayam	2
8. Pethanaicknur	5
9. Somandurai	2
10.Angalakurichi	5
11.Thensithur	5
12.Kottur	5
13.Periapodu	2

14.Anamalai	5
15.Odayakulam	5
16.Aathu Pollachi	5
17.Singanallur	2
18.Bodipalayam	2
19.Samathur	5
20.Subbegoundenpudur	5
21.Ganapathipalayam	3
22.Sethumadai	5
23.Marchinaickenpalayam	2
24.Ramapattinam	5
25.Mannur	3
26.Ambarampalayam	3
27.Ponnapuram	3
28.Pilchinnampalayam	2
29.Aliyar	6
30.Gengampalayam	3
31.Thondamuthur	5
32.Kottampatti	3
33.Naickenpalayam	3
34.Marappagoundenpudur	5
35.Kaliappagoundenpudur	3
36.Uthukuli	5
37.Avalchinnampalayam	3
38.Thimankuthu	3
Total	**150**

6.3.(e) The new area to be brought under fodder cultivation and the status of green fodder in the sub basin after implementation of the project is as follows.

Present Fodder Status :

Fodder Cholam @ yield rate of 45 tonnes /ha for 50 ha	Maize @ yield rate of 50 tonnes /ha for 75 ha	Co3 fodder @ yield rate of 250 tonnes /ha for 35 ha	Total availability (IN MT)
2250	3750	8750	14750

Fodder Availability Status after the end of project:

	Co3 fodder @ yield rate of 250 tonnes /ha for 150ha @ 60 ha for 2yr, 70 ha for 3rd yr, 10 ha for 4th yr and 10 ha for 5th yr (In MT)	Total Proposed Yield to be added (In MT)	Total fodder available during the end of the year (In MT)	shortage of fodder (In MT)	Co3 fodder@ Rs.6000/ha	Total Cost (In Rs.)
I Year	0	0	14750	100749	0	0
II Year	15000	15000	29750	85749	360000	360000
III Year	17500	17500	47250	68249	420000	420000
IV Year	2500	2500	49750	65749	60000	60000
V Year	2500	2500	52250	63249	60000	60000

6.3.(f) By the above cropping pattern in the sub basin, the green fodder availability will be increased from 14750 MT to 52250 MT. In addition 31,250 MT of green fodder will be available after the harvest of maize. Totally 83506 MT of green fodder will be available in the sub basin at the end of the project. Ultimately the shortage will be 31993 MT. The above shortage will be met by allowing the animals to graze in the tank bunds, Common P roperty Resources, etc.

6.4 Improving the knowledge level of the farmers by various out reach programmes.

6.4.(a) The success of the project depends on effective dissemination of information to the field in improving the knowledge level of the farmers o n best and latest animal husbandry practices, emerging new diseases and their control and optimum utilisation of fodder resources by various out reach programmes.

The out reach programmes planned in the project area are:

1) Infertility cum Total Veterinary Health Care camps.
2) Distribution of mineral mixture
3) Information, education and communications campaigns.

6.4.(b) ***Infertility cum Total Veterinary Health Care camps.***

6.4.(b).1. Under this programme, infertility cum total health cover both preventive and curative will be provided to all livestock and poultry by conducting special camps in each sub-basin Veterinary Unit service area at the rate of one camp per unit per month for 5 years. In these camps, various activities like health care, disease prevention vaccination against endemic diseases, deworming, castration, artificial insemination, pregnancy verification, infertility treatment, etc. will be carried out free of cost. An exhibition depicting various livestock diseases and preventive measures, fodder development measures, calf rally along with demonstration will also be conducted for creating awareness among the farmers.

6.4.(b).2. Prior wide publicity will be given regarding the village where the camp is to be conducted in the village and near by villages. In addition, the day and place where the camp is to be conducted will be displayed in the Water Users Association building. The services of the veterinarians and para-veterinarians working in the Animal Husbandry Department in the sub basin are a will be utilised for conducting the camps. A calf rally will be organised in the camp and best calf / calves will be given prizes which will act as motivation for other farmers. During the camps, pamphlets and leaflets on best and latest animal husbandry practices, emerging new diseases and their control and optimum utilisation of fodder will be distributed.

6.4.(b).3. Each camp will be conducted at a cost of Rs.6,000/ -.

Sl. No.	Component	Cost in Rs.
1.	Medicines	3,500
2.	Cost of 50 straws for artificial insemination	750
3.	Publicity and Propaganda	500
4.	Distribution of prizes in calf rally	500

5.	Miscellaneous charges like erection of shamina, etc., for conducting the camp	750
	Total	**6,000**

6.4.(b).4. Apart from total health cover the camp is expected to achieve, it will help in identifying animals affected by infertility due to mineral deficiency. The total financial cost for this component for 5 years is Rs.3.60/ - lakhs.

6.4.(c). ***Distribution of mineral mixture.***

6.4.(c).1. One of the major problems affecting conception is infertility. The major causative factor for infertility in the field is mineral deficiency. Hence to correct this deficiency, which is the vital factor affecting conception and calving, it is proposed to distribute mineral mixtures to needy animals in the project area.

6.4.(c).2. The sub basin veterinary extension officer visiting the villages on the scheduled programme will select the eligible animals during the visit. In addition animals will also be identified during the infertility cum total health cover camps. The eligible animals will be given mineral mixture @ 25 gms per day for 365 days. The sub basin veterinary extension officer will maintain the data of eligible animals covered under this programme and ensure examining the animals regularly for growth parameters. The sub basin wise cost required for distribution of 25 gms. of mineral mixture for 365 days to 100 animals at a cost of Rs.40/ - kg per sub basin veterinary extension officer for 5 years is 1.825 lakhs. For this component, 1.83 lakhs would be required for this component.

6.4.(c).3. By this the animals will come to estrum early and lead to better conception and calving rates. Moreover this will lead to reduction in inter -calving period there by increasing the productive life of the animal.

6.4.(d). Information, education and communications campaigns

6.4.(d).1. Printing of Pamphlets and leaflets.

Pamphlets and leaflets on best practices in animal husbandry, biosecurity measures to be taken to prevent diseases, economic diseases affecting livestock and their prevention and control measures, optimum utilisation of fodder resources with emphasis on inclusion level of non conventional feeds, etc. will be printed in Tamil for distribution to the farmers in the project area.

6.4.(d).2. Erection of hoardings and wall paintings in the project area.

Posters, hoardings and banners carrying the activities undertaken in the project area will be displayed in all Sub basin Veterinary Units. The same will also be displayed in all Government institutions functioning in the project area. In addition wall paintings depicting signs of commonly affecting diseases will be painted on walls where people congregate in large numbers

6.4.(d).3. Conducting Night meetings

6.4.(d).1.a. Night meetings will be conducted involving the Water Users Association, Animal Husbandry Department and Sub basin veterinary Extension Officer at a common place in the sub basin on a suitable day in each Sub basin Veterinary Unit and Graduate institution area at the rate of one per quarter. The meeting not only enables participation of all the farmers in the sub basin but also acts as a source of information to other farmers.

6.4.(d).1.b. During the night meetings, village people will be enlightened on benefits of rearing livestock and will be motivated to take up livestock rearing. Pamphlets and leaflets will be distributed to the farmers. A small exhibition and method demonstration will be organised for the benefit of the farmers. The services of link agencies like Tamilnadu Veterinary and Animal Sciences University and Tamilnadu Milk Producers Cooperatives Union will be utilised where ever necessary. In the night meetings successful animal husbandry entrepreneurs in the

village and neighboring villages will be requested to share their views on their methodology followed for their success.

6.4.(d).4. All the above Information, education and communications campaigns will be conducted in the sub basin at a total cost of Rs .3.85 lakhs.

6.5. Enhancing the knowledge level of human resource in the project area.

Continuing education is the touchstone of success. The project envisages capacity building at all levels like farmer, veterinarian, para -veterinarian operating in the sub basin to achieve the desired results of increased sustainable productivity at the end of the project.

6.5.(a). ***Training of Farmers***

6.5.(a).1. Farmers generally have a traditional knowledge of breeding and management of livestock. The existing awar eness, knowledge level and skill in profitable rearing of livestock with latest animal husbandry techniques among majority of farmers are minimum in the project area. Hence it is essential to impart training to upgrade the skills and knowledge level for pr ofitable animal husbandry rearing.

6.5.(a).2. Under this programme, elite farmers interested in animal husbandry activities will be selected and given training on best practices in livestock rearing. They will also be enlightened on importance of feedin g and cultivation of fodder crops. Emphasis will be given to enlighten the farmers on feeding of unconventional feeds and their inclusion level. Moreover they will be briefed about the diseases generally affecting the livestock in the basin and their sympt oms and control measures. In addition they will be enlightened on the importance of deworming, vaccination and clean milk production. The farmers trained will be utilised for dissemination of the above information to their counterparts in the villages.

6.5.(a).3. For the above purpose, progressive farmers @ 400 per year interested in animal husbandry activities in the sub basin will be selected for 3 day

training. They will be divided into batches of 25 per batch. Training will be provided in the nearest veterinary institution. They will be given a training incentive of Rs.100/day as they will have to attend the training programme foregoing their normal daily earning. During the training, each trainee will be given study material worth Rs.50/-. To motivate the trainer, a trainer honorarium of Rs.250/- per day will be provided. In addition miscellaneous charges of Rs.500/- will be provided for each batch. A total cost of Rs.10,000/- will be required for training each batch. During the project period of 5 years, a total of 2000 farmers (80 batches of 25 farmers per batch) in the sub basin will be trained at a cost of Rs.8.00 lakhs.

6.5.(b). Entrepreneurship Training to unemployed Veterinary Graduates :

2 Unemployed Veterinary Graduates are to be trained for the Aliyar Sub basin. 1 River basin veterinary unit is proposed in the sub basin area. One unemployed Veterinary graduate is trained additionally for the future in case there is any drop out. The entrepreneurship training is given to the unemployed veterinary graduate for sustainable animal husbandry activities.

6.5.(c). Orientation Training for Rural Veterinary Extension Officers

6.5.(c).1. Though the sub basin veterinary extension officers are basically veterinarians who may possess a sound theoretical knowledge on animal husbandry and veterinary treatment, their field experiences and exposure may be minimum. To attain the desired field results in a short term, it is essential to know the terrain and problems faced by the farmers in the basin. Hence 5 days orientation training is proposed for the sub basin veterinary extension officer selected to work in the Sub basin Veterinary Unit.

6.5.(c).2. Training will be provided to each Sub basin Veterinary Extension Officer in the nearest veterinary institution in the sub basin which will be identified by the Regional Joint Director and Assistant Director of Animal Husbandry of the concerned jurisdiction. They will be given a training incentive of Rs.150/day. During the training, each will be given study material worth Rs.100/-. To motivate the trainer, a trainer honorarium of Rs.500/- will be provided. A total cost of

Rs.1,350/- will be required for training each Sub basin Veterinary Extension Officer. Thus in the project area to train a Sub basin Veterinary Extension Officers, Rs.1350/- would be required.

6.5.(d). In-service Training for 6 Veterinarians

6.5.(d).1. Veterinarians have an overall knowledge of 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 management, breeding, diagnosis and treatment. Hence it is essential to update the knowledge and skills of the veterinarians in Government institutions in the project area.

6.5.(d).2. The 6 veterinarians working in the Government institutions in the sub-basin will be given a trainers training at Madras Veterinary College / Namakkal Veterinary College at a cost of Rs.2000/- per individual. The total cost for training the 6 veterinarians in the sub-basin would be Rs.0.12/- lakhs.

7. Ensuring marketing tie up for the products.

With the rapid urbanisation, changing life styles and increasing purchasing power of the people, the demand for livestock and livestock products is expected to rise steadily. Hence marketing the livestock and livestock products in the sub basin will not be a major problem.

ALIYAR SUB BASIN

The breedable age female population in the Aliyar S ub Basin is 17052 which include 14060 crossbred, 287 indigenous cattle and 2705 buffaloes.

