NATIONAL AGRICULTURE DEVELOPMENT PROGRAMME (NADP)

DISTRICT AGRICULTURE PLAN

THIRUVARUR

CENTRE FOR AGRICULTURAL AND RURAL DEVELOPMENT STUDIES
TAMIL NADU AGRICULTURAL UNIVERSITY
COIMBATORE -641 003

NATIONAL AGRICULTURE DEVELOPMENT PROGRAMME (NADP / RKVY)

NADP

DISTRICT AGRICULTURE PLAN

THIRUVARUR

CENTRE FOR AGRICULTURAL AND RURAL DEVELOPMENT STUDIES
TAMIL NADU AGRICULTURAL UNIVERSITY
COIMBATORE - 641 003

2017

CONTENTS

LIST OF TABLES

LIST OF FIGURES

EXECUTIVE SUMMARY

Thiruvarur District was formed on 1st, January 1997 by carving out of certain portions of erstwhile Nagappattinam and Thanjavur Districts. Accordingly 9 blocks from Nagappattinam District and 1 block from Thanjavur District were taken out and Thiruvarur District was formed with 10 blocks. For administrative purpose the district is divided into 2 divisions. i.e.Mannargudi and Thiruvarur. The district is bound by Palk straight in the south, Thanjavur in the west and Nagappatinam District in the East and parts of Nagapattinam and Thanjavur District in the North.

Tiruvarur District is located in the tail end of the Cauvery Delta. At present Thiruvarur is located approximately between 100 20'N and 11007'S of the north latitude and between 790 15'E and 790 45'W of east longitude. The total geographical area of the district is 2097.09 Sq. Km. In 2011, Thiruvarur had a population of 12, 68,094 of which males and females were 6, 27,616 and 6, 40,478 respectively. It has 1,52,240 hectares of cultivated area which constituted 56.6 percent of the total geographical area of the district. Thiruvarur district has four Municipalities, ten Panchayat Unions, seven Town Panchayats, 430 Village Panchayats and 573 Revenue Villages. Thiruthuraipoondi block has vast stretches of forest area.

The actual rainfall of the District is 1274.6 mm. The district receives rainfall from both South West and North East Monsoons. The normal annual rainfall in the district ranges from 1100 to 1260 mm. The main source of irrigation in the district is canals. Major crops cultivated in Thiruvarur district are Paddy, Black Gram, Green Gramm, Groundnut, and Coconut. As per the 18th Livestock Census, the total Livestock in the district was about 10, 31,697 numbers. The population of Poultry in the district was about 44,22 Lakhs.

The compound growth rates of area, production and productivity of major crops viz Paddy Black Gram, Green Gram, Sugarcane, coconut groundnut and Gingelly of Thiruvarur district exhibited a maximum growth rate area of 12.139 per cent in the case of groundnut crop followed by 9.515 percent in greengram followed by 4.383 percent in Black Gram. In groundnut, coconut and greengram 22.99, 7.170, & 6.069 percent respectively followed by 3.96 percent in blackgram with respect to production under cultivation. All other crops analyzed exhibited a negative growth rate in cultivated area. Even though crops like Maize, Black Gramm Coconut, Tapioca and banana had positive growth rates in their productivity, their area and production exhibited only a negative growth rate.

Thiruvarur district is more suitable for cultivation of paddy. Other important crops grown in the district are blackgram, greengram, cotton, sugarcane, gingelly, groundnut etc., and the major cash crops are paddy, blackgram, green gram, cotton. The land use pattern of the district indicates that land under net cropped area occupies maximum percentage, nearly 56.6 percent, while the land put to non –agricultural followed with 13.5 percent. Area sown more than once was 1, 26,138 Hectares. The other types of land uses occupied a minimum percentage of less than 10 percent for each category. The land under non-agricultural uses (13.5 percent) is causing concern as the growth of these activities will reduce the agricultural growth in the district. The current fallow and other fallow lands occupying 0.8 and 2.9 percent respectively can be reduced considerably by encouraging horticultural plantations. Meanwhile, the productivity of the crops has to be increased so as to compensate the reduction in land under agriculture by adopting modern practices and high yielding hybrid varieties. The irrigation sources of the district indicate that canals are the major source of irrigation supplemented by tube wells.

The major irrigated crops in the district are paddy, coconut, groundnut, cotton, gingelly, Sugarcane. The irrigated area under vegetables, fruit and flowers if increased by judicious use of water with modern water management techniques, yield of those crops can be boosted and thereby export potential can be explored. The productivity of food crops like paddy, cotton, sugarcane and pulses can also be increased to the target levels by proper water management practices. This district has a great potential for agribusiness and export of agricultural products. The establishment of industrial complexes and special economic zones will further contribute to the development of the district.

SWOT Analysis of the District

Strength

- Assured Channel Irrigation
- Soil with high water holding capacity
- Average land holdings of 1 acre
- Marine eco system

Weakness

- Mono cropping
- Susceptible for flood and Drought
- Sea water intension
- Clay soil with water logging nature.

- Less thrashing floor and storage facilities.
- Mind set of farmers not to go for alternate crop.
- Shortage of labour.
- Farm mechanization
- More area under cotton, Oil seeds etc.
- More area under vegetable and fruit crops.
- Scope for increase in Productivity in Rice, Blackgram and Greengram..
- More area under Bamboo
- Contract farming in maize. Pulses and cotton cultivation.
- Value addition in pulses.
- Scope for Minor Millets such as Kudiraivalli.

Thrust

- Recharging of Ground water table
- Rain water harvesting structures
- Drainage system
- Extraction of Rice bran oil from paddy husk.
- Straw based Industries
- Pulses processing Industries

Vision

- Increasing production under Paddy and Pulses such as Black gram and Green Gram
- Increasing production in cotton and oilseeds.
- Restoring Soil facilities.
- Area Expansion under cotton, oil seeds and coconut.
- Agricultural mechanization.
- Encouraging Vegetable cultivation in Summer with Groundwater.

Strategy

- Creating awareness through campaigns
- Imparting new technologies through Trainings, exposure visits, study tour kissanmelas.
- Conducting demonstrations.
- Issue of soil health cards.
- Promotion of Agri clinics.

- Promotion of agricultural machineries to farmers.
- Conducting farmer – scientists' interactions thro' workshops and seminars.
- Introduction of Technologies packed with required inputs with subsidized cost.

Position of Ongoing Schemes in Agriculture Department

The agricultural department implemented the State government funded schemes viz., the procurement and distribution of paddy, millets, oilseeds, cotton seeds including the distribution of coconut seedlings, crop yield competition and vermicompost in the year 2012-13 with the expenditure of Rs. 451 lakhs. The Centre and State government funded projects viz., Integrated Scheme for Oilseeds, Pulses, Oil palm and Maize, (ISOPOM) (75:25), Technology Mission Mode Scheme Macro Management Mode Schemes (90:10), (75:25) Coconut Development Board Schemes (50:50), Centrally Sponsored Schemes (100 per cent). National Food Security Mission (100%) are in operation in this district.

Major Interventions of Agriculture Development

The department of agriculture has proposed the following interventions in the district agriculture programme.

1. **Integrated Development of Rice**
   - Promotion of Green Manure in Paddy @75% Subsidy
   - Machine Direct Sowing Demonstration on Rice
   - Line Planting Demonstration on Rice
   - Distribution of Gypsum
   - Distribution of paddy MN mixture
   - Distribution of Bio-Fertilizers
   - Back ended subsidy for Machine Planting
   - Farmers Field School
   - Climate Risk Management- Farmers Field School
   - Distribution of Power Tiller
   - Distribution of Power Cono- weeder
   - Distribution of Tractor
   - Distribution of Pipes Carrying Water
   - Distribution of Rice- Transplanter
   - Imparting Training to Farmers for the Maintenance of Machines
   - Distribution of Seed Winnower

- Distribution of Production Subsidy in Paddy
- Distribution of Production Subsidy in Paddy
- Supply of agricultural machineries –Rotavator at 50% subsidized rate
- Supply of agricultural machineries –Seed Drill at 50% subsidized rate

2. Integrated Development of cotton

- Distribution of high yielding variety seeds
- Distribution of hybrid seeds
- Distribution of hybrid seeds
- IPM, FFS to farmers
- Distribution of MN mixture
- Production of seed
- Distribution of trap crop

3. Integrated Development of groundnut

- Distribution of Gypsum
- Distribution of MN mixture
- Distribution of seed treatment chemicals, PP Chemicals and Bio-Agents.
- Farmers field school

4. Coconut Development Scheme

- Establishment of Coconut Nurseries in 2 acres of Land in State Seed Farms
- Enhancing area under coconut through Distribution of MN mixture
- Enhancing area under coconut through Distribution of Quality seedlings

5. Agricultural Mechanization

- Sinking of shallow borewell near existing borewells for rain water harvesting

6. Restoring Soil Health

- Green Mauring
- Distribution of M.N. Mixture

7. Marketing of Infrastructure Development

- Establishment of godown

Horticulture Major Interventions Identified :

In Thiruvarur District there is a scope of increasing the area under vegetable crops by introducing new hybrid verities and also by introducing new technologies such as raising of good quality hybrid seedlings in portrays, growing vegetables in polygreen Houses under soil less culture and also raising vegetable crops and flower crops under 50% shade net. The area under fruit crops can be increased by introducing new improved varieties and kinds in Thiruvarur Districts. Especially in banana growing areas of Valangaiman, Nedamangalam, Mannargudi blocks introduction of TC Banana cultivation is a good option of increasing the area under banana. There is a potential for growing crops under Micro irrigation in certain blocks of Thiruvarur District their by increasing the area and production and productivity of fruit crops and vegetables crops.

1. Area expansion in Fruits and Plants, Vegetables, Spices, Flowers, Loose flowers
2. Pandhal system,
3. Polynation Support
4. Protected Cultivation,
5. Vermicompost unit and Vermi beds,
6. Mechanization Distribution of spreyars
7. Training of farmers,Farm School, Demonstration,

Major interventions identified under Marketing and Agri-Business

1. Construction of Storage Godown with 25 MT Capacity at 50% subsidy for FPO
2. One Day Training on Warehouse Storage & Grading
3. One Day Training on Minimizing Post Harvest Losses and Value Addition
4. One Day Training on Market Intelligence and Post Harvest Technology
5. One Day Training on Commodity market and Export Promotion
6. Construction of Drying Yard in Regulated Market Complex
7. Distribution of Tarpaulin @ 50 % Subsidy
8. Conducting Village Meeting
9. Publicity
10. Construction of Office cum Godown for Valangaiman Regulated Market
11. Construction of Agricultural Marketing and Agri Business cum DDAB Office Building
12. Exposure Visit (Within the state - 2No) - to motivate farmers to form FPO / to start Food processing industry/ to get market intelligence in paddy and pulses crops.

13. Three Days Exposure Visit (Outside the state - 1No) - to motivate farmers to form FPO / to start Food processing industry/ to get market intelligence in paddy and pulses crops.

New and Innovative interventions proposed under NADP-DAP by Agricultural Engineering Department

1. Introduction of newly developed Agricultural Machineries / Implements.
2. Promoting the concept of Mechanised Village
3. Popularisation of Agricultural Mechanaisation through conventional Machinery and Equipments
4. Ground water recharge structure cum fish pond
5. Water harvesting structures
6. Project of Construction of the 'Sub Surface Dyke' in the Rivers of Tiruvarur District for the Augmentation of Ground Water for Drinking Purpose
7. Control of sea water intrusion by recharge shafts
8. PVC Pipe laying
9. Remodeling of irrigation/drainage channels
10. Moisture conservation by summer ploughing
11. Farmation of Farm Roads
12. Construction of drying yard/thrashing floors

Major Interventions Identified in Animal Husbandry Department

1. Fodder Development (Green to White)
2. Provision of Grass Cutter to Farmers
3. Provision Of Chaff Cutter to Farmers
4. Establishment of Surgery Theaters at Veterinary Institutions

Major Interventions Identified in Sericulture Department

1. Mobile Cocoon market van
2. Plantation subsidy to plant mulberry crop
3. Installation of Drip Irrigation System
4. Rearing Shed subsidy to Farmers
5. Rearing Appliances subsidy to Farmers
6. Training for farmers

Interventions proposed under Fisheries department –District Agricultural Plan.

1. BiologicalControl of Aquatic Weeds by Stocking of Grass Carpsin Aquatic Weed Infested water bodies in Thiruvarur District.
2. Expansion of fish culture area by encouraging Farmers of Thiruvarur District.
3. Introduction of Short Seasonal Fish Varieties in existing Farm Ponds.
4. Increasing seed availability by establishing seed rearing Farms.
5. Establishment of GIFT Farms and provision of inputs to farmers
6. Increasing the Fishing efficiency of Inland Fisherman and Fish Farmers of Thiruvarur District.
7. Training to Marine Fishermen and Fish Farmers
8. Enhancement of Fish Production in Irrigation tanks and Panchayat tanks by stocking of fish seeds
9. Improvement of hygienic fish marketing by establishing modern Fish Kiosk.
10. Promotion of quality fish marketing by traditional fishers by providing Moped with Ice Box.
11. Increasing safety at sea by providing life safety Appliances.
12. Promotion of quality fish marketing by traditional fishers by providing Ice Box.
13. Establishment of District Extension and Training Centers in various places
14. Installation of Artificial reefs in the inshore areas of Thiruvarur District.
15. Providing Trainers Training and exposure Visit to Departmental Staff.
16. Training to Marine Fishermen and Fish Farmers and Exposure visit other states in Tiruvarur District
17. Increasing Fish production in existing Fish/ Shrimp farms by providing aerators and Infrastructures.
18. Resource enhancement by ranching of seed in rivers.
19. Conservation of Endangered / Indigenous fish Species.
20. Mapping and pooling of indigenous fish /water resources of Tiruvarur District.
21. Promotion of hygienic fish handling in fishing harbours and fish landing centers.
22. Organizing fish festival at Thiruvarur District

Major Intercessions Identified in Seed Certification Department

1. Incentives to Seed Farm Growers at Rs.1000 per acre
2. Seed Farm Growers Tour to Modernised seed processing unit

3. Paddy seed farm should be registered for Foundation Class like Pulses and Oilseeds to increase revenue of seed farm growers
4. Portable Digital moisture meter to all Seed Certification Officers and Assistant Seed Officers at Block level
5. Drying yard of minimum 100 sq.metre to benefit seed farm growers for drying their seeds
6. Construction of New Seed Godowns (100 MT Capacity)
7. Improvement of Facilities like Dunnages in seed godowns
8. New Digital Moisture Meter for Seed Processing Units
9. Modernised Seed Processing Machine (Fowler Westerup Machine) at 1000 kg per hour

The plan outlay for five years (2017-22) for Thiruvarur district is given in Table. Among the different activities, Agriculture sector requires huge financial outlay. (₹ 176346.15 lakhs) Greater emphasis has been given to increase the productivity of crops in Thiruvarur district

Budget Abstract for Thiruvarur District

(₹ in lakhs)

Sl. No	Sectors	2017-18	2018-19	2019-20	2020-21	2021-22	Total
1	Agriculture	23721.44	22124.85	23024.71	23582.69	25800.55	118254.24
2	Horticulture	502.61	611.21	726.27	790.95	870.40	3501.44
3	Agricultural Engineering	8207.23	5032.13	4885.58	5715.33	4843.33	28683.60
4	Agricultural Marketing	8.46	8.46	8.46	199.71	9.71	234.80
5	Seed Certification & Organic Certification	23.36	14.36	1.00	1.00	1.00	40.72
6	Animal Husbandry	2420.55	2480.55	2305.55	2045.55	2195.55	11447.75
7	Animal Science Research (TANVAS)	0.00	0.00	0.00	0.00	0.00	0.00
8	Dairy Development	449.25	790.25	740.25	449.25	459.25	2888.25
9	Fisheries	40.00	65.00	77.00	40.00	640.00	862.00
10	Fisheries Research (TNFU)	318.73	1155.53	698.73	373.73	109.73	2656.45
11	Water Resource Organization (PWD)	4390.00	582.00	148.00	0.00	0.00	5120.00
12	Civil Supplies & Co-Operation	1293.70	596.86	538.78	150.83	76.73	2656.90
	Total	**41375.33**	**33461.20**	**33154.33**	**33349.04**	**35006.25**	**176346.15**

CHAPTER I

INTRODUCTION

Rashtriya Krishi Vikas Yojana (RKVY) vis-à-vis National Agricultural Development Program (NADP) was initiated in 2007 as an umbrella scheme for ensuring holistic development of agriculture and allied sectors by allowing states to choose their own agriculture and allied sector development activities. The scheme has come a long way since its inception and has been implemented across two plan periods i.e. during 11th and 12th plan periods. Based on feedback received from States, experiences garnered and inputs provided by various stakeholders, schemes eligible for funding under RKVY have undergone modifications to enhance efficiency, efficacy and inclusiveness of the program.

The overall objectives of RKVY (NADP) are as follows:

Objectives of RKVY

a. To strengthen the farmers' efforts through creation of required pre and post-harvest agri-infrastructure that increases access to quality inputs, storage, market facilities etc. and enables farmers to make informed choices.
b. To provide autonomy, flexibility to States to plan and execute schemes as per local/ farmers' needs.
c. To promote value chain addition linked production models that will help farmers increase their income as well as encourage production/productivity
d. To mitigate risk of farmers with focus on additional income generation activities - like integrated farming, mushroom cultivation, bee keeping, aromatic plant cultivation, floriculture etc.
e. To attend national priorities through several sub-schemes.
f. To empower youth through skill development, innovation and agri-entrepreneurship based agribusiness models that attract them to agriculture.

District and State Agriculture Plans

As per the recent guidelines issued by the Government of India under Remunerative Approaches for Agriculture and Allied sector Rejuvenation (RAFTAAR), the new projects proposed and are to be implemented under NADP/RKVY

must be in consonant with District Agricultural Plans (DAP), State Agriculture Plans (SAP) and State Agriculture Infrastructure Development Program (SAIDP) prepared by the individual States. Thus, such action-oriented plan documents will remain as a cornerstone of planning and implementation of the NADP/RKVY and other schemes.

The overall guidelines suggested by the Government of India to be followed for preparation of District Agriculture Plans (DAP) and State Agricultural under NADP/RKVY are as follows:

- The several states have already prepared Comprehensive District and State Agriculture plans for 12th Plan period. These plans have to be revised and updated appropriately for implementing RKVY-RAFTAAR during 14th Finance Commission keeping in view modification proposed for the plan period and emerging needs of the State.
- The District Agriculture Plan (DAP) shall not be however the usual aggregation of existing schemes but would aim at moving towards projecting the requirements for development of Agriculture and allied sectors of the district and for the State a whole.
- These plans would also present the vision for Agriculture and allied sectors within the overall development perspective of the district and further State as a whole.
- The District Agriculture Plans and the State level plan would also present their financial requirements in addition to sources of financing the agriculture development plans in a comprehensive way.
- The District Agriculture Plan will include animal husbandry and fishery development, minor irrigation projects, rural development works, agricultural marketing schemes and etc. keeping in view the natural resources and technological possibilities in each district.
- District level potential linked credit plans (PLP) already prepared by the National Bank for Agriculture and Rural Development (NABARD) and Strategic Research and Extension Plans (SREP) developed under the Agricultural Technology Management Agency (ATMA) etc. may be referred for revision of DAPs.
- It should also be ensured that the strategies for convergences with other programs as well as the role assigned to the Panchayati Raj Institutions (PRIs) are

appropriately incorporated in DAPs.

Therefore, each State will also have a comprehensive State Agricultural Plan (SAP) for the remaining period of the Fourteenth Finance Commission by integrating the District Plans. SAPs will invariably have to indicate resources that can flow from the State to the districts.

The Process

Revision and updating of SAPs could be a two-way process. Firstly, State Nodal Department (or Agriculture Department) could get DAPs revised in the first instance to ensure that priorities of the State are properly covered in the district plans. States should, at this stage of scrutiny, ensure that requirements of districts and priorities of the State are appropriately captured and aligned in DAPs. Alternately, State Nodal Agency could communicate to the districts in the first instance, the State's priorities that ought to be reflected in the respective district plans and the districts may incorporate these in their updated district plans. Preparation/revision of the DAPs need to be an elaborate, exhaustive and iterative process and care has to be taken by the State Nodal department and District Agriculture Department in ensuring that these plans cover the entire gamut of agriculture and allied sectors.

Revision and Updation of DAP and SAP in Tamil Nadu

Tamil Nadu State continued to receive Central Assistance under NADP/RKVY. The Government of Tamil Nadu also prepared District and State Agriculture Plans covering 11th and 12th Plan periods. Tamil Nadu State has 32 districts including Chennai. The District Agriculture Plan were prepared for 31 districts excluding Chennai during 12th plan period. Thus, the current exercise is the continuation of the 12th plan period: which also covered two years of the 14th Finance Commission period (2015-16 and 2016-17) and also keeping in view of the changing scenario in the development and emerging needs of the State and to be eligible for fresh grants from Government of India. These plan were further revised and updated appropriately for implementing RKVY during the periods from 2017-18 to 2021-22.

Methodology followed

The revision of the District Agricultural Plan of Thiruvarur district, was done by gathering the secondary data about district and block with respect to rainfall, land use pattern, demography, livestock, machinery, infrastructure so far created etc. In addition,

the constraints in production and marketing of agricultural and livestock produce, crop/animal production and gaps between expected and actual yield and the reasons for such gaps were also discussed among the various stakeholders and incorporated in this plan document. Besides, in consultation with the line department officials and based on the data received from respective districts, a detailed year-wise action plan i.e. from 2017-18 to 2021-22 with physical and financial implications were presented.

CHAPTER II

PROFILE OF THE DISTRICT

In this chapter, the following details were discussed elaborately at block and district levels

2.1 Thiruvarur District at Glance

Thiruvarur district is situated in the tail end of the Cauvery delta and it is also a coastal district. During the raining periods apart from the rain water in Tiruvarur district the water from Trichy and Thanjavur districts is drained into Thiruvarur district that causes flooding and heavy damages to the crops. Even though there is heavy flood after the water drained, within 15 days there has been water scarcity. This may be avoided by water harvesting through formation of farm ponds, construction of bore wells in tanks and renovation of village tanks and temple tanks to increase their carrying capacity. By the creation of rain harvesting structures, flood damages can be avoided and ground water level may be raised by recharging and the stored-water can be re-used when required.

In Thiruvarur district most of the crop production is only from paddy. In comparison with other occupations, the income from Agriculture in Tiruvarur district is low. The wages for Agricultural labour is less and so the labour went to cities and towns for other jobs for earning more. 10 years ago agricultural labourers in Thiruvarur district were opposed to engaging machineries for farm works but nowadays due to labour scarcity, labour they insist to engage machineries apart from their works. Due to the huge development of Self Help Groups in Thiruvarur district the women labours were diverted to other works and for handicrafts production. There is scarcity for women labour for planting works and weeding.

2.2 Area, Location and Geographical Positions

Thiruvarur is located approximately between 100 20'N and 110 07'S of the north latitude and between 790 15'E and 790 45'W of east longitude. It has 2, 37,715 hectares of cultivated area which constituted 69 percent of the total geographical area of the district. Thiruvarur district has ten panchayat unions, seven town panchayats, 430 village panchayats and 573 revenue villages. Thiruthuraipoondi block has vast stretches of forest area.The district boundaries are: East: Nagapattinam district. West: Thanjavur district. North: Nagapattinam&Thanjavur districts. South: Palk Strait and Thanjavur district

2.3 Administrative Structure of Thiruvarur District

Thiruvarur district has been divided into 2 revenue divisions, 7 taluks, 10 blocks, 3 municipalities, 7 town panchayats and 573 villages for the administrative convenience. The district occupies an area of 2161 km². It is lies between Nagapattinam district on the east and Thanjavur district on the west, and is bounded by the Palk Strait on the south.

Table 2.1 Administrative Structure of ThiruvarurTaluk and Block

Sl. No	Taluk	No.of Villages	Block	No.of Villages
1	Kodavasal	106	Kodavasal	60
2	Nannilam	73	Nannilam	61
3	Valangaiman	71	Valangaiman	71
4	Thiruvarur	48	Thiruvarur	48
5	Mannargudi	128	Mannargudi	83
			Kottur	56
6	Thiruthuraipoondi	77	Thiruthuraipoondi	42
7	Needamangalam	70	Needamangalam	59
	Total	**573**		**480**

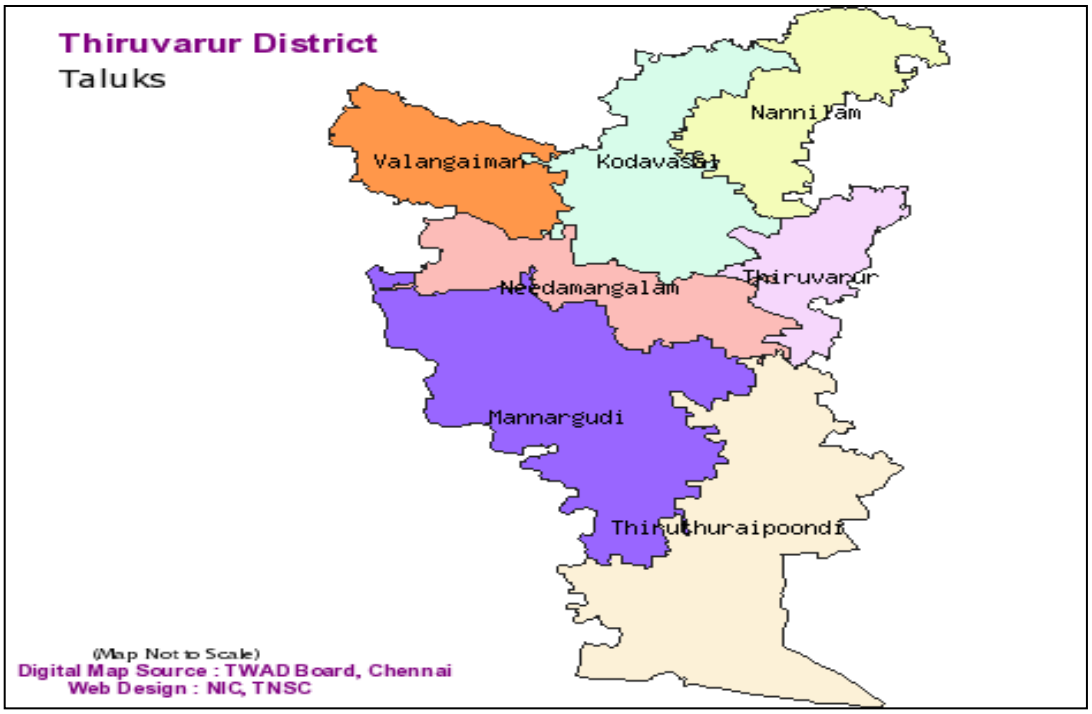

Fig.1Taluk location Map of Thiruvarur District

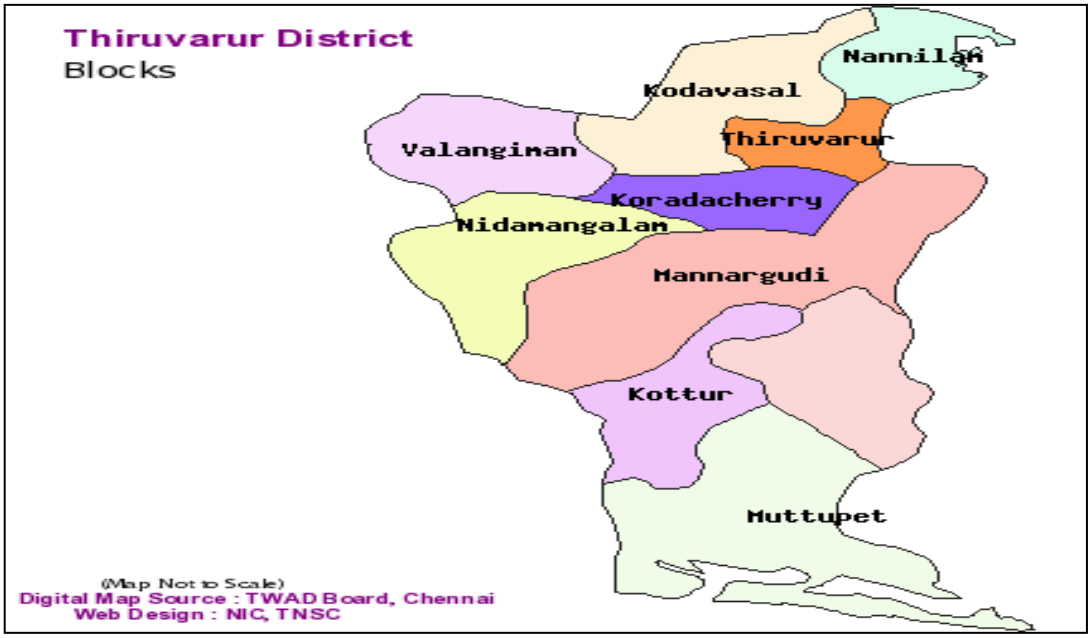

Fig. 2 Blocks in Thiruvarur district

2.4 Demographic Profile

In 2011, Thiruvarur had population of 12,68,094 of which males and females were 62,7,616 and 6,40,478 respectively. In 2001 census, Thiruvarur had a population of 11,69,474 of which males were 5,80,784 and the remaining 5,88,690 were females. Thiruvarur District population accounted for 1.76 percent of total Tamil Nadu's population. In 2001 census and at this figure for Thiruvarur District was 1.87 per cent of Tamil Nadu's population. The composition of population in Thiruvarur district as per 2001 and 2011 census is presented in Fig. 2.

Table 2.2 Demographic particulars of Thiruvarur district

Description	2011	2001
Actual Population	1,268,094	1,169,474
Male	627,616	580,784
Female	640,478	588,690
Population Growth (%)	8.43	6.31
Area Sq. Km	2,377	2,377
Density/km^2	533	492
Proportion to Tamil Nadu Population (%)	1.76	1.87
Sex Ratio (Per 1000)	1020	1014
Child Sex Ratio (0-6 Age)	962	970
Average Literacy	83.26	76.58
Male Literacy	89.65	85.43
Female Literacy	77.02	67.90
Total Child Population (0-6 Age)	114,977	140,099
Male Population (0-6 Age)	58,602	71,115
Female Population (0-6 Age)	56,375	68,984
Literates	960,036	788,302
Male Literates	510,137	435,421
Female Literates	449,899	352,881
Child Proportion (0-6 Age) (%)	9.07	11.98
Boys Proportion (0-6 Age) (%)	9.34	12.24
Girls Proportion (0-6 Age) (%)	8.80	11.72

With regards to Sex Ratio in Thiruvarur district, it stood at 1020 per 1000 male as compared to 2001 census figure of 1014 per thousand. The average national sex ratio in India is 940 as per the latest Census reports of 2011. In census enumeration, data regarding child under 0-6 age were also collected for all districts including Thiruvarur. In 2011, Children under 0-6 formed 9.07 percent of Thiruvarur District as compared to 11.98 percent of 2001. The demographic details of Thiruvarur district are furnished in Table. 2.1.

The total number of literates in Thiruvarur district was 9,60,036 persons which constituted 83.26 per cent of the district population. Of the total literates population,

510,137 were constituted by male population, and the remaining 449,899 were constituted by the female population.

2.5 Topography

Thiruvarur district is made up of tertiary and alluvial deposits. The cuddalore sand stones of tertiary age are well developed as seen near mannargudi. These sand stones are covered by a thin layer of windblown sandy clays, unconsolidated sands, clay bound sands and mottled clays with liginite seams. This tertiary formation is invariably capped by laterite. The alluvial deposits of the river cauvery and its tributaries lie over the tertiary sand stone. They consist of medium to firm sands, clays and sandy clays, thickness of these formations range from 30m to 400m.

The entire district contains plain land only. Predominant soil types in the district are Sandy coastal alluvium and red loam. These types of soils are very fertile. Cauvery is the main river flowing in this district. Vennar, Vettar, Koraiyar, Paminiyar, Mullaiyar, HarichandraNadi, Arasalar, Vanchiar, Nattaretc are some of the seasonal rivers flowing in this district. Canals extending to a length of around 612 Kms supported by the Cauvery system irrigate the entire district.

