NATIONAL AGRICULTURE DEVELOPMENT PROGRAMME (NADP)

DISTRICT AGRICULTURE PLAN

THANJAVUR

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

NATIONAL AGRICULTURE DEVELOPMENT PROGRAMME (NADP / RKVY)

NADP

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2017

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EXECUTIVE SUMMARY

Thanjavur being the foremost district of the Cauvery delta occupies an important position in the agricultural map of Tamil Nadu. Since its formation, the district is called as the rice bowl of Tamil Nadu. It was bifurcated and a new district named Nagapattinam was formed during 1993. Nagapattinam district was also bifurcated into Nagapattinam and Thiruvarur districts during 1997. Thus the erstwhile district of Thanjavur has been trifurcated into Thanjavur, Nagapattinam and Thiruvarur. The District is bounded on the north by the Coleroon which separates it from Perambalur and Tiruchirapalli district, and on the East it is bounded by the Thiruvarur and Nagapattinam districts and on the South by the Palk Strait and Pudukkottai district and on the West by Pudukottai and Tiruchirapalli districts.

The geological formation of Thanjavur district is made up of cretaceous, Tertiary and Alluvial deposits and the major area is occupied by the Alluvial and Tertiary deposits. The cretaceous formations occur as a small patch in West and South-West of Vallam. These formations have a very thick lateritic cap consisting of impure lime stones and sand stones of silt, clay calcarious and argillaceous variety. In the coast, these formations are over laid by Cuddalore sand stone of tertiary age. The agricultural occupation of the district was well supported by the river Cauvery and its tributaries. Cauvery is considered to be the best of the rivers that drain the Southern Peninsula of India. Thanjavur district consists of 8 Taluks with an area of 3397Sq.km viz., Kumbakonam, Orathanadu, Papanasam, Pattukkottai, Peravurani, Thanjavur, Thiruvaiyaru and Thiruvidaimarudur. The district has a population of 22.16 lakhs (2001 Census). It is further sub - divided into 14 community development blocks. The district is having 59 town panchayats and 906 revenue villages.

The Agriculture Department is implementing various schemes to increase the production and productivity of a wide range of crops, cultivated in the district. The schemes implemented in the district are Integrated. Cereal Production Scheme, Sugarcane development programme, TANWABE, National Pulses Development Scheme, Integrated Cotton Development Scheme, Oilseed Production Programme, Oilseed Production scheme, Oil palm promotion scheme, Seed Production Scheme, Farmers' Training Centre, Crop Productivity Competitions, Part II Plan Schemes, Supply of tarpaulins to Agricultural Extension Centers, Revamping Agricultural Extension Centres, Coconut Development Scheme, Sugarcane Development Scheme, and Seed village scheme. In addition the Department of Horticulture is implementing National Horticulture Mission, Precision Farming and Integrated Horticulture Development Scheme. There is a lot of scope to further strengthen these schemes and dovetail them with the schemes under NADP.

The district plan covers a range of activities involving crop-specific as well as non-crop-specific development activities. Agriculture and allied sectors such as horticulture, agricultural engineering, agricultural marketing, seed certification, animal husbandry, dairy development, co-operation, public works department and fisheries are proposed to be developed under the NADP with investments on popularization of latest technologies, strengthening extension support, farmers training as well as strengthening the required infrastructure facilities needed to spur growth in agricultural and rural sectors. The Agricultural Engineering Department has submitted proposals to conserve water and improve water conveyance efficiency under various canal irrigation projects in the district. The sector-wise and year-wise budget outlay is summarized below.