ASSUMPTIONS:

1) Available breedable female population in the basin after reducing for mortality, sterility etc., at the rate of 15% in crossbred, 5 % in indigenous an d 5 % in buffaloes, there will be 11951 crossbred, 273 indigenous and 2570 buffaloes.
2) At present there are 6 Graduate Veterinary Institutions and 10 Sub centres functioning under Government fold doing artificial insemination work of which 1 subcentres are vacant.
3) The above Government Institutions have carried out an average artificial insemination of 16469 in crossbred, 175 in indigenous and 876 in buffaloes.
4) Assuming 2.8 (35%) inseminations are required for consumption in cattle and 3.3 (30%) inseminations are required for conception in buffaloes, the actual animals covered is 5882 crossbred, 63 indigenous and 265 buffaloes.
5) Thus the breedable age female population unserved by the Government institutions is 6069 crossbred, 210 indigenous and 2304 buffaloes .
6) For the above animals unserved, a sub basin veterinary unis will be established in the sub basin covering around 17 villages.
7) During the first year 2,400, second year 2,700, third year 3,000, 4th year 3,360, 5th year 3,840 and from then on 3,840 artific ial inseminations will be done by each sub basin veterinary unit.
8) It is assumed that since the basin has a high crossbred population 90% crossbred (2160), 5% indigenous (120) and 5% (120) buffaloes will be targeted by the above unit during the first year.

Year wise Number of animals targeted

Year	AI done by the unit (90% crossbred, 5% Indigenous, 5% buffalo)		
	Crossbred	Indigenous	Buffalo
I Year	2160	120	120
II Year	2430	135	135
III Year	2700	150	150
IV Year	3024	168	168
V Year	3456	192	192

9) The conception rate for the Sub basin veterinary unit is as follows:

Year	Conception Rate in Cow	Conception Rate in Buffalo
1st year	35% (2.8)	30% (3.3)
2nd year	40% (2.5)	35% (2.8)
3rd year	45% (2.2)	40% (2.5)
4th year	50% (2.0)	45% (2.2)
5th year	50% (2.0)	50% (2.0)

10) Taking a conception rate of 35% for cattle and 30% for buffalo during the first year, the actual animals covered by the unit will be 771 crossbred, 43 indigenous and 36 buffaloes.

Year	**Yearwise Number of animals covered**		
	Crossbred	Indigenous	Buffalo
I Year	771	43	36
II Year	972	54	48
III Year	1227	68	60
IV Year	1512	84	76
V Year	1728	96	96

11) By the work done by this unit during the first year, out of the total 814 cattle (771 crossbred, 43 indigenous) conceived, 50% (407) heifer calves will be born. Similarly out of 36 buffaloes, 18 buffalo heifer calves will be born.

Year	**Yearwise Number of heifer calves born**	
	Crossbred	Buffalo
I Year	407	18
II Year	513	24
III Year	648	30
IV Year	798	38
V Year	912	48

12) Now calf mortality is taken as 5% for crossbred and 10% for buffaloes. Therefore out of the 407 crossbred heifer calves, 20 will be lost. Similarly out of 18 buffalo calves, 2 will be lost during the first year.

Year	**Yearwise Number of heifer calves lost**	
	Crossbred	Buffalo
I Year	20	2
II Year	26	2
III Year	32	3
IV Year	40	4
V Year	46	5

13) The actual crossbred animal in milk created in the sub basin by intervention by these units during first year will be 814 (771 Crossbred plus 43 Indigenous cattle). Similarly 36 buffaloes will be in the milk.

Year	**Yearwise Number of animals in milk**		
	Crossbred	Indigenous	Buffalo
I Year	771	43	36
II Year	972	54	48
III Year	1227	68	60
IV Year	1512	84	76
V Year	1728	96	96

14) The average milk yield in the project area will be increased to 7 litres in crossbred, 800 ml or maximum of 3.6 litres in indigenous and 4.5 litres for buffaloes.

15) During the first year, the total milk yield in the sub basin by intervention by these units will be 16.56 lakh litres by crossbred (assumi ng 7.16 lts. is the average yield), 0.38 lakh litres (assuming 3.12 lts. is the average yield) by indigenous and 0.45 lakh litres (assuming 4.16 lts. is the average yield) by buffalo.

Year	**Average Milk Yield/day (In Lts.)**			**Total Milk Yield/ lactation (In lakh Lts.)**		
	Crossbred	Indigenous	Buffalo	Crossbred (300 days lactation)	Indigenous (280 days lactation)	Buffalo (300 days lactation)
I Year	7.16	3.12	4.16	16.56	0.38	0.45
II Year	7.3	3.3	4.4	21.29	0.50	0.63
III Year	7.5	3.5	4.6	27.61	0.67	0.83
IV Year	7.8	3.6	4.8	35.38	0.85	1.09
V Year	8.0	3.7	5.0	41.47	0.99	1.44

16) Thus the value of milk in the sub basin will be Rs.156 lakhs (cost of cow milk is Rs.9/- and buffalo milk is Rs.10/-).

Year	Value of Milk (In lakh Rs.)			
	Crossbred	Indigenous	Buffalo	Total
I Year	149	3	4	156
II Year	192	4	6	202
III Year	248	6	8	262
IV Year	318	8	11	337
V Year	373	9	14	396

17) Thus economic return at the end of the project by way of milk will be Rs.396 lakhs, an increase of Rs.240 lakhs.

18) The cattle heifer calves born during the first year is brought into breeding stock during the 3rd year. Similarly in buffalo 1st year heifer calves is brought into 4th year breeding stock.

Year	Yearwise Female Breeding stock created		
	Crossbred	Indigenous	Buffalo
I Year	6069	210	2304
II Year	6069	210	2304
III Year	6214	210	2304
IV Year	6419	210	2309
V Year	6713	210	2318

19) The main advantages of the programme

- ☞ Provides service at the farmer's doorstep or nearest to the farmer's doorstep.
- ☞ Increased coverage
- ☞ Better conception rate
- ☞ Reduced stress to the animals
- ☞ Timely treatment
- ☞ Reduced recovery time from illness
- ☞ Ensuring coverage of animals with vaccination and deworming

- ☞ Saving the man hours of the farmers
- ☞ Genetic potential improvement (crossbred)
- ☞ Timely artificial insemination, there by not only increasing conception and calving rate, but also reducing the inter-calving period.
- ☞ Timely artificial insemination and calving, leads to more production days during the productive life cycle of the animal.
- ☞ Reducing scrub bulls born out of natur al service.
- ☞ Avoiding diseases like Trichomonosis, brucellosis, etc., affecting the uro-genital tract of females, leading to abortion, sterility, etc., when the animals are put into natural service.
- ☞ For natural service, the chance of the same bull serving t he mother and dam is higher which may lead to inbreeding, but if frozen semen is used, the semen can be rotated nullifying the chances of inbreeding.
- ☞ Increasing the per animal milk production potential, leading to a substantial increase in milk production
- ☞ Increasing the farmers income through animal husbandry.

OUTCOMES EXPECTED

Sl. No.	Project Year	I Year	II Year	III Year	IV Year	V Year	Total
1	Artificial Insemination Done (In Nos.)	2400	2700	3000	3360	3840	**15300**
2	Calves Born (In Nos.)	850	1074	1356	1672	1920	**6872**
3	Heifer calves born (In Nos.)	425	537	678	836	960	**3436**
4	Milk Yield (In lakh Lts.)	17	22	29	37	44	**150.15**
5	Value of Milk (In Lakh Rs.)	156	202	262	337	396	**1353**

Note: Out the total value of milk, around 70 - 75% will be cost of inputs lik e feed, fodder, health care, etc.

ESTIMATE FOR ANIMAL HUSBANDRY

	Components	Physical	Financial (In Lakhs)
1	**Productivity enhancement by improving delivery of veterinary services**		
	a. Establishment of Sub basin Veterinary Units (SBVU) @ Rs.5,72,720/- per unit	1	5.73
	b. Improving the essential infrastructure in the Government institutions (graduate institutions) @ Rs.33,000/-unit	6	1.98
	c. Improving the essential infrastructure in the Government institutions(subcentres) @ Rs.20,000/ -unit	10	2.00
	d. Strengthening the diagnostic facilities in the sub basin by providing special diagnostic tools to sub basin referral institutions @ Rs.3,00,000/- per unit	1	3.00
2	**Increasing availability of green fodder in private lands (in acres) - Co3 - 250 hac.**	250	9.00
3	**Out reach programmes.**		
	a. Infertility cum Total Veterinary Health Care camps @ Rs.6,000 per camp per month for each SBVU	60	3.60
	b. Distribution of mineral mixture @ Rs.1,8 2,500 per SBVU	1	1.83
	c. Information, education and communications campaigns	7	3.85
4	**Enhancing the knowledge level of human resource**		
	a. Training of Farmers	2000	8.00
	b. Enterpruneship training to 31 unemployed veterinary graduates to be placed as Sub basin Veterinary Extension Officer @ Rs.50,000/- per person	2	1.00
	b. Orientation Training for Sub basin Veterinary Extension Officers @ Rs.1,350/- trainee	1	0.01
	c. In-service Training for Veterinarians @ Rs.2,000/- per person	6	0.12
			40.12

TAMILNADU AGRICULTURAL UNIVERSITY

Irrigated Agriculture Modernization and Water Resource Management (IAMWARM)

TNAU component – Aliyar Sub Basin

Introduction

A. About the station

- Agricultural research station started in 1963 in western zone of Tamilnadu
- This centre released three groundnut varieties and one coconut variety ALR CN1
- Coconut research station was started during 1988 and ARS was renamed as Coconut Research Station in 2002.
- This station also produces quality coconut seedlings (Tall varieties WCT and ALR CN1)
- These seedlings are preferred by the farmers.
- The farmers from different parts of the state do visit the station for consulting on coconut cultivation.

B. Basic information about the sub basin

Aliyar is a tributary of Bharathapzha river, which empties in to Arabian sea. Aliayr reservoir is one among the main component in PAP and formed in the plains across the river Aliyar with a gross storage capacity of 109.35 Mcm. Apart from its own catchment, water can be diverted to this reservoir through Aliyar feeder canal and Contour canal from the Parambikulam group of reservoirs.

The Aliyar sub basin consists of the following canal systems

- Aliyar feeder canal system
- Sethumadai canal system
- Vettaikaranpudur canal system
- Pollachi canal system
- Old system in Aliyar river

The command area of the old system is 2,574 Ha which is of double crop lands whereas the total new command area under the above four canals are 17,962 Ha which is of single crop. The entire new ayacut is divided into two zones

i.e., 'A' and 'B' and each zone gets water once in two years under alternate sluice irrigation pattern. Apart from this, water is also being given to Kerala state for irrigating 8,094 ha. of old command. As per the inter state agr eement, it is ensure annually 7.25 TMC of water at Manacadavu weir for the benefit of the old ayacut in Kerala state based on the periodical demand of supplies made by Kerala state.

Soil

In this sub basin, due to different stages of weathering and paren t materials, the soil types are met with combination of Inceptisol, Alfisol and Entisol. More prominent type is Inceptisol.

Inceptiso l	Red or brown or grey soil with surface horizon more developed than sub surface. They are developing soils, moderately dee p, coarse loamy to loam moderately drained to well drained.	Suited for commonly grown crops with exceptions
Alfisol & Entisol	The red or brown soils having accumulation of illuviated clay in sub surface horizon it well drained, poor water and nutrient hol ding capacity	Annual crops with shallow roots systems comes up well

RAIN FALL

The average rainfall recorded at three stations is given below:

Sl. No.	**Name of Rain gauge Station**	**South west monsoon**	**North East monsoon**	**Winter**	**Summer**	**Annual**
1	Aliyarnagar	271	361	21	157	810
2	Vettaikaranpudur	247	242	41	105	635
3	Pollachi	383	303	17	158	861

Climate

Measurement of Hydro meteorological parameters in the basin area are recorded at three weather stations viz., 1. Sundakampalayam maintained by Ground Water Wing of Public Works Department, 2. Coimbatore Airport maintained by IMD and 3. Aliyarnagar.