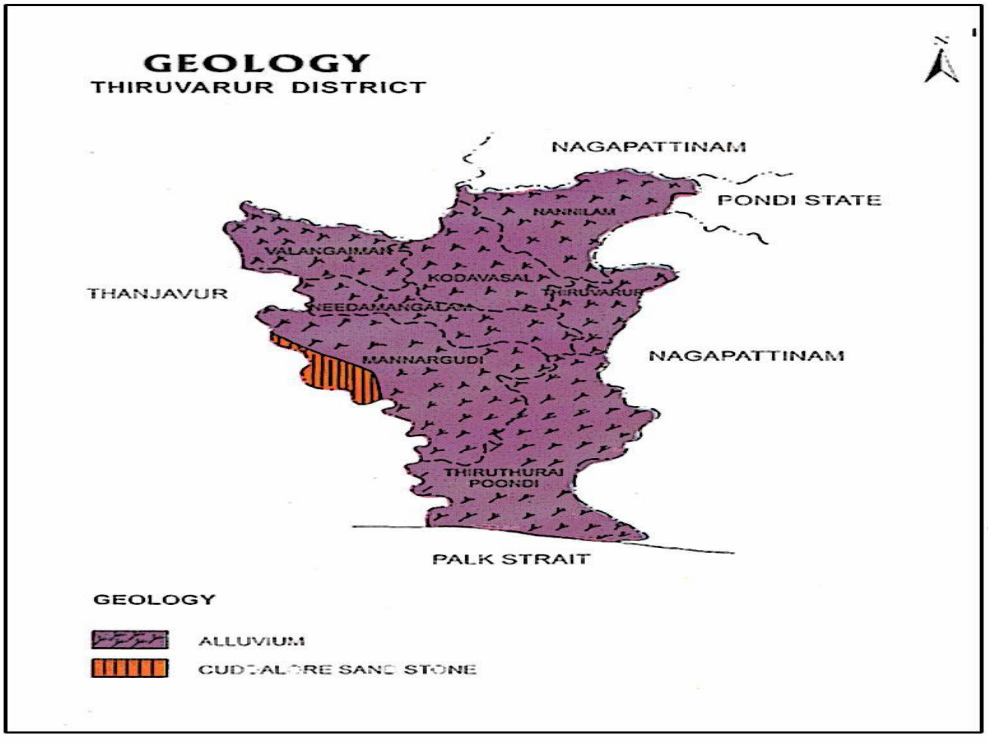

Fig. 3 Geology Map of Thiruvarur District

2.6 Soil types

The district has mainly alluvial soil consisting of sand, silt and clay.Thiruvarur district is a plain terrain with a gentle slope towards east in the northern and central parts and towards south in the southern part. The maximum surface elevation is about 30 m amsl in the western part of the district.The prominent geomorphic units identified in the district through interpretation of Satellite imagery are,

1. Deltaic plain,
2. Pediment and buried pediment
3. Natural levee- swale,
4. Lagoon/Backwater Coastal plain and
5. Beach and Beach ridges.

Major part of the district including Valangaiman, Nannilam, Thiruvarur and part of Thiruthuraipoondi taluks is occupied by delta plain. Sedimentary high land having pediment and buried pediment landforms are observed in Mannargudi and Needamangalam Taluks. Sedimentary plain consists of various landforms like natural levee, swale and marshy area, lagoon/Back water coastal plain and Beach ridges are seen in the southern part of the district.

Table 2.3 Soil Types in Thiruvarur district

Sl. No	Soil type	Characteristics	Area in ha
1.	Clay to clay loam	Old delta Low land	1,27,506
2.	Sandy to sandy clay loam	New delta Light textured low level laterite soil	27,048

Source: Dept. of Economics and Statistics, Govt. of Tamil Nadu

Table 2.4 Soils and Area in Hectares

Sl. No	Soil Description	Area (ha.)
1.	Very deep, fine, montmorillonitic, Vertisols	51326.93
2.	Deep, fine, mixed, Inceptisols	32616.90
3.	Deep, fine, mixed, Alfisols	29488.51
4.	Moderately deep, fine, mixed, Alfisols	18787.74
5.	Very deep, fine, mixed, Entisols	14481.35
6.	Very deep, fine loamy, mixed, Ultisols	6509.76
7.	Deep, fine, montmorillonitic, Vertisols	6260.03
8.	Very deep, fine loamy, mixed, Alfisols	5815.15
9.	Deep, fine, mixed, Ultisols	5624.05
10.	Very deep, fine, mixed, Inceptisols	5360.08

Sl. No	Soil Description	Area (ha.)
11.	Moderately shallow, fine loamy, mixed, Inceptisols	5282.52
12.	Very deep, fine loamy, mixed, Inceptisols	5046.95
13.	Very deep, coarse loamy, mixed, Inceptisols	3346.97
14.	Deep, fine loamy, mixed, Ultisols	2837.80
15.	Deep, fine loamy, mixed, Alfisols	2735.42
16.	Deep, fine silty, mixed, Inceptisols	1834.33
17.	Very deep, coarse loamy, mixed, Entisols	1572.70
18.	Moderately shallow, fine loamy, mixed, Alfisols	610.09
19.	Deep, fine loamy, mixed, Inceptisols	374.69
20.	Shallow, clayey, mixed, Entisols	123.03
21.	Deep, coarse loamy, mixed, Entisols	62.71
22.	Very deep, fine loamy, mixed, Entisols	45.00

2.7 Climate and Rainfall

The district receives rainfall from both southeast and northeast monsoons. The normal annual rainfall in the district ranges from 1100 to 1260 mm. It gradually increases towards east and south and attains a maximum around Thiruvarur in the eastern part. It is observed that the chances of receiving normal annual rainfall vary from 40 percentages at Needamangalam to 51 percentages at Thiruthuraipoondi. These changes are the highest (50-55 percentage) in a small area around Thiruthuraipoondi in the eastern part. In the rest of the district these chances are in the range 40-50 percentages.

The district has a hot tropical climate the summer season, which is very oppressive, is from March to about the end of May. The humidity is generally high in the coastal region throughout the year and exceeds 70 percentages during period from August to May. It is much drier towards the interior of the district.

Table 2.5 Season wise Rainfall in Thiruvarur District during 2014-15

Sl. No	Season	Actual (mm)	Normal (mm)
1	South west monsoon	247.3	296.4
2	North east monsoon	752.6	719.1
3	Winter season	3.5	60.1
4	Hot weather period	271.2	97.7
5	Whole year	1274.6	1173.3

(Source: India Meteorological Department, Chennai-600 006)

Table 2.6 Month wise / Season wise rainfall distribution in Thiruvarur District

Season / Month	2014-15	
	Actual (mm)	Normal (mm)
South West Monsoon		
June	2	33.4
July	119.8	64
August	94.8	94
September	30.7	105
Total	**247.3 (19.402)**	**296.4**
North East Monsoon		
October	333.2	200.3
November	251.8	304
December	167.6	214.8
Total	**752.6 (59.046)**	**719.1**
Winter Season		
January	3.5	40.9
February	0	19.2
Total	**3.5 (0.2746)**	**60.1**
Hot Weather		
March	22.2	17.2
April	122.7	33.7
May	126.3	46.8
Total	**271.2 (21.27)**	**97.7**
Annual rainfall	**1274.6 (100)**	**1173.3**

(Source: Season and Crop Report (2014-15), Department of Economics and Statistics, Government of Tamil Nadu)

Figures in parenthesis denote percentage to total annual rainfall

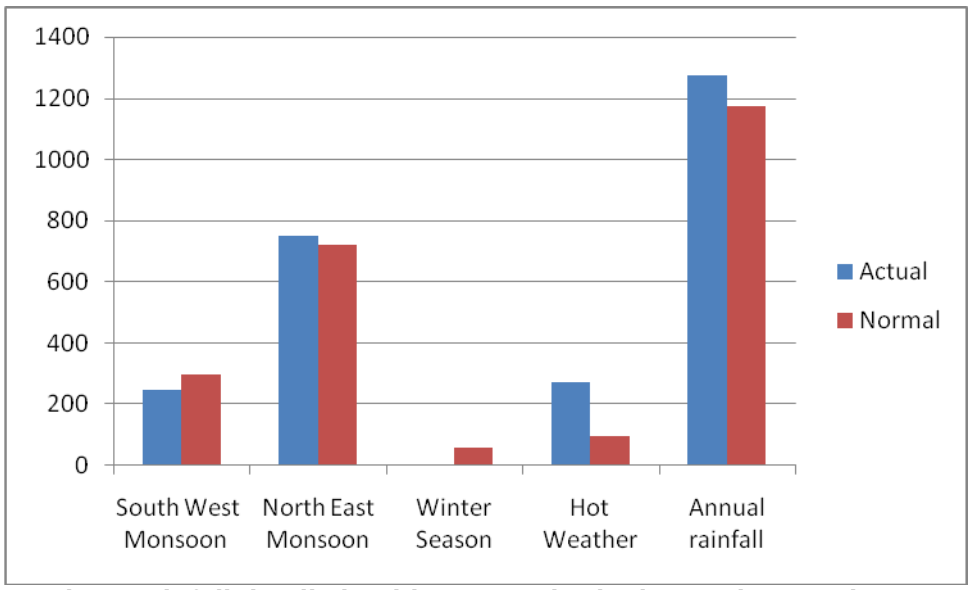

Fig:4 Rainfall details in Thiruvarur District in mm (2014-15)

2.8 Land

2.8.1 Land Use Pattern

The nine fold classification of the land use pattern of Thiruvarur district is provided in Table 2.7**.**

The total geographical area of the district is 2, 09,709 hectares. In 2014-15, 1, 57,165 hectares have been brought under cultivation as net area sown. This accounted for 74.94 per cent of the total area of the district. Area sown more than once was 1, 70,078 hectares. Total cropped area was 3, 27,243 hectares. Forests accounted for 2,452 hectares and formed 1.17 per cent of the total area. Nearly 18 per cent of the total area was put to non-agricultural use (37308 hectares). However, 0.67 per cent of the area accounted for current fallow lands (1,399 hectares).

Table 2.7 Land Use Pattern of Thiruvarur District (2014-15) Compound Growth Rates (2000-01 to 2011-12) per annum

Sl.No	Classification	Area (ha)	per cent	CGR (%)
1	Geographical Area	209709	100.00	0
2	Forest	2452	1.17	0
3	Barren & Unculturable Area	113	0.05	0
4	Land Put to Non-agricultural Uses	37308	17.79	0.04
5	Permanent Pastures & Other grazing lands	786	0.37	0.29
6	Misc.tree crops & groves not incl. in the net area sown	2017	0.96	-1
7	Current Fallow	1399	0.67	-13.83
8	Other Fallow	7313	3.49	0.05
9	Net area sown	157165	74.94	1.06
10	Area sown more than once	170078		5.23
11	Gross area sown	327243		2.47

Source:Crop seasonal report of Tamilnadu,2014-15

Block wise land use pattern and land holding pattetrnof Thiruvarur district is presented in table 2.8 and 2.9 respectively. Among the various blocks in the district,only Muthupettai block had the forest area and the entire forest area of the district is found in this block.The major cultivable areas (net area sown) in the district are Kottur and Mannargudi In that order. In most of the blocks a second crop is also raised as the area sown more than once is almost equal to net area sown including that the cropping intensity would be 150 to 200 per cent.With regard to land holding pattern, majority of the farms were more than 2.00 ha. The holding pattern is almost uniform across the blocks through the cultivable areas are concentrated in Kottur, Mannargudi, and Thruthuraipoondi blocks.

Table 2.8 Details of Land use pattern in the Blocks (Triennium ending Average 2013-14)

Sl. No	Particulars	B1	B2	B3	B4	B5	B6	B7
1	Area under forest	-	-	2452.00	-	-	-	-
2	Barren and Uncultivable waste	556.00	-	113.00	-	-	-	-
3	Land put to Non-agri. Uses	3251.00	2743.00	2521.00	5684.08	5859.06	3572.64	5131.80
4	Area under cultivable waste	556.00	124.00	35.00	67.20	44.80	245.34	124.40
5	Area under permanent pastures	27.00	80.00	138.00	138.64	124.98	82.14	155.30
6	Area under miscellaneous tree crops and groves not included in net are sown	63.00	55.00	54.10	443.69	234.01	140.84	144.80
7	Area under current fallows	465.00	15.00	200.07	261.38	65.34	32.51	1237.60
8	Area under other fallows	519.00	14.00	89.05	926.97	446.22	1182.80	715.50
9	Net area sown	9896.00	16099.00	15032.77	19220.01	19900.60	15240.06	16952.20
10	Total geographical area	14777.00	19129.00	20635.00	26745.00	26675.00	20391.00	24469.00
11	Area sown more than once	8749.00	28953.00	12039.00	140007.00	17311.00	7266.00	17251.00
12	Gross cropped area	18616.00	13196.00	26725.00	33774.00	37268.00	21993.00	35252.00
13	Extent of Waste Land	-	-	-	-	-	-	-

B1-Thiruvaur, B2-Thiruthuraipoondi, B3-Muthupettai, B4-Mannargudi, B5-Kottur, B6-Nannilam, B7-Needamangalam

Table 2.8 Details of Land use pattern in the Blocks (Triennium ending Average 2013-14) (Contd.,)

Sl. No	Particulars	B8	B9	B10	Total
1	Area under forest	-	-	-	2452.000
2	Barren and Uncultivable waste	-	-	-	669.000
3	Land put to Non-agri. Uses	2612.000	3178.000	2227.000	36779.588
4	Area under cultivable waste	64.000	2498.000	115.000	3873.746
5	Area under permanent pastures	-	19.240	16.000	781.306
6	Area under miscellaneous tree crops and groves not included in net are sown	235.880	405.480	275.000	2051.807
7	Area under current fallows	529.630	316.340	651.000	3773.878
8	Area under other fallows	686.540	1005.730	1867.000	7452.819
9	Net area sown	14264.070	12599.940	15173.000	154377.655
10	Total geographical area	18799.000	17765.000	20324.000	209709.000
11	Area sown more than once	10263.000	9482.000	9203.000	134524.000
12	Gross cropped area	24764.000	22280.000	24382.000	258250.000
13	Extent of Waste Land	-	-	-	-

B8-Kudavasal, B9-Koradacherri, B10-Valangaiman

Table 2.9 Land Holding Pattern at Block level

Sl. No	Types	B1	B2	B3	B4	B5	B6	B7
1	Upto 0.5	1049.141	1615.104	2344.284	1228.926	1228.926	355.931	430.526
2	0.5-1.0	1744.404	2685.429	3897.835	2043.332	2043.332	591.806	715.834
3	1.0-2.0	1580.792	2433.556	3532.247	1851.683	1851.683	536.299	648.694
4	2.0-3.0	2136.479	3289.010	4773.917	2502.594	2502.594	724.821	876.726
5	3.0-4.0	2375.650	3657.203	5308.340	2782.751	2782.751	805.963	974.873
6	4.0-5.0	1719.535	2647.144	3842.265	2014.201	2014.201	583.369	705.629
7	5.0-7.5	2305.445	3549.126	5151.470	2700.516	2700.516	782.145	946.063
8	7.5-10.0	1637.193	2520.383	3658.275	1917.749	1917.749	555.434	671.839
9	10.0-20.0	1439.312	2215.754	3216.113	1685.958	1685.958	488.301	590.637
10	20.0 & Above	1723.105	2652.640	3850.242	2018.383	2018.383	584.580	707.094
	Total	**17711.06**	**27265.35**	**39574.99**	**20746.09**	**20746.09**	**6008.65**	**7267.92**

B1-Thiruvaur, B2-Thiruthuraipoondi, B3-Muthupettai, B4-Mannargudi, B5-Kottur, B6-Nannilam, B7-Needamangalam

Table 2.9 Land Holding Pattern at Block level (Contd.,)

Sl. No	Types	B8	B9	B10	Total
1	Upto 0.5	158.212	132.537	106.624	8650.213
2	0.5-1.0	263.059	220.369	177.283	14382.684
3	1.0-2.0	238.386	199.700	160.655	13033.694
4	2.0-3.0	322.184	269.900	217.130	17615.354
5	3.0-4.0	358.252	300.114	241.436	19587.332
6	4.0-5.0	259.309	217.227	174.756	14177.637
7	5.0-7.5	347.665	291.245	234.302	19008.492
8	7.5-10.0	246.891	206.825	166.387	13498.728
9	10.0-20.0	217.050	181.827	146.277	11867.186
10	20.0 & Above	259.847	217.678	175.118	14207.070
	Total	**2670.85**	**2237.42**	**1799.97**	**146028.39**

B8-Kudavasal, B9-Koradacherri, B10-Valangaiman

2.9 Sources of Irrigation

The main source of irrigation in the district is canals. Canal irrigation is highest in Thiruvarur district. The gross and net area irrigated by different source of irrigation is given in Table 2.10.

Table 2.10 Area irrigated by different sources of water in Triennium ending 2014-15

Sl.No.	Sources of Irrigation		2012-13	2013-14	2014-15	Average
1	Canals	Gross	170759	192411	215083	192751.00
		Net	144985	146666	151750	147800.33
2	Tanks	Gross	0	0	0	0.00
		Net	0	0	0	0.00
3	Tube wells / Bore wells	Gross	0	0	0	0.00
		Net	0	0	0	0.00
4	Open wells	Gross	0	0	0	0.00
		Net	0	0	0	0.00
5	Supplementary wells	Gross	58136	64617	52229	58327.33
		Net	44450	45973	36504	42309.00
6	Other Sources	Gross	0	0	0	0.00
		Net	0	0	0	0.00

(Source: Season and Crop Report, 2014-15)

2.10 Cropping pattern

Major crops cultivated in Thiruvarur district are Paddy, Black gram, Green gram, Groundnut, cotton and coconut paddy accounted for 64 per cent of the cropped area in the triennium ending 2014-15. ADT 36, ASD 8, ASD 16, ADT 43, CO 43, IR 20, White Ponni and Bhavani are the most commonly raised paddy varieties in the district. Next to paddy, Black gram accounted for 16.1 per cent of the cropped area in the triennium ending 2014-15. Green gram accounted for 15.2 per cent of the cropped area in the triennium ending 2014-15 in the district. The details of area under major crops for the period 2014-15 are given in Table 2.11.

Table 2.11 Area under major crops (Triennium ending 2014-15)

Sl.No	Particulars	Area (in ha)	Production (in tonnes)	Productivity (in kg/ha)
1	Paddy	175295.00	622102.00	3449.33
2	Maize	0.33	1.67	1667.33
3	Cholam	0.33	0.67	717.33
4	Red Gram	5.67	5.33	1003.33
5	Black Gram	44098.67	38711.33	784.33
6	Green Gram	41605.00	34475.33	740.00
7	Groundnut	2795.67	12224.00	2887.67
8	Gingelly	728.67	405.00	346.67
9	Cotton	3384.33	7493.67	261.33
10	Coconut	4788.33	752.00	10468.67
11	Sugarcane	559.00	377455.00	70.33
12	Brinjal	34.33	309.67	9034.00
13	Bhendi	9.67	72.33	7361.33
14	Banana	368.67	14606.00	39706.00
15	Mango	184.00	1256.67	6823.00
16	Jack Fruit	24.67	317.67	12870.67
17	Guava	16.67	41.67	6151.67
18	Chillies	7.00	3.00	438.33
19	Turmeric	0.67	2.67	1262.33
20	Tamarind	131.00	309.00	2357.00
21	Tapioca	93.67	2952.67	32180.00
	Total	**274131.33**	**1113497.33**	**140580.67**

(Source: Season and crop report, 2014-15)

Block wise area and productivity of major agricultural crops are presented in table 2.12 and 2.13.

Table 2.12 Area under major Agricultural Crops (Triennium average ending 2013-14)

(Hectares)

Sl. No	Name of the Crop	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	Total
1	Paddy	10296	14892	13693	21724	21783	18007	21912	13714	15340	17861	**169222**
2	Black gram	1694	5811	4815	5095	4858	4521	4728	2686	2594	2273	**39075**
3	Green gram	4332	1448	164	2780	3618	3544	2321	4484	6014	5014	**33717**
4	Cotton	23	0	0	33	142	612	188	431	480	962	**2871**
5	Sugarcane	9	0	0	42	0	148	107	58	46	139	**549**
6	Gingelly	165	328	78	662	266	239	321	123	133	337	**2652**
7	Groundnut	0	1	7	1226	688	47	742	0	0	0	**2710**

B1-Thiruvaur, B2-Thiruthuraipoondi, B3-Muthupettai, B4-Mannargudi, B5-Kottur, B6-Nannilam, B7-Needamangalam, B8-Kudavasal, B9-Koradacherri, B10-Valangaiman

Table 2.13 Yield under Major Agricultural Crops (Triennium average ending 2013-14)

(t/ha)

Sl. No	Name of the Crop	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	Total
1	Paddy	5.827	5.827	5.827	5.827	5.827	5.827	5.827	5.827	5.827	5.827	58.270
2	Black gram	0.445	0.445	0.445	0.445	0.445	0.445	0.445	0.445	0.445	0.445	4.450
3	Green gram	0.450	0.359	0.222	0.359	0.359	0.313	0.450	0.450	0.450	0.450	3.862
4	Cotton	1.167	0.000	0.000	0.000	0.660	0.660	0.980	1.167	1.167	0.693	6.494
5	Sugarcane	0.032	0.000	0.000	0.100	0.000	0.100	0.100	0.100	0.100	0.100	0.632
6	Gingelly	0.387	0.387	0.387	0.617	0.617	0.387	0.387	0.387	0.387	0.617	4.560
7	Groundnut	0.000	1.983	0.000	4.713	4.713	1.983	2.729	0.000	0.000	0.000	16.121

B1-Thiruvaur, B2-Thiruthuraipoondi, B3-Muthupettai, B4-Mannargudi, B5-Kottur,B6-Nannilam,B7-Needamangalam,B8-Kudavasal,B9-Koradacherri,B10-Valangaiman

2.11 Regulated Markets

The number of regulated markets is given in Table.2.14. There are eight regulated markets and seven farmers markets in the district.

Table 2.14 Infrastructure facilities available in Regulated Markets of Thiruvarur district

Facilities	Numbers
Number of regulated Markets	8
Number of farmers markets	7
Agmark labs	Nil
Facilities available in Tiruvarur Regulated Markets	
Own Land	4
Godown	2
Rural Godown	5
Transaction shed	4
Rural Business Hub	--
Drying Yard	9
Automatic weighing and bagging machine	-
Farmers Rest Shed	2
Sanitary Facilities	4
Drinking water Facilities	2

Table 2.15 Regulated Markets and Farmer's Markets available in Thiruvarur District

Sl. No	Regulated Market	Farmer's Market
1.	Valangaiman	Tiruthuraipoondi
2.	Koradacheri	Mannargudi -1
3.	Mannarkudi	Mannargudi -2
4.	Poonthottam	Tiruvarur
5.	Vaduvur	Needamangalam
6.	Kudavasal	Muthupettai
7.	Thiruvarur	Valangaiman
8.	Thiruthuraipoondi	

2.12 Storage Facilities

The storage and marketing infrastructure available in the Thiruvarur district is presented in Table 2.16. The storage godown available in Thiruvar district amounted to 13 numbers and which also had 110 numbers of drying yard.

Table 2.16 Storage Infrastructure available in Thiruvarur District

Sl. No	Particulars	No	Capacity (MT) /Area(Sqm)
1.	Storage Godown (completed)	13	8750
2.	Storage Godown (under progress)	2	4000
3.	Cold Storage	-	-
4.	Agri Business Centre	-	-
5.	Collection centre	-	-
6.	Rural Business Hub	-	-
7.	Ripening chamber	-	-
8.	Market complex with cold storage	-	-
9.	Market complex	-	-
10.	Drying yard	110	44000

2.13 Animal Husbandry and Dairy Development

The Department of Animal Husbandry has contributed immensely in the development of animal husbandry in Thiruvarur and in providing additional income to the farmers in Thiruvarur district

2.13.1. Livestock Population

The details regarding livestock population in Thiruvarur district are provided in Table 2.17. Livestock Census the total livestock in the district was about 4,90,511 numbers. The population of poultry in the district was about 2,25,143 numbers.

Table 2.17 Livestock population in Thiruvarur district

Sl.No.	Particulars	Population (Numbers)
1	Cattle	195743
2	Buffaloes	2070
3	Sheep	4591
4	Goats	286879
5	Horses and ponies	12
6	Donkeys	7
7	Camels	0
8	Pigs	1209
	Total Livestock	**490511**
9	Elephants	0
10	Dogs	28099
11	Rabbits	508
	Poultry	
12	Back yard Poultry	219980
13	Farm Poultry	5163
	Total Poultry	**225143**

Source: Source: 19th livestock census, 2012

Table 2.18. Livestock population in Thiruvarur district

Sl. No	Name	Kudavasal	Koradachery	Kottur	Manargudi	Muthupet	Nannilam
1	Cattle	18444	13854	25489	26284	20110	19774
2	Buffalo	131	306	190	162	334	59
3	Sheep	309	15	460	383	1187	113
4	Goat	29891	25705	30079	34268	25733	31964
5	Pigs	34	-	62	36	482	0
6	Poultry	14362	21981	26502	23660	14346	23792
7	Others	-	-	-	-	-	-

Table 2.18. Livestock population in Thiruvarur district (Contd.,)

Sl. No	Name	Needamangalam	Tiruvarur	Thiruthuraipoondi	Valangaiman	District
1	Cattle	27300	13289	15337	16659	92359
2	Buffalo	78	277	414	44	872
3	Sheep	1725	36	173	50	2097
4	Goat	35930	23046	22650	22403	135993
5	Pigs	35	0	123	0	158
6	Poultry	36758	21575	16573	12906	111604
7	Others	3650	-	-	-	3650

The block wise livestock population in Thiruvarur district is furnished in Table 2.18. From the table we could observed that goat population and poultry were found be high in the district compared to other livestock population. The goat population was high in Needamangalam, manargudi and Nannilam blocks. Poultry population was high in Needamangalm and Kottur blocks. Also seen that cattle population was found to be high in Needamangalam, Manargudi, Kottur and Muthupet blocks. Buffaloes were concentrated in Thiruthuraipoondi, and Muthupet blocks. Likewise, sheep population was found to be more in Needamangalam and Muthupet blocks.

2.13.2 Veterinary Institutions

The majority of the blocks in the district possess dairy co-operative societies, veterinary clinics and milk collection centre for the welfare of the livestock. The details of veterinary institutions available are furnished in Table 2.19.

Table 2.19 Number of Veterinary Institutions

Sl. No	Name	Kudavasal	Koradachery	Kottur	Manargudi	Muthupet
1	Dairy co-operative society	Yes	No	-	Yes	Yes
2	veterinary Clinics	Yes	Yes	Yes	Yes	Yes
3	Milk Collection centre	Yes	Yes	Yes	Yes	Yes

Table 2.19 Number of Veterinary Institutions (Contd.,)

Sl. No	Name	Nannilam	Needa mangalm	Tiruvarur	Thiruthurai poondi	Valangaiman
1	Dairy co-operative society	Yes	Yes	Yes	Yes	NO
2	vetaniery Clinics	Yes	Yes	Yes	Yes	Yes
3	Milk Collection centre	Yes	Yes	Yes	Yes	Yes

2.13.3 Milk Yeild

Milk yield in thiruvarur district is presented in table 2.20. Huge Potentials are found in increasing the milk yield of livestock.

Table 2.20 Milk Yield in Thiruvarur District

Sl. No	Type of Animal	Kodavasal		Koradachery		Kottur		Mannargudi		Muthupettai	
		Potential	Actual	Potential	Actual	Potential	Actual	Potential	Actual	Potential	Actual
1	**COW**										
	1.Local	29376	14688	21968	10984	44260	26556	38250	24550	48228	28932
	2.Cross Breed	65240	99144	123570	74142	162260	97356	183998	110394	97820	58692
2	**Buffalo**										
	2.Cross Breed	1100	660	2700	1620	1134	680	966	483	2002	1201

Table 2.20 Milk Yield in Thiruvarur District (contd.,)

Sl. No	Type of Animal	Nannilam		Nidamangalam		Thiruvarur		Thiruthuraipoondi		Valaingaiman	
		Potential	Actual	Potential	Actual	Potential	Actual	Potential	Actual	Potential	Actual
1	**COW**										
	1.Local	39060	19530	39250	23550	21016	10508	39150	23490	26192	13096
	2.Cross Breed	175770	105462	192780	134946	118215	70929	72290	43374	147330	88398
2	**Buffalo**										
	2.Cross Breed	550	330	150	112	Poor	Poor	Poor	Poor	Poor	Poor

2.14 Banking and Insurance

Distribution of Scheduled Commercial Banks Officers, bank debit and Gross Bank Credit in Thiruvarur District (2011-12) is given in table 2.21 and 2.22

Table 2.21 Details of Banking in Thiruvarur District

Number of Banks / Offices	113
Credit (Rs. Crores)	2457
Debit (Rs. Crores)	1832
Cretical Difference Range (%)	

Table 2.22 Allocation and Achievement under Annual Credit Plan of Thiruvarur District (2011-12)

	Farm Sector	Non – Farm Sector (NFS)	Other Priority Sector (OPS)	Total
Allocation	790.89	39.96	150.16	981.01
Achievement	869.1	36.35	156.38	1061.83
Percentage of Achievement	110	91	104	108

Chapter III

DEVELOPMENT OF AGRICULTURE AND ALLIED SECTORS

Before suggesting an action plan for development of agriculture and allied sectors, a brief analysis (at district level) was done in the following components:

3.1 Assessing the trends in area, production and productivity of major crops and projection till the 12th Plan period (2015-16)

3.2 Projection on area, production and yield by 2023

3.3 Yield gap analysis for the major crops

3.4 Major problems

3.5 Strategies to be needed

3.1 Trends in area, production and productivity of major crops

Data on area, production and productivity of crops in Thiruvarur district were collected over a period of 10 years from 2005-06 to 2014-15 and the same were analysed to work out trend and Compound Growth Rate (CGR). The compound growth rates were calculated for area, production and productivity of all major crops based on these following formulae:

Compound Growth Rate (CGR)

The CGR measures the annual growth of any variable over a period of time and it is expressed in percentage.

$$Y_t = ab^t$$

It is estimated by fitting a semi-log equation of the following form.

$$Yt = \text{Log } a + t \log b$$

Where,

Y = Time series data of Area, Production & Yield
T = Number of years varies from the value 1,2,3…n
A = Intercept or constant coefficient
B = Regression coefficient

$$CGR = (\text{antilog } b-1) \times 100$$

Linear forecasting

A linear regression equation is usually written (straight-line model) as follows

$$Y_t = a + bX_t + e_t$$

Estimation Procedure

The estimated value of the b coefficient is:

$$b = \frac{\sum_{t=1}^{n}(X_t - \overline{X})(Y_t - \overline{Y})}{\sum_{t=1}^{n}(X_t - \overline{X})^2}$$

The estimated value of the a coefficient is:

$$a = \overline{Y} - b\overline{X}$$

Ordinary least Square (OLS) methods were used to calculate the coefficients of parameters to fit the non-linear trend line. Plotting the data against scatter diagram, non-linear trend line was best fit for paddy, Black gram, Green gram, sugarcane, coconut, groundnut and Gingelly. The area, production and productivity of the said crops were projected for 2023.

Trend in Area, Production and Productivity of Major Crops

The compound growth rates of (CGR) area and production and productivity of major crops like paddy, black gram, green gram, sugarcane, coconut, groundnut, cotton and gingelly of Thiruvarur district are given in Table 3.1. The results exhibited a maximum area of 63.95 per cent in the case of paddy crop with respect to area under cultivation, followed by 16.09 percent in Blackgram and followed by 15.18 percent in greengram, 1.75, 1.23 & 1.02 percent in Coconut, Cotton and Groundnut. All other import crops we analyzed exhibited a negative growth rate in cultivated area. Even though crops like Paddy, Black gram, Greengram, Groundnut and coconut had positive growth rates in their production and Area .The Compound growth rates are shown in Table 3.2.

Table 3.1 Area Production and Yield of major crops in Thiruvarur District (Triennium average ending 2014-15)

Sl.No	Particulars	Area (in ha)	Production (in tonnes)	Productivity (in kg/ha)	% share to area
1	Paddy	175295.00	622102.00	3449.33	63.95
2	Maize	0.33	1.67	1667.33	0.00
3	Cholam	0.33	0.67	717.33	0.00
4	Red Gram	5.67	5.33	1003.33	0.00
5	Black Gram	44098.67	38711.33	784.33	16.09
6	Green Gram	41605.00	34475.33	740.00	15.18
7	Groundnut	2795.67	12224.00	2887.67	1.02
8	Gingelly	728.67	405.00	346.67	0.27
9	Cotton	3384.33	7493.67	261.33	1.23
10	Coconut*	4788.33	752.00	10468.67	1.75
11	Sugarcane**	559.00	377455.00	70.33	0.20
12	Brinjal	34.33	309.67	9034.00	0.01
13	Bhendi	9.67	72.33	7361.33	0.00
14	Banana	368.67	14606.00	39706.00	0.13
15	Mango	184.00	1256.67	6823.00	0.07
16	Jack Fruit	24.67	317.67	12870.67	0.01
17	Guava	16.67	41.67	6151.67	0.01
18	Chillies	7.00	3.00	438.33	0.00
19	Turmeric	0.67	2.67	1262.33	0.00
20	Tamarind	131.00	309.00	2357.00	0.05
21	Tapioca	93.67	2952.67	32180.00	0.03
	Total	**274131.33**	**1113497.33**	**140580.67**	**100.0**

*In lakh nuts/**tons

Table 3.2 Compound Growth Rates (CGR) of Area, Production and Productivity under major crops in Thiruvarur District

Sl.No.	Crops	CGR during 2005-2006 to 2014-2015 (%)		
		Area	Production	Productivity
1	Paddy	1.30	9.34	7.94
2	Blackgram	-1.33	26.75	21.63
3	Greengram	4.21	14.31	15.86
4	Sugarcane	-21.96	-22.40	-0.74
5	Cotton	19.63	30.74	9.32
6	Groundnut	-2.49	10.97	10.23
7	Gingelly	-18.64	-17.39	0.21
8	Coconut	-1.64	N.A	N.A

N.A denotes Not Available

3.2 Projection on area, production and yield by 2023

To analyze the potentiality of selected agricultural commodities in 2023 the area, production and productivity of those crops need to be explored and projection of these parameters need to be worked out for the year 2023. The results of the linear forecasting using Ordinary Least Square are presented in Table.3.2. As per the current trend in the area, production and productivity of potential crops and their corresponding growth rates the projections for the year 2023 more or less similar to the area production and productivity of the current year ie 2014-15 in the case of paddy and pulses. The productivity of sugarcane and ground nut in 2023 need to be taken care since they are expected to show much lower in 2023 than their current productivity. The crop of gingelly only shows some satisfying figure of more than double the productivity in the year 2023.