Budget Abstract for Thanjavur District

(₹. In lakhs)

Sl. No	Sectors	2017-18	2018-19	2019-20	2020-21	2021-22	Total
1	Agriculture	19828.31	23515.66	25673.55	27175.52	31129.38	127322.41
2	Agricultural Research (TNAU)	466.00	411.00	416.00	26.00	431.00	1750.00
3	Horticulture	3128.01	3314.78	3591.48	3883.54	4165.83	18083.63
4	Agricultural Engineering	3097.04	2289.26	2114.08	2164.33	2517.04	12181.75
5	Agricultural Marketing	1744.74	1257.01	1554.96	1099.18	1295.55	6951.00
6	Seed Certification & Organic Certification	23.36	3.30	16.66	503.30	3.30	549.92
7	Animal Husbandry	2329.10	2104.70	1029.70	728.10	828.10	7019.70
8	Animal Science Research (TANUVAS)	514.72	971.33	1128.65	157.32	373.72	3145.74
9	Dairy Development	1439.00	1576.00	9911.00	2216.00	1406.00	16548.00
10	Fisheries	14.00	624.00	1319.00	510.00	660.00	3128.00
11	Fisheries Research (TNFU)	318.73	1155.53	698.73	373.73	109.73	2656.43
12	Water Resource Organization (PWD)	1299.00	243.10	307.35	97.61	0.00	1947.06
13	Civil Supplies & Co-Operation	766.85	400.95	398.83	317.29	161.08	2045.00
	Total	**34968.86**	**37866.62**	**48159.99**	**39251.92**	**43080.73**	**203328.64**

The plan outlay for five years (2017-22) for Thanjavur district is given in Table 4.28. Among the different activities, Agriculture and Horticulture sector requires huge financial outlay of the total plan outlay of **₹. 203328.64 lakh**. Greater emphasis has been given to farm mechanization and soil and water conservation measures as they have become pre-requisites to the implementation of modern technologies and also to increase the productive and potential of crops in Thanjavur district.

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 plans 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 Thanjavur 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 are discussed elaborately.