Sl. No.	Climatological Parameters	South West	North West	Winter	Summer
1	Temperature max/Min in C-deg	24.2/24.7	24.5/22.1	25.9/23.7	29.9/23.1
2	Avg. Temperature in Cº	25.95	23.23	24.80	26.83
3	Avg. Relative humidity in %	74.50	85.70	87.50	75.00
4	Avg. Wind velocity Km/hr	2.28	0.69	0.95	1.02
5	Avg. Pan Evaporation	140 mm per month			
6	Avg. Sunshine hours/day	5.63	4.20	7.85	8.97

CROPPING PATTERN OF ALIYAR RESORVOIR

C. Objectives

- To promote water saving technologies (SRI / Drip) in agriculture and horticultural crops for large scale adoption
- To enhance the crop and water productivity
- To increase the cropped area by crop diversification
- To cover with WRO and other line departments for over all improvement in the total farm income

2. Issues

- Fifty percent of the coconut area need drip fertigation
- Non adoption of fertigation in sugarcane and vegetables
- Lack of diversification

3. Counter measures

- Drip fertigation in sugarcane, coconut, banana
- SRI

Mission Mode Activities

Technologies for large scale adoption

Precision farming in Banana

Adoption of high density with drip fertigation in tissue is one of the important technology to improve the productivity of b anana. This concept was widely tested in TNAU and High density banana with tissue culture is more suitable for drip fertigation to realize higher crop and water productivity. Hence in Aliyar sub-basin TNAU included drip fertigation with high density which will have maximum adoption. Hence the cost on drip fertigation unit, cost on TC banana, cost on fertilizer / chemical are included.

Technology	Total area (hectares)	Unit cost (Rs. per ha)	Total cost (in lakhs)
Precision farming in Tissue Culture Banana	50	119315.00	59.7

Sl.No	Particulars		Amount in (Rs.)
1	*Cost of drip system*		52800.00
	Cost of fertilizers 210:50:390 g NPK/plant/year	:	
	Urea - 1139.25Urea /ha.@ Rs. 5 /kg	:	5697.00
	Super Phosphate - 781.25 @ Rs. 4 /kg	:	3128.00
	Muriate of Potash - 1618.5 kg @ Rs.4.75/ kg	:	7690.00
	Cost of TC banana @ 10/No for 5000 seedlings under high density		50000.00
	Total		119315.00

Production technology for groundnut

To enhance the productivity of groundnut in Aliyar sub basin this demonstrations included in 300 ha. The cost includes for the critical inputs like seed, improved varieties and fertilizers.

Technology	Total area (hectares)	Unit cost (Rs. per ha)	Total cost (in lakhs)
Production technology for groundnut	300	6000	18.0

Justification for the unit cost

Sl.No	***Particulars***		Amount in (Rs.)
1	Seed cost with seed treating chemicals (125kg/ha) @ Rs. 40 /kg	:	5000.00
2	Soil application of *Trichoderma viride* 2.50 kg @ Rs. 150 /kg	:	375.00
	Gypsum application @ 400 kg/ha @ Rs. 1. 50 /kg		600.0
3	Micronutrient spray(DAP - 2.5 kg, Ammonium sulphate – 1 kg, Borax – 500g and Planofix – 375 ml) @ Rs. 200/ spray for 3 sprays		600.00
	Cost of Bio fertilizer	:	
	Total cost		**6575.00**

e. Model village concept

Particulars	**Amount (Rs. in lakhs)**
Production of quality coconut (Tall) seedlings3 lakh seedling CRS, Aliyar. The cost on infrastructure for the production of 3 lakh	**15.00**
Demonstration of organic farming, IFS and other latest technologies in 20 ha (Sethumadai canal)	**1.00**

On farm demonstration and skill development

Details	**No.of persons/ batch**	**Cost per batch (in Lakhs)**	**Total no. of batches**	**Total cost (in lakhs)**
Drip Fertigation technologies in Sugarcane	50	0.20	2	0.40
Drip Fertigation technologies in TC Banana	50	0.20	2	0.40
Integrated Farming System	50	0.20	2	0.40
Coconut production technology with special emphasis on drip fertigation and inter/mixed cropping system	50	0.20	10	2.00
Total	300		**16**	**3.20**

Drip Fertigation in Coconut

Drip and fertigation system of the project ensured water economy, precise application of water-soluble fertilizers to root zone and keeping ideal moisture regime of 60 per cent. In conventional system, immediately after irrigation, the air gradient of soil becomes zero and moisture grad ient becomes 100 per cent. Before irrigation the gradients are reversed thus exerting stress over the root zone. In fields of fertigation, the moisture regime was 60 per cent and air gradient was 40 per cent which facilitates faster growth and early beari ng.

Technology Delivery

Drip fertigation in coconut

- Spacing 7.5 m x 7.5 m
- Drip – Online Drip
- Number of drippers per plant - 4
- Discharge rate 8 liter per hour
- Water Requirement 65 – 95 liters per tree

Fertigation

NPK : 560:320:1200 g/tree/year

P : as soil June/January

N & K : 12 equal split at monthly interval 46.5 g N (100.9 g Urea)
100 g K(166.00g Potash) per tree

Technology	Total area (hectares)	Unit cost (Rs. per ha)	Total cost (in lakhs)
Drip fertigation in coconut	1500	28,900	433.5

Justification for unit cost

Sl.No	***Particulars***	Area (ha)	Amount in (Rs.)
1	Cost of seedlings (6000) per hectare		90.00
2	Drip and fertigation for coconut cost per ha 22,900/ ha	1500	343.50

Gain of proposed system over the existing s ystem

Existing System	Fertigation
Water requirement – Flood and surface irrigation	Drip Irrigation
Nutrient application – Blanket and surface	As per crop requirement and fertigation
Fertilizers to field	Fertilizers to plant
Delayed operations	Timely operations
Labour intensive	Minimal labour
No farm documentation	Farm documentation
Marketing – growers	Marketing – Consumers
Production led	Market led
No empowerment	Empowerment
Individual effort	Collective effort

Expected output from mission m ode

Technological output	**Socio-economic output**
Yield enhancement	Increased income for the farmers
Increased water productivity	Employment generation with additional mandays
Maintenance of soil fertility	Reduction in water usage for agriculture and more available for human consumption
Increased fertilizer use efficiency	Additional infrastructure for marketing
Effective utilization of available resources	Avoidance of middle man and brokerage
Preventing pest, disease and weeds	Producer-marketer relations
Sustainable production	

Area proposed for coverage under mission mode : 1500 Ha

Location : As specified in activity chart
Table

Period : 2007-2012

Adoption and implementation of SRI system for rice cultivation

Objectives

1. To minimize the usage of water
2. To improve the productivity of rice and enriching the soil
3. To obtain higher net return

TECHNOLOGY

Scientific management technique of allocating irrigation water based on soil and climatic condition to achieve maximum crop production per unit of water applied over a unit area in unit time is very much essential under present condition. System Rice Intensification (SRI) is one among the scientific management tool. Under conventional system of rice cultivation the rice yield will be low due to poor weed management increases competition among crop and weeds, Poor aeration affects the root activity and tiller production and Poor water management increases the water requirement. SRI does not require the purchase of new seeds or the use of new high-yielding varieties and SRI dose require skillful management of the factors of production and at least initially, additional labor input – between 25 and 50% particularly for careful transplanting and for weeding. Square planting ensures Rotary weeder operation in either direction. Rotary weeder operation incorporates the weed biomass and aerates the soil for better root activity and tillering. Efficient water management reduces the irrigation water requirement.

As farmers gain skill and confidence in SRI methods, labor input decreases and can eventually become the same or even less compared with conventional rice - growing methods.

The SRI technique has the following features

- Young and robust seedling (14-15 days)
- One seedling per hill
- Square planting under wider spacing (22.5 x 22.5 cm)
- Rotary weeding up to 40 days at 7-10 days interval.
- Irrigation after the disappearance of ponded water
- “N” management through Leaf Colour Chart

SRI TECHNIQUE HAS THE FOLLOWING ADVANTAGES

- Saving of seed material 50-65 kg /ha.
- Saving of 10 laborers in planting
- Saving of 300-400 mm of irrigation water
- Saving of 12-16 women laborers in weeding
- Saving of 15-45 kg N/ha. by following LCC method of N management

Rotary weeder has the following advantages

- Improves soil structure
- Increases soil aeration,
- Enrichment of O_2 near the root zone,
- Increases the microbial population,
- Better nutrient availability and uptake by the plants,
- More tillering ability

Outcome

- Indiscriminate usage of water will be curtailed by saving up to 50%
- Improved soil health
- Enhanced productivity level of the crop

Jusification and Linkage

Adoption of SRI in rice system reduces the water requirement with a yield increase of 15-20%. In this south vellar sub basin area under rice will be reduced by 4000 ha in first season. To offset the production loss introduction of SRI will be the best option for maintaining overall production. TNAU introduce a demonstration of 100 ha which helps in large scale adoption.

Convergence

- The technologies resulted in the complementary effect of the water augmentation and micro irrigation methods
- Adoption of technologies resulted in over all standard of living of basin farmers

S.No	Particulars	Budget (Rs. in lakh)
Budget For Mission Mode III - SRI in Rice(300 ha)		
1	Cost of critical inputs seeds and nutrients @ 10000/ha	**30.00**
	Total	**30.00**

Justification for the unit cost

Sl.No	*Particulars*		Amount in (Rs.)
1	Seed cost with seed treating chemicals (8kg/ha) @ Rs. 25 /kg	:	200.00
2	Raising nursery (wooden frame, rosecan, polythene sheet)	:	1000.00
3	Square transplanting cost @ 50 B/ha @ Rs.80/labour (Labour cost should be borne by the farmers)	:	4000.00
4	Rotary weeder 5 No. Rs.500/no for square planting	:	2500.00
5	Cost of row marker for planting (One no.)	:	1000.00
6	Cost of fertilizers (150:50:50 kg NPK / ha)	:	
	Urea - 330 kg @ Rs. 5 / kg	:	1650.00
	Super Phosphate - 312.5kg @ Rs. 4 /kg	:	1250.00
	Muriate of Potash - 83 kg @ Rs.4.75/ kg	:	395.00
	$ZnSO_4$ 25 kg @ Rs. 25 / kg	:	625.00
	Cost of Bio fertilizer	:	120.00
	Azozpirillum and Phospho bacteria @ 10 pockets each	:	
7.	Cost of Plant protection chemicals	:	
	Pseudomononas 2.5 kg / ha @ Rs. 75 /kg		190.00
	Monocrotophos 1.5 litre/ha @ Rs. 300 /litre		450.00
	Quinylphos 2 litres / ha @ Rs. 250 / litre		500.00
	Mancozeb 2 kg/ha @ 250 / kg		500.00
	Total		14380.00

Expected output

Activity	Demonstration Area (Ha)	Area spread for adoption (Ha)	Additional productivity (kg/ha)
System Rice Intensification in rice	300	1500	700
Precision farming in TC banana	50	250	15 t
Production technology for groundnut	300	3000	300 kg
Coconut	1500	1500	2000 nuts/ha

Budget For Mission Mode

S. No.	Particulars(1500ha)	Amount (Rs. In lakh)
1	Cost of seedlings (6000) per hectare	90.00
2	Drip and fertigation for coconut cost per ha 22,900/ ha	343.50

IV. YEAR WISE ACTIVITY (HA)

Sl.No	Activity	I	II	III	IV	V
1	Production technology for groundnut	96	107	97		-
2	Precision farming in Tissue Culture Banana	10	20	10	10	-
3	Drip Fertigation in Coconut	300	500	400	300	-
4	Production of quality coconut (Tall) seedlings 3 lakh seedling (1500 ha)	5000	75000	75000	50000	50000
5	Model village	20	-	-	-	-
6	SRI	150	150	-	-	-