Table 3.3 Projected area, production and productivity of identified major crops in Thiruvarur district for 2023

Sl. No	Crops	Area (ha)	Production (tonnes)	Productivity (kg/ha)
1.	Paddy	159502.88	338450.62	2.082
2.	Green gram	26528.505	6485.425	0.477
3.	Black gram	43526.579	11981.901	0.363
4.	Sugarcane	2082.247	207644.68	96554
5.	Gingelly	1610.021	809.901	0.508
6.	Groundnut	2272.789	6251.207	2.843
7.	Cotton	1208.958	2339.320	0.468

3.3 Yield gap analysis

Yield gap I

The difference between Maximum yield in CCE (potential yield) and progressive farms yields (achievable yield) is termed as yield gap I.

The maximum yields in Crop Cutting Experiments (CCE) compared with yields obtained by progressive farmers (achievable yield) for the estimation of yield gap-I. The CCE yields are obtained from the office of Joint Director of Agriculture, Thiruvarur. Yield gap-I is calculated as follows. The progressive farms yields are obtained from the office of Joint Director of Agriculture, Thiruvarur and it is crosschecked with officials in line departments.

Yield Gap-I = Maximum yield in CCE (potential yield) - Progressive farms yields (achievable yield)

Yield Gap II

The difference between progressive farms yields (achievable yield) and farmer's average yield (actual yields) is termed as yield gap II.

The yields obtained by the farmers under improved technologies were recorded as progressive farms yields (achievable yield) and compared with the district level average yields for the estimation of yield gap-II. The progressive farms yields are obtained from the office of Joint Director of Agriculture, Thiruvarur and it is cross checked with officials in line departments. Yields obtained at district level represent the farmers average yields (actual yields) for triennium ending (2009-2011) are collected from season and crop report, Department of Economics and Statistics, Tamil Nadu. Yield gap-II is calculated as follows.

Yield Gap-II = Progressive farms yields (achievable yield) - Farmers average yield (actual yields)

Estimation of yield Gaps

Yield gap analysis for the major crops was presented variety wise in the following Table 3.4. The difference between potential yield and progressive farms yields explains about the yield gap I which was higher than the yield gap II (difference between progressive farmers yield and actual yield) in paddy varieties like ADT 45 and BPT 5204 paddy varieties.

The yield gap I was highest for the variety ADT 45 with 4850 Kg per hectare and it was lowest for ADT 43 with 4520 Kg per hectare.The yield gap II was highest for the variety ADT 45 with 1450 Kg per hectare and it was lowest for ADT 43 with 200 Kg per hectare.

Pulses crop especially in black gram, the yield gap I was recorded as 155 kg per hectare for the variety ADT3 and the same was 90 kg per hectare for T9 variety. Yield gap II was highest for the variety T9 with 175 Kg per hectare and the same was recorded as 60 Kg per hectare for ADT 3. In Green gram, Yield gap I was reported as 83 Kg per hectare for the variety KM 2. This situation warrants for higher scope of obtaining better yield to achieve the target of double the yield in the year 2023 with concerted effort to make the farmers adopting improved technologies and high yielding varieties.

The yield gaps I and II for the sugarcane crop was 24 tonnes per hectare and 51 tonnes per hectare, respectively for the variety CoC 86032. The yield loss from the potential yield has been incurred in sugarcane crops implying that bridging this yield gap will have a very huge impact in state’s exchequer.

Table 3.4 Yield gap analysis in major identified crops and varieties (Kg/ha) in Thiruvarur district

Sl. No	Crops	Variety	Area (ha)	Potential yield (Kg/ha) (A)	Progressive farmer yield (Kg/ha)(B)	Actual Yield (Kg/ha) (C)	Yield Gap I (Kg/ha) (A-B)	Yield Gap II (Kg/ha) (B-C)	Yield Gap III (Kg/ha) (A-C)
1.	Paddy	ADT 43	49876	7957	4720	4520	3237	200	3437
		ADT 45	49876	9230	6300	4850	2930	1450	4380
		ADT 39	49876	6525	4760	4300	1765	460	2225
		BPT 5204	49876	8658	5000	4500	3658	500	4158
2.	Black gram	ADT 3	24741	720	630	570	90	60	150
		T9	19440	1000	845	670	155	175	330
3.	Green gram	KM2	34789	767	684	665	83	19	102
4.	Sugarcane	COC 86032	1695	208000	184000	133000	24000	51000	75000

Table 3.5 Projected Area, Production and Yield Based for the Major Potential Crops Identified

Description	Paddy			Blackgram			Greengram			Groundnut		
	Area	Pro.	Yield	Area	Pro.	Yield	Area	Pro.	Yield	Area	Pro.	Yield
Compound Growth Rate (%)	1.309	3.774	2.412	4.383	3.969	-0.395	9.515	6.069	-2.864	12.139	22.998	9.687
Triennium Average ending 2011-12	170932	519574	2976	48165	15664	334	36071	10126	294	2622	13136	4768
2012-13	173321	413074	2382	52147	15030	288	44602	8180	189	3694	17632	4774
2013-14	175590	428664	2440	54432	15626	287	48845	8676	183	4143	21687	5236
2014-15	177889	444843	2499	56818	16247	285	53493	9203	178	4645	26675	5743
2015-16	180218	461632	2559	59309	16892	284	58582	9761	173	5209	32810	6300

Description	Coconut			Gingelly			Sugarcane			Cotton		
	Area	Pro.	Yield	Area	Pro.	Yield	Area	Pro.	Yield	Area	Pro.	Yield
Compound Growth Rate (%)	0.954	7.170*	7.497*	-10.411	-11.346	-0.997	-6.980	-7.301	-0.161	-11.184	-8.940	1.995
Triennium Average ending 2011-12	5124	863	16936	873	319	425	1030	108445	109	868	2702	490
2012-13	5389	1128	21914	747	310	416	1110	118702	109	556	1299	435
2013-14	5440	1209	23557	669	275	412	1033	110036	109	494	1182	444
2014-15	5492	1296	25324	600	244	408	961	102002	109	439	1077	453
2015-16	5545	1389	27222	537	216	404	894	94555	109	389	981	462

Area in Hectares; Production in Tonnes; Yield in Kg/ ha (* Denotes growth rates from 2014 to 2015)

Table 3.6 Paddy yield and Production

Year	ADT-43	ADT-45	ADT-39	BPT-5204
2011-12	4520	4850	4300	4500
2012-13	4698	5059	4433	4697
2013-14	4882	5277	4571	4902
2014-15	5074	5505	4712	5116
2015-16	5274	5742	4859	5340
2016-17	5481	5989	5009	5573
2017-18	5696	6247	5164	5817
2018-19	5920	6517	5325	6071
2019-20	6153	6798	5490	6336
2020-21	6395	7090	5660	6613
2021-22	6646	7396	5835	6902
2022-23	6907	7715	6016	7204

Projection of Paddy Production in 2023

The projection of production for select varieties of paddy is presented in Table.3.7. The projected production for major varieties of paddy was worked out over a period of the next 11 years. Among the varieties, the projected production for the year 2022-23 was higher for the variety ADT 43 with 344490 tonnes and the same was ranged between 200037 tonnes to 344490 tonnes for the varieties ADT 43, ADT 45, ADT 39 and BPT 5204.

Table 3.7 Projection of Paddy Production in Thiruvarur District

Varieties	ADT-43	ADT-45	ADT-39	BPT-5204
Proportion of varieties	0.3	0.25	0.2	0.25
Area	49876	41563	33250	41563
2012-13	234297	210269	147409	195207
2013-14	243505	219331	151979	203737
2014-15	253075	228784	156690	212641
2015-16	263021	238645	161547	221933
2016-17	273358	248931	166555	231632
2017-18	284101	259660	171719	241754
2018-19	295266	270851	177042	252319
2019-20	306870	282525	182530	263345
2020-21	318930	294701	188189	274853
2021-22	331464	307403	194022	286864
2022-23	344490	320652	200037	299400

3.4.1. Pulses

Performance and required growth of pulses to bridge the yield gap in 2023

Among the varieties of black gram, the yield gap I was higher for the variety ADT 5 with 550 kg per hectare and the same was lower for the variety ADT 3 with 40 kg per hectare. The yield gap II was worked out to 250 kg per hectare for the variety ADT5. Yield gap I and II was worked out to 400 kg and 213 kg per hectare respectively for the green gram variety Co 6 (Table.3.8)

The expected growth rate of pulses to bridge the yield gap in 2023 has been recorded. The required cumulative growth rates were arrived to the range of 20 to 30 per cent over a period of the next 11 years for the varieties of black gram and the same was 13 per cent for the variety KM 2 of green gram. The annual growth rate to bridge the yield gap was ranged between 1.8 to 3 for the varieties of black gram and the same was worked out to 1.2 per cent for the variety KM 2 of green gram (Table.3.9.)

Table 3.8 Performance of select varieties of Pulses in Thiruvarur district

	Variety	Yield GAP I	Yield GAP II	Overall Yield gap
Black gram	ADT3	90	60	150
	T9	155	175	330
Green gram	KM2	83	19	102

Table 3.9 Performance of select varieties of Pulses in Thiruvarur district

Particulars	Black gram		Green gram
	ADT3	T9	KM2
Potential Yield	720	1000	767
Progressive farmer yield	630	845	684
Average Yield	570	670	665
Overall Yield Gap	150	330	102
Required Growth Rates	20.83	33.00	13.30
Annual Growth Rate	1.89	3.00	1.21

Yield projection for select varieties of pulses in Thiruvarur district

Yield projection for select varieties of pulses presented in Table.3.10. The projected yield for major varieties of pulses was worked out over a period of the next 11 years. The projected yield for the varieties (ADT3 & T9) of black gram ranged between 700 to 927 kg per hectare for the year 2023 and the same was worked out to 759 kg per hectare for the variety KM2.

Table 3.10 Projection of Yield of Pulses in Thiruvarur district

Year	Black gram		Green gram
	ADT3	T9	KM2
2011-12	570	670	665
2012-13	581	690	673
2013-14	592	711	681
2014-15	603	732	689
2015-16	614	754	698
2016-17	626	777	706
2017-18	638	800	715
2018-19	650	824	723
2019-20	662	849	732
2020-21	675	874	741
2021-22	687	900	750
2022-23	700	927	759

Projection of production of pulses

The projection of production for select varieties of pulses presented in Table.3.11.The projected production for major varieties of pulses was worked out over a period of the next 11 years. The projected production for the year 2023 for the varieties for black gram ranged between 17328 to 18029 tonnes from the current production and the same was projected to 26407 tonnes for the green gram variety KM 2.

Table 3.11 Projection of production of pulses in Thiruvarur district

Particulars	Black gram		Green gram
	ADT3	T9	KM2
Proportion of varieties	0.56	0.44	1
Area	24741	19440	34789
2012-13	14369	13415	23415
2013-14	14641	13818	23698
2014-15	14917	14232	23985
2015-16	15199	14659	24275

Particulars	Black gram		Green gram
	ADT3	T9	KM2
2016-17	15487	15099	24569
2017-18	15779	15552	24866
2018-19	16078	16019	25167
2019-20	16381	16499	25471
2020-21	16691	16994	25779
2021-22	17006	17504	26091
2022-23	17328	18029	26407

3.4.2. Sugarcane

Performance of select varieties of Sugarcane

Yield gap I and II was worked out to 24 tonnes and 51 tonnes respectively for the sugarcane variety CoC-86032 (Table 3.12). The expected growth rate of sugarcane to bridge the yield gap in 2023 has been recorded. The required cumulative growth rates were arrived to 36 per cent over a period of the next 11 years for the variety CoC-86032 of sugarcane. The annual growth rate to bridge the yield gap was worked out 3.2 per cent for the variety CoC-86032 of sugarcane (Table 3.13).

Table 3.12 Details of Yield Gap in sugarcane crop in Thiruvarur District

Variety	Yield GAP I	Yield GAP II	Overall Yield Gap
CoC-86032	24000	51000	75000

Table 3.13 Performance of select varieties of sugarcane in Thiruvarur district

Particulars	CoC-86032
Potential Yield	208000
Progressive farmer yield	184000
Average Yield	133000
Overall Yield Gap	75000
Required Growth Rates	36.06
Annual Growth Rate	3.28

Yield projection for select varieties of Sugarcane in Thiruvarur district

Yield projection for select varieties of sugarcane presented in Table.3.14. The projected yield for sugarcane was worked out over a period of the next 11 years. The projected yield for the variety CoC 86032 of sugarcane was worked out to189648 tonnes for the year 2023.

Table 3.14 Projection of Yield of Sugarcane in Thiruvarur district

Year	COC 86032
2011-12	133000
2012-13	137362
2013-14	141868
2014-15	146521
2015-16	151327
2016-17	156291
2017-18	161417
2018-19	166711
2019-20	172180
2020-21	177827
2021-22	183660
2022-23	189684

Projection of variety wise sugarcane production for 2023 in Thiruvarur district

The projection of production for sugarcane is presented in Table.3.15. The projected yield for sugarcane was worked out over a period of the next 11 years. The projected production for the variety CoC 86032 of sugarcane was worked out to 3,21,514 tonnes for the year 2023.

Table 3.15 Projection of production of Sugarcane in Thiruvarur district

Variety	COC 86032
Proportion of variety	1
Area	1695
2012-13	232829
2013-14	240466
2014-15	248353
2015-16	256499
2016-17	264913
2017-18	273602
2018-19	282576
2019-20	291844
2020-21	301417
2021-22	311303
2022-23	321514

Table 3.16 Major problems Under Crops

Crops	Major problems identified
Rice	• Difficulty adopting SRI • Low yield due to stem borer, leaf folder and sheath rot, Brown Plant Hopper • Low yield due to depletion of micro nutrients, sodicity • Low productivity in direct sown paddy due to weed menace • Non availability of labour for transplanting
Groundnut	• Poor population due to traditional method of sowing • Drudgery of farm women
Home Science	• Mal nutrient in preschool children
Rice fallow black gram	• Low yield due to severe incidence of spodoptera
Forage	• Non availability of green fodder
Vegetables	• Production of poor quality seedlings • Low yield due to shoot and fruit borer
Rice fallow cotton	• Poor germination and establishment

3.5.1 Strategies to be needed in Thiruvarur District

Drum Seeded Rice

Tiruvarur district is being the major partner of 'Rice Granary' region of Tamil Nadu. Nearly 35,000 Hectares area is being under Kurvai season rice cultivation. Of late, this region is facing several problems viz., uncertainty in availability of canal water, paucity of labour availability coupled with hike in labour wages leads to rice cropping becomes lack luster and less profitable.

By considering the above prevailing problems this KVK introduced popularized TNAU improved drum seeder in Tiruvarur district. To step up the profitability in rice cultivation cost cutting technology is the only way despite of the productivity aspects. Hence several on-campus and off-campus training and demonstration programmes were organized by the KVK to make horizontal spread of the same to the end users. Off-campus training cum demonstration has been organized pulavarnatham and poonthalagudi on 10.8.07 and 8.10.07 respectively to make easy reach of the technology to the out reach peoples. Apart on-campus training programme were organized on 23.6.2007 on 'Need Farm mechanization in rice cultivation'. More than 6 FLD'S were conducted during kuravai-07 season. In consequent more than 300 farmers contacted this Kendra to know the technology and its limitation to different situations. Due to the

concerted effort the different ways and means drum seeded rice cultivation is being in more than 1000 Acres in the district due to Rs.1500 to 10000 saving in this technologies since, it doesn't need nursery, seedling pulling out, transplanting. Moreover, farmer's can take up sowing with family laboour/ limited labour in event of peak.

System of Rice Intensification (SRI)-Status of rice cultivation in Thiruvarur district

About 10,000 ha is under cultivation in Thiruvarur district during kuruvai season. The productivity in this particular season is largely varies due to uncertainty in receipt of canal water from Mettur dam. So it is inevitable for the farmers to raise the paddy with less amount of irrigation water without compromising the yield. So, the new method popularly known as SRI cultivation is one such innovative and integrated approach well suited in this situation. This method is very useful for not only increasing the yield with less amount of water, but also to reduce the considerable amount of inputs like seed, labor etc. Therefore, we decided to popularize the technology to all parts of Thiruvarur district.

Popularizing the SRI

Though this particular technology has been known in some pockets of Thiruvarur district most of the framers were reluctant to take up this technology, since they were not fully aware of technical know-how of this technology. Hence KVK had taken as challenge of popularizing this technology to every parts of this district. Initially it has been decided to popularize through FLD in villages where SRI was not adopted earlier. Accordingly ten FLDs were conducted viz., Amirthavalli, Vaduvur, Edamelaiyur, Vaiyakalathur, Munnavalkottai, Vikravandi, Senthannipuram, Pandaravadai and Ammaiappan during 2007-08 (kuruvai). As a result of demonstration the FLD farmers were completely satisfied and they had taken the job of motivating the other farmers in those villages.

Demonstration plot at KVK

In addition to farmers field, we have also laid out SRI method of cultivation as demonstration plot in our KVK farm in all kuruvai seasons (2005-08) which is compared with the normal method of planting and direct sowing with using same variety sown on the same date. So the farmers visiting to our farm could actually realize the benefits this technology.

On campus and off campus training

The KVK has conducted about 20 on campus and 8 off campus trainings on SRI in which 814 farmers and farm women were participated. In addition, five on campus trainings were given to SRI farmers on how to raise PAI nursery for SRI cultivation. Exercise were also made to know how many of them are actually cultivated the SRI and the results were encouraging (about 66%)

State sponsored ICDP-SRI

Our efforts were made easy through State Government sponsored ICDP programme. Totally 193 demonstrations were successfully conducted throughout the district for which critical inputs includes polythene sheet, conoweeder, nursery frame, rope, rose can and LCC were demonstrated and distributed to the beneficiaries. They realized the benefits of SRI on saving of 8-10 women labours for planting, 12-16 for weeding, 3-4 irrigations and 15-45 kg of N/ha. It has also been realized by farmers that there is reduction in input costs upto Rs.2000/ha and increased net profit of Rs.10000-11000/ ha. All the farmers were reported that they are highly satisfied with this method of cultivation. The farmers in these villages are very much enthusiastic on realizing the benefit of SRI especially on the production of more tillers, lengthy panicle, increased grain weight and characters like non lodging and early harvest. Based on the request from the SRI experienced farmers, an Interactive Workshop on SRI cultivation was convened at KVK, Needamangalam. The extension functionaries of both Thiruvarur and Nagapatttinam districts and the scientists involved in this new method accounting more than 75 SRI farmers participated and got clarified their practical problems on this method.

Status of Rice Cultivation after Inception of KVK, Needamangalam

It was only 600 ha under SRI cultivation out of 9500 hectares and now it has been increased to 3500 ha under SRI during kuruvai season. This remarkable task has been achieved through efforts of KVK scientists as well as extension functionaries from State Government.

Now the SRI method becomes a profitable and alternate method of rice cultivation in the CDZ during this water scarcity period and more than 90 per cent of farmers in vaduvoor, Ammaiappan, Senthannipuram, Pandaravadai,Pullavarayankudikadu, Alangudi, Pulavarnatham, Amirthavalli, Edamelaiyur, Munavalkottai and Melanagai villages are adopting this technology during kuruvai season(2007).

A Paradigm Shift towards Drum Seeded Rice inThiruvarur District

Thiruvarur district is being the major partner of 'Rice Granary' region of Tamil Nadu. Nearly 35,000 hectares are being under rice cultivation during Kharif season. Of late, this region is facing several problems viz., uncertainty in availability of canal water and paucity of labour availability coupled with enhanced labour wages which led to rice cropping less profitable. To step up the profitability in rice cultivation, cost cutting technology is the only way despite of the productivity aspects. By considering the above constraints, the KVK Thiruvarur district has initiated to popularize TNAU improved drum seeder in Thiruvarur district from 2007 onwards. Hence several on-campus and off-campus training and demonstration programmes were organized by the KVK to make horizontal spread of the technology to the end users. Off-campus training *cum*demonstrations and on-campus training programme were also organized on 'Need of Farm mechanization in rice cultivation'. In consequent, more than 360 farmers contacted this Kendra to know the technology and its utilization to different situations. Front Line Demonstrations were conducted during 2007-09 in key stake holders at different blocks for two years during kharif season. Due to the concerted effort through different ways and means, drum seeded rice cultivation has been expanded to more than 2620 acres in the district during 2008-09. On an average, an amount of Rs.1500 to Rs.2000 is saved from this technology, as it doesn't need nursery, seedling pulling out and transplanting. Moreover, the farmers can take up sowing with family labour or limited labour in the peak season. Because of the meticulous and timely demonstrations and trainings coupled with Government subsidy scheme for drum seeder, more than 60 seeders were sold in Thiruvarur district during 2008-09 which shows a greater success of drum seeder in rice cultivation.

CHAPTER IV

DISTRICT PLAN

4.1. Agriculture

4.1.1. Enhancing the Paddy productivity

Among 1740624 ha area of paddy in Thiruvarur district about 65 % area is under kuruvai season with the productivity of 2083 kg/ha. The productivity in this particular season is largely varies due to uncertainty in receipt of canal water from Mettur dam. Thiruvarur district is located in cauvery delta zone under new ayacut and is mainly depend on mainly canal water and monsoon rain.The farmers to raise the paddy with less amount of irrigation water without compromising the yield. So, it is necessary to increase the paddy production by using appropriate production technologies like SRI, soil health enhancement,plant protection measures, machine transplanting technologies and direct sown rice.

Project components

a) Promotion of SRI in all blocks
b) Distribution of certified seeds in all blocks
c) Distribution of MN mixture in all blocks
d) Distribution of bio control agents in all blocks
e) Soil health enhancements in all blocks
f) Incentives for paddy machine planting in all blocks
g) Distribution of herbicide in all blocks

Budget

It is proposed to incur ₹.**78809.50** lakhs over a period of five years with the finance facilities under the NADP and other sources.

Implementing agency

Department of Agriculture will implement the project and report the progress to the District-level officials.

Expected outcome

The results will be enhancing the paddy production and productivity by adopting SRI technology will result in an increase in the yield of paddy.

Table 4.1 Budget for interventions in Paddy

(₹ in lakhs)

Sl. No	Interventions	Blocks covered	Unit	Unit Cost	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
1	Promotion of SRI	All Blocks	Ha	15000	27500	2250.00	32500	4875.00	33000	4950.00	33800	5070.00	33800	5070.00	160600	22215.00
2	Distribution of High Yielding Varieties	All Blocks	MT	35000	850	12250.00	950	332.50	1000	350.00	1100	385.00	1200	420.00	5100	13737.50
3	Distribution of Foundation	All Blocks	MT	40000	10	16000.00	10	4.00	10	4.00	10	4.00	10	4.00	50	16016.00
4	Seed production – Foundation / MGR 100 Rice	All Blocks except B3, B5, B8,B9	MT	32000	120	10240.00	220	70.40	270	86.40	295	94.40	320	102.40	1225	10593.60
5	Seed production - Certified class	All Blocks	MT	26000	800	6760.00	800	208.00	1000	260.00	1000	260.00	1200	312.00	4800	7800.00
6	Incentives for paddy machine planting	All Blocks	Ha	10000	60000	1000.00	60000	6000.00	65000	6500.00	65000	6500.00	65000	6500.00	315000	26500.00
7	Distribution of Protray	All Blocks	No	80	15000	0.06	15000	12.00	20000	16.00	15000	12.00	15000	12.00	80000	52.06
8	Distribution of MN mixture/ Copper Sulphate	All Blocks	Ha	1000	50000	10.00	50000	500.00	50000	500.00	50000	500.00	50000	500.00	250000	2010.00
9	Distribution of biofertilizer / PPFM / bioinputs / plant nutrient mobilizing bacteria	All Blocks	Ha	300	50000	0.90	50000	150.00	50000	150.00	50000	150.00	50000	150.00	250000	600.90
10	Distribution of Zinc sulphate (Soil application & foliar)	All Blocks	Ha.	1000	37500	10.00	37500	375.00	37500	375.00	37500	375.00	40000	400.00	190000	1535.00
11	Distribution of biocontrol agents/biopesticides	All Blocks	Ha..	1000	5000	10.00	5000	50.00	5000	50.00	5000	50.00	5000	50.00	25000	210.00
12	Gypsum application	All Blocks	Ha.	1500	20000	22.50	30000	450.00	30000	450.00	30000	450.00	30000	450.00	140000	1822.50

Sl. No	Interventions	Blocks covered	Unit	Unit Cost	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
13	Distribution of herbicides	All Blocks	Ha.	1000	20000	10.00	30000	300.00	30000	300.00	30000	300.00	30000	300.00	140000	1210.00
14	Hybrid Rice seed distribution	All Blocks	Ha	4000	0	160.00	0	0.00	0	0.00	0	0.00	0	0.00	0	160.00
15	Polyvinyl coated Tarpaulin (6m x 5m)	All Blocks	No.	2000	750	40.00	750	15.00	750	15.00	750	15.00	750	15.00	3750	100.00
16	Direct sown paddy with seed drill sowing	All Blocks	Ha	7000	30000	490.00	30200	2114.00	30300	2121.00	30400	2128.00	30500	2135.00	151400	8988.00
17	Establishment of community paddy nursery	All Blocks	ha	25000	50	12.50	50	12.50	50	12.50	50	12.50	50	12.50	250	62.50
18	Demonstration of drip irrigation	All Blocks	ha	100000	20	20.00	20	20.00	20	20.00	20	20.00	20	20.00	100	100.00
	Grand total					**14402.40**		**15483.40**		**16154.90**		**16320.90**		**16447.90**		**78809.50**

Koradacherry - B1, Kottur - B2, Kudavasal - B3, Mannargudi - B4, Muthupettai - B5, Nannilam - B6, Needamangalam - B7, Thiruthuraipoondi - B8, Tiruvarur - B9, Valagaiman - B10

4.1.2. Enhancing millets productivity

In Thiruvarur district, millet crop raised under dry conditions generally for grain and to some extent for fodder. Nowadays farmers are interested to utilize the Sorghum for value addition and healthy preparation of food stuff. Sorghum being a major crop, increasing the productivity from 2.7tonnes/ ha is most important for increasing the total production of the crop. The productivity of millets depends on the quality of seed materials and use of high yielding varieties. The adoption of package of practices like IPM and INM with high yielding varieties gives the maximum potential yield. The increasing cost of labour can be minimized by use of mechanized weeder and thresher.

Project Components

a) Seed distribution subsidy in all blocks except Muthupettai and Thiruthuraipoondi.
b) Distribution of millet micro nutrient mixture and bio-fertilizers all blocks except Muthupettai and Thiruthuraipoondi
c) Distribution of LPG bird scarrer all blocks except Muthupettai and Thiruthuraipoondi
d) Distribution of biofertilizers Liquid / Carrier all blocks except Muthupettai and Thiruthuraipoondi
e) Demonstration of seed treatment and minor millet processing unit all blocks except Muthupettai and Thiruthuraipoondi

Budget

The budget requirement for fulfilling the various interventions is **₹4866.00** Lakhs. The details of budget requirement for each intervention across the blocks are shown in Table 4.2.

Expected outcome

There is a scope to increase the area under millets in Thiruvarurdistrict. By distributing improved varieties/ hybrids of millets willcertainly improve the living standard of the farmers of this tract. The implementation of the project will result in an increase of 10 per cent in the yield and production of millets. This will help the bakery units and to supply more of raw material for their value added products.

Implementingagency

The projects will be implemented by the Department of Agriculture.

Table 4.2. Budget for interventions in Millets

(₹. In Lakhs)

Sl. No.	Components	Unit	Unit cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	Millets															
1	Distribution of LPG operated Bird Scarrer	Nos.	0.1	All Blocks except B5 & B8	16	1.60	24	2.40	32	3.20	40	4.00	48	4.80	160	16.00
2	Distribution on biofertilizer - Liquid / Carrier	Ha	0.003	All Blocks except B5 & B8	400	1.20	400	1.20	400	1.20	400	1.20	400	1.20	2000	6.00
3	Expansion of area under Minor Millets (Demo - supply of seed, seed treatment, MN mixture & Organic package)	Ha	0.05	All Blocks except B5 & B8	400	20.00	400	20.00	400	20.00	400	20.00	400	20.00	2000	100.00
	Sorghum															
4	Demonstration (Supply of seed, seed treatment, MN mixture & Organic package)	Ha	0.05	All Blocks except B5 & B8	400	20.00	400	20.00	400	20.00	400	20.00	400	20.00	2000	100.00
5	Distribution of biofertilizers Liquid / Carrier	Ha	0.003	All Blocks except B5 & B8	400	1.20	400	1.20	400	1.20	400	1.20	400	1.20	2000	6.00
6	Distribution of MN mixture (12.5kg/ha)	Ha	0.007	All Blocks except B5 & B8	400	2.80	400	2.80	400	2.80	400	2.80	400	2.80	2000	14.00
7	Seed distribution	MT	0.7	All Blocks except B5, B8	8	5.60	8	5.60	8	5.60	8	5.60	8	5.60	40	28.00
	Maize															
8	Demonstration (Supply of seed, seed treatment & MN mixture, organic package)	Ha	0.05	All Blocks except B5 & B8	400	20.00	400	20.00	400	20.00	400	20.00	400	20.00	2000	100.00
9	Distribution of biofertilizers Liquid / Carrier	Ha	0.003	All Blocks except B5 & B8	400	1.20	400	1.20	400	1.20	400	1.20	400	1.20	2000	6.00
10	Distribution of Maize maxim (15 kg/ha)	Ha	0.045	All Blocks except B5 & B8	400	18.00	400	18.00	400	18.00	400	18.00	400	18.00	2000	90.00

Sl. No.	Components	Unit	Unit cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
11	Seed Distribution	MT	0.4	All Blocks except B5 & B8	400	160.00	400	160.00	400	160.00	400	160.00	400	160.00	2000	800.00
12	Seed Distribution Hybrid seeds for maize	MT	1.8	All Blocks except B5 & B8	400	720.00	400	720.00	400	720.00	400	720.00	400	720.00	2000	3600.00
	Total					**971.60**		**972.40**		**973.20**		**974.00**		**974.80**		**4866.00**

Koradacherry - B1, Kottur - B2, Kudavasal - B3, Mannargudi - B4, Muthupettai - B5, Nannilam - B6, Needamangalam - B7, Thiruthuraipoondi - B8, Tiruvarur - B9, Valagaiman - B10

4.1.3. Pulses

Enhancing the productivity of pulses

Pulses are one of the most important food components in maintaining the health of the human beings. In Tiruvarur District Pulse crop Black gram & Green gram is cultivated in 70000 Ha as irrigated and Rice fallow crop. With a decreasing area under cultivation, the possibility to improve the production and productivity of pulses is by the adoption of pulse improvement programme, high yielding varieties and improved packages of practices to meet out the requirement of pulses.

Project components

a) Production of foundation and certified seeds in all blocks
b) Distribution of certified seeds in all blocks
c) Pure crop demonstration in all blocks
d) Supply of soil health enhancers in all blocks
e) IPM kits in all blocks
f) Supply of pulse wonder in all blocks
g) Supply of sprayers in all blocks
h) Plant Protection & weedicide in all blocks
i) Demonstrations given in all blocks

Budget

It is proposed to incur ₹.**8977.24** lakhs over a period of five years with the finance facilities under the NADP and other sources.

Area Coverage

Expected outcome

The results will be increased area under pulse with improved varieties along with the package of practices resulting in an increase in the pulse production. Increased productivity will also increase the income of the farmers.