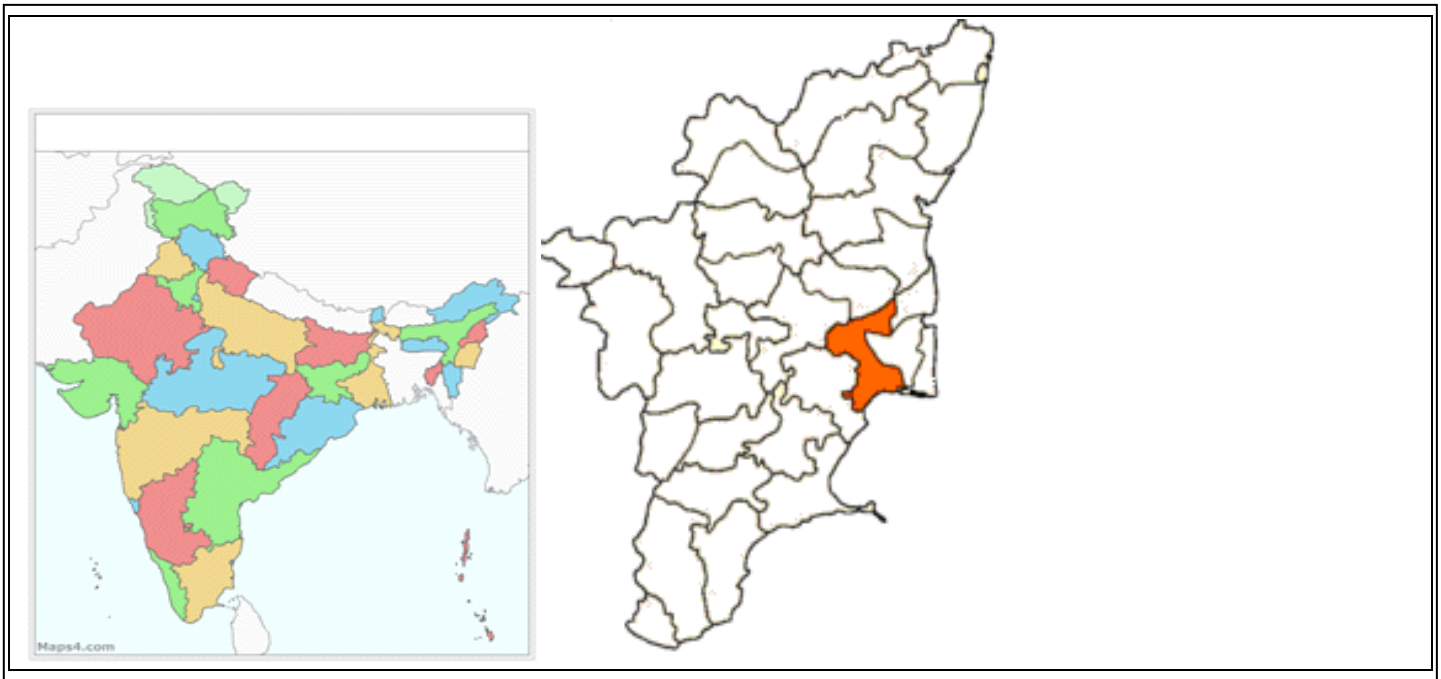
2.1 Thanjavur District at Glance

Thanjavur is called the rice bowl of Tamil Nadu. It is being the foremost district of the Cauvery delta. Thanjavur has been trifurcated now into Thanjavur, Nagapattinam (formed 1993) and Thiruvarur (formed 1997). The District is bounded on the north by the Coleroon which separates it from Perambalur and Tiruchirapalli districts, and on the East it is bounded by the Thiruvarur and Nagapattinam districts and the Palk Strait and Pudukottai district are bounded on the south while in the west it is bounded by Pudukottai and Tiruchirapalli districts (Fig.1).

The geological formation of Thanjavur district is made up of Cretaceous, Tertiary and Alluvial deposits. The economy of the district is, therefore, primarily agrarian in nature with very few industrial units.

The district can be divided into two distinct regions viz., the a) deltaic region, b) the upland area or non-deltaic region. The deltaic region covers the whole northern and eastern portions of the district where the Cauvery with its wide network of branches irrigate more than half of the district area.

It comprises the whole of Kumbakonam taluk and parts of Thanjavur, Papanasam taluks. The rest of the southern and western areas of the district are non-deltaic or upland region. A good portion of upland regions which was dry has now been brought under irrigation with the help of Grand Anaicut canal, fed by the Cauvery-Mettur Project and by extension of the Vadavar river and are now called new delta region**.**