Adoption rate year wise (ha)

Activity	**I**	**II**	**III**	**IV**	**V**	**Total**
Production technology for groundnut	**-**	**-**	**500**	**1000**	**1500**	**3000**
Precision farming in Tissue Culture Banana	**-**	**-**	**-**	**50**	**200**	**250**
Drip Fertigation in Coconut	**-**	**-**	**1000**	**3000**	**3500**	**7500**
SRI	**-**	**300**	**500**	**700**	**-**	**1500**

Finance (Rs.Laksh)

Sl.No	Particulars	I	II	III	IV	V	Total
I	Activities						
1	Precision farming in Tissue Culture Banana	**0.66**	**1.31**	**0.66**	0.65	**-**	**3.28**
2	Production technology for groundnut	**5.76**	**6.42**	**5.82**	-	**-**	**18.0**
3	Drip Fertigation in Coconut	**82.20**	**137.0**	**109.6**	82.20	**-**	
4	SRI	**10.00**	**10.00**	**10.00**			
5	**Production of quality coconut (Tall) seedlings 3 lakh seedling (1500 ha)**	**5.0**	**5.0**	**5.0**	**-**	**-**	**15.0**
6	**Model village**	**4.2**	-	**-**	-	**-**	**4.2**
II	Out Sourcing	**24.0**	**24.0**	**24.0**	**7.2**	**7.2**	**86.4**
III	Contingencies	**1.50**	**1.50**	**1.50**	**1.50**	**1.50**	**7.5**
IV	Equipments	**1.50**	1.50	-	-	-	3

Budget for Agribusiness Farm advisory cell

(Rs. in lakhs)

Sl.No	Details	I year	II year	III year	IV year	V year	Total
1.	**SRF salary (16nos)**	6.21	10.34	17.99	18.95	20.39	73.88
2.	**Data entry operation (1)**	0.42	0.42	0.60	0.60	0.60	**2.64**
3.	**JRF salary (9)**	6.42	6.42	6.42	6.42	6.42	**32.10**
4.	**Travelling allowance for SRF, JRF and Scientists**	7.50	8.50	9.50	10.50	11.50	**47.50**
Recurring contingences							
5	**Stationery, telephone, postal, transport and others**	1.50	2.00	2.50	2.50	2.50	**11.00**
6	**Soft ware packages**	0.75					**0.75**
	Total						

V. TOTAL BUDGET FOR ALIYAR (PAP)

Sl.No	Particulars	Physical	Financial (in lakhs)
I	Activities		
1	**Precision farming in Banana**	**50 ha**	**59.7**
2	**Production technology for groundnut**	**300 ha**	**18.0**
3	**Drip fertigation – Coconut**	**1500 ha**	**433.50**
4	**SRI in rice**	**300 ha**	**30.00**
5	**Quality coconut seedling production**	**3 lakhs Nos.**	**15.00**
6	**Demonstration of organic farming and IFS modal in Model villages**	**20 ha**	**1.00**
7	**OFD and skill development**	**-**	**3.20**
		Sub Total	*560.4*
II	Out Sourcing for technical assistance		
1	**20 nos for first 3 years, 6 nos for 4th and 5th year**	**9000 Salary + 1000 FTA per Month**	**86.40**
		Sub Total	*86.40*
III	Contingencies		
	a. Vehicle hire charge for Scientists @ Rs.60000/yr		**3.00**
	b. Documentation and Reporting		**2.00**
	c. Stationeries and publicity etc.,		**2.50**
		Sub Total	*7.50*
IV	Equipments Computer, Printer, Scanner, LCD, Copier		3.00
		Sub Total	*3.00*
		Total	**657.30**
	Incentive 1% of the total cost		**6.57**
	Total		663.87
V	Agri business and Farm advisory cell		177.40
		Total	841.27
	Institutional charges @ 7.5 %		**63.09**
	Grand Total		904.36

*** 50 % of the drip system cost for banana** **13.2 lakhs**

50 % of the drip system cost for coconut **171.75 lakhs**

Impact

- **Crop:** Rice
- **Technology:** SRI
- **Area under demonstration:** 300 ha
- **Area under adoption :** 1500 ha

- **Crop:** Coconut
- **Technology:** Drip fertigation
- **Area under demonstration:** 1500 ha
- **Area under adoption :** 7500 ha

- **Crop:** Banana
- **Technology:** Drip fertigation
- **Area under demonstration:** 50 ha
- **Area under adoption :** 250 ha

- **Crop:** Groundnut
- **Technology:** Production technology
- **Area under demonstration:** 300 ha
- **Area under adoption :** 3000 ha

Activity chart

Locations in WUA area for each year

Production technology for groundnut

Sl No	W.U.A	Block	Years					
			Ist	2nd	3rd	4th	5th	Total
1	Sethumadai canal Vettaikaranpudur village water users association	Anaimalai	6	6	6			18
2	Vettaikaranpudur canal Kaliyapuram village water users association	Anaimalai	6	7	6			19
3	Vettaikaranpudur canal M.N.Palayam village water water users association	Anaimalai	6	6	6			18
4	Vettaikaranpudur canal Odayakulam village water users association	Anaimalai	6	6	7			19
5	Pollachi canal Kottur village No.1 water users association	Anaimalai	6	6	6			18
6	Pollachi canal Kottur village No.2 water users association	Anaimalai	6	6	6			18
7	Pollachi canal Pethanaickenur village water users association	1.Anaimalai 2.Pollachi(S)	6	6	6			18
8	Pollachi canal Angalakurichi village water users association	Anaimalai	6	6	6			18
9	Pollachi canal Thoraiyur village water users association	Anaimalai	6	6	6			18
10	Pollachi canal Kambalapatti village water users association	Anaimalai	6	8	6			20

11	Pollachi canal Samathur village water users association	1.Anaimalai 2.Pollachi(S)	6	8	6			20
12	Pollachi canal Naickenpalayam village water users association	Pollachi (South)	6	8	6			20
13	Pollachi canal Uthukuzhi village water users association	Pollachi (S) Pollachi (N)	6	8	6			20
14	Pollachi canal Mannur village water users association	Pollachi (North)	6	8	6			20
15	Pollachi canal Thimmankuthu village water users association	Pollachi (North)	6	6	6			18
16	Aliyar feeder canal Vettaikaranpudur village water users association	Anaimalai	6	6	6			18
	Total		96	107	97			300

Drip fertigation in Coconut (Mission mode)

Sl. No	W.U.A	Block	Years					
			Ist	2nd	3rd	4th	5th	Total
1	Sethumadai canal Vettaikaranpudur village water users association	Anaimalai	27	54	43	15		139
2	Vettaikaranpudur canal Kaliyapuram village water users association	Anaimalai	15	35	34	23		107
3	Vettaikaranpudur canal M.N.Palayam village water water users association	Anaimalai	13	35	23	20		91
4	Vettaikaranpudur canal Odayakulam village water users association	Anaimalai	25	45	40	30		140
5	Pollachi canal Kottur village No.1 water users association	Anaimalai	5	9	5	1		20
6	Pollachi canal Kottur village No.2 water users association	Anaimalai	10	35	22	20		87
7	Pollachi canal Pethanaickenur village water users association	1.Anaimalai 2.Pollachi(S)	18	27	18	15		78
8	Pollachi canal Angalakurichi village water users association	Anaimalai	12	14	12	15		53
9	Pollachi canal Thoraiyur village water users association	Anaimalai	9	19	9	1		38
10	Pollachi canal Kambalapatti village water users association	Anaimalai	13	16	13	10		52
11	Pollachi canal Samathur village water users association	1.Anaimalai 2.Pollachi (S)	9	10	9	10		38

12	Pollachi canal Naickenpalayam village water users association	Pollachi (South)	10	25	23	20		78
13	Pollachi canal Uthukuzhi village water users association	Pollachi (S) Pollachi (N)	12	24	22	30		88
14	Pollachi canal Mannur village water users association	Pollachi (North)	20	21	20	20		81
15	Pollachi canal Thimmankuthu village water users association	Pollachi (North)	21	22	21	20		84
16	Aliyar feeder canal Vettaikaranpudur village water users association	Anaimalai	34	34	39	30		137
17	Old Aliyar Channel – Pallivilangal Puram Anaicut Pasana vivasayigal sangam	Anaimalai	5	10	5	-		20
18	Old Aliyar Channel – Ariya Puram Anaicut Pasana Vivasayigal sangam	Anaimalai	9	18	9	-		36
19	Old Aliyar Channel – Karaipatti Anaicut Pasana vivasayigal sangam	Anaimalai	6	12	6	-		24
20	Old Aliyar Chennel – Periyanai Anaicut Pasana vivasayigal sangam	Anaimalai	14	18	14	10		56
21	Old Aliyar Channel – Vadakkalur Anaicut Pasana vivasayigal sangam	Anaimalai	13	17	13	10		53
	Total		**300**	**500**	**400**	**300**		**1500**

1. Drip fertigation technologies in **Tissu culture Banana**

Sl. No	W.U.A	Block	Years					
			Ist	2nd	3rd	4th	5th	Total
1	Sethumadai canal Vettaikaranpudur village water users association	Anaimalai	5	3	2	-	-	10
2	Vettaikaranpudur canal Kaliyapuram village water users association	Anaimalai	-	-	-	-	-	-
3	Vettaikaranpudur canal M.N.Palayam village water water users association	Anaimalai	-	-	-	-	-	-
4	Vettaikaranpudur canal Odayakulam village water users association	Anaimalai	7	15	8	-	-	30
5	Pollachi canal Kottur village No.1 water users association	Anaimalai	-	-	-	-	-	-
6	Pollachi canal Kottur village No.2 water users association	Anaimalai	-	-	-	-	-	-
7	Pollachi canal Pethanaickenur village water users association	1.Anaimalai 2.Pollachi(S)	-	-	-	-	-	-
8	Pollachi canal Angalakurichi village water users association	Anaimalai	-	-	-	-	-	-
9	Pollachi canal Thoraiyur village water users association	Anaimalai	-	-	-	-	-	-
10	Pollachi canal Kambalapatti village water users association	Anaimalai	-	-	-	-	-	-
11	Pollachi canal Samathur village water users association	1.Anaimalai 2.Pollachi(S)	-	-	-	-	-	-

12	Pollachi canal Naickenpalayam village water users association	Pollachi (South)	-	-	-	-	-	-
13	Pollachi canal Uthukuzhi village water users association	Pollachi (S) Pollachi (N)	-	-	-	-	-	-
14	Pollachi canal Mannur village water users association	Pollachi (North)	-	-	-	-	-	-
15	Pollachi canal Thimmankuthu village water users association	Pollachi (North)	3	2	5	-	-	10
16	Aliyar feeder canal Vettaikaranpudur village water users association	Anaimalai	-	-	-	-	-	-
17	Old Aliyar Channel – Pallivilangal Puram Anaicut Pasana vivasayigal sangam	Anaimalai	-	-	-	-	-	-
18	Old Aliyar Channel – Ariya Puram Anaicut Pasana Vivasayigal sangam	Anaimalai	-	-	-	-	-	-
19	Old Aliyar Channel – Karaipatti Anaicut Pasana vivasayigal sangam	Anaimalai	-	-	-	-	-	-
20	Old Aliyar Chennel – Periyanai Anaicut Pasana vivasayigal sangam	Anaimalai	-	-	-	-	-	-
21	Old Aliyar Channel – Vadakkalur Anaicut Pasana vivasayigal sangam	Anaimalai	-	-	-	-	-	-
	Total		**15**	**20**	**15**	**-**	**-**	**50**

Sl. No	W.U.A	Block	Years					
			Ist	2nd	3rd	4th	5th	Total
1	Old Aliyar Channel – Pallivilangal Puram Anaicut Pasana vivasayigal sangam	Anaimalai	30	30	-	-	-	60
2	Old Aliyar Channel – Ariya Puram Anaicut Pasana Vivasayigal sangam	Anaimalai	30	30	-	-	-	60
3	Old Aliyar Channel – Karaipatti Anaicut Pasana vivasayigal sangam	Anaimalai	30	30	-	-	-	60
4	Old Aliyar Chennel – Periyanai Anaicut Pasana vivasayigal sangam	Anaimalai	30	30	-	-	-	60
5	Old Aliyar Channel – Vadakkalur Anaicut Pasana vivasayigal sangam	Anaimalai	30	30	-	-	-	60
	Total		**150**	**150**	**-**	**-**	**-**	**300**

HORTICULTURE

DEPARTMENT

HORTICULTURE

WORLD BANK MULTI DISCIPLINARY IRRIGATED AGRICULTURE MODERNIZATION AND WATER RESOURCES MANAGEMENT PROJECT

Sub basin : ALIYAR
District : COIMBATORE
WRO Region : COIMBATORE
Blocks Covered : ANAIMALAI, POLLACHI NORTH AND POLLACHI SOUTH.