Implementing Agency

Department of Agriculture will implement the project and report the progress to the District-level officials

Table 4.3. Budget for interventions in Pulses

(₹. in lakhs)

Sl. No	Interventions	Unit	Unit cost	Block Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
1	Production of Foundation/ Certified pulses seeds	MT	86000	All Blocks	10	8.60	10	8.60	10	8.60	10	8.60	10	8.60	50	43.00
2	Distribution of Certified Seeds	MT	100000	All Blocks	63	63.00	63	63.00	63	63.00	63	63.00	63	63.00	315	315.00
3	Distribution of Gypsum	ha	400	All Blocks	27500	110.00	23000	92.00	23000	92.00	27500	110.00	27500	110.00	128500	514.00
4	Distribution of Biofertilizer/ Organic packages (Rhizobium + Phosphobacteria) - Liquid / Carrier	Ha	600	All Blocks	20000	120.00	20000	120.00	20000	120.00	20000	120.00	20000	120.00	100000	600.00
5	Distribution of Micro Nutrients(5 kgs/ Ha)	Ha	350	All Blocks	23000	80.50	23000	80.50	23000	80.50	23000	80.50	23000	80.50	115000	402.50
6	DAP Spray	Ha	700	All Blocks	23000	161.00	32000	224.00	36500	255.50	41000	287.00	45500	318.50	178000	1246.00
7	Pulse wonder - 5 kg/ha	Ha	1000	All Blocks	10000	100.00	10000	100.00	15000	150.00	20000	200.00	25000	250.00	80000	800.00
8	Bund Cropping	Ha	300	All Blocks	5000	15.00	5000	15.00	5000	15.00	5000	15.00	5000	15.00	25000	75.00
9	Line sowing	Ha	2250	All Blocks	10000	225.00	20000	450.00	25000	562.50	30000	675.00	35000	787.50	120000	2700.00
10	Distribution of Yellow sticky trap /pheromone trap	ha	1000	All Blocks	500	5.00	500	5.00	500	5.00	500	5.00	500	5.00	2500	25.00
11	Cropping system based demonstration	Ha	12500	All Blocks	500	62.50	500	62.50	500	62.50	500	62.50	500	62.50	2500	312.50

Sl. No	Interventions	Unit	Unit cost	Block Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
12	Distribution of weedicide	Ha	1000	B4	100	1.00	100	1.00	100	1.00	100	1.00	100	1.00	500	5.00
13	Plant Protection Chemicals	Ha	1000	All Blocks	14000	140.00	14000	140.00	14000	140.00	14000	140.00	14000	140.00	70000	700.00
14	Seed treatment and soil application with Trichoderma viridi	Ha	700	All Blocks	15000	105.00	15000	105.00	15000	105.00	15000	105.00	15000	105.00	75000	525.00
15	Pure crop demonstration - Black gram and green gram	Ha	6300	B4	500	31.50	500	31.50	500	31.50	500	31.50	500	31.50	2500	157.50
16	Demonstration on intercropping of pulses with other crops	Ha	8300	All Blocks	190	15.77	190	15.77	190	15.77	190	15.77	190	15.77	950	78.85
17	Demonstration on pulses production	Ha	8250	All Blocks	1000	82.50	1000	82.50	1000	82.50	1000	82.50	1000	82.50	5000	412.50
18	Seed treatment with chemicals	Ha	250	All Blocks	5500	13.75	5500	13.75	5050	12.63	5050	12.63	5050	12.63	26150	65.38
	Total					**1340.12**		**1610.12**		**1803.00**		**2015.00**		**2209.00**		**8977.24**

Koradacherry - B1, Kottur - B2, Kudavasal - B3, Mannargudi - B4, Muthupettai - B5, Nannilam - B6, Needamangalam - B7, Thiruthuraipoondi - B8, Tiruvarur - B9, Valagaiman - B10

4.1.4. Oilseeds

Enhancing the productivity of oilseeds

Oilseeds are one of the most important part of food components for maintaining the health of the human beings. Groundnut is the major oilseed crop of this district under rainfed condition. With a decreasing area under cultivation, the possibility to improve the production of oilseeds is only through increasing the productivity of oilseeds by the adoption of high yielding varieties and improved packages of practices.

Project components

- Distribution of quality seeds
- CBD- for oil seeds in Kudavasal, Mannargudi, Needamangalam and Valangaiman
- Distribution of gypsum in Kottur, Mannargudi, Needamangalam and Valangaiman
- Combined Nutrient Spray in Kottur, Mannargudi, Needamangalam and Valangaiman
- Supply of soil health enhancements in all blocks
- Supply of micro nutrients in all blocks
- Distribution of certified seed in all blocks except Thiruthuraipoondi

Budget

It is proposed to incur ₹.**917.43** lakhs over a period of five years with the finance facilities under the NADP and other sources.

Expected outcome

The expected outcome of the project will result in an increase in the production of oilseed especially groundnut, gingelly and castor for producing oil and major supply of quality raw material to the oilseed industry which will improve the income of the farmers and requirement of oilseeds.

Implementing Agency

Department of Agriculture will implement the project and report the progress to the District-level officials.

Table 4.4. Budget for interventions in Oilseeds

(₹. in lakhs)

Sl. No	Components	Unit	Unit Cost	Blocks Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	OILSEEDS															
1	Light trap (NCIPM)	Nos.	0.01	B2, B4, B7 & B10	14	0.14	14	0.14	14	0.14	14	0.14	14	0.14	70	0.70
2	Bio pesticide/ fungicide	Ha	0.01	B4 & B10	100	1.00	100	1.00	100	1.00	100	1.00	100	1.00	500	5.00
3	Compact Block Demonstration - Groundnut	Ha	0.2	B4 & B10	50	10.00	50	10.00	50	10.00	50	10.00	50	10.00	250	50.00
4	Compact Blocks Demonstration- Gingelly / Castor	Ha	0.06	B2, B4, B7 & B10	25	1.50	25	1.50	25	1.50	25	1.50	25	1.50	125	7.51
5	Compact Blocks Demonstration-- Sunflower	Ha	0.08	B2 & B7	50	4.00	51	4.04	51	4.04	51	4.04	51	4.04	252	20.16
	GROUNDNUT															
6	Strengthening seed chain by foundation seed production	Mt	0.76	B2 & B7	20	15.20	20	15.20	20	15.20	20	15.20	20	15.20	100	76.00
7	Strengthening seed chain by certified seed production	Mt	0.73	B4, B7 & B10	14	10.22	14	10.22	14	10.22	14	10.22	14	10.22	70	51.10
8	Distribution of Certified seeds	Mt	0.84	B4 & B10	4	3.36	4	3.36	4	3.36	4	3.36	4	3.36	20	16.80
9	Distribution of Seed Treatment Chemicals and Bioagents (T.Viridi)	Kg	0.0015	B4 & B10	2	0.00	2	0.00	2	0.00	2	0.00	2	0.00	10	0.02
10	Application of Gypsum to Groundnut Crop	Ha	0.016	B2, B4, B7 & B10	102	1.63	103	1.66	103	1.66	103	1.66	103	1.66	516	8.25

Sl. No	Components	Unit	Unit Cost	Blocks Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
11	Distribution of Micro Nutrient Mixture	Ha	0.015	B2, B4, B5, B7 & B10	372	5.58	374	5.61	374	5.61	374	5.61	374	5.61	1867	28.00
12	Distribution of Biofertilizer	Ha	0.006	B2, B4, B7 & B10	101	0.61	101	0.61	101	0.61	101	0.61	101	0.61	505	3.03
13	Distribution of Liquid Biofertilizer	Ha	0.006	B2, B4, B7 & B10	150	0.90	151	0.90	151	0.90	151	0.90	151	0.90	753	4.52
14	Distribution of Rhizobium/ PSB Culture	Ha	0.006	B2, B4, B7 & B10	150	0.90	151	0.90	151	0.90	151	0.90	151	0.90	753	4.52
15	Distribution of Pheromone Traps	Nos.	0.02	B2 & B7	50	1.00	50	1.01	50	1.01	50	1.01	50	1.01	251	5.02
16	Distribution of Light Traps	Nos.	0.02	B2 & B7	50	1.00	50	1.01	50	1.01	50	1.01	50	1.01	251	5.02
17	Castor as Bund crop	Ha	0.006	B2, B4, B7 & B10	60	0.36	60	0.36	60	0.36	60	0.36	60	0.36	301	1.81
18	Combined Nutrient Spray	Ha	0.015	B2, B4 & B10	150	2.25	150	2.25	150	2.25	150	2.25	150	2.25	750	11.25
19	Seed Drill Sowing / Line sowing of Groundnut with Pulses as intercrop(hiring charges only)	Ha	0.03	B4 & B10	10	0.30	10	0.30	10	0.30	10	0.30	10	0.30	50	1.50
20	Seeddrill Sowing of Groundnut with Redgram as Intercrop	Ha	0.04	B2 & B7	5	0.20	5	0.20	5	0.20	5	0.20	5	0.20	25	1.00
21	Distribution of Tractor operated thresher	Nos.	1.5	B2 & B7	50	75.00	51	76.13	51	76.13	51	76.13	51	76.13	253	379.50
22	Distribution of Power Operated Groundnut Stripper	Nos.	1.3	B2 & B7	5	6.50	5	6.70	5	6.70	5	6.70	5	6.70	26	33.28

Sl. No	Components	Unit	Unit Cost	Blocks Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	GINGELLY															
23	Production of Foundation Seeds	Mt	1.13	B4, B6, B8 & B10	4	3.96	4	3.96	4	3.96	4	3.96	4	3.96	18	19.78
24	Production of Certified Seeds	Mt	1.09	B4, B5, B6, B8 & B10	4	4.36	4	4.36	4	4.36	4	4.36	4	4.36	20	21.80
25	Distribution of certified seeds	Mt	1.25	All Blocks except B7	5	5.63	5	5.63	5	5.63	5	5.63	5	5.63	23	28.13
26	Distribution of Micro nutrients (Manganese sulphate/ Zinc sulphate)	Ha	0.004	All Blocks	351	1.40	351	1.40	351	1.40	351	1.40	351	1.40	1755	7.02
	CASTOR															
27	Production of Foundation Seeds	Mt	0.52	B7	0	0.00	1	0.33	1	0.33	1	0.33	1	0.33	3	1.30
28	Production of Certified Seeds	Mt	0.5	B2 & B7	50	25.00	50	25.10	50	25.10	50	25.10	50	25.10	251	125.40
	Total					**181.99**		**183.86**		**183.86**		**183.86**		**183.86**		**917.43**

Koradacherry - B1, Kottur - B2, Kudavasal - B3, Mannargudi - B4, Muthupettai - B5, Nannilam - B6, Needamangalam - B7, Thiruthuraipoondi - B8, Tiruvarur - B9, Valagaiman - B10

4.1.5. Enhancing the productivity of Oil palm

India is the largest consumer of palm oil in the world, consuming around 17 per cent of total world consumption. Indonesia is the largest oil palm producer contributing to over 40 per cent of the world production. India is also the largest importer of palm oil amounting to 44 per cent of world imports. Palm Oil is extracted from the pulpy portion (monocarp) of the fruit of Oil Palm. The Crude Palm Oil is deep orange red in colour and is semi solid at a temperature of 20 degree centigrade. Palm Oil contains an equal proportion of saturated and unsaturated fatty acid containing about 40% oleic acid, 10% linoleic acid. 44% palmitic acid and 5% stearic acid. The unprocessed palm oil is used for cooking in various countries. Palm Oil is a very rich source of Beta Carotene, an important source of Vitamin A and it contains Tecopherols and Tocotrienols, a natural source of Vitamin E. Vitamin A and Vitamin E contents are the highest in palm oil in comparison with any other types of oil and hence consumption of the same boosts health. By virtue of the high vitamin contents the Red Palm Oil is a nature's gift for the human beings. In view of the rich content of vitamins, palm oil can be utilised for the preparation of cosmetics as well. there is a need to promote oil palm by the way of area expansion and better cultivation practices, it is equally important to focus on innovative growth strategies through National Mission on Oilseeds and Oil Palm (NMOOP) has been launched in which Mini Mission-II (MM-II) is dedicated to oil palm area expansion and productivity increases. MM-II of NMOOP and MM-III of NMOOP is being implemented in 13 States viz; Tamil Nadu, Andhra Pradesh, Assam, Arunachal Pradesh, Chhattisgarh, Gujarat, Karnataka, Kerala, Mizoram, Nagaland, Odisha, Telangana, and West Bengal.

4.1.3.2. Project components

- Oil palm area expansion programme in all blocks except Muthupet and Thiruthuraipoondi.
- Inputs for intercropping in all blocks except Muthupet & Thiruthuraipoondi.
- Supply of diesel pumps in Muthupet & Thiruthuraipoondi
- Supply of aluminum ladder, wire mesh and oil palm cutter in all blocks

4.1.3.3. Budget

It is proposed to incur ₹.**410.51** lakhs over a period of five years with the finance facilities under the NADP and other sources.

4.1.3.4. Expected outcome

The expected outcome of the project will result in an increase in the production of oil palm for producing oil and major supply of quality raw material to the oilseed industry which will improve the income of the farmers and requirement of oilseeds.

4.1.3.5. Implementing Agency

Department of Agriculture will implement the project and report the progress to the District-level officials.

Table 4.5 Budget for interventions in Oil palm

(₹. in lakhs)

Sl. No	Components	Unit	Unit Cost	Blocks Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	OILPALM															
1	NMOOP -Mini Mission -II (Oilpalm)															
2	Oilpalm Area Expansion Programme	Ha	0.14	All Blocks except B5 & B8	82	11.48	82	11.48	84	11.76	86	12.04	115	16.10	449	62.86
3	Cultivation maintenance	Ha	0.1	All Blocks except B5 & B8	80	8.00	80	8.00	80	8.00	0	0.00	0	0.00	240	24.00
4	Inputs for Intercropping	Ha	0.1	All Blocks except B5 & B8	30	3.00	30	3.00	40	4.00	52	5.20	80	8.00	232	23.20
5	Supply of Diesel pumps	No	0.3	B5 & B8	40	12.00	40	12.00	40	12.00	40	12.00	40	12.00	200	60.00
6	Construction of Borewells	No	1	All Blocks except B5 & B8	40	40.00	40	40.00	40	40.00	40	40.00	40	40.00	200	200.00
7	Alumium portable ladder	No	0.06	B4	1	0.06	1	0.06	1	0.06	1	0.06	1	0.06	5	0.30
8	Wire mesh	No	0.1	B5 & B8	80	8.00	80	8.00	80	8.00	80	8.00	80	8.00	400	40.00
9	Oilpalm Cutter	No	0.03	B4	1	0.03	1	0.03	1	0.03	1	0.03	1	0.03	5	0.15
	Total					**82.57**		**82.57**		**83.85**		**77.33**		**84.19**		**410.51**

Koradacherry - B1, Kottur - B2, Kudavasal - B3, Mannargudi - B4, Muthupettai - B5, Nannilam - B6, Needamangalam - B7, Thiruthuraipoondi - B8, Tiruvarur - B9, Valagaiman - B10

4.1.6. Coconut

Enhancing the productivity of Coconut

Coconut cultivation gained momentum for farmers of Thiruvarur district under the area of 5200 ha which is contribute third largest crop in this district and it is located in coastal area and is known for coconut is well growing. By adopting improved technologies will increase in an area and yield of the coconut.

Project components

a) Distribution of quality hybrid seedlings in all blocks
b) Supply of MN mixtures in all blocks
c) Distribution of climbers at subsidized cost in Koradacherry and Mannargudi
d) Training on Neera production in Mannargudi

Budget

It is proposed to incur ₹.**116.75** lakhs over a period of five years with the finance facilities under the NADP and other sources.

Expected outcome

High yielding varieties of coconut seedlings will result in an increase in the yield and production of coconut. This in turn will also help in the increase in the production of coconut oil and availability of tender coconuts to the people.

Implementing Agency

Department of Agriculture will implement the project and report the progress to the District-level officials.

Table 4.6. Budget for interventions in Coconut

(₹. in lakhs)

Sl. No	Components	Unit	Unit cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
1	Distribution of T x D hybrid seedlings	No	0.0006	All Blocks	10000	6.00	10000	6.00	10000	6.00	10000	6.00	10000	6.00	50000	30.00
2	Distribution of Tall Seedlings	No	0.0004	All Blocks	5000	2.00	5000	2.00	5000	2.00	5000	2.00	5000	2.00	25000	10.00
3	Distribution of MN mixture	Ha	0.1	All Blocks	150	15.00	150	15.00	150	15.00	150	15.00	150	15.00	750	75.00
4	Distribution of tree climbers	No	0.15	B1 & B4	2	0.30	2	0.30	2	0.30	2	0.30	2	0.30	10	1.50
5	Training on neera production	Batches	0.25	B4	0	0.00	1	0.25	0	0.00	0	0.00	0	0.00	1	0.25
	Grand Total					**23.30**		**23.55**		**23.30**		**23.30**		**23.30**		**116.75**

Koradacherry - B1, Kottur - B2, Kudavasal - B3, Mannargudi - B4, Muthupettai - B5, Nannilam - B6, Needamangalam - B7, Thiruthuraipoondi - B8, Tiruvarur - B9, Valagaiman - B10

4.1.7. Enhancing the productivity of Cotton

In Thiruvarur district about 23724 ha of cotton is cultivated, which contributes 0.33 % to the gross cropped area. The cotton is mainly cultivated by rice fallow cotton. The problem is poor germination of the crop which will decrease the crop stand. The soil is suitable for cotton cultivation in this District more area will be bought under cotton cultivation. To increase the area and productivity of cotton, in order to increase the income level of the farmers, more emphasis should be given in distribution hybrid variety seeds and demonstration of improved package of practices will help increase the income to farmers.

Project components

a) Demonstration of IPT in Muthupettai and Thiruthuraipoondi blocks
b) Distribution of bio fertilizer in Muthupettai and Thiruthuraipoondi blocks
c) Distribution of biofertilizers in Muthupettai and Thiruthuraipoondi blocks
d) Distribution of sticky trap in Muthupettai and Thiruthuraipoondi blocks blocks
e) Distribution of cotton picking machine in all blocks except kudavasal, Muthupettai, Thiruthuraipoondi and Tiruvarur blocks
f) Field days and exposure visits to Muthupet and Thiruthuraipoondi blocks

Budget

It is proposed to incur ₹.**1536.91** lakhs over a period of five years with the finance facilities under the NADP and other sources.

Expected outcome

The expected outcome will be expanding the areaof cotton will be brought under rice fallow and irrigated condition and the productivity will also get increased.

Implementing Agency

Department of Agriculture will implement the project and report the progress to the District-level officials.

Table 4.7. Budget for interventions in Cotton

(₹. in lakhs)

Sl. No	Components	Unit	Unit Cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
1	Cotton seed treatment	Ha	300	B5 & B8	270	0.81	400	1.20	750	2.25	750	2.25	750	2.25	2920	8.76
2	Demonstration of IPT	Ha	15000	B5 & B8	6	0.90	8	1.20	8	1.20	8	1.20	8	1.20	38	5.70
3	Distribution of biofertilizer	Ha	300	B5 & B8	225	0.68	400	1.20	800	2.40	800	2.40	800	2.40	3025	9.08
4	Distribution of biopesticides / Bio agents	Ha	1000	B5 & B8	260	2.60	400	4.00	400	4.00	800	8.00	800	8.00	2660	26.60
5	Distribution of cotton picking machine	No	5000	All Blocks except B3, B5, B8 & B9	26	1.30	26	1.30	26	1.30	26	1.30	26	1.30	130	6.50
6	Distribution of MN Mixture	Ha	1000	B5 & B8	270	2.70	550	5.50	550	5.50	550	5.50	550	5.50	2470	24.70
7	Distribution of Pheromone trap	No	6000	B5 & B8	0	0.00	400	24.00	400	24.00	400	24.00	400	24.00	1600	96.00
8	Distribution of PP chemicals	Ha	1000	B5 & B8	270	2.70	700	7.00	1500	15.00	1600	16.00	1700	17.00	5770	57.70
9	Distribution of Yellow Sticky trap	No	3000	B5 & B8	20	0.60	400	12.00	560	16.80	640	19.20	800	24.00	2420	72.60
10	Exposure visits	No	40000	B5 & B8	2	0.80	8	3.20	8	3.20	8	3.20	8	3.20	34	13.60
11	Farmers training	No	20000	B5 & B8	2	0.40	16	3.20	16	3.20	16	3.20	16	3.20	66	13.20
12	Field days	No	10000	B5 & B8	1	0.10	8	0.80	8	0.80	8	0.80	8	0.80	33	3.30
13	Intercropping with pulses	Ha	10000	B5 & B8	270	27.00	550	55.00	700	70.00	850	85.00	1000	100.00	3370	337.00
14	Soil reclamation with gypsum	Ha	1000	B5 & B8	70	0.70	750	7.50	2850	28.50	3550	35.50	3550	35.50	10770	107.70
15	TNAU Cotton plus distribution (6 Kg./ Ha)	Ha	1200	B5 & B8	260	3.12	550	6.60	850	10.20	1150	13.80	1450	17.40	4260	51.12
16	Frontline demo on ICM in cotton	Ha	7000	B5 & B8	3	0.21	8	0.56	8	0.56	8	0.56	8	0.56	35	2.45

Sl. No	Components	Unit	Unit Cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
17	Application of weedicide	Ha	3000	B5 & B8	320	9.60	500	15.00	500	15.00	500	15.00	500	15.00	2320	69.60
18	Spraying of growth regulator	Ha	3000	B5 & B8	320	9.60	500	15.00	500	15.00	700	21.00	700	21.00	2720	81.60
19	Topping of cotton	Ha	1000	B5 & B8	320	3.20	500	5.00	500	5.00	500	5.00	500	5.00	2320	23.20
20	Summer ploughing	Ha	7500	B5 & B8	1220	91.50	1450	108.75	1450	108.75	1450	108.75	1450	108.75	7020	526.50
	Grand total					**158.52**		**278.01**		**332.66**		**371.66**		**396.06**		**1536.91**

Koradacherry - B1, Kottur - B2, Kudavasal - B3, Mannargudi - B4, Muthupettai - B5, Nannilam - B6, Needamangalam - B7, Thiruthuraipoondi - B8, Tiruvarur - B9, Valagaiman - B10

4.1.8. Enhancing the productivity of sugarcane

Sugarcane is one of the most important industrial crop to generate more income for farmers. The area and production is decreasing trend was observed. The productivity of sugarcane in future need to be taken care since they are expected to show much lower in future than their current productivity. Sugarcane productivity is maximize through improved packages of practices for enhancing the productivity of minimum of 5 to 10 tonnes increase in cane production per hectare.

Project components

a) Distribution of micronutrients mixtures in Muthupettai and Thiruthuraipoondi
b) Supply of gypsum in Muthupettai and Thiruthuraipoondi
c) Distribution of biocontrol agrnt in in Muthupettai and Thiruthuraipoondi
d) Distribution of Micro irrigation to in Muthupettai and Thiruthuraipoondi
e) Strengthening of sugarcane tissue culture laboratory in Muthupettai and Thiruthuraipoondi
f) Promotion of SSI in Muthupettai and Thiruthuraipoondi
g) State Level training in Sugarcane cultivation in Muthupettai and Thiruthuraipoondi

Budget

It is proposed to incur ₹.**895.95** lakhs over a period of five years with the finance facilities under the NADP and other sources.

Expected outcome

The project will be Increasing the productivity of sugarcane may increase 5 to 10 tonnes per hectare will help in making available required quantity of canes to the mills and also would enhance income and employment opportunities of farmers and farm labourers.

Implementing Agency

Department of Agriculture will implement the project and report the progress to the District-level officials.

Table 4.8. Budget for interventions in Sugarcane

(₹. in lakhs)

Sl. No	Components	Unit	Unit cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
1	Distribution of Gypsum (500 Kg/Ha)	Ha	0.02	B5 & B8	660	13.20	660	13.20	660	13.20	660	13.20	660	13.20	3300	66.00
2	Distri. of biofertilizer (Ha)	Ha	0.006	B5 & B8	660	3.96	660	3.96	660	3.96	660	3.96	660	3.96	3300	19.80
3	Distri. of weedicide (Ha)	Ha	0.01	B5 & B8	660	6.60	660	6.60	660	6.60	660	6.60	660	6.60	3300	33.00
4	Distribution of FeSO4 Spray	Ha	0.005	B5 & B8	660	3.30	660	3.30	660	3.30	660	3.30	660	3.30	3300	16.50
5	Distribution of ZnSO4 Spray	Ha	0.005	B5 & B8	660	3.30	660	3.30	660	3.30	660	3.30	660	3.30	3300	16.50
6	Distribution of Micro Nutrient Mixture	Ha	0.02	B5 & B8	660	13.20	660	13.20	660	13.20	660	13.20	660	13.20	3300	66.00
7	Distribution of Parasite Trichogramma	Ha	0.00125	B5 & B8	660	0.83	660	0.83	660	0.83	660	0.83	660	0.83	3300	4.13
8	Microirrigation - Drip (1.2x0.6)	ha	1.24	B5 & B8	80	99.20	80	99.20	80	99.20	80	99.20	80	99.20	400	496.00
	Sustainable Sugarcane Initiative (SSI)															
9	A. Establishment of Shadenet	Nos	1.5	B5 & B8	8	12.00	8	12.00	8	12.00	8	12.00	8	12.00	40	60.00
10	B.Distribution of Single Bud Seedling	Ha	0.225	B5 & B8	48	10.80	48	10.80	48	10.80	48	10.80	48	10.80	240	54.00
11	Trash Mulching	Ha	0.04	B5 & B8	80	3.20	80	3.20	80	3.20	80	3.20	80	3.20	400	16.00
12	Demonstration on intercropping in Sugarcane	Ha	0.08	All Blocks	80	6.40	80	6.40	80	6.40	80	6.40	80	6.40	400	32.00
13	State Level training in Sugarcane cultivation	No	0.4	B5 & B8	8	3.20	8	3.20	8	3.20	8	3.20	8	3.20	40	16.00
	Grand Total					**179.19**		**179.19**		**179.19**		**179.19**		**179.19**		**895.95**

Koradacherry - B1, Kottur - B2, Kudavasal - B3, Mannargudi - B4, Muthupettai - B5, Nannilam - B6, Needamangalam - B7, Thiruthuraipoondi - B8, Tiruvarur - B9, Valagaiman - B10

4.1.9. Enhancing the livelihood of farmers through training

Agricultural extension is being provided at the Block level and below, under the Extension Reforms scheme being implemented. Contact them or any other functionary of the State Government in Agriculture and allied departments to get answers for the queries, information about any Programme / Scheme and appropriate technologies for the area or individual farmer. The new information that farmers gain through these training sessions makes their daily farming activities much easier. It also leads to an increase in productivity and bigger profits in the long run.

Project components

- State level trainings to Extension officials in all blocks
- State level and interstate level training programmes to farmers in all blocks
- Exposure visits in all blocks

Budget

It is proposed to incur ₹.**1147.00** lakhs over a period of five years with the finance facilities under the NADP and other sources.

Expected outcome

The project will results better income to farmers. They may learn many things to improve their knowledge of cultivation if they listen this programme which will improve the income of the farmers.

Implementing Agency

Department of Agriculture will implement the project and report the progress to the District-level officials.

Table 4.9. Budget for interventions in Trainings

(₹. in lakhs)

Sl. No	Components	Unit	Unit Cost	Block Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	Training of Farmers															
1	Inter State Training of Farmers	Nos.	1.25	All Blocks	10	12.50	10	12.50	10	12.50	10	12.50	10	12.50	50	62.50
2	Inter State Training of Farmers	Nos.	1.75	All Blocks	10	17.50	10	17.50	10	17.50	10	17.50	10	17.50	50	87.50
3	Training of 536 Groups of Seed Village Farmers in quality Seed Production technology.	Nos.	0.1	All Blocks	10	1.00	10	1.00	10	1.00	10	1.00	10	1.00	50	5.00
4	Training of Farmers under Mission Soil Health Card	Nos.	0.15	All Blocks	100	15.00	100	15.00	100	15.00	100	15.00	100	15.00	500	75.00
5	Within the district training of Farmers	Nos.	0.1	All Blocks	10	1.00	10	1.00	10	1.00	10	1.00	10	1.00	50	5.00
6	Within the State training of Farmers	Nos.	1.2	All Blocks	10	12.00	10	12.00	10	12.00	10	12.00	10	12.00	50	60.00
	Training of Farmers With in the district															
7	Awareness campaigns	Nos.	0.1	All Blocks	200	20.00	200	20.00	200	20.00	200	20.00	200	20.00	1000	100.00
8	Cotton	Nos.	0.1	All Blocks	100	10.00	100	10.00	100	10.00	100	10.00	100	10.00	500	50.00
9	Groundnut	Nos.	0.1	All Blocks	50	5.00	50	5.00	50	5.00	50	5.00	50	5.00	250	25.00
10	IFS	Nos.	0.1	All Blocks	50	5.00	60	6.00	50	5.00	50	5.00	50	5.00	260	26.00
11	Major & Minor Millets	Nos.	0.1	All Blocks	100	10.00	100	10.00	100	10.00	100	10.00	100	10.00	500	50.00
12	Moisture conservation practices	Nos.	0.1	All Blocks	70	7.00	50	5.00	70	7.00	70	7.00	70	7.00	330	33.00
13	oil Palm	Nos.	0.1	All Blocks	60	6.00	60	6.00	60	6.00	60	6.00	60	6.00	300	30.00
14	Organic cultivation practices	Nos.	0.1	All Blocks	100	10.00	60	6.00	100	10.00	100	10.00	100	10.00	460	46.00
15	Paddy	Nos.	0.1	All Blocks	100	10.00	100	10.00	100	10.00	100	10.00	100	10.00	500	50.00

Sl. No	Components	Unit	Unit Cost	Block Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
16	Pulses	Nos.	0.1	All Blocks	150	15.00	150	15.00	150	15.00	150	15.00	150	15.00	750	75.00
17	Sugarcane	Nos.	0.1	All Blocks	100	10.00	100	10.00	100	10.00	100	10.00	100	10.00	500	50.00
18	Value addition training	Nos.	0.1	All Blocks	100	10.00	60	6.00	100	10.00	100	10.00	100	10.00	460	46.00
	Exposure visit of Farmers															
19	Rodent Pest Management Demonstration	Nos.	0.04	All Blocks	480	19.20	480	19.20	480	19.20	480	19.20	480	19.20	2400	96.00
20	With in State Exposure visit	Nos.	0.4	All Blocks	50	20.00	50	20.00	50	20.00	50	20.00	50	20.00	250	100.00
21	Organisation of Kisan gosthies on Soil test based nutrient application (Campaign)	Nos.	0.15	All Blocks	50	7.50	50	7.50	50	7.50	50	7.50	50	7.50	250	37.50
22	With in the district exposure visit	Nos.	0.15	All Blocks	50	7.50	50	7.50	50	7.50	50	7.50	50	7.50	250	37.50
	TOTAL					**231.20**		**222.20**		**231.20**		**231.20**		**231.20**		**1147.00**

Koradacherry - B1, Kottur - B2, Kudavasal - B3, Mannargudi - B4, Muthupettai - B5, Nannilam - B6, Needamangalam - B7, Thiruthuraipoondi - B8, Tiruvarur - B9, Valagaiman - B10

4.1.10. Infrastructure development

Facilities for Seed production

Seed is the most basic input in agriculture. Therefore, the sustained supply of the quality seeds will continue to be a key factor for augmenting agricultural growth. The seed processing is a vital part of the seed production activities and the State Government has accorded high priority. In view of above, efforts have to be taken with the objective of production of quality seeds of agricultural crops through scientific methods and adopting appropriate processing techniques through establishment and modernization of State seed processing plants.

After harvesting, cleaning, drying, processing, and packaging, the representative samples of seed lot are required to be taken and sent to the laboratory for quality testing. From the test results, genetic, physical, physiological, and health qualities of seeds are determined. Different countries have set their own standards to find out these qualities in the seed lot. The National Seed Board, for instance, has approved maximum amount of moisture content, minimum germination potential, and minimum physical purity in foundation, certified and truthfully labeled seeds of different crops as basic seed standards. The test results must conform the approved seed standards to send the seeds in the market for commercial transaction.

Establishment of Laboratories

Quality control is the process of checking the quality of the material against the standard set by the organizations and if the material does not match with the standards, then such material is said to be substandard. Quality control laboratories are being established by the Government with an intention to supply quality inputs viz., seed, fertilizers and pesticide and services like soil testing to the farmers. To have effective quality control of inputs, quality inspectors are to be appointed.

The Agricultural Research - NABL Accreditation lab, Organic Fertilizer Testing laboratory, Bio-Fertilizer Quality Control Laboratory, Pesticide Residual Laboratory and laboratory for leaf analysis for selective nutrient application, Soil Testing Laboratory and Fertilizer Control Laboratory, Strengthening of Mobile Soil Testing Laboratory for Ensuring Soil Health were proposed.

The major interventions are

1. Construction of Sub-AEC in Mannargudi block
2. Construction of UzhavarMaiyam/Farmers Hub in all blocks
3. Dunnage, Electronic platform balance and Moisture meter in all blocks

Budget

It is proposed to incur ₹. **3285.25** lakhs over a period of five years with the finance facilities under the NADP and other sources.

Expected outcome

The projects will results better income to farmers. They may learn many things to improve their knowledge of cultivation through basic infrastructure facilities which will improve the income of the farmers.

Implementing Agency

Department of Agriculture will implement the project and report the progress to the District-level officials.