I. Existing Horticulture Crop Scenario

The following horticulture crops are grown in the sub basin **.**

S.No.	Crops	Area in Ha					
		Varieties	Fully irrigated	Partially irrigated	Total	Productivity in MT	Production in MT
1	Tomato	Lakhshmi 5005	30	-	30	11.91	357.300
2	Bhendi	Mahyco-10	10	-	10	8.56	85.600
3	Gourds Pandal vegetables	Mahyco-Hybrids Nunhems	40	-	40	12	480.00
4	Mango	Alphonso, Neelam, Senthuram	117	60	177	2.890	338.130
5	Banana	Poovan	90	-	90	29.280	2635.200
6	Sapota	PKM -1	15	-	15	25	375
7	TC Banana		-				
8	Coconut with Inter crops		252		252		
	Total		**554**	**60**	**614**		

a)	Cocoa	F1 Hybrids	177	-	177	1	177
b)	Nutmeg	Local Variety	50	-	50	1	50
c)	Arecanut		15	-	15	2.87	43.05
d)	Vanilla		10				

II. Existing Horticulture Practices:

Existing cropping pattern and Season :

1. Tomato – Through out the year
2. Bhendi - Through out the year
3. Banana - Through out the year
4. Gourds – June, July, January – February.

Proposed Generic Cropping Pattern:

1. Banana - January – December.
2. Gourds - January – February.

Existing Irrigation Potential:

Out of the registered Ayacut area of 20558 Ha. the present irrigation potential is

Fully Irrigated 16497 Ha
Partially Irrigated 2554 Ha
Gap 1485 HA

20536 Ha

Proposed Irrigation Facilities:

Out of 623 Ha. under Horticulture Crops, an area of 623 Ha. is proposed to cover micro irrigation with fertigation by the Agricultural Engineering Department

INM & IPM :

None of the farmers adopting INM but few farmers are adopting IPM in pre project.

It is proposed to adopt INM in 145 Ha. under fruits and 100 Ha. vegetables.

1. Inputs:

a. Seeds:

Certified seeds and seeds of traditional varieties of veg etables are used by farmers at present. Many farmers use their own seeds and also exchange seeds among themselves. Few innovative farmers get the required seeds from the near by Tamil Nadu agricultural University research stations, Krishi Vigyan Kendras an d private sources also.

It is proposed to procure Planting materials from the Government farms, Horticulture Research station. The Hybrid Seeds are available from the private sources and it will be procured and supplied to the farmers and under Tender acts.

b. Soil :

In Aliyar sub-basin mostly the soil is red loam, sandy loam , reddish gravel , black clayey soils and black soils with PH - ranging from 7 to 8.9. Soil is tested by soil testing laboratory at Coimbatore. Few farmers are practicing the STL recommendation and mobile soil laboratory at Coimbatore. The climate is mainly tropical in nature with the temperature ranges from 20 to 28 ºc and relative humidity ranging from 60 to 80%.

In view of the large number of soils samples proposed to be cover ed in the proposed intensive cropping pattern, private sources like Agri - Clinic, Spic, MFL services etc also will be utilized for testing.

c. Prevalence of Organic farming :

Organic farming is practiced by few farmers, less than 60 Ha.

It is proposed to cover 378 Ha. under Organic farming in cocoa -363 ha and Nutmeg-15 Ha.

d. Actual extension service available for TOT - Government / Private.

Available extension officers - Horticulture Officer, Aliyar - 1 No

Assistant Agriculture Officer

1) Animalai block	-	2nos
2) Pollachi North block	-	1no
3) Pollachi South block	-	1nos

Available extension officers and extension service to the farmers are inadequate. Apart from this no NGOs providing extension service to the farmers.

For transfer of latest farming techniques, many extension methods are being adopted. Besides distribution of inputs, required technical advice essential for the increased productivity are also given to the farmers. As per the Training and Visit program norms, there must be one Village Extension Worker (VEW) for every 800 to 1000 farm families. But such norms are not followed in reality due to vacancies at all levels of extension staff.

In view of the above, it is proposed to out source Technical Input Provider for 84 man months for 5 years according to the existing policy..

2. Practices - Ground realities :

a. Irrigation :

Irrigation is by open well and borewell. Mostly farmers are using ridges and furrow irrigation system. Only 20% of the farmers are using drip irrigation.

b. Micro irrigation :

There is lot of scope for developing Orchards in this sub -basin area by introducing Micro irrigation system.

Drip and sprinkler irrigation are proposed during the current year.

Out of 623 Ha. under Horticulture Crops, an area of 1210 Ha. is proposed to cover micro irrigation with fertigation by the Agricultural Engineering Department (vide page number -)

S.No.	Crop	Area Proposed to Cover Under Drip Irrigation
A.	**Fruits plants**	
1	Mango	180
2	Sapota	30
3	Banana	220
	Total	**430**
B	**Coconut intercrops**	**510**
C.	**Vegetables crops**	
1	Tomato	70
2	Pandal Vegetables	200
	Total	**270**
Total		**1210**

c. Fertigation :

Farmers apply fertilizers directly. Awareness on Fertigation amo ng the farmers is inadequate.

It is proposed to adopt INM in 145 Ha. under fruits

d. Contract farming :

Contract farming is not practiced in command area. Farmers are reluctant to adopt contract farming practice due to fluctuation in produce prices and for want of legal guarantee. However steps are being taken to convince to the farmers to take up contract farming atleast for commercial crops, to start with.

e. Pre & Post harvest practices adopted :

No Specific pre and post harvest practices are adopted in the basin.

f. Labour issues :

Availability of labour is very scarce. Labour availability is a problem due to migration of labours to urban area to get more wages by doing non agricultural works. Spinning mill, Ginning factories, Match indust ries, Fireworks industries are more popular in this district. Hence labour availability is a problem for farm work. Many farmers use family labours in addition to hired labours by paying over wages. Skilled labours are more scarce than the un skilled labou rs.

3. Agri - Processing - Factories, Capacity, etc.

No Agri Processing factories are located in the sub basin.

The major production of TC Banana (about 10000 MT) would be marketed in Kerala besides at terminal market proposed at Madurai. The production of Vegetables and flowers (2800 MT) would be marketed at the terminal market proposed during this project. Staggered planting methods are recommended to the farmers to maintain price fall in Vegetables especially during peak perio d of harvest.

III. Constraints :

1. Constraints in Existing Scenario :

a. Soil :

1) Soil P^H is slightly moderate.

2) Less humus content

To overcome the problem soil, addition of organic matter has to be done based on soil test reports. Green manuring composting and application of Farm Yard Manure have to be increased.

b. Adverse climatic condition :

.Rainfall is not distributed uniformly through out the year. Maximum rainfall is received during North east monsoon and with minimum rainfa ll during South West monsoon ..

c. Inferior quality of seed and planting material :

Farmers are using local and poor quality seeds. Truthfull seeds are used by very few farmers.

Quality planting materials are supplied through Department of Horticulture. There are two State Horticulture farms at ANAIKATTY and KANNAMPALAYAM..

Nutmeg plants can be procured from state Horticulture farm Kallar and Purliyar which produces 10,000 nos annually in which only 2400 nos are required for this sub basin.

The Hybrid seeds are available from the private sources and it will be procured and supply to the farmers under Tender acts.

d. Limited planting material available from government sources :

Required quantity of seeds is not available with department of Horticulture.

Seeds are supplied to the farmers by department after procuring the Hybrid Seeds through tender system.

e. Improper varieties :

Traditional varieties of vegetables are adopted by majority of the farmers. In some cases varieties of fruit plants were not true to type, hence purchased from vendors of un known sources.

f. Improper irrigation practices(Ridges and Furrows, Basin irrigation)

Ridges and Furrows system is followed for Vegeta bles and Basin irrigation is followed for Fruits. Drip irrigation is going to be introduced by the Agriculture Engineering Department for 1210 Ha.

g. Inadequate extension service :

Available extension officers to provide extension service to the farmers are inadequate. More extension personnel are required.

Only 1 Horticultural Officers for Pollachi Taluk and 4 Assistant Agriculture Officers are available in three Blocks. They are not sufficient event for the ongoing schemes of the Horticultur e Department.

Hence to cater the need of Technical Input Providers for Anaimali, Pollachi south and Pollachi North blocks. It is proposed to hire TIP for 84 man months for 5 years.

h. Low price for produce :

There is price fluctuation for fruits and vegetables due to un organized marketing and inadequate storage facilities, Middleman are taking the major portion

of the profit of the farmers. Farmers are cultivating same vegetables in a particular season year after year. So produce arrival to the mark et is heavy during particular season every year leading to low price.

The staggered planting methods recommended to the farmers will maintain price fall in Vegetables especially during peak period of harvest. It is recommended to plant early and late sea son varieties.

i. Poor adoption of Pre & Post harvest technologies :

Farmers are not following pre and post harvest technologies, this needs more attention.

1. **Banana**

   - The farmers are not following pre harvest technologies to overcome the problem of seeds in Poovan variety.
   - Bunch covering
   - Removal of male flowers
   - Fruit ripening
   - Grading

2. **Protected cultivation.**
   - Training on Cultivation of Cut flowers.
   - Pre and post harvest techniques.

3. **All fruits and vegetables**
   - Grading
   - Processing
   - Packing
   - Refrigerated vans for transport

     Awareness should be created among the farmers in pre and post harvest techniques by giving training to the farmers.

j. Limited availability of Credit facilities :

Credit facilities are available through primary Agriculture Cooperative Banks and Nationalized banks. However to avail these facilities many formalities has to be gone through. Hence simplification of procedure and single window system is essential.

k. Risk aversion

Few farmers have the knowledge of Risk aversion. However many farmers have poor knowledge on this, due to non visit to Horticulture depots and Departmental officers often. Due to lack training, lack of capacity building, etc awareness of the new technologies in cultivation of crops and price trend of the produces at various levels are low.

l. Limited processing units :

No Processing units are available in the sub-basin. Required type of processing unit for the required crop is not available.

m. Availability of labour

Labour availability is in decreasing trend for agriculture works, due to availability of non agricultural works which pays more wages to the labours.

IV. Diversification / Future vision proposed :

S.No.	Components	Physical target in Hectares						Production MT	Productivity MT	
		I Year	II Year	III Year	IV Year	V Year	Total		EXISTING	PROPOSED
I.	**AREA EXPANSION**									
A.	**Fruits plants**									
1.	TC Banana	30	40	25	25	25	145	8700	40	60
	Total	30	40	25	25	25	145			
B.	**Vegetables crops**									
1.	Hybrid tomato		20				20	1200	25	60
2.	Pandal vegetables	10	10	30	30		80	1600	15	20
	Total	10	30	30	30		100			
C.	**Inter crops Spices and Plantations**									
1.	Cocoa	50	150	100	63		363	545	1	1.5
2.	Nutmeg		15		-	-	15	2205	-	1.5
	Total	50	165	100	63	-	378			
	GRAND TOTAL	90	235	155	118	25	623			

Aliyarsub-basin , Coimbatore.