Table 4.10. Budget for interventions in infrastructure development

(₹. in lakhs)

Sl. No	Components	Unit	Unit Cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
1	Construction of Sub-Agricultural Extension Centre (498 Nos.)	Nos.	3000000	B4	2	60.00	2	60.00	2	60.00	0	0.00	0	0.00	6	180.00
2	Construction of Uzhavar Maiyam (Farmers Hub)	Nos.	15000000	All Blocks	10	1500.00	0	0.00	0	0.00	0	0.00	0	0.00	10	1500.00
3	Establishment of Threshing floor/drying yard	Nos.	500000	All Blocks	10	50.00	10	50.00	10	50.00	10	50.00	10	50.00	50	250.00
4	Dunnage	Nos.	7500	All Blocks	650	48.75	650	48.75	650	48.75	650	48.75	1550	116.25	4150	311.25
5	Moisture meter	Nos.	25000	All Blocks	30	7.50	0	0.00	0	0.00	0	0.00	0	0.00	30	7.50
6	Bag closure	Nos.	10000	All Blocks	100	10.00	100	10.00	100	10.00	100	10.00	100	10.00	500	50.00
7	Electronic platform balance	Nos.	150000	All Blocks	1	1.50	0	0.00	10	15.00	0	0.00	0	0.00	11	16.50
8	Seed rack	Nos.	30000	All Blocks	2	0.60	20	6.00	1	0.30	1	0.30	1	0.30	25	7.50
9	Tarpaulin	Nos.	25000	All Blocks	250	62.50	250	62.50	250	62.50	250	62.50	250	62.50	1250	312.50
10	Office Furnishings and other amenities	Nos.	200000	All Blocks	10	20.00	10	20.00	10	20.00	10	20.00	10	20.00	50	100.00
11	Strengthening of training institute / nursery / FTC / KVK	Nos.	50000000	All Blocks	1	500.00	0	0.00	0	0.00	0	0.00	0	0.00	1	500.00
12	Infrastructure for empowerment of coconut nurseries	Nos.	5000000	All Blocks	0	0.00	0	0.00	1	50.00	0	0.00	0	0.00	1	50.00
	Grand total					**2260.85**		**257.25**		**316.55**		**191.55**		**259.05**		**3285.25**

Koradacherry - B1, Kottur - B2, Kudavasal - B3, Mannargudi - B4, Muthupettai - B5, Nannilam - B6, Needamangalam - B7, Thiruthuraipoondi - B8, Tiruvarur - B9, Valagaiman - B10

4.1.11. Soil Health Management

It has been observed that the average productivity of major crops in Tamil Nadu is only about 60 percent of the potential yield. The reason may be due to decline in organic matter content of the soil of the State leading to low soil fertility. The availability of organic manures to farmers has become scanty and costly. The importance of FYM/Green manuring in maintaining the organic matter status of the soil has to be educated to the farmers. The total production of bio-fertilizers has to be stepped up to meet the growing demand. Similarly, crop based micronutrient mixtures need to be promoted. Soil amendments *viz.,* gypsum and lime have to be provided at a subsidized rate as a reclamation measure for the cultivable acid and alkali soils. Besides, efficient earthworm cultures should be provided for vermicompost unit by providing subsidy for establishment of vermicompost units with training in vermicompost.

Project Component

- Reclamation of acid and alkali soils in all blocks
- Distribution of enriched press mud and blue green algae in all blocks
- Establishment of model organic villages in all blocks
- Distribution of soil health card in all blocks

Budget

Enhancing soil health by distributing enriched farm yard manure, micro-nutrient mixture, gypsum, bio-fertilizers, *etc.* is essential to maximize profitability. The overall budget to undertake the various interventions in Thiruvarur district is ₹.**1403.25** lakhs.

Expected Outcome

Healthy soils are the foundation for profitable, productive and environmentally sound agricultural systems. In an agricultural context, it refers to the ability of the soil to sustain agricultural productivity and protect environmental resources. The proposed soil health management practices will improve soil health by increasing productivity and profitability immediately and into the future.

Implementing Agency

The projects will be implemented by the Department of Agriculture.

Table 4.11. Budget for interventions in Soil Health Management

(₹. in lakhs)

Sl. No	Components	Unit	Unit Cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	Soil Health Management															
1	Permanent Vermi compost units	Cluster Nos.	50000	All Blocks	10	5.00	10	5.00	10	5.00	10	5.00	10	5.00	50	25.00
2	Reclamation of Alkali Soil	MT	50000	All Blocks	100	50.00	100	50.00	100	50.00	100	50.00	100	50.00	500	250.00
3	Green Manuring	Nos	4000	All Blocks	5000	200.00	5000	200.00	5000	200.00	5000	200.00	5000	200.00	25000	1000.00
4	Establishment of Model organic villages	Ha	1000000	All Blocks	0	0.00	0	0.00	10	100.00	0	0.00	0	0.00	10	100.00
5	Procurement and Distribution of Blue Green Algae	Nos	2500	All Blocks	50	1.25	50	1.25	50	1.25	50	1.25	50	1.25	250	6.25
6	Composting of Farm Waste Through Pluerotus (Production and Distribution of Kits)	MT	200	All Blocks	1000	2.00	1000	2.00	1000	2.00	1000	2.00	1000	2.00	5000	10.00
7	Distribution of Soil Health Card	Ha	300	All Blocks	800	2.40	800	2.40	800	2.40	800	2.40	800	2.40	4000	12.00
	Total					**260.65**		**260.65**		**360.65**		**260.65**		**260.65**		**1403.25**

Koradacherry - B1, Kottur - B2, Kudavasal - B3, Mannargudi - B4, Muthupettai - B5, Nannilam - B6, Needamangalam - B7, Thiruthuraipoondi - B8, Tiruvarur - B9, Valagaiman - B10

4.1.12. Integrated Pest Management (IPM)

Integrated Pest Management also known as integrated pest control is a broad based approach that integrates practices for economic control of pests. IPM aims to suppress pest populations below the economic injury level. IPM used in agriculture, horticulture, forestry, human habitations, preventive conservation and general pest control, including structural pest management. The principle is on control not eradication. IPM holds that wiping out an entire pest population is often impossible, and the attempt can be expensive and unsafe. IPM programmes first work to establish acceptable pest levels, called action thresholds, and apply controls if those thresholds are crossed. The IPM process starts with monitoring, which includes inspection and identification, followed by the establishment of economic injury levels. Integrated pets management employ a variety of actions including cultural controls, including physical barriers, biological controls, including adding and conserving natural predators and enemies to the pest and finally chemical controls or pesticides.

Farmers Field Schools (FFS) is group based learning process that has been used by a governments to promote Integrated Pest Management (IPM). The FFS is a form of adult education, which evolved from the concept that farmers learn optimally from field observation and experimentation. It was developed to help farmers tailor their IPM practices to diverse and dynamic ecological conditions.

Interventions

1. Farmers Field Schools (FFS) in all blocks
2. Field days in all blocks
3. Integrated Pest Management Villages in all blocks
4. Establishment of Sugar cane Parasite Breeding Station in all blocks
5. IPM School in all blocks

Budget

It is proposed to incur ₹. **1038.00** lakhs over a period of five years with the finance facilities under the NADP and other sources.

Expected outcome

The project will results may increase the productivity of crops through following of IPm technologies for controlling of pest and disease which will improve the income of the farmers.

Implementing Agency

Department of Agriculture will implement the project and report the progress to the District-level officials.

Table 4.12. Budget for interventions in IPM

(₹. in lakhs)

Sl. No	Components	Unit	Unit Cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
1	Farmers Field Schools (FFS)	Nos.	20000	All Blocks	100	20.00	100	20.00	120	24.00	180	36.00	200	40.00	700	140.00
2	Field days	No.	20000	All Blocks	50	10.00	60	12.00	60	12.00	60	12.00	60	12.00	290	58.00
3	Integrated Pest Management Villages	Nos.	100000	All Blocks	30	30.00	40	40.00	60	60.00	60	60.00	60	60.00	250	250.00
4	Establishment of Sugar cane Parasite Breeding Station	Nos.	3500000	All Blocks	0	0.00	0	0.00	10	350.00	0	0.00	0	0.00	10	350.00
5	Establishment of Bio-pesticide production unit	Nos.	12000000	B1	1	120.00	0	0.00	0	0.00	0	0.00	0	0.00	1	120.00
6	IPM School	Nos.	40000	All Blocks	60	24.00	60	24.00	60	24.00	60	24.00	60	24.00	300	120.00
	Total					**204.00**		**96.00**		**470.00**		**132.00**		**136.00**		**1038.00**

Koradacherry - B1, Kottur - B2, Kudavasal - B3, Mannargudi - B4, Muthupettai - B5, Nannilam - B6, Needamangalam - B7, Thiruthuraipoondi - B8, Tiruvarur - B9, Valagaiman - B10

4.1.13. Farm Mechanization

Agricultural mechanization is the need of the hour to meet out the growing shortage of labour workforce in Agriculture. It has been identified as one of the critical inputs for increasing production in time. The labour intensive crops need high man power requirement, which is fast depleting and posing a big challenge to crop productivity. Agricultural labour wages are increasing at an alarming rate in Tamil Naduresulting in shifting from labour intensive to mechanization intensive techniques.The farm machinery for land preparations, land development, seeding, planting, transplanting, weeding and intercultural operations, harvesting and threshing which are predominantly used in other parts of the country/other countries are proposed for introduction in the farmers field ofCuddalore district.

Project Component:

- Distribution of tractor, mini tractor and power tiller in all blocks
- Distribution of MB plough, rotavator, laser leveller, baler and paddy transplanter in all blocks
- Distribution of tractor drawn seed cum fertilizer drill in Mannargudi
- Distribution of mobile sprinklers, rain guns and PVC Pipes to carry irrigation water from source to field in all blocks
- Solar power pump system in in Mannargudi
- Distribution of sprayers (power, hand and battery operated sprayer) in all blocks

Budget:

Agricultural mechanization programs are proposed to implement in a big way to increase the agricultural production and to popularize the agricultural machinery among the farmers of this district with a budget of ₹.**13840.55** lakhs.

Expected Outcome:

Distribution of farm machinery / implements to farmers will increase the farm power. All the proposed agricultural machinery / implements will be put into use by the farmers. The acute agricultural labour scarcity will be reduced. The benefit of agricultural mechanization is to be extended to all categories of farmers with due consideration to small, marginal, scheduled caste, scheduled tribes and women farmers.

Implementing Agency:

The projects will be implemented by the Department of Agriculture.

.

Table 4.13. Budget for interventions in Farm Machineries

(₹. in lakhs)

Sl. No	Components	Unit	Unit Cost	Block Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	Farm Mechanization															
1	Solar light trap	No.	4000	All Blocks	55	2.20	100	4.00	150	6.00	200	8.00	250	10.00	755	30.20
2	Battery operated sprayer	Nos.	4000	All Blocks	10	0.40	10	0.40	10	0.40	10	0.40	10	0.40	50	2.00
3	Power operated sprayer	Nos.	8000	All Blocks	250	20.00	250	20.00	250	20.00	250	20.00	300	24.00	1300	104.00
4	Hand operated sprayer	Nos.	1500	All Blocks	150	2.25	150	2.25	150	2.25	150	2.25	150	2.25	750	11.25
5	Distribution of combine harvester	Nos	1700000	B4	1	17.00	1	17.00	1	17.00	1	17.00	1	17.00	5	85.00
6	Distribution of Mini Tractor	Nos	300000	All Blocks	19	57.00	28	84.00	37	111.00	37	111.00	64	192.00	185	555.00
7	Distribution of Mobile Sprinklers	Ha	30000	All Blocks	500	150.00	500	150.00	500	150.00	500	150.00	500	150.00	2500	750.00
8	Distribution of Paddy transplanter	Nos	500000	All Blocks	10	50.00	10	50.00	10	50.00	10	50.00	10	50.00	50	250.00
9	Distribution of Powertiller	Nos	150000	All Blocks	140	210.00	140	210.00	140	210.00	185	277.50	298	447.00	903	1354.50
10	Distribution of Rain guns	Ha	30000	All Blocks	470	141.00	525	157.50	540	162.00	550	165.00	570	171.00	2655	796.50
11	Distribution of Rotavator	Nos	80000	All Blocks	28	22.40	37	29.60	46	36.80	55	44.00	46	36.80	212	169.60
12	Distribution of Tarpaulins	Nos	8000	All Blocks	1100	88.00	1100	88.00	1100	88.00	1100	88.00	1200	96.00	5600	448.00

Sl. No	Components	Unit	Unit Cost	Block Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
13	Distribution of Tractor	Nos	600000	All Blocks	55	330.00	55	330.00	55	330.00	55	330.00	55	330.00	275	1650.00
14	Distribution of Tractor Drawn Seed cum Fertilizer Drill	Nos	70000	B4	2	1.40	2	1.40	2	1.40	2	1.40	2	1.40	10	7.00
15	PVC Pipes to carry Irrigation water from source to field	Unit	40000	All Blocks	2500	1000.00	2500	1000.00	2500	400.00	2500	1000.00	3000	2500.00	13000	5900.00
16	Solar power pump system	Nos	550000	B4	5	27.50	5	27.50	5	27.50	5	27.50	5	27.50	25	137.50
17	Distribution Oil Engine Pumpset	Nos	30000	All Blocks	1000	300.00	1000	300.00	1000	300.00	1100	330.00	1200	360.00	5300	1590.00
	Total					**2419.15**		**2471.65**		**1912.35**		**2622.05**		**4415.35**		**13840.55**

Koradacherry - B1, Kottur - B2, Kudavasal - B3, Mannargudi - B4, Muthupettai - B5, Nannilam - B6, Needamangalam - B7, Thiruthuraipoondi - B8, Tiruvarur - B9, Valagaiman - B10

4.1.14. Strengthening of State Seed Farm

Seed is the basic and most critical input for sustainable agriculture. The response of all other inputs depends on quality of seeds to a large extent. It is estimated that the direct contribution of quality seed alone to the total production is about 15–20% depending upon the crop and it can be further raised up to 45% with efficient management of other inputs. The total seed requirement of the country amounts to 2.56 lakh tonnes. However, about 20 per cent of the total seed requirement is met as quality seeds, while the rest is managed by farm saved seeds. The main reason for wider gap in agricultural crops especially pulses and oilseeds was that most of the private and multinational companies are concentrating on high value and low volume crops like hybrid cotton, millets and vegetables whereas only public institutions are producing and marketing high volume and low value crops like pulses and oilseeds. Hence, high emphasis has to be given for the production and supply of quality seeds of pulses and oilseeds to farmers and increase the Seed Replacement Rate. Hence there is an urgent need for the State Seed Corporations also to transform themselves in tune with the industry in terms of infrastructure, technologies, approach and the management culture to be able to survive in the competitive market and to enhance their contribution in the national endeavour of increasing food production to attain food & nutritional security.Therefore, the infrastructurefacilities at the SSFs like levelled land, more area, assured irrigation, thrashing floor, drying yard, processing units, storage etc., are essential to produce, process and pack quality seeds. Therefore, the strengthening of state seed farms is aimed for quality seed production in Tamil Nadu.

Project components

- Soil Fertility Improvement and Land development works in Needamangalam and Thiruthuraipoondi blocks
- Provision of Irrigation facilities viz., Solar pump sets, Deepening of bore well Laying of pipelines, Rain gun, Mobile sprinkler, Laying of drip, New bore well with EB connection, Deepening of open well and Farm Pond in Needamangalam and Thiruthuraipoondi blocks
- Supply of machineries in Needamangalam and Thiruthuraipoondi blocks
- Infrastructure development for seed production in Needamangalam and Thiruthuraipoondi blocks

Budget

It is proposed to incur ₹.**907.00** lakhs over a period of five years with the finance facilities under the NADP and other sources.

Expected outcome

The expected outcome of the project will result it will Enhance production of quality seeds of Crop varieties and Ensure timely delivery of seeds to farmers and it will increase supply of good quality seed which increase the production of the crops and the income of the farmers of Tamil Nadu.

Implementing Agency

Department of Agriculture will implement the project and report the progress to the District-level officials.

Table 4.14. Budget for interventions in Strengthening State Seed Farm (SSF)

(₹. in lakhs)

Sl.No	Components	Unit	Unit Cost	Block Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
I	**Soil Fertility Improvement and Land development works in SSF**	ac	2	B7 & B8	160	320.00	0	0.00	0	0.00	0	0.00	0	0.00	160	320.00
II	**Irrigation Component**															
1	Solar pumpsets	nos	6	B7 & B8	4	24.00	0	0.00	0	0.00	0	0.00	0	0.00	4	24.00
2	Deepening of bore well	nos	4	B7 & B8	3	12.00	0	0.00	0	0.00	0	0.00	0	0.00	3	12.00
3	Laying of pipelines	mt	0.05	B7 & B8	130	6.50	0	0.00	0	0.00	0	0.00	0	0.00	130	6.50
4	Rain gun	nos	0.4	B7 & B8	20	8.00	0	0.00	0	0.00	0	0.00	0	0.00	20	8.00
5	Mobile sprinkler	nos	0.3	B7 & B8	10	3.00	0	0.00	0	0.00	0	0.00	0	0.00	10	3.00
6	New bore well with EB connection	nos	8	B7 & B8	3	24.00	0	0.00	0	0.00	0	0.00	0	0.00	3	24.00
7	Farm Pond	nos	1	B7 & B8	0	0.00	4	4.00	0	0.00	0	0.00	0	0.00	4	4.00
III	**Machineries**															
8	Dunnage (Poly Pallets)	nos	0.075	B7 & B8	400	30.00	0	0.00	0	0.00	0	0.00	0	0.00	400	30.00
9	Seed grading machine	nos	20	B7 & B8	4	80.00	0	0.00	0	0.00	0	0.00	0	0.00	4	80.00
10	Paddy Transplanter	nos	5	B7 & B8	4	20.00	0	0.00	0	0.00	0	0.00	0	0.00	4	20.00
11	Rotavator	nos	1	B7 & B8	3	3.00	0	0.00	0	0.00	0	0.00	0	0.00	3	3.00
12	Tractor and accessories	nos	10	B7 & B8	4	40.00	0	0.00	0	0.00	0	0.00	0	0.00	4	40.00
13	Power Tiller	nos	3	B7 & B8	4	12.00	0	0.00	0	0.00	0	0.00	0	0.00	4	12.00

Sl.No	Components	Unit	Unit Cost	Block Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
14	Tarpaulin	nos	0.1	B7 & B8	40	4.00	0	0.00	0	0.00	0	0.00	0	0.00	40	4.00
15	Generator	nos	7	B7 & B8	4	28.00	0	0.00	0	0.00	0	0.00	0	0.00	4	28.00
IV	**Civil Works**															
16	Farm protection structure	mt	0.15	B7 & B8	645	96.75	0	0.00	0	0.00	0	0.00	0	0.00	645	96.75
17	New Threshing floor	nos	5	B7 & B8	4	20.00	0	0.00	0	0.00	0	0.00	0	0.00	4	20.00
18	seed godown	nos	25	B7 & B8	4	100.00	0	0.00	0	0.00	0	0.00	0	0.00	4	100.00
19	Farm office	nos	8	B7 & B8	4	32.00	0	0.00	0	0.00	0	0.00	0	0.00	4	32.00
20	culvert	nos	6	B7 & B8	4	24.00	0	0.00	0	0.00	0	0.00	0	0.00	4	24.00
21	Farm connectivity	Meter	0.015	B8	1050	15.75	0	0.00	0	0.00	0	0.00	0	0.00	1050	15.75
	Total					**903.00**		**4.00**		**0.00**		**0.00**		**0.00**		**907.00**

Koradacherry - B1, Kottur - B2, Kudavasal - B3, Mannargudi - B4, Muthupettai - B5, Nannilam - B6, Needamangalam - B7, Thiruthuraipoondi - B8, Tiruvarur - B9, Valagaiman - B10

4.1.15. Information Technology in Agriculture

Agriculture is a major sector which is vital for the survival of modern man. The produce from agriculture drives trade from one country to another, brings income for farmers, makes productive use of otherwise idle land, and brings food on the table. It is such an important part of everyone's daily life, although it may not be seen as a direct factor since the produce goes a long way before reaching the hands of everyone who benefits from it. Because of its importance to society, it's must to evolve with the times and adjust to meet the needs of modern people. By adapting and making use of IT to help improve agricultural progress, everyone benefits from the union of these sectors.

Role of IT in Agriculture

In the context of agriculture, the potential of information technology (IT) can be assessed broadly under two heads: (a) as a tool for direct contribution to agricultural productivity and (b) as an indirect tool for empowering farmers to take informed and quality decisions which will have positive impact on the way agriculture and allied activities are conducted. The indirect benefits of IT in empowering farmer are significant and remain to be exploited. The farmer urgently requires timely and reliable sources of information inputs for taking decisions. At present, the farmer depends on trickling down of decision inputs from conventional sources which are slow and unreliable. The changing environment faced by farmers makes information not merely useful, but necessary to remain competitive.

Components include input devices, output devices, processors, storage devices, software, networking devices, transmission media and other accessories.

Budget

It is proposed to incur ₹.**102.90** lakhs over a period of five years with the finance facilities under the NADP and other sources.

Expected outcome

The expected outcome of the project will result in an increase in the adoption of technologies for production of the crops which will improve the income of the farmers

Implementing Agency

Department of Agriculture will implement the project and report the progress to the District-level officials.

Table 4.15. Budget for interventions in Information Technology

(₹. in lakhs)

Sl. No	Components	Unit	Unit Cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
1	Procurement of Hardware for replacement of old hardware	Nos	50000	All Blocks	40	20.00	0	0.00	0	0.00	0	0.00	0	0.00	40	20.00
2	Connectivity Charges	Nos	11000	All Blocks	40	4.40	0	0.00	0	0.00	0	0.00	0	0.00	40	4.40
3	Printer cum Scanner	Nos	20000	All Blocks	10	2.00	0	0.00	0	0.00	0	0.00	0	0.00	10	2.00
4	UPS and Electrical Accessories	Nos	35000	All Blocks	10	3.50	0	0.00	0	0.00	0	0.00	0	0.00	10	3.50
5	Xerox machine	Nos	75000	All Blocks	10	7.50	0	0.00	0	0.00	0	0.00	0	0.00	10	7.50
6	Laptop/Desktop	Nos	50000	All Blocks	20	10.00	0	0.00	0	0.00	0	0.00	0	0.00	20	10.00
7	Anti -virus software	Nos	2500	All Blocks	20	0.50	0	0.00	0	0.00	0	0.00	0	0.00	20	0.50
8	Television	Nos	100000	All Blocks	10	10.00	0	0.00	0	0.00	0	0.00	0	0.00	10	10.00
9	Colour printer	Nos	15000	All Blocks	10	1.50	0	0.00	0	0.00	0	0.00	0	0.00	10	1.50
10	4G Internet - Dongle	Nos	2500	All Blocks	20	0.50	0	0.00	0	0.00	0	0.00	0	0.00	20	0.50
11	**Equipments for Documentation**															
a	Handycam	Nos	30000	All Blocks	10	3.00	0	0.00	0	0.00	0	0.00	0	0.00	10	3.00
b	Camera	Nos	25000	All Blocks	10	2.50	0	0.00	0	0.00	0	0.00	0	0.00	10	2.50
c	GPS instrument	Nos	20000	All Blocks	10	2.00	0	0.00	0	0.00	0	0.00	0	0.00	10	2.00
d	Android mobile	Nos	15000	All Blocks	20	3.00	0	0.00	0	0.00	0	0.00	0	0.00	20	3.00
e	External Hard disk	Nos	5000	All Blocks	50	2.50	0	0.00	0	0.00	0	0.00	0	0.00	50	2.50
12	Audio - visual Aids	Nos	150000	All Blocks	10	15.00	0	0.00	0	0.00	0	0.00	0	0.00	10	15.00
	LCD projector	Nos	75000	All Blocks	10	7.50	0	0.00	0	0.00	0	0.00	0	0.00	10	7.50
	pico Projector	Nos	35000	All Blocks	10	3.50	0	0.00	0	0.00	0	0.00	0	0.00	0	3.50
13	Air conditioner for computer room	Nos	40000	All Blocks	10	4.00	0	0.00	0	0.00	0	0.00	0	0.00	10	4.00
	Total					**102.90**		**0.00**		**0.00**		**0.00**		**0.00**		**102.90**

Koradacherry - B1, Kottur - B2, Kudavasal - B3, Mannargudi - B4, Muthupettai - B5, Nannilam - B6, Needamangalam - B7, Thiruthuraipoondi - B8, Tiruvarur - B9, Valagaiman - B10

4.16. Budget requirement for Agriculture sector

(₹.in lakhs)

Sl. No	Components	2017-18	2018-19	2019-20	2020-21	2021-22	Total
1	Paddy	14402.40	15483.40	16154.90	16320.90	16447.90	78809.50
2	Millets	971.60	972.40	973.20	974.00	974.80	4866.00
3	Pulses	1340.12	1610.12	1803.00	2015.00	2209.00	8977.24
4	Oilseeds	181.99	183.86	183.86	183.86	183.86	917.43
5	Oil Palm	82.57	82.57	83.85	77.33	84.19	410.51
6	Cotton	158.52	278.01	332.66	371.66	396.06	1536.91
7	Sugarcane	179.19	179.19	179.19	179.19	179.19	895.95
8	Coconut	23.30	23.55	23.30	23.30	23.30	116.75
9	Training	231.20	222.20	231.20	231.20	231.20	1147.00
10	Infrastructure	2260.85	257.25	316.55	191.55	259.05	3285.25
11	Soil Health Management	260.65	260.65	360.65	260.65	260.65	1403.25
12	Rainfed Area Development	0.00	0.00	0.00	0.00	0.00	0.00
13	Integrated Pest Management	204.00	96.00	470.00	132.00	136.00	1038.00
14	Farm Mechanization	2419.15	2471.65	1912.35	2622.05	4415.35	13840.55
15	Strengthening of State Seed Farm	903.00	4.00	0.00	0.00	0.00	907.00
16	Agriculture Information Technology	102.90	0.00	0.00	0.00	0.00	102.90
	Total	**23721.44**	**22124.85**	**23024.71**	**23582.69**	**25800.55**	**118254.24**

4.2. HORTICULTURE

Horticulture plays a vital role in the food and nutritional security of the people as well as in earning foreign exchange through export of raw and value added horticultural crops. The farmers are ready to go in for the cultivation of horticultural crops which prove remunerative. The challenge lies in taking the technologies to 90 per cent of farmers who are small and marginal farmers. In all, horticulture crops are grown in 10.01 lakh hectares, of which vegetables, spices, plantation crops, flowers and medicinal plants are the major crops cultivated in the State. Totally, 86 horticultural crops are grown in the State which clearly indicates the crop diversity and also the possibility of augmenting the income of farmers. The major strategies suggested are as follows:

Area expansion of Horticultural crops

a. Fruit Crops

Today's changing food pattern enhances the area expansion under fruits. The preferable choices of fruits are Mango, papaya, Banana, lime, Orange, Guava, Pomegranate, Sapota etc. Fruits are rich in fiber which is very essential for the smooth movement of the digestive system. There are some fruits that give body energy as they contain carbohydrates which are the main source of energy. Carbohydrates in fruits are mainly sugar which actually breaks down easily and make a quick source of energy. They also contain minerals, vitamins and nutrients that are useful for a healthy life. Considering the importance of fruits, the productivity can be increased by promotion of cultivation of fruit crops in the potential areas.

b. Vegetable crops

Vegetables are the store houses of most of the vitamins and minerals and also proteins. In order to ensure continuous supply of fresh vegetables to the burgeoning urban markets, it is absolutely necessary to create forward linkages from rural to urban areas. This will also ensure assured income to farmers in the rural areas adjoining the cities. Cultivation of vegetables, formation of farmer clusters, formation of farmers society, collection centers, reefer vans, retail outlets, mobile stores are the components to be promoted for increasing the productivity and marketing of vegetables.

c. Flower crops

The major flowers grown are Gundumalli, Mullai, Rose, Crossandra, Chrysanthemum, Marigold, Arali and Jathimalli etc. Floriculture activity has evolved as a viable and profitable alternative, with a potential to generate remunerative self-employment among small & marginal farmers. The flower crops require lots of manpower for picking flowers and perform other operations, hence providing opportunity to marginal and small farmers for generating more income, employment and promote greater involvement of women work force. Keeping this in mind, the promotion area of cultivation of traditional and cut flowers are planned for different flower crops.

d. Spice crops

Spice crops play a unique role in India's economy by improving the income of the rural people. Cultivation of spices is labor intensive so it can generate lot of employment opportunities for the rural population. The demand of Indian spice is very much in other countries. Hence production of spices has very much scope to meet that demand by huge production.

e. Plantation crops

Plantation crops are high value commercial crops of greater economic importance and play a vital role in our Indian economy. These crops help to conserve the soil and ecosystem. The crops include tea, coffee, rubber, cocoa, coconut, arecanut, beteluine, etc. So the promotion of cultivation of plantation crops in the potential districts will increase the economy of the farmer and also Indian economy.

Rainfed Area development

Rainfed Area Development Programme is structured in Thiruvarur with an broad objectives of; a) Increasing agricultural productivity of rainfed areas in a sustainable manner by adopting appropriate farming system based approaches; b) To minimize the adverse impact of possible crop failure due to drought, flood or un-even rainfall distribution through diversified and composite farming system; c) Restoration of confidence in rainfed agriculture by creating sustained employment opportunities through improved on-farm technologies and cultivation practices; d) Enhancement of farmer's income and livelihood support for reduction of poverty in rainfed areas e) Convergence of relevant developmental programmes in project area for optimal

utilization of resources by establishing an integrated and coordinated system involving different sectors and institutions.

Organic farming

Organic farming is an alternative agricultural system which originated early in the 20th Century in reaction to rapidly changing farming practices. It relies on fertilizers of organic origin such as compost, manure, green manure, and bone meal and places emphasis on techniques such as crop rotation, companion planting. Biological pest control, mixed cropping and fostering of insect predators are encouraged. Since 1990, the market for organic food and other products has grown rapidly, reaching $63 billion worldwide in 2012. This demand has driven a similar increase in organically managed farmland that grew from 2001 to 2011 at a compounding rate of 8.9 per cent per annum. As of 2011, approximately 3.70 lakh hectares worldwide were farmed organically, representing approximately 0.9 per cent of total world farmland. Organic farming encourages crop diversity. The science of agro ecology has revealed the benefits of polyculture (multiple crops in the same space), which is often employed in organic farming. Planting a variety of vegetable crops supports a wider range of beneficial insects, soil microorganisms, and other factors that add up to overall farm health. Crop diversity helps environments thrive and protects species from going extinct. The profitability of organic agriculture can be attributed to a number of factors. First, organic farmers do not rely on synthetic fertilizer and pesticide inputs, which can be costly. In addition, organic foods currently enjoy a price premium over conventionally produced foods, meaning that organic farmers can often get more for their yield.

The price premium for organic food is an important factor in the economic viability of organic farming. Organic agriculture can contribute to ecologically sustainable, socio-economic development, especially in poorer countries. The application of organic principles enables employment of local resources (e.g., local seed varieties, manure, etc.) and therefore cost-effectiveness. Local and international markets for organic products show tremendous growth prospects and offer creative producers and exporter's excellent opportunities to improve their income and living conditions.

Bee keeping for pollination

Production of apiary honey in the country reached 10,000 tons, valued at about Rs.300 million. Bee-Keeping Industry is one of the important activities. The Government provides financial support to this Industry by way of providing grant for supply of bee-hives to the Tribal

on hill areas, Scheduled Castes /Scheduled Tribes under Western Ghats Development Programmes, Hill Area Development Programme and Integrated Tribal Development Programme. The income earned by the farmers through bee-keeping activities is an additional income to their agriculture income. Honey industry in the country can well become a major foreign exchange earner if international standards are met. Beekeeping is an age-old tradition in India but it is considered a no-investment profit giving venture in most areas. Of late, it has been recognized that it has the potential to develop as a prime agri-horticultural and forest-based industry. Honey production is a lucrative business and it generates employment.

Crop Insurance and Risk Mitigating schemes

Risk is exacerbated by a variety of factors, ranging from climate variability and change, frequent natural disasters, uncertainties in yields and prices, weak rural infrastructure, imperfect markets and lack of financial services including limited span and design of risk mitigation instruments such as credit and insurance. Farmers face not only yield loss but also economic loss. Therefore, to protect the farmers against yield and market losses, crop insurance is an important need.

Protected cultivation

Precision Farming through Hi tech cultivation Practices It is proposed to plan for increasing the production of crops by adopting advanced technology like high tech cultivation practices which includes high density planting, use of quality planting materials, tissue culture planting materials, canopy management, micro irrigation fertigation, mulching, use of bunch sleeves for banana, protected cultivation, shade net nursery and mechanization in horticulture crop cultivation by popularizing the same among the growers to enhance productivity. It is proposed to adopt high density planting in mango, guava and sapota in select districts of the State by providing subsidy.

Vermi compost Units

It is also imperative to establish vermi compost production laboratories. Organic input like vermi compost is now a days in high demand by most of the farmers and house owners especially by the city dwellers. To promote the organic input like vermi compost by providing HDPE vermibeds.

Supporting structures for fruit production

The allocation of area under fruits is highly influenced by the prevailing market prices and hence the area is fluctuating year after year. The productivity of fruits is also comparatively lower than the attainable average yield. As the area under fruits crops is influenced by market price, the possibility of increasing the production can be increased by improving the productivity of fruits. The major goal or objective of the project is to increase the area and productivity of fruits by 15 to 20 per cent in the next five years. The major intervention in this project is; permanent pandal installation to increase the fruits` production, staking/ trellies/ propping in fruits crops to increase the productivity as well as the standard of living of the farming communities.

Mechanization - Machineries, Equipments and Tools

Horticultural mechanization helps in increasing production, productivity and profitability in horticulture by achieving timeliness in farm operations, bringing precision in metering and placement of inputs, reducing available input losses, increasing utilization efficiency of costly inputs (seed, chemical, fertilizer, irrigation, water etc.), reducing unit cost of produce, enhancing profitability and competitiveness in the cost of operation. It also helps in the conservation of the produce and byproducts from qualitative and quantitative damages; enables value addition and establishment of agro processing enterprises for additional income and employment generation from farm produce. It is one of the important inputs to usher in all round development of the district.

Water / Irrigation Management

Irrigation Management is important since it helps determine future irrigation expectations. Irrigation is the artificial exploitation and distribution of water at project level aiming at application of water at field level to agricultural crops in dry areas or in periods of scarce rainfall to assure or improve crop production. The goal of irrigation management is to use water in the most profitable way at sustainable production levels. For production agriculture this generally means supplementing precipitation with irrigation by means of Sprinkler and Water harvesting system for individuals.

Capacity building

Building the indigenous human capacity required to support smallholders investing in horticultural enterprises is very essential. This can be done with the a) Promoting training and capacity building, b) Organizing in situ training sessions with the skilled and experienced

faculties, c) Organizing e-learning programs with specific partners, d) Organizing workshops and seminars to better implicate these farmers in the horticultural sector. This is achieved by bringing the farmers to the nearby district and also outside the district through training programmes thereby creating awareness among farmers for the cultivation of horticulture crops and also in adoption of new technologies.

Budget

The total cost of the project for 5 years is estimated as ₹. **3501.44** lakhs

Implementing Agency

The projects will be implemented by the Department of Horticulture.

4.17. Budget for Horticulture Development

(₹. in lakhs)

Sl. No	Interventions	Unit	Unit cost	Block Covered	2017-2018		2018-2019		2019-2020		2020-2021		2021-2022		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
A	**Production Growth**															
I	**Area expansion of fruit crops**															
1	TC Banana & TC Pineapple	Ha	1.25	All Blocks	17	21.25	17	21.25	23	28.75	23	28.75	29	36.25	109	136.25
2	Banana / Hill Banana sucker & Pine apple sucker	Ha	0.875	All Blocks	25	21.88	25	21.88	30	26.25	39	34.13	44	38.50	163	142.63
3	HDP in Mango, Guava, Litchi, Pomegranate	Ha	1	All Blocks	20	20.00	20	20.00	26	26.00	29	29.00	29	29.00	124	124.00
4	Normal Planting in lime / lemons	Ha	0.6	B3,B5, B7,B1, B6,B9	4	2.40	4	2.40	6	3.60	7	4.20	7	4.20	28	16.80
5	Normal Planting in Mango	Ha	0.6	All Blocks	19	11.40	19	11.40	23	13.80	23	13.80	23	13.80	107	64.20
6	Normal planting in Guava	Ha	0.6	All Blocks Except B9	7	4.20	7	4.20	11	6.60	11	6.60	14	8.40	50	30.00
7	Normal planting in Sapota	Ha	0.6	B3,B5, B7,B1, B6	4	2.40	4	2.40	4	2.40	4	2.40	4	2.40	20	12.00
8	Normal planting in Papaya	Ha	0.6	B2,B3, B5	3	1.80	3	1.80	3	1.80	3	1.80	4	2.40	16	9.60
II	**Area expansion of vegetable crops**															
9	Brinjal	Ha	0.5	All Blocks	15	7.50	16	8.00	29	14.50	29	14.50	32	16.00	121	60.50
10	Bhendi	Ha	0.5	All Blocks	85	42.50	85	42.50	105	52.50	110	55.00	150	75.00	535	267.50
11	Green Chillies	Ha	0.5	B5,B7, B2,B6, B9,B10	6	3.00	6	3.00	9	4.50	10	5.00	10	5.00	41	20.50
12	Tomato	Ha	0.5	B4,B3, B5,B7, B8	5	2.50	5	2.50	6	3.00	8	4.00	8	4.00	32	16.00
13	Gourds including pumpkin and tinda	Ha	0.5	All Blocks	10	5.00	12	6.00	13	6.50	20	10.00	20	10.00	75	37.50

Sl. No	Interventions	Unit	Unit cost	Block Covered	2017-2018		2018-2019		2019-2020		2020-2021		2021-2022		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
14	Greens	Ha	0.5	All Blocks	62	31.00	62	31.00	80	40.00	102	51.00	125	62.50	431	215.50
15	Melons	Ha	0.5	B5,B7, B10,B2,B1, B6	7	3.50	7	3.50	8	4.00	8	4.00	8	4.00	38	19.00
16	Cluster bean	Ha	0.5	All Blocks	17	8.50	17	8.50	34	17.00	34	17.00	50	25.00	152	76.00
17	Tapioca	Ha	0.5	B1,B3, B5,B7	9	4.50	9	4.50	9	4.50	9	4.50	10	5.00	46	23.00
18	Cultivation of hybrid Vegetables under protected structures	1000 Sq.m	1.4	B4,B8, B3,B5, B7,B10	5	7.00	5	7.00	11	15.40	11	15.40	11	15.40	43	60.20
III	**Area expansion of Spices crops**															
19	Seed and Rhizomatic spices (Coriander, Turmeric, Ginger, Dry Chilly, Cumin, Fennel, Fenu greek, Dil, Cardamom etc.,)	Ha	0.3	All Blocks	10	3.00	14	4.20	16	4.80	21	6.30	26	7.80	87	26.10
20	Perennial spices (Pepper, Curry leaf, All spice, Cinnamon, Clove, Tamarind, Nut meg etc.,)	Ha	0.5	B2	1	0.50	1	0.50	1	0.50	1	0.50	1	0.50	5	2.50
IV	**Area expansion of Flower crops**															
21	Loose flowers - Jasminum sp, Crossandra, Marigold, Rose, Chrysanthemum, Nerium, Torenia	Ha	0.4	All Blocks	17	6.80	17	6.80	21	8.40	25	10.00	31	12.40	111	44.40
V	**Area expansion /Gap filling of Plantation crops**															
22	Cocoa	Ha	0.5	B5	1	0.50	1	0.50	1	0.50	1	0.50	1	0.50	5	2.50
23	Arecanut	Ha	0.5	B5,B7	2	1.00	2	1.00	2	1.00	2	1.00	2	1.00	10	5.00

Sl. No	Interventions	Unit	Unit cost	Block Covered	2017-2018		2018-2019		2019-2020		2020-2021		2021-2022		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
24	Betelvine	Ha	0.5	B10	2	1.00	2	1.00	2	1.00	2	1.00	2	1.00	10	5.00
25	Coconut	Ha	0.5	All Blocks	16	8.00	16	8.00	24	12.00	24	12.00	32	16.00	112	56.00
VI	**Rejuvenation/INM-IPM/Mulching/Anti bird net**															
26	INM/IPM for Horticultural crops	Ha	0.04	B10	0	0.00	10	0.40	10	0.40	10	0.40	10	0.40	40	1.60
VII	**Pollination Support through Bee Keeping**															
27	Bee hive & Colony	No	0.04	All Blocks	100	4.00	100	4.00	100	4.00	100	4.00	100	4.00	500	20.00
28	Honey Extractor	No	0.2	All Blocks	10	2.00	10	2.00	10	2.00	10	2.00	10	2.00	50	10.00
VIII	**Organic Farming**															
29	Organic farming and PGS certification in 50 acre cluster	1 cluster	14.95	B8,B9	0	0.00	2	29.90	1	14.95	1	14.95	1	14.95	5	74.75
30	HDPE Vermibed	No	0.16	All Blocks	20	3.20	20	3.20	24	3.84	27	4.32	35	5.60	126	20.16
IX	**Rainfed Area development**															
31	Integrated farming system - Horticulture Based farming	Ha	0.5	B5	1	0.50	1	0.50	1	0.50	1	0.50	1	0.50	5	2.50
32	Moisture stress management - Minimum irrigation gurantee by PUSA hydrogel	Ha	0.1	All Blocks	250	25.00	250	25.00	250	25.00	250	25.00	250	25.00	1250	125.00
B	**Infra structures and Assets creation**															
I	**Protected cultivation**															
1	Poly Green House	1000 Sq.m	9.35	All Blocks	3	28.05	7	65.45	9	84.15	10	93.50	10	93.50	39	364.65
2	Shadenet	1000 Sq.m	7.1	All Blocks	2	14.20	7	49.70	10	71.00	10	71.00	10	71.00	39	276.90

Sl. No	Interventions	Unit	Unit cost	Block Covered	2017-2018		2018-2019		2019-2020		2020-2021		2021-2022		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
II	**Mushroom production**															
3	Cottage mushroom unit	1 No.	1	B8	0	0.00	1	1.00	1	1.00	1	1.00	1	1.00	4	4.00
III	**Vermicompost unit**															
4	Permanent Vermicompost Unit	600 cu.ft	1	All Blocks	10	10.00	10	10.00	10	10.00	10	10.00	10	10.00	50	50.00
IV	**Supporting structures for Horticulture crop production**															
5	Staking/ Trellies/ Propping	Ha	1	B3,B5	2	2.00	2	2.00	2	2.00	2	2.00	2	2.00	10	10.00
6	Permanent Pandhal structure	Ha	4	All Blocks	8	32.00	8	32.00	8	32.00	10	40.00	10	40.00	44	176.00
C	**Special interventions**															
7	Promotion of Roof top Garden/ Potager garden Kit	No	0.005	All Blocks	55	0.28	55	0.28	100	0.50	100	0.50	100	0.50	410	2.05
8	Promotion of Roof top Garden/ Potager garden Kit with shadenet	No	0.0735	All Blocks	8	0.59	8	0.59	10	0.74	10	0.74	10	0.74	46	3.38
9	Banana Bunch Sleeve	Ha	0.25	All Blocks	50	12.50	50	12.50	50	12.50	0	0.00	0	0.00	150	37.50
10	AESA based IPM in fruits and vegetables Pheramone trap	Ha	0.04	All Blocks	50	2.00	50	2.00	50	2.00	50	2.00	50	2.00	250	10.00
11	AESA Based IPM in fruits and vegetables Yellow sticky trap	Ha	0.04	All Blocks	50	2.00	50	2.00	50	2.00	50	2.00	50	2.00	250	10.00
12	AESA Based IPM in fruits and vegetables Light trap	Ha	0.08	All Blocks	50	4.00	50	4.00	50	4.00	50	4.00	50	4.00	250	20.00
13	Coastal area development programme - Public	Per village	1		0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00

Sl. No	Interventions	Unit	Unit cost	Block Covered	2017-2018		2018-2019		2019-2020		2020-2021		2021-2022		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
D	**Mechanization - Machineries, Equipments & Tools**															
1	Power tiller/Tractor/Minitractor	Nos	1	All Blocks Except B4,B8	8	8.00	8	8.00	8	8.00	8	8.00	8	8.00	40	40.00
2	Manual Sprayer-Knapsack/Foot operated Sprayer	Nos	0.12	All Blocks	50	6.00	50	6.00	50	6.00	50	6.00	100	12.00	300	36.00
3	Nets for safe harvesting of fruits,Headlights for flower picking	Nos	0.005	B5,B7,B10, B2,B1,B6,B 9	7	0.04	7	0.04	7	0.04	7	0.04	7	0.04	35	0.18
4	Power operated sprayer	Nos	0.05	B10	1	0.05	1	0.05	1	0.05	1	0.05	1	0.05	5	0.25
5	Plastic crates for vegetable & fruits handling	No of sets containing 10crates	0.075	All Blocks	85	6.38	85	6.38	85	6.38	85	6.38	85	6.38	425	31.88
6	5 layered Polythene spread sheets for drying horticulture produce	No	0.16	All Blocks	41	6.56	41	6.56	41	6.56	41	6.56	41	6.56	205	32.80
E	**Water / Irrigation Management**															
1	Micro Irrigation - Drip	Ha	1.12	All Blocks	21	23.52	21	23.52	22	24.64	32	35.84	32	35.84	128	143.36
2	Rain gun	Ha	0.34	All Blocks	85	28.90	90	30.60	115	39.10	145	49.30	170	57.80	605	205.70
3	Sprinkler	No	0.195	All Blocks	55	10.73	55	10.73	75	14.63	100	19.50	100	19.50	385	75.08
G	**Capacity Building**															
1	Training to farmers within the State. 2 days Rs.1000/farmer/day	No	0.02	All Blocks	100	2.00	100	2.00	100	2.00	100	2.00	100	2.00	500	10.00
2	Training to farmers outside the state. 30 farmers/Batch	No	0.105	All Blocks	10	1.05	10	1.05	10	1.05	10	1.05	10	1.05	50	5.25
3	Exposure visit to farmers for 5 days. Rs.1000/farmer/day	No	0.05	All Blocks	10	0.50	10	0.50	10	0.50	10	0.50	10	0.50	50	2.50

Sl. No	Interventions	Unit	Unit cost	Block Covered	2017-2018		2018-2019		2019-2020		2020-2021		2021-2022		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
4	Exposure visit of farmers outside India	No	4	B5,B9	2	8.00	2	8.00	2	8.00	2	8.00	2	8.00	10	40.00
5	Training to staff outside the state / Batch of 5 members	No	0.04	All Blocks Except B3,B4, B8	7	0.28	7	0.28	7	0.28	7	0.28	7	0.28	35	1.40
6	Training to staff outside India	No	6	B5,B9	2	12.00	2	12.00	2	12.00	2	12.00	2	12.00	10	60.00
7	Computerization & governance	No	1	All Blocks	10	10.00	10	10.00	10	10.00	10	10.00	10	10.00	50	50.00
8	Publicity and Documentation	No	0.5	All Blocks	20	10.00	20	10.00	20	10.00	20	10.00	20	10.00	100	50.00
H	**Crop Insurance and Risk Mitigating schemes**															
1	Crop Insurance	Ha	0.025	B7,B10	7	0.18	7	0.18	7	0.18	7	0.18	7	0.18	35	0.88
	Grand Total					**502.61**		**611.21**		**726.27**		**790.95**		**870.40**		**3501.44**

Koradacherry - B1, Kottur - B2, Kudavasal - B3, Mannargudi - B4, Muthupettai - B5, Nannilam - B6, Needamangalam - B7, Thiruthuraipoondi - B8, Tiruvarur - B9, Valagaiman - B10

4.3. Agricultural Engineering

Agricultural mechanization is the process whereby equipments, machineries and implements are utilized to boost agricultural and food production. It is the application of machineries, equipments and implements in the day to day farm activities to increase marginal output in food production and poverty eradication. It increases productivity of land and labour by meeting timeliness of farm operations and increase work out-put per unit time. Besides its paramount contribution to the multiple cropping and diversification of agriculture, mechanization also enables efficient utilisation of inputs such as seeds, fertilisers and irrigation water. The agricultural mechanization is the only way out to face the challenge of farm worker's shortage. Thus the ultimate objective of Agricultural Mechanization Strategies in developing countries is to help increase the welfare of farm households and create positive dynamics and opportunities for economic growth in rural areas.

Strategies:

- Promotion and strengthening of Agricultural Mechanization through training, Testing and Demonstration inorderto ensure performance testing of agricultural machinery and equipment, capacity building of farmers and end users and promoting farm mechanization through demonstrations.
- Demonstration, Training and Distribution of post-harvest Technology and Management (PHTM) to popularize the technology for primary processing, value addition, low cost scientific storage/transport and the crop by-product management through demonstrations, capacity building of farmers and end users. Provides financial assistance for establishing PHT units.
- Promotion of ownership to small and marginal farmers for various agricultural machinery and equipments such as Tractors, Power tillers, Rice transplanter, Self-propelled machinery, Tractor/Power tiller drawn equipments (MB Plough, Disc plough, Cultivator, Harrow, Leveler Blade, Ridger, Laser Land Leveller, Reversible Mechanical Plough, Rotavator, Rotopuddler, Reversible Hydraulic Plough, Post hole digger, Reaper, Seed driller, Balers, Coconut thrash cutter, coconut frond chopper, Multi crop thresher, Paddy thresher, Brush cutter, Chaff cutter, Drum Seeder) and Plant protection equipments .
- Provision of suitable financial assistance to establish farm machinery banks for custom hiring for appropriate locations and crops
- Establishment of hi-tech machinery hubs for high value crops like sugarcane, cotton etc.

- Promotion of appropriate technologies and to set up farm machinery banks in identified villages
- Provision of financial assistance on per hectare basis to the beneficiaries hiring machinery/equipments from custom hiring centres
- Increases the tractor hire services in the farms of small and marginal farmers
- Strengthening of Minor irrigation for the rainfed and hard rock areas. It would establish through construction of open well, tube wells and Bore wells. Revitalisation of wells by side boring and blasting in hard rock areas.
- Introduction of renewable energy in the villages which would replace other fuels. Also attractive for water pumping applications in remote areas. Hence solar operated photovoltaic water pumping system provides better sustainable alternative option to fulfill irrigation requirement of agriculture.
- Provision of components such asHightech Earth excavator, Poly Green House with Fogging facility, Vermi Compost unit with packing accessories, Farm pond / Fish pond, Farmers kit (Crow bar, Hand hoe, rose can, pruning siccature, coconut dehusker, trolley etc.,), Land levelling, Pipe laying, Stening wall, Well deepening, Replacement of old Pumpsets, Infrastructure like packing unit, godown, cattle shed and Threshing floor, Publicity and propaganda for farm mechanization in AED, Special Training for Coconut Growers, Special Training for Coconut Tree Climbing, J C B, Mini Drill, Compartmental Bund Formation, Farm Ponds, Community Bore wells, Deepening of Open Wells, Renovation of MI Tanks, Check Dam, Percolation Pond, Recharge Shaft, Summer Ploughing, PVP pipe laying, Replacement of Submersible Motors pump sets, Telescopic Pruner, Motorized Rubber Roller, Trays for Paddy Nursery Raising, Combine Harvester, Diesel Pump, Rotary Tiller, Smoke House, Mist Blower, Tea Harvester, Construction of LD & MI Repair Shed and Construction of Training Centre for farmers with furniture and accessories at the department of Agricultural engineering
- Strengthening of communication and information facilities in order to disseminate the information in rural areas
- Awareness to be created towards the usage of Sugarcane infielder, Bird scarer, Mechanized row crop cultivation and Modernization of tractor workshop which indirectly increase the production.
- Promotion of agro-processing and management machinery at community level through supply of post-harvest machinery such as self-propelled/other driven horticultural machinery (Chain saw/ wheel barrow/ Mango grader/ planter and other suitable self-

propelled machineries and equipments), Manual horticultural equipments (Aluminium ladder/ Ladder, Aluminium pole, Plucker), Post-harvest equipments for grains, oil seeds and Horticultural crops (Mini Rice mill, Mini Dhall mill, Millet Mill, Oil mill with filters, Extractor, pomegranate air extractor, Custard apple pulper, Dehydration unit, Pricking Machine, Humidifier, Packing machine, power driven dehusker, thresher, Harvester, De-spiking, Deconing, Peeler, Splitter, Stripper, Boiler, Steamer, Dryer solar, Washing Machine, Grinder, Pulveriser, Polisher, Cleaner cum grader, gradient separator, Specific gravity separator) this would make sure that more value is added to farm outputs locally

- Promotion of Bio-mass gasifier unit which hold huge potential technology for decentralized electricity generation in rural villages. Biomass is a CO2 neutral fuel and, therefore, unlike fossil fuels such as diesel does not contribute to net CO2 emissions, which makes biomass based power generation systems an attractive option in mitigating the adverse effects of climate change.
- Establishment of Agricultural Engineering Extension centres in order to collect information related to Government subsidy on agricultural / machineries / equipment / irrigation systems etc., compilation of latest technologies related to Agricultural Engineering and Development of video cassettes library related to Processing of agricultural products, Working of important agricultural machines and equipment and Repair, maintenance and proper setting of the different agricultural Machines / and equipment
- Promotion of training to AED engineers on post-harvest techniques and bio energy
- Rehabilitation of irrigation network to bring water directly to the root zone of the crop, improve application and conveyance efficiency, thereby reduce the wastage of water due to flood irrigation.
- Prevention of sea water intrusion through construction of subsurface dyke, Village Pond / Community Pond, Farm Pond, Recharge shaft and Weir/Bed Dam.
- Reclamation of problem soils which needs special management for satisfactory crop production. Physical limitations can be managed by irrigation, drainage, mulching, manuring, tillage, and soil conservation measures such as terracing, contouring, and cover crops whichever is appropriate.

Expected outcome

Implementation of the above strategies such as supply of farm implements to carry out mechanised cultivation operations and demonstration to farmers the advantage of using

Agricultural implements and machinery would increase the production and productivity. Post-Harvest Technologies to farmers would prevent loss of food grains during harvest and storage and Preserve the quality of produce in respect of perishable commodities. Disseminated technologies on renewable energies, in particular, solar energy for agricultural activities in respect of pumping with solar powered pumps, drying farm produce for enhancement of quality to fetch reasonable market price.

Budget

Agriculture continues to be the most predominant sector of this district economy, as 70 percent of the population is engaged in Agriculture and allied activities for their livelihood. Agricultural Mechanization could provide the stability in agricultural production in a sustainable manner to meet the food requirement of growing population and also to meet the raw material needs of agro based industries, thereby providing employment opportunities to the rural population**.** The overall budget requirement for implementation of above interventions is ₹**28683.60** lakhs. The details of budget requirement for each intervention across the blocks are shown in Table 4.17.

Implementing agency

The projects will be implemented by the Department of Agricultural Engineering

Table.4.18. Budget requirement for Agricultural Engineering

(₹.in lakhs)

Sl. No	Interventions	Unit	Unit cost	Blocks Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
1	Demonstration of Agricultural Machinery	No's/Ha	0.04	All Blocks	100	4.00	100	4.00	100	4.00	100	4.00	100	4.00	500	20.00
2	Training of farmers	No's/Ha	0.04	All Blocks	80	3.20	80	3.20	80	3.20	80	3.20	80	3.20	400	16.00
3	Training of Rural Youth in workshops	No's/Ha	0.04	All Blocks	100	4.00	100	4.00	100	4.00	100	4.00	100	4.00	500	20.00
4	Demonstration of Post-Harvest Technologies	No's/Ha	0.04	All Blocks	100	4.00	100	4.00	100	4.00	100	4.00	100	4.00	500	20.00
5	Financial assistance for Post-Harvest Equipment	No's/Ha	4	All Blocks except B2	2	8.00	0	0.00	2	8.00	2	8.00	2	8.00	8	32.00
6	Tractor (15-20 PTO HP)	No's/Ha	4	All Blocks	10	40.00	10	40.00	10	40.00	10	40.00	10	40.00	50	200.00
7	Tractor (Above 20-40 PTO HP)	No's/Ha	6	All Blocks	80	480.00	80	480.00	80	480.00	80	480.00	80	480.00	400	2400.00
8	Tractor (40-70 PTO HP)	No's/Ha	8.5	All Blocks	60	510.00	60	510.00	60	510.00	60	510.00	60	510.00	300	2550.00
9	Power Tiller (8 BHP & above)	No's/Ha	1.75	All Blocks	1000	1750.00	600	1050.00	600	1050.00	600	1050.00	600	1050.00	3400	5950.00
10	Self-Propelled Rice Trans planter (4 rows)	No's/Ha	2.5	All Blocks	40	100.00	30	75.00	30	75.00	30	75.00	30	75.00	160	400.00
11	Self-Propelled Rice Trans planter (Above 4-8 rows)	No's/Ha	16	All Blocks	20	320.00	20	320.00	20	320.00	20	320.00	20	320.00	100	1600.00
12	Post Hole Digger / Augur	No's/Ha	0.63	All Blocks	10	6.30	10	6.30	10	6.30	10	6.30	10	6.30	50	31.50
13	Leveler Blade	No's/Ha	0.15	All Blocks	4	0.60	4	0.60	4	0.60	4	0.60	4	0.60	20	3.00

Sl. No	Interventions	Unit	Unit cost	Blocks Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
14	Rotavator	No's/Ha	0.35	All Blocks	5	1.75	5	1.75	5	1.75	5	1.75	5	1.75	25	8.75
15	f. Chaff Cutter (Operated by engine / electric motor below 3 hp and by power tiller and tractor of below 20 BHP tractor)	No's/Ha	0.25	All Blocks	2	0.50	2	0.50	2	0.50	2	0.50	2	0.50	10	2.50
16	Cultivator	No's/Ha	0.25	All Blocks	10	2.50	10	2.50	10	2.50	10	2.50	10	2.50	50	12.50
17	Power Weeder (engine operated above 2 BHP)	No's/Ha	0.7	All Blocks	4	2.80	4	2.80	4	2.80	4	2.80	4	2.80	20	14.00
18	Brush Cutter	No's/Ha	0.3	All Blocks	2	0.60	2	0.60	2	0.60	2	0.60	2	0.60	10	3.00
19	Cultivator	No's/Ha	0.3	All Blocks	5	1.50	5	1.50	5	1.50	5	1.50	5	1.50	25	7.50
20	Rotavator	No's/Ha	0.95	All Blocks	40	38.00	40	38.00	40	38.00	40	38.00	40	38.00	200	190.00
21	Post Hole digger	No's/Ha	1.05	All Blocks	4	4.20	4	4.20	4	4.20	4	4.20	4	4.20	20	21.00
22	Balers (Round)	No's/Ha	3.5	All Blocks	20	70.00	20	70.00	20	70.00	20	70.00	20	70.00	100	350.00
23	Manual sprayer:Knapsack/foot operated sprayer	No's/Ha	0.015	All Blocks	5	0.08	5	0.08	5	0.08	5	0.08	5	0.08	25	0.38
24	Powered Knapsack Sprayer/Power operated Taiwan sprayer (capacity 8-12 lts)	No's/Ha	0.06	All Blocks	20	1.20	20	1.20	20	1.20	20	1.20	20	1.20	100	6.00
25	Establishment of Farm Machinery Banks for Custom Hiring	No's/Ha	28	All Blocks	10	280.00	10	280.00	10	280.00	10	280.00	10	280.00	50	1400.00
26	Promotion of Farm Mechanization in	No's/Ha	11.5	All Blocks	100	1150.00	60	690.00	50	575.00	50	575.00	50	575.00	310	3565.00

Sl. No	Interventions	Unit	Unit cost	Blocks Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	Selected Villages															
27	Financial assistance for promotion of Mechanized Farming operations	No's/Ha	0.04	All Blocks	3000	120.00	5000	200.00	5000	200.00	5000	200.00	5000	200.00	23000	920.00
28	Purchase of Tractors for AED	No's/Ha	8	All Blocks	30	240.00	0	0.00	0	0.00	20	160.00	0	0.00	50	400.00
29	Purchase of Tractor drawn implemnets for AED	No's/Ha	0.5	All Blocks	20	10.00	5	2.50	5	2.50	5	2.50	0	0.00	35	17.50
30	Purchase of Bull Dozers for AED	No's/Ha	80	B9 & B4	2	160.00	0	0.00	0	0.00	0	0.00	0	0.00	2	160.00
31	Purchase of Paddy Transplanter for AED	No's/Ha	18	All Blocks	10	180.00	0	0.00	0	0.00	5	90.00	0	0.00	15	270.00
32	Purchase of Paddy combine Harvester for AED	No's/Ha	17	All Blocks	30	510.00	0	0.00	0	0.00	20	340.00	0	0.00	50	850.00
33	Purchase of Balers for AED	No's/Ha	4.5	All Blocks	20	90.00	5	22.50	5	22.50	5	22.50	0	0.00	35	157.50
34	Purchase of Rotary Drill for AED	No's/Ha	72	All Blocks	7	504.00	0	0.00	0	0.00	3	216.00	0	0.00	10	720.00
35	Purchase of Air Compressor 750 cfm for AED	No's/Ha	25	B9	1	25.00	0	0.00	0	0.00	0	0.00	0	0.00	1	25.00
36	Purchase of Resitivity Metres for AED	No's/Ha	3	B9	1	3.00	0	0.00	0	0.00	0	0.00	0	0.00	1	3.00
37	Purchase of Electrical Loggers for AED	No's/Ha	7.5	B9	1	7.50	0	0.00	0	0.00	0	0.00	0	0.00	1	7.50
38	5 hp	No's/Ha	3.75	All Blocks	150	562.50	100	375.00	100	375.00	100	375.00	100	375.00	550	2062.50

Sl. No	Interventions	Unit	Unit cost	Blocks Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
39	7.5 hp	No's/Ha	5.3	All Blocks	100	530.00	80	424.00	80	424.00	80	424.00	80	424.00	420	2226.00
40	10 hp	No's/Ha	6.75	All Blocks	50	337.50	40	270.00	40	270.00	40	270.00	40	270.00	210	1417.50
41	Computer & its accessories	No's/Ha	0.8	B9	5	4.00	1	0.80	2	1.60	2	1.60	0	0.00	10	8.00
42	Tablet (Tab)	No's/Ha	0.25	B9 & B4	2	0.50	0	0.00	1	0.25	2	0.50	0	0.00	5	1.25
43	Xerox machine	No's/Ha	1.5	B9 & B4	0	0.00	1	1.50	1	1.50	0	0.00	1	1.50	3	4.50
44	Modernisation of Tractor workshops of AED	No's/Ha	50	B9 & B4	1	50.00	1	50.00	1	50.00	1	50.00	1	50.00	5	250.00
45	Mini Dal Mill	No's/Ha	1.7	All Blocks	0	0.00	9	15.30	0	0.00	0	0.00	2	3.40	11	18.70
46	Oil mill with filter press (for all type of Horticulture / Food grain / Oil seeds crop)	No's/Ha	1.2	B9 & B4	0	0.00	3	3.60	0	0.00	0	0.00	1	1.20	4	4.80
47	Packing Machines (for all types of Horticulture / Food grain / Oil seeds crop)	No's/Ha	3	All Blocks	0	0.00	10	30.00	0	0.00	0	0.00	0	0.00	10	30.00
48	All types of Grinder/ Pulveriser/ Polisher (for all type of Horticulture / Food grain / Oil seed crop)	No's/Ha	0.3	B9 & B4	0	0.00	4	1.20	0	0.00	0	0.00	0	0.00	4	1.20
49	Subsurface dyke	No's/Ha	15	All Blocks	0	0.00	2	30.00	3	45.00	4	60.00	1	15.00	10	150.00
50	Village pond/community pond	No's/Ha	5.5	B9	0	0.00	1	5.50	0	0.00	0	0.00	0	0.00	1	5.50
51	Farm Pond	No's/Ha	1	All Blocks	0	0.00	10	10.00	10	10.00	20	20.00	20	20.00	60	60.00

Sl. No	Interventions	Unit	Unit cost	Blocks Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
52	Weir/ Bed Dam	No's/Ha	30	B9 & B4	3	90.00	0	0.00	0	0.00	0	0.00	0	0.00	3	90.00
	Total					**8207.23**		**5032.13**		**4885.58**		**5715.33**		**4843.33**		**28683.60**

Koradacherry - B1, Kottur - B2, Kudavasal - B3, Mannargudi - B4, Muthupettai - B5, Nannilam - B6, Needamangalam - B7, Thiruthuraipoondi - B8, Tiruvarur - B9, Valagaiman - B10

4.4. Agricultural Marketing

The Government is taking every effort to attain sustainable agricultural development by transforming agriculture into a commercial venture, by switching over to new scientific methods of cultivation so as to increase the productivity manifold. Besides, through value addition, processing and utilization of the marketing opportunities, the incremental output can be ensured. To further improve the marketing opportunities and to reduce the loss of agricultural produces, several measures have to be taken up by way of interventions like promotion of commodity groups and market information, strengthening of Uzhavarshandies and regulated markets, construction of storage godown, provision of market access and market activities, supply chain and post-harvest management, infrastructure and assets, and capacity building of farmers.

The core problem however in Agribusiness development is the general failure in coordinating the decisions of the private stakeholders*viz.,* farmers, traders and agricultural processors and service providers by the government and non-governmental sectors. In fact farmers fail to link themselves through effective producer-organizations to undertake joint decisions in production and marketing as well. Such weak linkages also due to limited access to relevant market intelligence and inadequate market infrastructure. Farmers are also poorly linked to research and extension service providers to address their specific technology and knowledge needs that would enable them into high-value production systems.

Entrepreneurs also have weak linkages with the farmers through contracts and vertical integration arrangements and are away from consumers because of absence of organized retail chains. Linkage with service providers are characterized by lack of confidence. The inadequacy in certification, quality assurance systems and inadequate infrastructure continues to limit the integration of production and international markets.

Agricultural produce are seasonal and perishable in nature. In a good season there may be a local glut, but because of insufficient transport facilities, lack of good roads and poor availability of packaging materials, the surplus cannot be taken quickly enough to the natural markets in urban areas. Moreover, the surplus often cannot be stored for sale in the off-season because of inadequate local storage facility; the farmers are often forced to market their produce at low price. Thus, the cultivars do not get a good price for their produce because of the glut, and some of it is spoiled resulting in complete loss. Currently pulses are processed manually using thirugu, ural, chakki, etc., which is laborious and time consuming. Due to existing problems in processing of pulses and millets, their market is not profitable for the

farmers growing pulses. To reduce the loss of agricultural produce which are up to 30 per cent, necessary provisions are needed to ensure remunerative price to the produce, encourage processing from the present level of 10 per cent of the total.