Places of Diversification of crops are furnished as follows

Sl. No.	Crops	Area increased in ha during W.P.	Places of diversification
I	**Fruits.**		
1.	T.C. Banana(G.9)	145	Anaimalai and pollachi
II.	**Vegetables**		
1.	Tomato(Ruchi,& suruchi)	20	Pollachi north and South
2.	Pandal vegetables	80	Pollachi north and South
III.	**Inter crops Spices and Plantations**		
1.	Cocoa	363	Pollachi north and South
2.	Nutmeg	15	Pollachi north and South
	Total		

V. Challenges thrown up by diversification /area expansion :

1. Judicious Utilization of water.

WRO should ensure quality and required quantum of irrigation water especially during the sowing season and the peak period of water requirement for each crop till harvest. Water can be judicially utilized by adopting micro irrigation and mulching techniques.

2. Identification of suitable crops/ varieties.

The crops, cropping pattern proposed in this project are suggested based on the micro climatic suitability market trend, soil type and based on the choice of the farmers(WUA) / FA.

3. Production of quality / quantity planting materials.

Timely supply of good quality and required quantity of pedigree planting materials that will be made available from the State Horticu lture Farms and quality Hybrid seeds should be made available through the horticulture depots.

4. Farmers acceptability for new crops.

On farm training at the successful / progressive farmers fields, training, meetings, motivation campaigns, should be conduc ted. Publicity and propaganda to be taken up.

5. Lack of transfer of technology

Transfer of latest farming techniques, distribution of inputs, technical advice should be given to the farmers through the extension personnel. Now the existing extension person al is inadequate. Hence out sourcing technical input provider is the only solution.

6. Strengtherning of Horticulture information centers

Information Education and communication facilities should be strengthened. Required training should be given to t he extension personal and field level workers. The infra structure facilities should be strengthened at sub basin level as well as project cell.

VI. Solutions and Recommendations

1. Soil reclamation :

i) Soil reclamation will be made as per the recommendations STL.

ii) Mulching, addition of organic manure.

2. TIP (Technical Input Provider) - Agri clinic :

i) Extension service should be provided to the farmers at 100 ha/TIP.

ii) The problem of inadequate TOT due to in sufficient in extension personnel can be overcome by employing TIP. Outsourcing of tip for 216 man months for 5 years period is proposed in this project.

	I YEAR	II YEAR	III YEAR	IV YEAR	V YEAR	TOTAL
TARGET /YEAR(HA)	90	235	155	118	95	623
Number of TIP	1	2	2	1	1	7

LOCATION	Anaimalai					
MANMONTHS PER YEAR	12	24	24	12	12	84

3. Staggered Planting :

Farmers can be advised on phased planting and long and short duration varieties and off season planting.

4. Mulching, Micro - irrigation :

Efficient water usage by adoption of micro irrigation and mulching.

5. Consultative process undertaken in the sub basin :

The walk through survey was conducted Discussion was held with farmers and their requirement was heard. Then after discussion among t he officers the decision taken up, accordingly the cropping pattern revised and updated.

6. Stakeholders demands (List)

i. Instead of local variety farmers demanded hybrid variety of vegetables and quality seeds.
ii. Demand for micro irrigation.
iii. Latest technology transfer - production technology and post harvest technology.
iv. Inputs for organic farming.
v. Credit facilities
vi. Processing unit for preserving vegetables and fruits.
vii. Need technical advise,
viii. Need market information centre.

8. Marketing intervention proposed with reference to identified constraints :

CONSTRAINTS AND CHALLENGES	COUNTER MEASURES
1) Identifying suitable crop / varieties according to agro climatic suit abilities and market limitations	Tissue Culture Banana is a new introduction for the sub-basin with fertigation which has a potential yield and income to the farmers
2) Increased requirement / production of planting material	Monopoly in supply of Tissue Culture plants is from Spic Bio-Tech which is 50 km. from the basin. Plants can also be obtained from M/s. Sunglow Bio-Tech which subsidized through rehabilitation of Tissue Culture Lab under National Horticulture Mission.
3) Cost of Tissue Culture plantlets are quite high Much can should be given in the early stage till establishment	Increased income of 60% uniformity in bearing Earliness in crop duration Disease free plantlets are produced Responds well to fertigation
4) Timely supply of seeds	Seeds will be procured from private agencies and supplied in time by the Department of Horticulture. The Kishi Vigyan Kendra attached to Tamil Nadu Agricultural University will also ensure supply of good quality seeds.
5) Improving the water the efficancy to cater to the needs of the additional area.	Drip irrigation can be followed for fruit crops and vegetable crops. Micro sprinklers can be used for onion.
6) Educating farmers on Good Agricultural Practices	• The water user Association can have linkage with the Government officials and Tamil Nadu Agricultural University.

	• Trainings can be organized for the farmers. • Handouts, folders and Booklet can be printed for the benefit of the farmers. • Promotion of INM/IPM concept by distributing organic manner bio pesticides and Bio fertilizers. It is also implemented under National Horticulture Mission scheme.
7) Labour demand	• Family labour can be utilized.
8) Credit facilities	Water users Association can be linked to Co-operative banks and Nationalised banks
9) Additional manpower	For effective implementation and proper monitoring and evaluation a Technical input provider can be appointed for every 200 Ha. Of the extended area.
10) Protected cultivation – Training to the farmers	New introduction to the basin for increase income.

PROJECT ON DEVELOPMENT OF HORTI CULTURE CROPS IN ALIYARSUB-BASIN

Physical In Ha **Fin in Rs.**

S.No	Components	Fin in Rs.			Physical target in Hectares					
		Unit cost	Assistance 75%	25% share by farmers	I Year	II Year	III Year	IV Year	V Year	Total
I.	**AREA EXPANSION**									
A.	**Fruits plants**									
1.	TC Banana	50000	37500	12500	30	40	25	25	25	145
	TOTAL				30	40	25	25	25	145
B.	**Vegetables crops**									
1.	Hybrid tomato	30000	22500	7500		20			-	20
2.	Hybrid Bhendi	30000	22500	7500	10	10	30	30		80
	TOTAL				10	30	30	30		100
C.	**Spices and Plantation**									
1.	Cocoa	15000	11250	3750	50	150	100	63		363
2.	Nutmeg	15000	11250	3750		15		-	-	15
	TOTAL				50	165	100	63	-	378
	GRAND Total				90	235	155	118	25	623

PROJECT ON DRIP IRRIGATION FOR HORTICULTURE CROPS

S.No.	Crop	Area Proposed to Cover Under Drip Irrigation	Implemented by
A.	**Fruits plants**		Agricultural Engineering Department
1	Mango	180	
2	Sapota	30	
3	Banana	220	
	Total	**430**	
B	**Coconut intercrops**	**510**	
C.	**Vegetables crops**		
1	Tomato	70	
2	Pandal Vegetables	200	
	Total	**270**	
Total		**1210**	

PROJECT ON INM / IPM

S.No	Components	Fin in Rs.		Physical target in Hectares					
		Unit cost	Assistance 100%	I Year	II Year	III Year	IV Year	V Year	Total
A.	**Fruits plants**								
3.	TC Banana	1000	1000	30	40	25	25	25	145
	TOTAL			30	40	25	25	25	145
B.	**Vegetables crops**								
1.	Hybrid tomato	1000	1000		20			-	20

2.	Pandal Vegetables	1000	1000	10	10	30	30		80
	TOTAL			10	30	30	30		100
	GRAND Total			**40**	**70**	**55**	**55**	**25**	**245**

PROJECT ON ORGANIC FARMING

S.No	**Components**	**Fin in Rs.**	**Physical target in Hectares**					
		Financial proposal already given in area expansion programme	**I Year**	**II Year**	**III Year**	**IV Year**	**V Year**	**Total**
C.	**Spices and Plantation**							
1.	Cocoa		50	50	100	63	0	363
2	Nutmeg			15		0	0	15
	Total		50	65	100	63	0	378

PROJECT ON DEVELOPMENT OF HORTICULTURE CROPS IN ALIYARSUB-BASIN

Physical In Ha Fin in Lakhs

S.No.	Components	Estimated cost	Financial in lakhs					Total (in lakhs)
			I Year	II Year	III Year	IV Year	V Year	
I.	Area Expansion	.						
A.	**Fruits** TC Banana	0.500	15.00	20.00	12.50	12.50	12.50	**72.50**
1.	**Vegetables**							
B.	Hybrid Tomato	0.300		6.00				**6.00**
1.	Pandal Vegetables	0.500	5.00	5.00	15.00	15.00		**40**
C.	**INTER CROP**							
1.	Cocoa	0.150	7.50	22.50	15.0	9.45		**54.45**
2.	Nutmeg	0.150	-	2.25		-	-	**2.25**
1.	PROTECTED CULTIVATION Shade net (500sq mt)/No Polygreen House (500 sq.mt)No	Rs.650/sq.mt Rs.7000/500 sqmt	6.50 0.63	32.50 0.70	- 	- 	- 	**39.0** **1.33**
	Overall Total		**34.63**	**88.95**	**42.50**	**36.95**	**12.50**	**215.53**
II -1	**Extension support @ Rs 8000/ month (84 man months for 5 years)**	**0.96**	**0.96**	**1.92**	**1.92**	**0.96**	**0.96**	**6.72**
2	**Advertisement charges**	**0.24**	**0.24**	**0.24**	**0.24**	**0.24**	**0.24**	**1.20**

3	**Hiring computers**	**0.50**	**0.5**	**0.50.**	**0.5**	**0.5**	**0.5**	**2.50**
	Total		**1.70**	**2.66**	**2.66**	**1.70**	**1.70**	**10.42**
III	**Organic farming**	**Amount already proposed in area expansion programmes.**						
IV	**INM /IPM**	**1000**	**0.40**	**0.70**	**0.55**	**0.55**	**0.25**	**2.45**
V	**Micro Irrigation**	**Implemented by Agriculture Engineering Departmen t.**						
	Grand Total		**36.73**	**92.31**	**45.71**	**39.20**	**14.45**	**228.40**

Aliyarsub-basin , Coimbatore.

Technologies Proposed under Horticulture.

S. No	Technology / Practices	Existing output tons/ha	Area proposed in ha	Proposed output tons/ha	Percentage of increase	Budget out lay Rs. in lakhs.
I	**Varietal Diversification, micro irrigation, INM in fruits.**					
1.	T.C. Banana(G.9)	40	145	60	50	72.500
II.	**Varietal Diversification, micro irrigation, and IPM in Vegetables**					
1.	Tomato(Ruchi,& suruchi)	25	20	60		6.00
2.	Pandfal vegetables	15	100	20	33	40.00
III.	**Varietal Diversification, micro irrigation, Organic farming in Spices**					
1.	Cocoa	1	363	1.5	50	54.450
2.	Nutmeg	1	15	1.50	-	2.25
III	Protected cultivation					**40.330**
	Total		**623**		**75**	**215.530**

Aliyarsub-basin , Coimbatore.