So, to accelerate the growth substantially, a new way of linking of Agricultural produce and marketing and promoting Agribusiness are focused. Promotion of commodity groups, farmer producer agencies, marketing organization and market linkage, encouraging of private players in marketing, value addition, crop specific supply chain management, more infrastructural facilities for processing and sensitizing the farmers for market-led agriculture by rendering crop advisory and market information are focused. Agri-business also contributes to the production of higher-value products and diversification away from the staple foods. Through this diversification and the development of the value chain between producers and consumers, the rural economy benefits from innovation and the creation of non-farm employment.

Components

a) Promotion of commodity groups and market information in Thiruvarur blocks

b) Construction of Storage godown for commodity groups in Mannargudi

c) Construction of drying yards in all blocks

d) Upgradation of rural shandies and uzhavar shandies in all blocks

e) Structures for Rural Market in Muthupet blocks

f) Exposer visits- within & outside states in Koradacherry blocks

g) Exposure visit (within state & outside state) for commodity group farmers to acquire value addition technologies in valangaiman blocks

Budget

The district plan proposes an outlay of **Rs.234.80** lakhs over a period of five years

Expected Outcome

The expected impact of the intervention will be increasingly competitive agribusiness sector leading to diversification, higher-value added products and higher incomes for farmers, farm workers and entrepreneurs and reduced rural poverty. The interventions will facilitate the development of a competitive agriculture sector, promoting diversification and contributing to the transformation of agriculture into a system producing higher value produces. The interventions

will also provide higher-value for consumers, value that will be shared as distributed benefits to value chain stakeholders including farmers, entrepreneurs and workers.

Implementing Agency

The Block-level officials of the Department of Agricultural Marketing and Agri-Business will implement the programs.

Table 4.19. Budget for strengthening of Agricultural Marketing and Agri-Business in Thiuvarur District

(₹.in lakhs)

Sl. No	Intervention	Unit	Unit cost	Block Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	Promotion of Commodity Groups and Market Information															
1	Agri Marketing Information Centre at District level	Nos.	30	B1	0	0.00	0	0.00	0	0.00	1	30.00	0	0.00	1	30.00
2	Publicity-Press Release, Printing of Pamplets, Booklets, Banners, Flex.	Nos.	0.01	B1	10	0.10	10	0.10	10	0.10	10	0.10	10	0.10	50	0.50
	Strengthening of Uzhavar Sandhai and Regulated Market															
3	Drying Yard	Nos.	6	All Blocks	0	0.00	*0*	0.00	0	0.00	10	60.00	0	0.00	10	60.00
4	Storage godown	Nos.	1.25	B3	0	0.00	0	0.00	0	0.00	1	1.25	1	1.25	2	2.50
5	Structures for Rural Market	Nos.	100	B4	0	0.00	0	0.00	0	0.00	1	100.00	0	0.00	1	100.00
6	Tarpaulin	Nos.	0.02	All Blocks	50	1.00	50	1.00	50	1.00	50	1.00	50	1.00	250	5.00
	Capacity building Programme															
7	Exposure Visits - within state	Nos.	0.5	B10	2	1.00	2	1.00	2	1.00	2	1.00	2	1.00	10	5.00
8	Exposure Visits - outside state - 3 days	Nos.	1.5	B10	1	1.50	1	1.50	1	1.50	1	1.50	1	1.50	5	7.50
9	Training on Market led Extension, Agmark grading&Food safety, postharvest technology, Supply Chain Management, Grading-sorting-packing, Market linkages & Exports, Food processing and value addition at district level	Nos.	0.113	All Blocks	43	4.86	43	4.86	43	4.86	43	4.86	43	4.86	215	24.30
	Total					**8.46**		**8.46**		**8.46**		**199.71**		**9.71**		**234.80**

B1-Thiruvarur, B2-Thiruthuraipoondi, B3-Mannargudi, B4-Muthupet, B5-Needamangalam, B6-Valangaiman, B7-Kottur, B8-Nannilam, B9-Kodavasal, B10-Koradachery

4.5. Seed Certification and Organic Certification

Seed is a critical input for long-term sustained growth of agriculture. Timely availability of certified quality seeds with good yield potential continues to be a decisive factor in agricultural production. Farmers in Tamilnadu state are well aware of the benefits of using quality seeds which include foundation, certified and truthfully labelled seeds. In our State, the seed replacement rate is being adopted as per the guidelines of Government of India. In order to achieve the target of doubling the income of farmers, timely availability of quality seeds is given utmost importance. Concerted efforts are essential in ensuring timely availability of seeds as well as increasing the Seed Replacement Rate (SRR). The National Mission on Seeds has been formulated with a view to upgrade the quality of farm saved seeds and also to enhance Seed Replacement Rate. The Department of Seed Certification & Organic Certification plays the supporting role in the enhancement of Seed Replacement Rate by certifying quality seeds in an increasing trend over the years.

Seed certification is a legally sanctioned system for quality control of seed multiplication and production. The immediate objective of seed certification is to supply high quality seed to farmers and other growers, which is true to identity, high in purity and germination capacity and free from certain pests and diseases. Seed quality is most important in crop production, as high quality seed is essential for good crop yields and good returns, and minimize the likelihood of crop failure. Moreover, growing consciousness of health hazards due to possible contamination of farm products from use of chemicals have immensely contributed to the revival of organic agriculture. Organic certification is a certification body for organic production which was established as a government department on 17 of May 2007. Thus the major focus of the department will be creation of new facilities for better certification by strengthening the lab facilities, and infrastructure, create more awareness on quality seed and organic agriculture through capacity building, expanding communication and networking facilities in order to enhance the activities on seed and organic certification.

Project components

- Strengthening of Seed Testing laboratories in all blocks

  Samples received in a seed testing laboratory should be processed through various stages in the laboratory as quickly as possible so that result may be sent to sender promptly. The space provided for seed testing, the arrangement of that space and furnishing available would contribute greatly in the efficient functioning of the laboratory. In order to carry out seed quality tests and maintaining the purity in the

seed testing laboratory the equipments such as Dehumidifier, R.O.System, Humidifier, Thermo hydrometer, Digital Moisturemeter, Microscope, Working table, Working Chair, Air conditioner, Sample Racks, Geaser, Heater, Trolley for Carriages, Generator 30KV, Induction Stove, Fabricated Display Racks, Conductivity Meter, Dehuller/ Scarifier, Seed Grinder, Blower, Hot Air oven, Incubator and Miscellaneous are required.

- Capacity building in all blocks

  Promotion of quality seed production and distribution the training programmes would be organized. The training to be given on the seed production to seed producers. The training includes seed growers who are mostly small and marginal farmers. Also training to be given to the seed dealers on quality maintenance in storage, selling of seeds.

- Strengthening of communication and networking facilities in all blocks

  Information on quality seed production techniques would be disseminating among the farmers and seed growers.

Expected outcome

Enhancement of infrastructure facilities, capacity building, communication and networking would promote the quality of seed and organic certification.

Budget

Seed testing plays a pivotal role in modern agriculture. It is being carried out to analyze factors like germination, physical purity, moisture, seed health and admixture of other distinguishable varieties. Seed testing is carried out in the notified seed testing laboratories. The Seed testing results are very important for the successful implementation of Seed Certification and Seed Law Enforcement programmes. Apart from certified seed samples and samples received from the seed quality control wing, the service samples sent by the farmers, seed dealers and seed producers are also tested in these laboratories of Thiruvarur district. The budget requirement for Seed certification is ₹**40.72** lakhs.

Implementingagency

The projects will be implemented by the Directorate of seed and organic certification.

Table.4.20. Budget requirement for Seed and Organic Certification

(₹.in lakhs)

Sl. No	Interventions	Unit	Unit cost	Blocks Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
I	**Strengthening of laboratory facilities**															
1	Blower, Conductivity meter, Dehuller/Scarifier, Dehumidifier Air Conditioner, Digital moisture meter, Dunnage, Fabricated display Racks ,Geaser, Generator, Heater, Hot air oven, Humidifier, Incubator, Induction stove, Microscope, Moisture meter, Packing machine, R. O system, Sample racks, Seed Grinder, Sieve, Thermo hydro meter, Dunnage, Trolley for carriages, Working chair, Working table, Miscellaneous,	No's	13.36	All Blocks	1.00	13.36	1.00	13.36	0.00	0.00	0.00	0.00	0.00	0.00	2.00	26.72
II	**Strengthening of communication and networking facilities**															
1	Computer accessories	No's	0.5	All Blocks	20	10.00	0	0.00	0	0.00	0	0.00	0	0.00	20	10.00
III	**Capacity Building**															
1	Training to seed grower for quality seed production	No's	0.2	All Blocks	0	0.00	5	1.00	5	1.00	5	1.00	5	1.00	20	4.00
	Total					**23.36**		**14.36**		**1.00**		**1.00**		**1.00**		**40.72**

Koradacherry - B1, Kottur - B2, Kudavasal - B3, Mannargudi - B4, Muthupettai - B5, Nannilam - B6, Needamangalam - B7, Thiruthuraipoondi - B8, Tiruvarur - B9, Valagaiman - B10

4.6. Animal husbandry

Livestock have been an integral component of India's agricultural and rural economy since time immemorial, supplying energy for crop production in terms of draught power and organic manure, and in turn deriving their own energy requirements from crop byproducts and residues. Livestock are now more valued as source of food and contribute over one-fourth to the agricultural gross domestic product and engage about 9% of the agricultural labour force. The livestock sector has been growing faster than crop sector; however, in recent years, the growth both in livestock production and productivity has decelerated considerably. India's livestock sector is one of the largest in the world. It has 56.7% of world's buffaloes, 12.5% cattle, 20.4% small ruminants, 2.4% camel, 1.4% equine, 1.5% pigs and 3.1% poultry. In 2010-11, livestock generated outputs worth Rs. 2075 billion which comprised 4% of the GDP and 26% of the agricultural GDP. The total output worth was higher than the value of food grains.

Animal Husbandry sector plays a crucial role in ensuring the welfare of rural population. A majority of farmers depend on Animal Husbandry for their livelihood. Moreover, livestock sector provides supplementary employment and sustainable source of income to many small and marginal farmers. Thus, this sector is emerging as an important sector, leveraging the rural economy. In addition, this sector provides a continuous flow of essential food products like milk, meat, eggs besides draught power, raw materials like wool and hides for industries, and manure. With increase in production of livestock products, livestock rearing is also considered as an avocation with high export potential. Distribution of livestock wealth is more egalitarian, compared to land and hence, from the equity and livelihood perspective, it is considered as an important component in poverty alleviation programmes.

Keeping view in this mind, various major interventions are being planned and proposed in the district agricultural plan to be implemented beyond 12th five year plan. The major interventions are:

1. Increasing the availability of fodder through field level interventions in all blocks
2. Increasing the availability of fodder by strengthening farm infrastructure in Thiruthuraipoondi block
3. Livestock breeding management in all blocks
4. Livestock health in Thiruthuraipoondi block
5. Improving the livestock productivity in all blocks
6. Improving the service delivery at veterinary institutions in all blocks
7. Enhancing livestock management in all blocks
8. Capacity building in all blocks

Increasing the availability of fodder through field level interventions

Livestock rearing is one of the major occupations in India and is making significant contribution to the country's GDP. The livestock population, over the years, has shown a steady growth on broadly two counts i.e. (i) increase in the number of stall feeding based bovine livestock viz. buffaloes and hybrid cattle, and (ii) increase in the number of free grazing based livestock like goats and sheep that can survive on the fast degrading pasturage. The animal husbandry sector has a good growth potential. However, further growth of the sector will be as much dependent upon the availability of fodder. The available data reveals that the present fodder availability in the country is well below requirement. The data also reveals that only about half of the annual fodder requirement is met from the cultivated fodder and crop residues, whereas open grazing and fodder availability from common property resources like forests, pastures, village commons, etc. fulfills the remaining half of the annual fodder requirement. The issue to be taken note of is that it is the open grazing and fodder availability from the common property resources that provides sustenance to a vast majority of households with animal husbandry as the only vocation.

The increasing number of livestock and the changing dynamics of animal husbandry practices require corresponding increase in the type of fodder needed to meet the requirements of these new situations.. To overcome these issues the following field level interventions are proposed to improve the fodder availability.

1. Establishment of vermicomposting unit in all blocks
2. Distribution of Azolla trays in all blocks
3. Fodder plot development in all blocks
4. Distribution of silage bag for conservation of fodder crops in all blocks
5. Distribution of seedlings, sprinklers, grass cutter and raingun to the farmers in all blocks

Increasing the availability of fodder by strengthening farm infrastructure

The livestock sector is handicapped due to inadequate infrastructure facilities as a result of low productivity. Infrastructure development for animal husbandry is felt essential to provide the desired veterinary services in the interior pockets of the districts so as to enable the livestock owners living in the remote areas can avail the opportunities to consider AH activities as livelihood option and maximize profit through livestock sector. Adequately providing proper infrastructure and equipment to the veterinary health care institution is necessary for the timely

diagnosis and treatment of animal diseases. Further, emphasis has to be laid on optimum utilization of waste land to grow fodder.

Improved infrastructure facilities will provide improved veterinary services contributing to reduction in the incidences of animal diseases thereby increasing the overall productivity of animals. The Rural Veterinary Dispensaries are either functioning from rented premises or in dilapidated buildings. Further, functioning of Veterinary Institutions in the rental buildings do not satisfy the requirement of a typical Veterinary Institution and with a restricted scope for further expansion, these are not ideal infrastructure. This necessitates strengthening the infrastructure of the veterinary institutions to offer better delivery of services and to reshape it into knowledge resource centers where best practices can be disseminated to the farmers. The following infrastructure facilities will strengthen the fodder availability such as

1. Establishment of farm production cover in Nannilam block
2. Construction of silo pit and overhead tanks in Nannilam block
3. Establishment of vermin compost units in in Nannilam block
4. Installation of rain gun and drip irrigation in Nannilam block
5. Procurement of Agri inputs in Nannilam block

Livestock breeding management

Over the past few decades, imported exotic cow varieties have gain a boost in milk production in Tamil Nadu. Most of the cattle breeds are exotic. These breeds theoretically produce a lot of milk, but are not well-adapted to our conditions. About 69% of Indian cows are owned by the economically poor strata of the society. These folks cannot afford to house these exotic breeds in regulated climate conditions.

The government has significantly mismanaged cow breeding. The average milk yield per animal in India is just 3.2 kgs, compared to a global average of 6.6 kgs. The dairy policy and outlook is highly outdated and needs to be replaced with modern, evidence-based thinking

Livestock industry continues to demonstrate a beneficial impact on rural people by improving their income, employment and consumption and thereby acting as a potential tool in alleviating rural poverty. Artificial insemination (AI) has proven to be very effective for the improvement of the genetic potential of animals for higher production and there is no surprise why today AI is the back bone of all breeding programmes in India. The replacement of unproductive and ageing animals in the herd and its expansion are very important to maintain

the scale of economy of the farm. Augmentation of fertility in repeat breeders and sex-sorted semen are some of the modern scientific tools which have been proposed to be employed for effective breeding management to enhance the livestock fertility and productivity. The following interventions will help to improve livestock breeding management, such as

1. CIDR in all blocks
2. Distribution of sex-sorted semen facility in all blocks

Livestock health

A large number of infectious and metabolic diseases prevalent in Indian livestock have serious implication for animal productivity, export potential and safety/ quality of livestock products and many of these diseases have zoonotic implications. The current efforts of prevention and control of livestock diseases needs to be strengthened. There is a shortage of veterinary and Para-veterinary manpower and facilities including mechanisms for diagnosis, treatment, tracking and prevention of the diseases. Adequate infrastructure for ensuring bio-security, proper quarantine systems and services to prevent the ingress of diseases across the states and national borders is not available. By providing the following facilities will prevent the above diseases such as

1. Animal quarantine facility in govt. farm in Nannilam block
2. Induction of new genetic pool in Nannilam

Improving the livestock productivity

Although India is a major producer of livestock products the average productivity of livestock is lower compared to world average. Inadequate availability of feed and fodder, insufficient coverage through artificial insemination, low conception rates, non-availability of quality males for breeding, poor management practices, high mortality and morbidity losses due to diseases, inadequate marketing infrastructure and unorganized marketing are the other major concerns. To maximize the livestock productivity the following activities should be implement.. The intervention have been propose are

1. Distribution of sheep, goat, units-semi intensive system in all blocks
2. Establishment of modern poultry, in Nannilam block
3. Distribution of Buffalow unit in all blocks
4. Integrated farming in all blocks

Improving the service delivery at veterinary institutions

Veterinary hospitals, dispensaries, Aid Centers, diagnostic laboratories and veterinary manpower already available are much less than what is required. These services would be improved and expanded and will continue to be provided by the state owned facilities with an appropriate system of recovery of cost wherever feasible. Private investment to improve delivery of animal health services including facilities by private veterinary graduates would be encouraged. Mobile veterinary dispensaries with provision for vaccination and facilities to generate awareness of farmers regarding various livestock management issues would be promoted to improve outreach. For companion animals, state governments may consider to extend the veterinary services on full cost recovery basis. To improve the service delivery the below mentioned intervention have been proposed. The intervention have been propose are

1. Deep freezer facility for storage of vaccines and medicines in all blocks
2. Establishment of infrastructure facilities, institutions in all blocks

Enhancing livestock management

The country has rich and diverse genetic resources of livestock in the form of a large number of species, breeds, and strains within a species. India has some of the best breeds of cattle and buffaloes with traits for dairy, draught power and dual purposes, several carpet wool breeds of sheep, highly prolific breeds of goats and adaptive breeds of poultry. Such utility genes and breeds would be identified, conserved and utilized for breeding and research. The focus would be on conservation of indigenous breeds of livestock and poultry. By developing slaughter house, livestock shandy also be helpful to enhancing livestock management. The intervention have been propose are

1. Animal identification and traceability in all blocks
2. Conservation of indigenous breeds in all blocks

Capacity building

Educating the farmers about the advanced crop production technologies as well as the techniques will enrich the knowledge of farmers through conduct of trainings and demonstrations to the farmers, youths and young entrepreneurs. On field demonstrations are conducted on fodder production technologies, seed production, poultry farming and sheep farming etc.

Capacity building programme is to strengthen the capacities of farmers, indigenous and local communities, and their organizations and other stakeholders, to manage sustainable biodiversity so as to increase their benefits, and to promote awareness and responsible action, in the form of trainings, demonstrations, exposure visits, etc. To create awareness among the farmers the following trainings and campaigns have to be conducted. Establishment of farmers training Centre

1. Conducting demonstrations camps and campaigns in all blocks
2. Creating awareness of livestock management to the farmers through training programmes in all blocks

Budget allocation

The major themes proposed in the plan for animal husbandry sector with a total budget out lay of₹. **11447.75**

Project implementing agency

The projects proposed will be implemented by the Department of Animal husbandry sector.

Table. 4.21 Budget requirement for Animal Husbandry

(₹in lakhs)

Sl. No	Interventions	Unit	Unit cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	Increasing the Availability of Fodder through Field level Interventions															
1	Establishment of Vermicomposting unit (single bed)	Nos	4	All blocks	10	40.00	10	40.00	10	40.00	10	40.00	10	40.00	50	200.00
2	Distrbution of Azolla trays	Nos	0.5	All blocks	150	75.00	150	75.00	150	75.00	150	75.00	150	75.00	750	375.00
3	Distribution of Silage bags for conservation of fodder crops	Nos	0.005	All blocks	10	0.05	10	0.05	10	0.05	10	0.05	10	0.05	50	0.25
4	Fodder plot development	acre	0.05	All blocks	400	20.00	400	20.00	400	20.00	200	10.00	200	10.00	1600	80.00
	Increasing the Availability of Fodder by Strengthening Farm Infrastructure															
5	Establishment of Vermicompost unit (10 beds) at Farms	Nos	4	B8	5	20.00	5	20.00	5	20.00	5	20.00	5	20.00	25	100.00
6	Erection of Transformers to improve irrigation facility in Govt.farm	Nos	30	B8	0	0.00	1	30.00	0	0.00	0	0.00	0	0.00	1	30.00
7	Establishment of Farm Protection Cover (Bio-security wall)	km	5	B8	0	0.00	10	50.00	0	0.00	0	0.00	0	0.00	10	50.00
8	Establishment of Feed mixing/ feed block units	Nos	25	B8	0	0.00	1	25.00	0	0.00	0	0.00	0	0.00	1	25.00
9	Construction of silo Pit for livestock farm	Nos	1	B8	0	0.00	2	2.00	2	2.00	2	2.00	2	2.00	8	8.00
10	Construction of Over Head Tanks/ GLR / Pre-fabricated tanks in farm	Nos	20	B8	0	0.00	2	40.00	0	0.00	0	0.00	0	0.00	2	40.00

Sl. No	Interventions	Unit	Unit cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
11	Drip irrigation for livestock farms	acre	0.6	B8	30	18.00	30	18.00	30	18.00	30	18.00	30	18.00	150	90.00
12	Borewell for livestock farms	Nos	8	B8	2	16.00	2	16.00	2	16.00	2	16.00	2	16.00	10	80.00
13	Installation of Raingun in Govt.farm in cultivated areas	acre	0.4	B8	10	4.00	10	4.00	10	4.00	10	4.00	10	4.00	50	20.00
14	Installation of Sprinkler system in fodder cultivated areas in Govt.farm	acre	0.4	B8	5	2.00	5	2.00	5	2.00	5	2.00	5	2.00	25	10.00
15	Procurement of Agri inputs for Farms	acre	0.15	B8	45	6.75	45	6.75	45	6.75	45	6.75	45	6.75	225	33.75
16	Procurement of Agricultural implements (tractor, trailers, harvesters, ploughs, chaff cutter, grass cutter etc)	Pack	50	B8	1	50.00	1	50.00	1	50.00	1	50.00	1	50.00	5	250.00
	Livestock Breeding Management															
17	CIDR (Controlled Internal Drug Release) for increasing Fertility in Cattle	Nos	0.1	All Blocks	300	30.00	300	30.00	300	30.00	300	30.00	300	30.00	1500	150.00
18	Distribution of sex sorted semen to veterinary institution	Nos	0.015	All Blocks	79200	1188.00	79200	1188.00	79200	1188.00	79200	1188.00	79200	1188.00	396000	5940.00
	Livestock Health															
19	Animal Quarantine Facility in Govt.farm to prevent disease outbreak	Nos	50	B8	1	50	0	0	0	0	0	0	0	0	1	50
20	Induction of new Genetic Pool	Nos	0.25	B8	25	6.25	25	6.25	25	6.25	25	6.25	25	6.25	125	31.25
	Improving the Livestock															

Sl. No	Interventions	Unit	Unit cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	Productivity															
21	Distibution of Sheep/Goat units - semi intensive system	Unit	0.5	All Blocks	25	12.50	25	12.50	25	12.50	25	12.50	25	12.50	125	62.50
22	Distribution of Buffalo units(5 Buffaloes)	Nos	4.5	All Blocks	10	45.00	10	45.00	10	45.00	10	45.00	10	45.00	50	225.00
23	Integrated farming (Goat+Cattle+Fish+ Agriculture /Horticulture)	Unit	2	All Blocks	5	10.00	5	10.00	5	10.00	5	10.00	5	10.00	25	50.00
24	Development of Native chicken farms	Farm	1	All Blocks	25	25.00	25	25.00	25	25.00	25	25.00	25	25.00	125	125.00
25	Establishment of disposal pits for poultry unit	All Blocks	1	All Blocks	25	25.00	25	25.00	25	25.00	25	25.00	25	25.00	125	125.00
26	Establishment of Modern Dairy/ Bull Shed	Nos	150	B8	1	150.00	0	0.00	1	150.00	0	0.00	1	150.00	3	450.00
	Improving the Service Delivery at Veterinary Institutions															
27	Deep freezer facility for Storage of vaccines and Medicines	Nos	10	All Blocks	0	0.00	0	0.00	10	100.00	0	0.00	0	0.00	10	100.00
28	Establishment of Infrastructure facilities for Veterinary Institutions	Nos	30	All Blocks	10	300.00	10	300.00	10	300.00	10	300.00	10	300.00	50	1500.00
29	Establishment of Mobile Disease Diagnostic Labs	Nos	20	B8, B9	2	40.00	0	0.00	0	0.00	0	0.00	0	0.00	2	40.00
30	Establishment of Mobile Veterinary Units	Nos	10	B8, B9	2	20.00	0	0.00	0	0.00	0	0.00	0	0.00	2	20.00

Sl. No	Interventions	Unit	Unit cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
31	Establishment of surgical theatres at veterinary institution	Nos	30	All Blocks	2	60.00	2	60.00	2	60.00	2	60.00	2	60.00	10	300.00
32	Providing solar lighting panels at veterinary institution	Nos	1	All Blocks	20	20.00	20	20.00	20	20.00	20	20.00	20	20.00	100	100.00
33	Package of Modern Veterinary Diagnostic Aids to Veterinary Institutions such as Computerised X rays, Ultrasound, Diathermy etc.	Nos	30	All Blocks	2	60.00	2	60.00	2	60.00	2	60.00	2	60.00	10	300.00
34	Establishment of Ambulance facility for animals	Nos	80	B9	1	80.00	1	80.00	0	0.00	0	0.00	0	0.00	2	160.00
	Livestock Management															
35	Animal Identification and Traceability	Unit of 1000 animals	0.1	All Blocks	300	30.00	30	3.00	30	3.00	30	3.00	30	3.00	420	42.00
36	Conservation of Indigenous breeds	Pack	10	All Blocks	1	10.00	1	10.00	1	10.00	1	10.00	1	10.00	5	50.00
37	**Capacity Building**															
38	Establishment of Farmers training Centre	Nos	200	B9	0	0.00	1	200.00	0	0.00	0	0.00	0	0.00	1	200.00
39	Conducting Demonstrations, Camps and Campaigns	Nos	0.1	All Blocks	10	1.00	10	1.00	10	1.00	10	1.00	10	1.00	50	5.00
40	Creating awarness of livestock management to the farmers through Training Programmes	Nos	0.1	All Blocks	10	1.00	10	1.00	10	1.00	10	1.00	10	1.00	50	5.00

Sl. No	Interventions	Unit	Unit cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
41	Conducting demonstration on enrichment of dry fodder and silo making for green fodder	Nos	0.5	All Blocks	10	5.00	10	5.00	10	5.00	10	5.00	10	5.00	50	25.00
	Grand Total					**2420.55**		**2480.55**		**2305.55**		**2045.55**		**2195.55**		**11447.75**

Koradacherry - B1, Kottur - B2, Kudavasal - B3, Mannargudi - B4, Muthupettai - B5, Nannilam - B6, Needamangalam - B7, Thiruthuraipoondi - B8, Tiruvarur - B9, Valagaiman - B10

4.7. Dairy development

The importance of dairying in a country like India hardly needs emphasize. India has vast resources of livestock, which play an important role in the national economy and also in the socioeconomic development of millions of rural households. India has one of the largest stocks of cattle and buffaloes: more than 50 percent of the world's buffaloes and 20 percent of its cattle. Dairy sector acts as an important source of income for rural families, plays a vital role in providing gainful employment and income generating opportunities in the district. Dairy industry in the country is expected to witness spectacular growth in 2017, according to experts.

During the last 10 years, the annual growth rate in Indian dairy industry is 4.6 per cent as compared to the global growth rate of 2.2 per cent. During this period, per capita consumption of milk in the country was 340 g a day as against 299 g globally. “India’s milk production has touched 155.4 metric tonnes during 2015-16. Consumption is increasing at a faster rate. However in the country more than 90 per cent of the dairying is at the subsistence level so the emerging trends have to increase the county’s milk production moreover. To fulfill the shortage in dairy sector the following interventions have been suggested.

Strengthening of milk storages and processing units

Clean milk production is a concept being used everywhere, where quality of milk has become prime importance. It has to be maintained throughout the milk supply chain right from the dairy farm environment to cooling & storage to its packaging. The machinery and equipment required depends on the level of mechanization desired and the scale of operation. However, some machinery and equipment are essentially required such as storage tanks, washer, coolers, pumps and processing equipment’s. Except for this some electrical installation also required to provide proper storage facilities.

The major interventions are,

1. Milk storage tanks of various capacities in all blocks
2. Milk tankers in all blocks
3. Milk pumps in all blocks
4. Processing equipment’s in all blocks
5. Pasteurizers in all blocks
6. Heaters and chillers in all blocks
7. Washer and conveyors in all blocks

8. Pipes and fittings in all blocks
9. Cleaning equipment's in all blocks
10. Electrical installations (UPS, generators, stabilizers, control panel) in all blocks

Enhancing milk production and milk processing units

The quality of animals is critical in determining its milk productivity and hence overall production. Currently, low productivity per animal hinders development of the dairy sector. Despite being the world's largest milk producer, India's productivity per animal is very low, at 987 kg per lactation, compared with the global average of 2038 kg per lactation.

The low productivity is a result of ineffective cattle and buffalo breeding programmes, limited extension and management on dairy enterprise development, traditional feeding practices that are not based on scientific feeding methods, and limited availability and affordability of quality feed and fodder. Animal health and breeding services provision, veterinary infrastructure development and vaccinations are the responsibility of the state government. These services have traditionally been provided for free or at a very subsidized rate but in the past few years it has been payable. state livestock development agencies are being set up as autonomous bodies to offer services in animal breeding in the form of procurement, production and distribution of breeding inputs (such as semen and liquid nitrogen), training and promotional activities. Despite these initiatives, the availability of services remains limited and extension activities in dairy management are woefully lacking. Let to get a better improvement in milk production than before the following inputs have been suggested.

1. Provision of veterinary medicine in all blocks
2. Fodder development equipment and seed material in all blocks
3. Milk testing equipment's in all blocks
4. Equipment's for artificial insemination in all blocks
5. Milk society buildings and cow shed in all blocks
6. Cryogenic containers in all blocks
7. Weighing machines in all blocks
8. Computer accessories in all blocks

Capacity building

India is the largest milk producer in the world with an annual production of over 155.4 metric tonnes of milk, yet the sector faces numerous issues. One of the major challenges facing the dairy sector is the growing gap between milk supply and demand. Another major challenge

arises from the fact that more than 92 percent of the animals are owned by smallholders who had little ownership of land to manage them. The small farmers do not have sufficient resources and lack training in dairy sector that leads to poor animal health and low milk yield. Furthermore, the small farmers lack knowledge of modern breeding practices. To make the farmers as scholars in particular thing some trainings and camps has to be conducted. To make sure this the following intervention has been proposed.

1. Training of personnel of MPCS, Union and federation in all blocks
2. Infertility camps in all blocks

Marketing structures

Marketing is generally defined as the process of planning and executing the conception, pricing, promotion, and distribution of ideas, goods, and services to create exchanges that satisfy individual and organizational objectives. The word Dairy marketing means where the milk is kept and marketing. Dairy marketing truly came into the public consciousness with the introduction of the “Got milk” campaign in 1993. Marketing plays a vital role not only in stimulating production and consumption, but also in accelerating the pace of economic development. An efficient marketing system minimizes costs, increases returns to farmers by reducing the number of middlemen or by restricting the commission of marketing system. To increase the income in dairy sector the suitable marketing structure is vital. For that the following structures have been suggested

1. Parlour structure in all blocks
2. Milk product storage cabinets in all blocks
3. Product billing system in all blocks

Quality control

Quality is a vital ingredient of a good brand. Remember the “core benefits” – the things consumers expect. These must be delivered well. To ensure the quality of the following interventions have been suggested

1. Adulteration detection equipment’s in all blocks
2. Milk testing equipment and laboratory in all blocks

Processing and value addition

While adding value to farm and livestock products before they reach the local and international market is one of the key aims of Vision 2030. Product diversification has become

an important aspect of business strategy with reasons for this increased focus being increased profitability, reduction in risk, increasing competition, higher growth and more efficient resource allocation. Value addition in the dairy value chain is still a challenge in our country. Value addition has been hailed as one of the solutions to the perishability challenge of milk by converting it to a more durable form and hence reducing farm losses. But only few of them undertake the value addition In India. To maximize the value addition in rural areas the following interventions have been suggested

1. Efflument treatment plant in all block
2. Dairy equipment in all block
3. Fat handling and other dairy equipment's in all block

Development for dairy sector

Though the milk production has reached an all-time high in the district, the producers are not able to market the milk produced. This is mainly due to inadequate infrastructure available for procurement, processing of milk and marketing network. Providing proper infrastructure to the veterinary health care institutions is necessary for the timely diagnosis and treatment of animal diseases. An efficient management of cattle will be incomplete without a well-planned and adequate housing of cattle. Good quality milk is essential for production of good quality dairy products, taste and flavor, free from pathogens and long keeping quality. Immediately after milking, the milk must be cooled preferably to 4° C. This requires mechanical refrigeration or milk cooling tanks. These are expensive and can usually be afforded by large scale commercial farms. For small scale dairy farmers, setting up a milk cooling centre centrally may be the ideal solution. The following buildings have been proposed for better storage and improvement

1. BMC building in all blocks
2. Ware house for dairy products in all blocks

Budget allocation

An outlay of Rs.**2888.25** lakhs is proposed to fulfill the aforementioned interventions for five years.