REQUIREMENTS OF INPUTS

Slno	Name of the Component	Varieties	Area in Ha	Seeds and plants requirement/ ha	Total Requirement	Source of planting material
	Area Expansion					
1	Fruits TC Banana	G9	145	3000	435000 Nos	Private Tender
2	Vegetables					
	Hybrid Tomato	Lakhsmi 5005	20	0.150	3.00 kg	Private Tender
	Pandal Vegetables	Mahyco Nunhens	80	1.50	120 Kg	Private Tender
3	INTER CROP					
	Cocoa	F 1 Hybrids	363	500	181500 Nos	Private Tender
	Nutmeg	Local	15	160	2400 nos	SHF Kallar/ Burliyar

OUTCOME OF THE PROJECT

SL.NO	DETAILS	WITHOUT PROJECT	WITH PROJECT	% INCREASE
1	Area in Horticulture crops(Ha)	614	1195	194.63
2	Introduction of IPM/INM(Ha)	0	245	245
3	Introduction of Organic Farming(Ha)	0	378	378
4	Average Increase in Production (MT)	82	143	75

FISHERIES

DEPARTMENT

FISHERIES DEPARTMENT

The sub basin with the Aliyar Reservoir and one major (System) tank offer good scope for inland fisheries development. Aquaculture is currently done by the Tamil Nadu Fisheries Development Corporation in Aliyar reservoir. For the last decades the fish production in this reservoir has been good when compared to the other reservoir in Tamil Nadu and it is about 100kg/ha/year. Judicious stocking, manage and capture is the strategy followed. The fishery constitute mostly the cultured carps. Which are fast growing and has good market. To increase the unit productivity of fish "Farming of fish in floating cages" is been piloted in the reservoir by the TNFDC. A fresh water aquaria has been established in this sub basin at Aliyar which acts as source of attraction for tourist. As far as tanks are concerned there is only one major irrigation tank where in aquaculture is done by Fisherman co-op society.

The sub basin located with one fish seed farm at Aliyar Dam which is operated by TNFDC is functioning effectively and meets more than the needs of the sub basin. All the three Indian major carps are produced in this farm.

There is no governmental fisheries extension officer in this basin. The quality of water of this basin is found to be suitable for aquaculture. There are no private ornamental fish farms in this sub basin.

The fresh water fishes produced in this basin are mostly marketed in Pollachi and Coimbatore. There are no hurdles or lack of infrastructure facilities found in this sub basin. Mostly fishes are marketed fresh and also preserved by proper hygienic method.

The following proposals is made under IAM WARM project as fisheries component

AQUACULTURE IN FARM PONDS :

Farm ponds are been proposed to be excavated in the sub - basin by the Agriculture Engineering departments, primarily as rain water harvesting and storage tanks in the farmers field with a water spread area of 1000 m^2. Aquaculture will be promoted in these farm ponds as an integrated component. Some alteration shall be made in the pond by providing a layer of clay on the pond bottom to prolong the retention of water at least for 4 months.

The members of the water users association were consulted extensively and 48 of them have expressed their willingness to take up aquaculture. Considering their genuine demand and also to promote a type of integrated aquaculture, inputs for 48 farms ponds are proposed. The bottom line is that the aquaculture activity is not going to consume an y water which is in harmony with the concept of the IAM WARM project (i.e.) saving water and the activity will not interfere with the irrigation activity. The aquaculture input is for one time and the farmer shall take up the activity in the ensuing years. Stocking density of one stock size fish (50 gm) per metre square is proposed and a net revenue of about 10000/- per pond is envisage. This shall be an additional income for the agriculture farmer.

ORNAMENTAL FISH CULTURE

The Water Quality of the Sub Basin is suitable for ornamental fish rearing. Marketing potential is also available. Hence to promote commercial ornamental fish culture two units shall be establish ed in this basin on pilot basis.

Like cash crop of Agriculture ornamental fish culture is a fast growing business venture in the field of fisheries. Aquarium keeping is a healthy hobby recommended by doctors to avoid stress and to have peace of mind.

In Aliyar Dam the TNFDC is running successfully an aquarium for public and a culture unit attached to it. The Climatic condition and water quality are suitable for aquarium fish rearing.

The pilot unit proposed shall have 4 nos of rearing ponds (4000 Sq.mt) each. The pond is a earthen one apart from rain water harvesting , to support continuous maintenance of water level a 6 " dia borewell with motor will be provided.

Young once of ornamental fishes (1- 2 cm) will be purchased from TNFDC farmers and grown upto marketable size of about 6-10 cm depending on the species.

An investment of 1.27 lacs per unit and an operational cost of 0.93 lacs per 3 cycles is proposed.Net return of about 1 lacs per year is envisaged.

TRAINING AND CAPACITY BUILDING

IAMWARM projects target groups are primarily WUA whose members are agriculture farmers with little knowledge on aquaculture .Hence training and capacity building on fresh water aquaculture and ornamental fish culture etc., is highly essential. The IAMWARM project training component shall lay emphasis on planning the aquaculture training.

- For monitoring the aquaculture activities vehicle hire charges of 1.20 lakhs and documentation charges of 0.30 lakhs are provided.

OUTCOME EXPECTED/ ANNUALS

Slno	Description	Fish fingerings (nos in Lakhs)	Fish production (Tonnes)	Net Revenue (Rs. In lakhs)
1	Aquaculture in Farm ponds (48 Nos)	Nil	28.80	4.80
2	Ornamental Fish culture (2 units)	0.84	Nil	2.34

ABSTRACT

1.	Input cost for 48 farm ponds (48 X 16,500)	=	7.92 Lakhs
2.	Ornamental fish culture (2x 2.20)	=	4.40 Lakhs
3.	Vehicle hire charges	=	1 .20 Lakhs
4.	Documentation	=	0.30 Lakhs
	TOTAL	**=**	**13.82 Lakhs**

DETAILS FOR ONE UNIT - FARM POND.

A. Fixed Cost

1. Pond (available)	-	NIL
2. Improvement to pond by providing clayey layer	-	5,000.00

B. Operational Cost (in Rs.)

1. Lime	-	250.00
2. Manure	-	750.00
3. Stock size fish seed @ Rs. 3/- per seed	-	3,000.00
4. Feed (Rs. 4/- per kg of RB 6000 kg Rs.12/- per kg of Goc 300 kg)	-	6,000.00
5. Harvesting and Miscellaneous	-	1,500.00

TOTAL		11,500.00

C. Returns

By Sale of 600 kg of fish @ Rs. 35/- per kg	-	21,000.00
(Gross Profit) – (C-B)	-	9,500.00

Ornamental Fish Culture

Water Spread Area	Sq.m	1600			
Culture Period	months	60 to 70 days per cycle. Totally 3 cycles			
Depth of Water	meter	1.0 meter			
		With Project			
			Financial	Financial	Economic
	Units	Quantity	Unit Price (Rs)	Value (Rs/Pond)	Value (Rs/Pond)
INPUTS, Fixed costs					
Excavation of four ponds	LS	40000	1	40000	36000
Bore well (6" diameter and 200' depth)	LS	20000	1	20000	18000
3 HP Motor cost and wiring	LS	15000	1	15000	13500
Equipments-Oxygen cylinder/Nets/Velon/screen/Feed trays	LS	7000	1	7000	6300
Electricity Service Connection (3 phase) with accessories	LS	30000	1	30000	27000
Shed for store cum packing (1500 sq.ft)	LS	15000	1	15000	13500
				127000	**114300**
INPUTS, Recurrent costs					
Cowdung	Ton	1.0	1000	1000	900
Fish fry	Lakh No	0.6	75000	45000	40500
Electricity	LS	10000	1	10000	9000
Pellet feed	Kg	240	60	14400	12960
Transport charges	LS	2000	1	2000	1800
Prophylactic measures	LS	3000	1	3000	2700
Labour	LS	120	100	12000	10800
Packing material and oxygen	LS	3000	1	3000	2700
Miscellaneous	LS	2000	1	2000	1800
Sub Total	**Rs**			**92400**	**83160**
OUTPUT					
Percentage of recovery					
Fish, above 7.5 cm each	%	70%			
Fish production					
Fish, above 7.5 cm each	Lakh No	0.42	500000	210000	189000
Gross Income	**Rs**			**210000**	**189000**
Net Income	**Rs**			**117600**	**105840**
INCREMENTAL NET INCOME	**Rs**			**117600**	**105840**

ENVIRONMENTAL CELL

ENVIRONMENTAL CELL

The PAP command area is located in parts of Pollachi, Udumalpet, Palladam and Triuppur taluks in Coimbatore district. A little part of the areas extends into Kangeyam and Dharapuram taluks of Periyar district. The area falls between coordinates 76°24ə 30" to 11°02ə 00" N Latitude. This is a multi purpose project located in the Anaimalai hill range with the highest elevation of 8251 ft. and caters to the irrigation, p ower generation and drinking water requirements. The total catchment area of PAP is 841 sq.km. The normal annual rainfall of PAP ranges from 330cm in Aliyar sub basin to 90cm in Palar sub basin. Aliyar sub basin is a part of PAP basin.

I.ENVIRONMENTAL AND SOCIAL ISSUES

Agriculture is the predominant occupation of the basin and the Environmental and Social issues in this basin are furnished below:

Sl.No	Environmental & Social Issues	Remedial Measures
1	Scarcity of Water	• Promoting do nothing farming in coconut gardens. • Promoting drip, sprinkler along with mulching, and introducing earthworms in field. • Promoting Less water intensive crops and creating a market for those produces. • More Environmental awareness on natural temperate climate foods rather than fast food culture and Tie up with urban people. • Rain water-harvesting systems in the basin. • Reuse of domestic wastewater by proper treatment.

2	Shortage of labour	• Mechanization and introduction of less labour intensive cultivation practices. • Weight to Rural development schemes to stop migration from rural area. • Promoting rural based agro industries like preparation of vermi composting, panchakavya and Bio repellant liquids etc. • Special incentives to agricultural laborers.
3	Ground water depletion	• Rain water-harvesting structures based on water shed area including promotion of tree saplings plantations. • Motivation for conjunctive use of ground water and surface water. • Speedy Enact of ground water regulation law. • Change of the existing cultivation practices and promoting the farmers to go for the crops based on the availability of water **as like at Raleagan Sidhhi in Maharastra.**
4	Water Pollution due to domestic wastewater in Anaimalai and Pollachi towns.	• Motivating the local bodies for effective wastewater management and implementation of treatment plants based on the experience of the WRCP-I schemes. • Reuse of the wastewater after proper treatment. •

5	Water pollution due to dumping of solid wastes like municipal wastes, construction debris's and coir wastes in Aliyar, Kottur, Pollachi, Anaimalai towns.	• Motivating the local bodies and public for effective solid waste management and promoting bio compost. • Motivating the public, institutions, Construction industries and industries to implement waste management systems. • Promoting Bio composting schemes for effective integrated approach.
6	Soil pollution and increase of health problems due to Inorganic farming and usage of Chemical fertilizers and pesticides.	• Motivating the farmers to adopt chemical free farming. • Creating Environmental awareness on the need of maintaining the agro ecosystems. • Promoting more families for preparation of bio compost, panchakavya and vermicompost industries. • Conducting health camps in the basins.
7	Issues due to Tourism at Aliyar, Anaimalai, Valparai and TopSlip.	• Conserving the water bodies by. Promoting Eco tourism. • Arresting the existing pollution from solid wastes and liquid wastes. • Promoting Herbal Gardens to create awareness on the importance of herbal plants and conservation of environment.
8	Encroachments in water bodies and irrigation canals.	• Eviction of all kind of encroachments. • Creating some kind of forum to stop further encroachments of water bodies.

9	Monoculture crops.	• Motivating the farmers to improve the agriculture ecology by introducing Bio diversity cultivation. • Crop promotion as per the soil nature and water availability.
10	Man animal and Man Bird conflicts. (Increase of Peacock Population in Aanaimalai area poses disturbances to farmers)	• Training the farmers to manage the issue in coordination with forest department and Environmental organizations like SACON.
11	Natural Resources degradation and pollution	• More Environmental awareness meetings, seminars, Workshop/ Training and exhibition for public.
12	Water weeds in and around Aanaimalai and Pollachi area	• Implementing scientific weed management schemes. •
13	Export of raw materials to other area.	• Introducing new value addition industries.
14	Increase of soil erosion.	• Implementing water shed management programme.
15	Lack of data on environmental Conservation in new projects.	• More Environmental awareness meetings, seminars, Workshop/ Training and exhibition
16	Deforestation	• Promoting afforestation programmes
17	Water Quality and Problems (excess fluoride and Nitrite)	• General awareness programmes to reduce the pollutants at the source itself and identifying the source.

II.ENVIRONMENTAL ACTIVITIES SO FAR CONDUCTED

The following works were carried out in the previous years

(i)Periodical water sampling is carried out at 35 points in the basin.
(ii)Training on Organic Farming to farmers.
(iii)Environmental training & Field visit to students.
(iv)Seminars in colleges, Schools and SHG.
(v)Solid waste Management in Anaimalai and Aliyar towns.

III.ENVIRONMENTAL ACTIVITIES PROPOSED

The following activities are proposed under the IAMWARM Project. The details of the activities are given below:

(i) Environmental Monitoring of River Basins

The water samples will be collected from the prefixed points periodically and will be analysed and documented to assess the impacts. Soil samples will be collected from the farmers field and waste lands.

(ii) Seminars / Trainings

It is proposed to conduct the seminars and workshops to the students, farmers, department officials and public to create awareness about the importance of environment and the threats due to pollution and the remedial measures.

a. For College and school Students

It is proposed to conduct one-day awareness seminar in the institution premises itself with eminent resource persons delivering lectures and participating in interactive sessions with the students.

This will help the students understand the importance of environment and the necessity to safeguard the environment. Further it will motivate them to undertake and implement projects in their campuses that will protect the environment and lead them to form **Eco-clubs.**

b. For Farmers

It is proposed to conduct one day seminar to farmers on safe guarding the environment from farmers perspective. The seminar will focus on the issues relating to optimal use of fertilizers and pesticides for agriculture and motivating and prepare them to practice chemical free farming.

It is proposed to conduct one seminar for every 4 WUAs with a maximum of 25no of participants from each WUA totaling 100.

This program will be conducted in consultation and coordinatin with the line departments and TNAU.

c. For Department officials and Local Bodies

The Proposed one day seminar will highlight the latest issues and developments in the matters related to environment. The objective is to keep the officials informed and updated in tune with the current scenario, which in turn will help them in addressing the issues falling in their domain more effectively.

III) Exposure Visits

a. For Farmers

The field visits will be conducted in sequel to the seminar. The farmers who are willing to adapt the methods / technologies will be taken to the fields in the near by locality which are adopting them.

This will give them a chance to have first hand information and interact with the farmers already adopting them, clear their suspicions and will motivate to implement those practices in their own field.

b. For Department Officials and local bodies.

The field visits will be conducted in sequel to the seminar. The department officials will be taken to the places where cleaner technologies were successfully implemented.

This will help them understand the difficulties in day to day operation and prepare them for effective implementation in their own area.

(IV)Environmental Projects

It is proposed to implement the following small scale environmental related projects.

a. Formation of Eco Gardens in Public Places, schools / Colleges etc

It is proposed to put display boards emphasizing the importance and necessity to preserve the environment on the following topics

- Solid Waste Management
- Conservation of energy
- Protection of water bodies, forest and animals.
- Bio diversity
- Planting native species of plants

This program will be implemented in the existing parks and public places in the towns.

b. Promoting Eco Tourism

Aliyar, Valparai, and Top slip are some of the important tourist spots in the sub basin frequented by large no of tourists every day. Undoubtedly tourism plays a big role in developing the local economy, but if not managed properly it also poses a whole lot of new problems such as Solid and liquid waste management, traffic etc.

Especially solid waste management requires special attention in the above said areas as they are in close proximity to reserved forest areas. The proper collection and disposal of non degradable material such as plastic brought by the tourist assumes significance and hence it is proposed to

- Place separate garbage bins at important places in coordination with local bodies.
- To put up hoardings highlighting the importance to protect the environment.
- Distribution of notices and hand bills
- Organizing rallies to highlight the environmental issues.

c. Motivating Educational Institutions to adopt cleaner technologies in their campuses.

This program will be carried out in sequel to the seminars conducted in institutions.

It is proposed to help the educational institutions in implementing the programs that will help protect the environments. For this one time help like providing bins for segregating wastes at the source or for forming biocompost or vermicomposting yards etc in their own premises

(iv)Lab facilities

The EC division has its own water quality-testing laboratory for testing 16 parameters. The lab has to be strengthe ned for conducting all necessary parameters for which a lump sum amount has been provided in this estimate.

(v) Capacity building

The officials from various line departments and farmers has to be continuously informed and educated about the environmental protection, economical benefits and social uplift while carrying out the IAMWARM Project, for which purchase of journals and publication of news letter and books has been included in this estimate.

(vi) Documentation

The entire activities carried during the project have to be documented for reference and information to future planning and so necessary provision has been made in this estimate.

(vii) Conclusion

The above-proposed activities are based on Sustainable development concept. These proposed envi ronmental Components are essential to safe Guard the water resources, Soil, human health and other natural resources.

The estimate is based on the current schedule of rates and the estimate value works out to Rupees Nineteen Lakhs Only.

Project Cost

Sl. No.	Description of Component	No	Months / Years	Qty	Unit Rate	Amount	Total
1	**Periodical water samples & soil samples collection , preparation , testing and anlysis and other Environmental & social parameters data collection.**						
a.	Water samples.	15	20	300	750	225,000	
b.	Soil sample in polluted fields and waterbodies..	10	4	40	1000	40,000	
c.	Outsourcing mazdoor cat 2/computer operator for assisting the field officers in collection ,testing, of water soil and other social and environmental related data's.	2	20	40	3000	120,000	
d.	Outsourcing driver for the Government jeep for assisting the field officers in collection ,testing, of water soil and other social and environmental related data's.	1	20	20	3500	70,000	
e.	Outsourcing Technical Assistant for assisting the field officers in collection ,testing, analysing and report writing	2	20	40	5000	200,000	
f.	Conveyance and transportation charges				10000	10000	
							665,000
2	**Conducting Environmental & social Awareness meeting , training, exhibition & work shop for conserving the natural resources and environment including video & photoGraph, training material momentos and Documentation works etc.,**						
a.	**Meeting/ Seminar.**						
	1. For college students-One day seminar on Environmental Issues	5	25	25	17000	425000	

	2. For Farmers- One day seminar on Imporatnce and necessity of Environmental friendly farming practices (For 4 WUAs Combined)	5	5	5	17000	85000	
	3. For Local bodies-On Solid waste management and department Officals on Environmenatl Issues	3	3	3	12000	36000	
							546000
b.	**Field Visits**						
	1. Exposure visits to members of WUA on eco friendly farming and modern farming techniques	5	5	5	14000	70000	
	2. Exposure visits on eco friendly practices to officials of WRO and line departments & Local Bodies for waste management	1	5	5	14000	70000	
							140000
c.	**Exhibition/Demonstration./ Health camp**						
	1. For participating in the important exhibitions like AGRI EXPO, BUILD EXPO and putting up stalls to highlight the environmental problems	1	5	5	20000	100000	
							100000
3	**Implementing Environmental Projects such as to improve the soil ecology, water conservation, Prevention of water pollution, solid waste management, Eco- tourism in parks and Increasing Bio -diversity plants in command area.**						
a.	Formation of Eco Gardens in Public places , Government Office Premises and parks.	1	5	5	10000	50000	
b.	Promoting eco tourism in the existing tourists spots to protect the water resource from all kind of pollution	1	1	1	50000	50000	
c.	Motivating the Educational institutions and Schools to implement the alternative technology for the Environmental pollution in their campus.	1	5	5	20000	100000	
							200000

4	Institutional Strengthening and Capacity building to the Engineers,Officers and farmers for effective implementation of IAMWARM PROJECT.						
a.	Purchase of Environmental related journals, Bulletins , and Books to improve the existing libraroy.			1	10000	25,000	
b.	Publication of books,phamplets,posters and News letters.			1	10000	15,000	
c.	Procuring electronic machines like LCD projector ,GPS,PEN DRIVE and improving the computer facilities in office					60000	
d.	Provision for upgrading existing waste water testing laboratory of EC Division, Coimbatore					75000	
							175000
5	**Documentation of the entire activities and preparation of annual reports for line departments of the out come of this project.**					50,000	
6	**Unforseen items if any.**					24,000	
							1900000

PROJECT COST

TN IAM WARM PROJECT

PARAMBIKULAM ALIYAR BASIN

ALIYAR SUB BASIN

PROJECT COST ESTIMATION

GENERAL ABSTRACT

Sl. No.	Name of the Line Department	Estimate Amount in Lakhs	Remarks
1	Water Resources Organisation	2903.00	
2	Agricultural Engineering Department	1463.34	
3	Agricultural Marketing and Agri. Business	29.40	
4	Agricultural Department	149.855	
5	Animal Husbandry Department	40.12	
6	Tamil Nadu Agriculture University	904.36	
7	Horticultural Department	228.40	
8	Fisheries Department	13.82	
9	Environmental Cell	19.00	
	Total	**5751.295**	

(or) 575.13 Million

FINANCIAL PROGRAMME

FINANCIAL PROGRAMME

Sl. No.	Name of the Line Department	Estimate Amount in Lakhs	I st year	II nd year	III rd year	IV th year	V th year
1	Water Resources Organisation	2903.00	900	900	1103	0	0
2	Agricultural Engineering Department	1463.34	500	500	463.34	0	0
3	Agricultural Marketing and Agri. Business	29.40	9	9	11.40		
4	Agricultural Department	149.86	27.37	32.04	30.15	30.15	30.15
5	Animal Husbandry Department	40.12	8	8	8	8	8.12
6	Tamil Nadu Agriculture University	904.36	300	300	304.36		
7	Horticultural Department	228.40	45	45	45	45	48.40
8	Fisheries Department	13.82		4	4	5.82	
9	Environmental Cell	19.00	4	4	4	4	3
	Total	**4784.375**	**1793.37**	**1802.04**	**1973.25**	**92.97**	**89.67**

ECONOMIC ANALYSIS

ECONOMIC ANALYSIS

In an economic analysis, the investment is to be made under development departments with benefits to be realised over a period of years from the developmental activities were examined and the sa me are subjected to analysis. The Analysis generated an IRR of % revealed that the investments are viable.

OUTCOME OF THE IAM WARM PROJECT – PROJECTION

The integrated approach adopted in the project with the support of Line Department and water-using stakeholders will aim to achieve the increased level of agriculture and alied sector production per unit of water by adopting appropriate technologies in the farm frond. Due to the modernization activities, the gap of the command wil l also be met with by impasting efficiency in water resources management.

The water released into the modernized canal system inturn facilitate timely supply of water at required quantity that promotes adoption of different landuse technologies. Such Techn ologies generate additional return besides generating employment of opportunities to the rural folk leading to reduction of poverty.

THE INTERNAL RATE OF RETURN is arrived at % which explain the worthiness of the investment in this project. Appropriat e monitoring and followup will definitely add additional benefit to the farming community.

ANNEXURE I – MAPS

1. Aliyar Sub Basin Index Map
2. PAP Schematic Layout of Reserviors
3. Drainage Map
4. Administrative Map
5. Categorization Map
6. Command Area Map
7. Soil Map
8. Land Use Map
9. Geomorphology Map
10. Geology Map

ANNEXURE II – PHOTOS

1. Stack Folders Meeting
2. Line Department Meeting
3. Water Users Association Meeting
4. Joint Walk Through Survey
5. Damaged Canal Lining
6. World Bank Consultant Visit
7. Project Director Discussion with WUA
8. Field Visit by Project Director
9. Project Director Discussion with Line Department Officials
10. Madyapradesh Field Visit

ANNEXURE III – WUA Representation

1. Sethumadai Canal Vettaikaranpudur Village Water Users Association Representation.
2. Vettaikaranpudur Canal Odayakulam Village Water Users Association Representation.
3. Pollachi Canal Pethanaickanur Village Water Users Association Representation.

ANNEXTURE IV

MAPS SHOWING THE LINE DEPARTMENT

ACTIVITIES

1. Agriculture Department.
2. Agriculture marketing and Agri Business
3. Tamilnadu Agricultural university
4. Animal Husbandry Department.
5. Horticulture Department.