Implementing agency

The projects will be implemented by the Department of Dairy Development.

Table. 4.22 Budget requirement for Dairy Development

(₹ in lakhs)

Sl. No	Interventions	Unit	Unit cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	Engineering section															
1	Electrical installation like Tranformemr, UPS, Stabilisers, Control Panel MCC etc.,	1	25	All blocks	1	25.00	1	25.00	0	0.00	0	0.00	0	0.00	2	50.00
2	Milk Storage Tanks of various capacities	1	15	All blocks	0	0.00	2	30.00	2	30.00	2	30.00	2	30.00	8	120.00
3	Tub washer, Canwashers, Crate conveyor systems.	1	10	All blocks	0	0.00	0	0.00	0	0.00	1	10.00	1	10.00	2	20.00
5	SS pipes and fittings	1	5	All blocks	1	5.00	1	5.00	1	5.00	1	5.00	1	5.00	5	25.00
6	Solar system for water heating	1	2	All blocks	2	4.00	2	4.00	2	4.00	2	4.00	2	4.00	10	20.00
7	Packing Machineries for milk, Butter, Ghee, SMP and Other Milk products	1	18	All blocks	0	0.00	2	36.00	2	36.00	0	0.00	0	0.00	4	72.00
8	Plate Heat type Chillers and pasteurizers	1	10	All blocks	1	10.00	0	0.00	0	0.00	1	10.00	0	0.00	2	20.00
10	Milk Pumps of Vaious capacities	1	0.5	All blocks	5	2.50	5	2.50	5	2.50	5	2.50	5	2.50	25	12.50
11	Generator of various capacities	1	20	All blocks	0	0.00	0	0.00	0	0.00	0	0.00	1	20.00	1	20.00
12	Cleaning In Place equipments with accessories	1	75	All blocks	0	0.00	0	0.00	1	75.00	0	0.00	0	0.00	1	75.00
	Procurement and Input															
13	Veterinary Medicine	1	2	All blocks	2	4.00	2	4.00	2	4.00	2	4.00	2	4.00	10	20.00
14	Two wheeler for AI technician	1	0.5	All blocks	5	2.50	5	2.50	5	2.50	5	2.50	5	2.50	25	12.50
15	Computer system with accessories	1	0.5	All blocks	5	2.50	5	2.50	5	2.50	5	2.50	5	2.50	25	12.50
16	Fodder seed materials	1	0.25	All blocks	5	1.25	5	1.25	5	1.25	5	1.25	5	1.25	25	6.25
17	Fodder development equipments like chaff	1	0.2	All blocks	15	3.00	15	3.00	15	3.00	15	3.00	15	3.00	75	15.00

Sl. No	Interventions	Unit	Unit cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	cutter, Mower etc.,															
18	Bulk Milk coolers of Various capacities	1	15	All blocks	2	30.00	2	30.00	2	30.00	2	30.00	2	30.00	10	150.00
19	Milk cans	1	0.035	All blocks	200	7.00	200	7.00	200	7.00	200	7.00	200	7.00	1000	35.00
20	Electronic weighing scales of various capacities.	1	0.3	All blocks	5	1.50	5	1.50	5	1.50	5	1.50	5	1.50	25	7.50
21	Electronic milk testing equipments	1	1.25	All blocks	5	6.25	5	6.25	5	6.25	5	6.25	5	6.25	25	31.25
22	Milking machine	1	0.8	All blocks	5	4.00	5	4.00	5	4.00	5	4.00	5	4.00	25	20.00
23	Cow shed	1	5	All blocks	5	25.00	5	25.00	5	25.00	5	25.00	5	25.00	25	125.00
24	Society Buildings	1	20	All blocks	5	100.00	5	100.00	5	100.00	5	100.00	5	100.00	25	500.00
25	Cryogenic containers	1	0.35	All blocks	5	1.75	5	1.75	5	1.75	5	1.75	5	1.75	25	8.75
26	Equipments for Artificial Insemination	1	0.5	All blocks	5	2.50	5	2.50	5	2.50	5	2.50	5	2.50	25	12.50
	Capacity building															
27	Training of personnel of MPCS, Union and Federation.	1	0.05	All blocks	50	2.50	50	2.50	50	2.50	50	2.50	50	2.50	250	12.50
28	Infertility Camps	1	0.2	All blocks	50	10.00	50	10.00	50	10.00	50	10.00	50	10.00	250	50.00
	Marketing															
29	Parlour structures	1	5	All blocks	10	50.00	10	50.00	10	50.00	10	50.00	10	50.00	50	250.00
30	Milk product storage cabinets	1	0.3	All blocks	100	30.00	50	15.00	50	15.00	50	15.00	50	15.00	300	90.00
31	Product Billing systems	1	0.3	All blocks	100	30.00	100	30.00	100	30.00	100	30.00	100	30.00	500	150.00
	Quality control															
32	Adulteration detection equipments	1	4	All blocks	1	4.00	1	4.00	1	4.00	1	4.00	1	4.00	5	20.00
33	Milk testing equipment and Laboratory.	1	5	All blocks	1	5.00	1	5.00	1	5.00	1	5.00	1	5.00	5	25.00

Sl. No	Interventions	Unit	Unit cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	Processing															
34	Effluement treatment plant	1	100	All blocks	0	0.00	1	100.00	0	0.00	0	0.00	0	0.00	1	100.00
35	Fat handling equipments	1	200	All blocks	0	0.00	0	0.00	1	200.00	0	0.00	0	0.00	1	200.00
36	Dairy equipments	1	50	All blocks	1	50.00	1	50.00	1	50.00	1	50.00	1	50.00	5	250.00
	Civil work Infrastructure															
37	BMC buildings	1	15	All blocks	2	30.00	2	30.00	2	30.00	2	30.00	2	30.00	10	150.00
38	Ware house for Dairy products	1	200	All blocks	0	0.00	1	200.00	0	0.00	0	0.00	0	0.00	1	200.00
	Grand Total					**449.25**		**790.25**		**740.25**		**449.25**		**459.25**		**2888.25**

Koradacherry - B1, Kottur - B2, Kudavasal - B3, Mannargudi - B4, Muthupettai - B5, Nannilam - B6, Needamangalam - B7, Thiruthuraipoondi - B8, Tiruvarur - B9, Valagaiman - B10

4.8. Fisheries

Sustaining fish production through improved technologies

Aquatic weeds are the most important obstacle for rearing of fishes in the lakes and ponds. The eradication or control of aquatic weeds is essential to improve the fish production. There are only a few biological agents available which are expected to be of real importance in the near future, i.e. phytophagous fishes, such as grass carp, and arthropods which feed specifically on water hyacinth. Possibly, biological agents in combination with mechanical/manual methods, or to a lesser extent chemical means of control, could offer a promising perspective for the control of aquatic weeds in the tropics. Mopped ice boxes are the modern tools to maintain the quality of the fish products. So supply of ice boxes to the fishermen helps them to maintain the quality of fish.

Short seasonal fish species in existing farm ponds

Homestead seasonal ponds and road-side canals, which are formed either due to burrowing of soil for house or road construction or ponds dug for household uses (bathing, washing) or irrigation, can be used for aquaculture of short-cycle species. The culture practice is simple, requiring very low labour input and hence, can be undertaken by women and children, producing fish for household consumption and for market. Landless farmers can also benefit from this technology by culturing fish.

Popularization of fishing technologies

Cross-cutting most activities of the fish rearing is the provision of training. The development of knowledge and skills of small-scale fishers, traders and processors, as well as extension workers and public sector staff, is a fundamental aspect of most interventions to improve standards, fish handling, management and ultimately improved business. Training on fish rearing technology and exposure visits to the fishermen will helps them to increase their income by rearing new fish varieties and adoption of advanced fishing technologies. The trainings and exposure visit are planned to train for the fisher folks in all the blocks of Thiruvarur district except in Mannargudi, Muthupettai, Thiruthuraipoondi and Needamangalam.

Project goal

The main objective of the project is to increase the fish production through assured supply of IMC fish seeds and introduction of short seasonal fishes and dissemination of

technologies through trainings, demonstrations and exposure visits.These activities will increase the livelihood of the fishermen and fish catchers.

Project components

The major components of the fish production are

a) Biological control of aquatic weeds by stocking of grass carps in aquatic weed infested water bodies in all blocks
b) Increasing fishing efficiency of Inland fishermen and fish Farmers in all blocks
c) Enhancement of fish production in irrigation tanks and Panchayat tanks by stocking fish seeds in all blocks
d) Propagation of fish culture in multi-purpose farm ponds in Tamil Nadu in all blocks
e) Introduction of short seasonal fish species in existing farm ponds in all blocks
f) Exposure visit to farmers to other states in Mannargudi, Muthupettai and Needamangalam
g) Training to fish in Needamangalam and Thiruthuraipoondi

Project area

The proposed interventions are planned to be implemented in the major inland fish production areas in all the blocks viz. Kodavasal, Koradacheri, Kottur, Mannargudi, Muthupettai, Nannilam, Needamangalam, Thiruthuraipoondi, Thiruvarur and Valangaiman.

Overall budget

The total cost for implementation of the above project will arrive to ₹. **862.00** lakhs.

Expected out come

The implementation of these interventions will improve the fish production in the district and helps in sustainable fish production. The distribution of IMC seeds will increase the production of varieties of fishes. Trainings and visits helps the fisher folks in technical know-how.

Project implementing agency

The project will be implemented by the Department of Fisheries. The progress of the work will be monitored by the heads of officials of the district headquarters

Table.4.23 Budget for Increasing Fish Production

(₹. In lakhs)

Sl. No	Interventions	Unit	Unit cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	Enhancement of fisheries															
1	Propagation of Fish Culture in Multi-purpose farm ponds in Tamil Nadu	1	0.17	All Blocks	50	8.50	50	8.50	50	8.50	50	8.50	50	8.50	250	43.00
2	Introduction of short seasonal fish species in existing farm ponds	1	0.79	All Blocks	5	3.95	5	3.95	5	3.95	5	3.95	5	3.95	25	20.00
3	Increasing fishing efficiency of inland fishermen and fish farmers	1	0.15	All Blocks	50	7.50	50	7.50	50	7.50	50	7.50	50	7.50	250	38.00
4	Enhancement of Fish production in irrigation tanks and Panchayat tanks by stocking fish seeds	1	0.02	All Blocks	500	10.00	500	10.00	500	10.00	500	10.00	500	10.00	2500	50.00
5	Biological Control of Aquatic Weeds by Stocking of Grass Carps in Aquatic Weed Infested water bodies	1	0.02	All Blocks	500	10.00	500	10.00	500	10.00	500	10.00	500	10.00	2500	50.00
	Section Total					**40.00**		**40.00**		**40.00**		**40.00**		**40.00**		**200.00**
	Capacity building programme															
6	Exposure visit to farmers to other states	10	0.6	Mannar gudi; Muthuopettai; Needamangalam	0	0.00	10	6.00	30	18.00	0	0.00	0	0.00	40	24.00
7	Training to fish farmers	25	0.75	Needaman galam; Thiruthurai poondi	0	0.00	25	18.75	25	18.75	0	0.00	0	0.00	50	38.00
8	Creation of Marine infrastructure facilities for the fisher-folk of coastal towns and villages to enhance	Nos	300	All Blocks	0	0	0	0	0	0	0	0	2	600	2	600

Sl. No	Interventions	Unit	Unit cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	Marine fish production, hygienic handling of catch and prevention of Post-harvest losses															
	Section Total					**0.00**		**25.00**		**37.00**		**0.00**		**0.00**		**62.00**
	Grand Total					**40.00**		**65.00**		**77.00**		**40.00**		**640.00**		**862.00**

Koradacherry - B1, Kottur - B2, Kudavasal - B3, Mannargudi - B4, Muthupettai - B5, Nannilam - B6, Needamangalam - B7, Thiruthuraipoondi - B8, Tiruvarur - B9, Valagaiman - B10

4.9 Fisheries Research

Inland Aquaculture

Natural resources are to be protected, nurtured and used meaningfully for the human welfare. Land and water resources are obviously and primarily to be used for the food production in order to prevent the human-animal conflicts for food. Indian fisheries sector has been playing an important role in the country's economy by its contributions to employment generation, income augmentation, foreign exchange earnings and providing food and nutritional security. The State of Tamil Nadu is geographically blessed with good natural resources like land and water. The fishery wealth of the State comprises of marine and inland fisheries that contribute remarkably for the supply of food Protein to the people of Tamil Nadu in addition to the export front. Like any other tropical province on the earth, Tamil Nadu too has conducive and supportive climate for the biological advantages of many aquatic organisms. The natural resources are bountiful with regard to fisheries development in the State and if meaningfully managed and maintained, it can yield a long term sustainable production for the benefit of the people of the State.

Harvest Technology

Fishing is one of the multi-million dollar industry provides huge foreign exchange and livelihood opportunities to millions of people in the country besides offering high quality protein rich food. Among the coastal state in India, Tamil Nadu is one of the major fish producing state, 5th in total fish production and contributing 0.7 percent of the total Gross State Domestic Product of the State. The state Tamil Nadu has a long coastline of about 1076 kms, accounting for about 17% of the Indian coastline. It has the EEZ area of 0.19million sq.km sharing 9.4% of the total EEZ of the country. The total fish production of the State during the year 2014-15 is 6.97 lakh tons (sector wise, from marine resources-4.57 lakh tons and freshwater and brackish water resources -2.40 lakh tons). A total of 5,395 traditional crafts 30,022motorized traditional crafts and 5,936 mechanized crafts are supports the coastal fish production. (Tamil Nadu Fisheries Department report, 2017). Tamil Nadu is one of the leading exporter of the marine products, exported to the tune of 93,477 MT and earned a foreign exchange of Rs.5,308.17 crore during 2014-15.

Project components

- Yield enhancement through innovative farming techniques for commercially important inland fishes in Thiruvarur block
- Strenghtening of farm infrastructure facilities in inland centres of TNFU in Thiruvarur block
- Reduction of post -harvest losses in Thiruvarur blocks
- Enhancement of per capita consumption of fish in Thiruvarur blocks
- Deisgn and development of e interface gadgets for sustainable aquaculture in Thiruvarur block

Project area

The proposed interventions are planned to be implemented in the major inland fish research areas in Thiruvarur blocks.

Overall budget

The total cost for implementation of the above project will arrive to ₹. **2656.45** lakhs.

Expected out come

The implementation of these interventions will improve the fish research in the district and helps in sustainable fish production.

Project implementing agency

The progress of the work will be monitored by the heads of officials of the district headquarters

Table.4.24 Budget for TNFU Fisheries Research

(₹. in lakhs)

Sl. No	Interventions	Unit cost	Block Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
				Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
1	**Aquaculture**														
i	**Inland Aquaculture**														
a	Yield enhancement through innovative farming techniques for commercially important inland fishes	200	Thiruvarur	1	200.00	0	0.00	0	0.00	1	200.00	0	0.00	2	400.00
b	Strenghtening of farm infrastructure facilities in inland centres of TNFU	150	Thiruvarur	0	0.00	1	150.00	0	0.00	0	0.00	0	0.00	1	150.00
iii	**Aquatic animal health and management**														
c	Establishment of regional labs for disease diagnosis, water qaulity and aquatic animal health management	150	Thiruvarur	0	0.00	0	0.00	1	150.00	0	0.00	0	0.00	1	150.00
d	Mobile aquaclinics for water quality analysis and disease diagnosis	100	Thiruvarur	0	0.00	0	0.00	1	100.00	0	0.00	0	0.00	1	100.00
2	**Harvest and Post-harvest**														
i	**fish processing technology**														
a	**Reduction of post-harvest losses**														
	Awareness to fishers on hygienic handling of fish	0.005	Thiruvarur	133	0.67	133	0.67	133	0.67	133	0.67	133	0.67	665	3.33
	Creation of awareness among fishers on fish processing technologies	0.6	Thiruvarur	25	15.00	25	15.00	25	15.00	25	15.00	25	15.00	125	75.00
	Capacity building and skill development programmes	6.6	Thiruvarur	13	85.80	13	85.80	13	85.80	13	85.80	13	85.80	65	429.00

Sl. No	Interventions	Unit cost	Block Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
				Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	on fish processing technologies														
b	**Enhancement of per capita consumption of fish**														
	Awareness campaign on health beneficial attributes of fish	0.005	Thiruvarur	52	0.26	52	0.26	52	0.26	52	0.26	52	0.26	260	1.30
	Production of short films on nutritive value of fish and screening in theatres and television channels	50	Thiruvarur	0	0.00	0	0.00	1	50.00	0	0.00	0	0.00	1	50.00
c	**Ensuring nutritional security through fish and fishery products**														
	supply of preserved ready to eat and ready to cook fish products through public distribution sytems	12.9	Thiruvarur	0	0.00	1	12.90	0	0.00	0	0.00	0	0.00	1	12.90
	Supply of fish and fish products in mid day meal programme	12.9	Thiruvarur	0	0.00	1	12.90	0	0.00	0	0.00	0	0.00	1	12.90
	Supply chain management to promote consumption of farmed freshwater fishes	64.5	Thiruvarur	0	0.00	1	64.50	0	0.00	0	0.00	0	0.00	1	64.50
ii	**Utilization of fish processing waste and by catch**														
	installation of waste rendering plant at selected fishing harbors and fish markets	130	Thiruvarur	0	0.00	1	130.00	0	0.00	0	0.00	0	0.00	1	130.00
	Development of fish compost for production of organic agricultural and horticultural crops	65	Thiruvarur	0	0.00	1	65.00	0	0.00	0	0.00	0	0.00	1	65.00
	Installation of unit for biogas from fish waste	161.5	Thiruvarur	0	0.00	1	161.50	0	0.00	0	0.00	0	0.00	1	161.50
	Development of technologies for effective utilization of shrimp shell waste	100	Thiruvarur	0	0.00	1	100.00	0	0.00	0	0.00	0	0.00	1	100.00

Sl. No	Interventions	Unit cost	Block Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
				Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
3	**Fisheries Engineering**														
i	**Aquacultural engineering**														
a	**Farm implements**														
	Deisgn and development of e interface gadgets for sustainable aquaculture	20	Thiruvarur	0	0.00	1	20.00	0	0.00	0	0.00	0	0.00	1	20.00
b	**Harvestors**														
	Deisgn and development of synchronised harvester for freshwater aquaculture	30	Thiruvarur	0	0.00	0	0.00	1	30.00	0	0.00	0	0.00	1	30.00
c	**Renewable energy technologies**														
	Design and development of renewable energy powered aerators for aquaculture	35	Thiruvarur	0	0.00	1	35.00	0	0.00	0	0.00	0	0.00	1	35.00
	Design and development of renewable energy powered feeders for aquaculture	50	Thiruvarur	0	0.00	0	0.00	0	0.00	1	50.00	0	0.00	1	50.00
d	**Automation technologies**														
	Developnment of mobile gadgets/apps for remote monitoring system for aquaculture farms	15	Thiruvarur	0	0.00	0	0.00	1	15.00	0	0.00	0	0.00	1	15.00
ii	**Navigation and Fisheries Engineering**														
	Development of cost effective gadgets for effective fishing	15	Thiruvarur	1	15.00	0	0.00	0	0.00	0	0.00	0	0.00	1	15.00
	Development of mobile apps for effective fishing	8	Thiruvarur	0	0.00	0	0.00	0	0.00	0	0.00	1	8.00	1	8.00

Sl. No	Interventions	Unit cost	Block Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
				Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
iii	**Post-harvest fisheries engg**														
a	**Handling, transportation and storage**														
	Design and development of handling devices/machines for fish processing	50	Thiruvarur	0	0.00	1	50.00	0	0.00	0	0.00	0	0.00	1	50.00
	Design and development of solar powered tricycle for fish vendors	2	Thiruvarur	1	2.00	1	2.00	1	2.00	1	2.00	0	0.00	4	8.00
b	**Processing machines**														
	Design and development of gadgets for fish processing	20	Thiruvarur	0	0.00	0	0.00	0	0.00	1	20.00	0	0.00	1	20.00
4	**Incubation centres**														
c	Establishment of incubation centre for value added product development	250	Thiruvarur	0	0.00	1	250.00	1	250.00	0	0.00	0	0.00	2	500.00
	Grand total				**318.73**		**1155.53**		**698.73**		**373.73**		**109.73**		**2656.45**

4.10. Public Works Department

Increasing the ground water level

Water is one of the most important natural resources. A large quantity of water is used for irrigation and there is an urgent need for proper water management in irrigation sector. The main source of irrigation in the district is canals. Canal irrigation is highest in the Mannargudi block, which is followed by Needamangalam block. Adverse climate change and over use of ground water resulted with ground water depletion. It is important to recharge the ground water by rain water harvesting. Hence, it is important to create facilities for increasing water harvesting mechanism to increase the production in agriculture. There is a need for farmer's participation not only inthe construction of infrastructure but also in its maintenance to reap the benefits. The farmers are to be trained and involved in thedevelopment and maintenance of these structures as a common property of the village. The livelihood of the people in this basin depends on agriculture only. Most of the canals and tanks are silted and bushes occupied major part of the tanks and canals, which are major source of flow water for tanks during the rainy period. There by storage capacity of the tank is very much reduced. Hence, to raise the water table level, construction of new tanks, grade wall and desilting of canals need to be taken up in Thiruvarur district to increase the storage capacity of the tanks and there by crop cultivation area in tank ayacut area may be increased.

Project components (furnished in table 9)

- Construction of a New Regulator in Koradacherry
- Forming new tanks in Muthupettai
- Construction of grade wall in Muthupettai

Budget

It is proposed to incur **₹.51.20 crores** over a period of five years

Expected outcome

The project will increase the Ground water table level and carrying capacity of canals during the heavy rain period and thereby increasing the crop cultivation area. This will result in the ensuring of food security for the people.

Implementing agency

Department of Public Works will be implementing the project.

Table.4.25 Budget for PWD works

(₹. in lakhs)

Sl. No	Intervention	Unit	Unit cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
1	Construction of a New Regulator across Konavoikkal drain at mile 7/6.	Ha	0.14	Koradachery	1075	150.00	0	0.00	0	0.00	0	0.00	0	0.00	1075	150.00
2	Construction of a New Tailend Regulator across New Kilaithangiyar drain at LS 9.300 km in Idumbavanam village of Thiruhturaipoondi Taluk in Thiruvarur District.	Ha	2.23	Muthupet	58.18	130.00	0	0.00	0	0.00	0	0.00	0	0.00	58.18	130.00
3	Construction of a New Tailend Regulator across Old Kilaithangiyar drain at LS 9.500 km in Thillaivilagam village of Thiruhturaipoondi Taluk in Thiruvarur District.	Ha	1.84	Muthupet	73.53	135.00	0	0.00	0	0.00	0	0.00	0	0.00	73.53	135.00

Sl. No	Intervention	Unit	Unit cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
4	Construction of a New Tailend Regulator across Maraikkakoraiyar at LS LS 22.500 km in Idumbavanam village of Thiruhturaipoondi Taluk in Thiruvarur Dt.	Ha	4.3	Muthupet	81.44	350.00	0	0.00	0	0.00	0	0.00	0	0.00	81.44	350.00
5	Forming new tank in Saluvanar padugai in Ezhilur village	Ha	0.45	Thiruthurai poondi	1782.97	800.00	0	0.00	0	0.00	0	0.00	0	0.00	1782.97	800.00
6	Forming new tank in Saluvanar padugai in Vanganagar village	Ha	0.49	Muthupettai	1624.78	800.00	0	0.00	0	0.00	0	0.00	0	0.00	1624.78	800.00
7	Forming new tank in Saluvanar padugai in Overkudi village	Ha	0.44	Thiruthurai poondi	1813.25	800.00	0	0.00	0	0.00	0	0.00	0	0.00	1813.25	800.00
8	Forming new tank in Valavanar at Melamaruthur village	Ha	0.12	Thiruthurai poondi	1279.72	150.00	0	0.00	0	0.00	0	0.00	0	0.00	1279.72	150.00
9	Desilting the bed of water spread area and supply channels in Udayamarthandapuram tank in Natchikulam Village of Muthupet union	Ha	0.53	Muthupet	474.71	250.00	0	0.00	0	0.00	0	0.00	0	0.00	474.71	250.00

Sl. No	Intervention	Unit	Unit cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	of Thiruthuraipoondi Taluk.															
10	Desilting the bed of water spread area and supply channels in Katchankottagam tank in Nochiyur Village of Kottur union of Mannargudi Taluk.	Ha	4.34	Kottur	57.66	250.00	0	0.00	0	0.00	0	0.00	0	0.00	57.66	250.00
11	Providing of dyke across Vennar at mile 66/7 (bed width 100m) in Kilariyam Village of Needamangalam taluk.	Ha	0.02	Koradachery	1265.45	25.00	0	0.00	0	0.00	0	0.00	0	0.00	1265.45	25.00
12	Rehabilitatoin of inlet and outlet channel to Kamalalayam tank in Thiruvarur District.	Ha	34.37	Tiruvarur	11.64	400.00	0	0.00	0	0.00	0	0.00	0	0.00	11.64	400.00
13	Providing of dyke across Vettar at mile 83/0. (bed width 80m) in Parvathamkovil pathu village of Thiruvarur Taluk and District.	Ha	0.04	Koradachery	1800	75.00	0	0.00	0	0.00	0	0.00	0	0.00	1800	75.00
14	Supplementary Source for Maraikkakoraiyar	Ha	0.02	Muthupet	3344.26	75.00	0	0.00	0	0.00	0	0.00	0	0.00	3344.26	75.00

Sl. No	Intervention	Unit	Unit cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	below Melaperumalai Regulator Palliyamedu Channel off take in LB of Koraiyar at LS 151.400 Km.															
15	Infrastructure development work by Constructing Grade wall across Solasudamaniyar river at mile 65/6-370 to feed in Arasur Moolangudi Channel in Ohai Village in Kudavasal Taluk in of Thiruvarur District.	Ha	0.45	Kudavasal	0	0.00	265.07	120.00	0	0.00	0	0.00	0	0.00	265.07	120.00
16	Infrastructure development work by Constructing Grade wall across Keerthimannar river at mile 72/7 to feed Serugudi channel in Serugudi Village of Kudavasal Taluk in Thiruvarur District.	Ha	1.2	Kudavasal	0	0.00	130.31	156.00	0	0.00	0	0.00	0	0.00	130.31	156.00

Sl. No	Intervention	Unit	Unit cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
17	Infrastructure development work by Constructing Grade wall across Noolar river at mile 83/5-6 to feed Menangudi channel and Kollapuram channel in Menangudi village of Nannilam Taluk in Thiruvarur District.	Ha	0.54	Nannilam	0	0.00	291.78	158.00	0	0.00	0	0.00	0	0.00	291.78	158.00
18	Infrastructure development work by Constructing Grade wall across Nattar river at mile 80/3 to feed Thalaiyur channel in Pangattankudi Channel and Alvarkattalai Channel in Thalaiyur village of Nannilam Taluk in Thiruvarur District.	Ha	0.56	Nannilam	0	0.00	264.67	148.00	0	0.00	0	0.00	0	0.00	264.67	148.00

Sl. No	Intervention	Unit	Unit cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
19	Infrastructure development work by Constructing Grade wall across Nattar river at mile 81/5 to feed Agarapavattagudi channel Kadiramangalam channel Pandaravadai channel and Grusthalam channel in Pandaravadai village of Nannilam Taluk in Thiruvarur District.	Ha	0.42	Nannilam	0	0.00	0	0.00	353.7	148.00	0	0.00	0	0.00	353.7	148.00
	Total					**4390.00**		**582.00**		**148.00**		**0.00**		**0.00**		**5120.00**

4.11. Agriculture Cooperation

Cooperatives all over the world have become an effective and potential instrument of economic development. The Cooperative Movement in Tamil nadu has witnessed over the decades substantial growth in diverse areas of economy. There is not a single major sphere ofeconomic activity which has not been touched by Cooperatives. Cooperatives are also envisaged as an instrument for implementing many important policies like agricultural credit, urban credit, market intervention, and price support for agricultural commodities through Cooperative Wholesale stores, PublicDistribution system etc., from a small beginning, the Cooperative movement in Tamil Nadu has grown in strength overthe years. From Agricultural Banks to Marketing societies and Consumer Cooperatives provide service to the people in various economic activities. Cooperatives also run the Public Distribution system which provides relief to each and every family in the state.

Project components

a) Office infrastructure in all blocks
b) Capital Asset Creation in all blocks

Budget

It is proposed to incur **₹.2656.90** lakhs over a period of five years

Expected outcome

The expected outcome for the project agricultural credit, urban credit, market intervention, and price support for agricultural commodities through Cooperative Wholesale stores, Public Distribution system. This will result in the ensuring of food security for the people.

Implementing agency

Department of Agriculture Cooperation will be implementing the project.

Table.4.26 Budget for Cooperation

(₹. in lakhs)

Sl. No	Co-operation	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
			Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	Infrastructure													
1	Construction of Complex Fertiliser Processing unit	B5	0	0.00	0	0.00	1	90.00	0	0.00	0	0.00	1	90.00
2	Construction of Compound wall	All blocks	18	140.49	33	223.34	26	190.40	3	32.41	0	0.00	80	586.64
3	Construction of Godown	B2,B4,B4,B5, B6,B7,B8	6	86.15	4	53.40	4	51.40	4	55.00	0	0.00	18	245.95
4	Construction of Office Building	All blocks except B4,B8	21	353.70	16	270.10	7	135.75	0	0.00	2	40.59	46	800.14
5	Establishment of Tractor Shed	B3,B4,B5,B6, B7,B8	20	211.85	2	3.16	0	0.00	0	0.00	0	0.00	22	215.01
6	Renovation of Godown	B3,B4,B6,B9, B10	12	31.00	0	0.00	0	0.00	0	0.00	0	0.00	12	31.00
7	Renovation of Office Building	All blocks	21	79.20	0	0.00	0	0.00	0	0.00	0	0.00	21	79.20
8	Strong Room construction	B3,B4,B6,B10	3	17.50	3	11.08	2	14.00	1	3.48	1	3.48	10	49.54
9	Strengthening of Cooperation Centres (Furniture's, Solar panel, Modern counter, Xerox machine, Air Conditioner, CCTV Camera, Bore well, Generator, UPS Battery, Cash Counting Machine, Invertor, Jewel Weighing Machine, Packing Machine, Purchase of computer and peripherals, Hand Billing	All Blocks	115	373.81	44	35.78	56	57.23	55	59.94	35	32.66	305	559.42

Sl. No	Co-operation	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
			Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	machine, LED Display for tender process, Purchase of Jewel Carat Meter, Smart Card Printing Machine, Burglary Alarm, Agricultural Equipments, Safety Locker, Purchase of Display racks, Defender Door, Purchase of Paddy drying machine, Automatic Printer machine, Conveyer, E-Tender process, Fork Lifter, Gunny Bag Stitching machine, Jewel tester, Pallets, Tarpaulin, Trolley and Printing Press machineries)													
	Total			**1293.70**		**596.86**		**538.78**		**150.83**		**76.73**		**2656.90**

Koradacherry - B1, Kottur - B2, Kudavasal - B3, Mannargudi - B4, Muthupettai - B5, Nannilam - B6, Needamangalam - B7, Thiruthuraipoondi - B8, Tiruvarur - B9, Valagaiman - B10

Table 4.27 Budget Abstract for Thiruvarur District

(₹.in lakhs)

Sl. No	Sectors	2017-18	2018-19	2019-20	2020-21	2021-22	Total
1	Agriculture	23721.44	22124.85	23024.71	23582.69	25800.55	118254.24
2	Horticulture	502.61	611.21	726.27	790.95	870.40	3501.44
3	Agricultural Engineering	8207.23	5032.13	4885.58	5715.33	4843.33	28683.60
4	Agricultural Marketing	8.46	8.46	8.46	199.71	9.71	234.80
5	Seed Certification & Organic Certification	23.36	14.36	1.00	1.00	1.00	40.72
6	Animal Husbandry	2420.55	2480.55	2305.55	2045.55	2195.55	11447.75
7	Animal Science Research (TANVAS)	0.00	0.00	0.00	0.00	0.00	0.00
8	Dairy Development	449.25	790.25	740.25	449.25	459.25	2888.25
9	Fisheries	40.00	65.00	77.00	40.00	640.00	862.00
10	Fisheries Research (TNFU)	318.73	1155.53	698.73	373.73	109.73	2656.45
11	Water Resource Organization (PWD)	4390.00	582.00	148.00	0.00	0.00	5120.00
12	Civil Supplies & Co-Operation	1293.70	596.86	538.78	150.83	76.73	2656.90
13	**Total**	**41375.33**	**33461.20**	**33154.33**	**33349.04**	**35006.25**	**176346.15**

The plan outlay for five years (2017-22) for Thiruvarur district is given in Table 4.17. Among the different activities, Agriculture sector requires huge financial outlay **(₹176346.15 lakhs)** Greater emphasis has been given to increase the productivity of crops in Thiruvarur district


KARNATAKA
KERALA
SRI LANKA