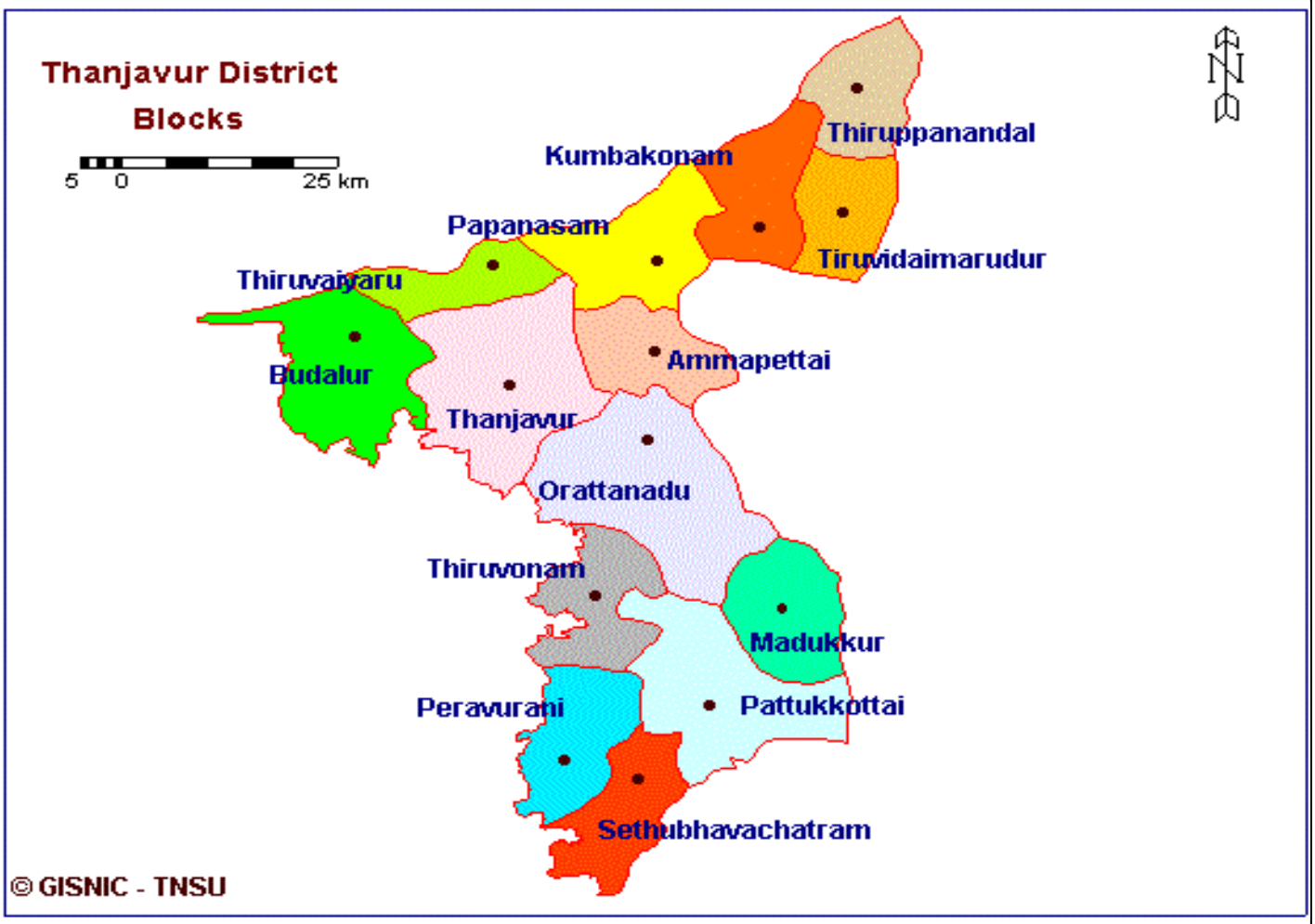


Fig.1. District Location in Tamil Nadu.

2.2 Area, Location and Geographical Features

Thanjavur is called the rice bowl of Tamil Nadu. It is being the foremost district of the Cauvery delta. Thanjavur has been trifurcated now into Thanjavur, Nagapattinam (formed 1993) and Thiruvarur (formed 1997). Thanjavur District lies in the East Coast of Tamil Nadu. It is located between 9°50' and 11°25' of the northern latitude and 78°45' and 70°25' of the Eastern longitude. The District is bounded on the north by the Coleroon which separates it from Perambalur and Tiruchirapalli districts, and on the East it is bounded by the Thiruvarur and Nagapattinam districts and the Palk Strait and Pudukottai district are bounded on the south while in the west it is bounded by Pudukottai and Tiruchirapalli districts.

2.3 Administrative Structure of Thanjavur District

The district has been divided into three revenue divisions viz.,a) Kumbakonam comprising of Kumbakonam, Papanasam and Thiruvidaimaruthur taluks, b) Thanjavur division comprising Thiruviyaru, Thanjavur and Orathanadu taluks and c) Pattukottai divison covering Pattukottai and Peravurani taluks. Thanjavur district is divided into eight taluks covering 14 Blocks. Fig.2 The taluks are 1. Kumbakonam, 2.Orathanadu (Orathanadu & Thiruvonam blocks), 3.Papanasam (Papanasam & Ammapettai blocks), 4 .Pattukottai (Pattukottai & Madukkur blocks), 5.Peravurani (Peravurani & Sethubahavachatram blocks), 6. Thanjavur (Thanjavur & Budalur), 7. Thiruvaiyaru and 8. Thiruvidaimaruthur (Thiruvidaimaruthur & Thirupanadal). There are 906 Revenue villages and 5869 Village panchayats in this district.

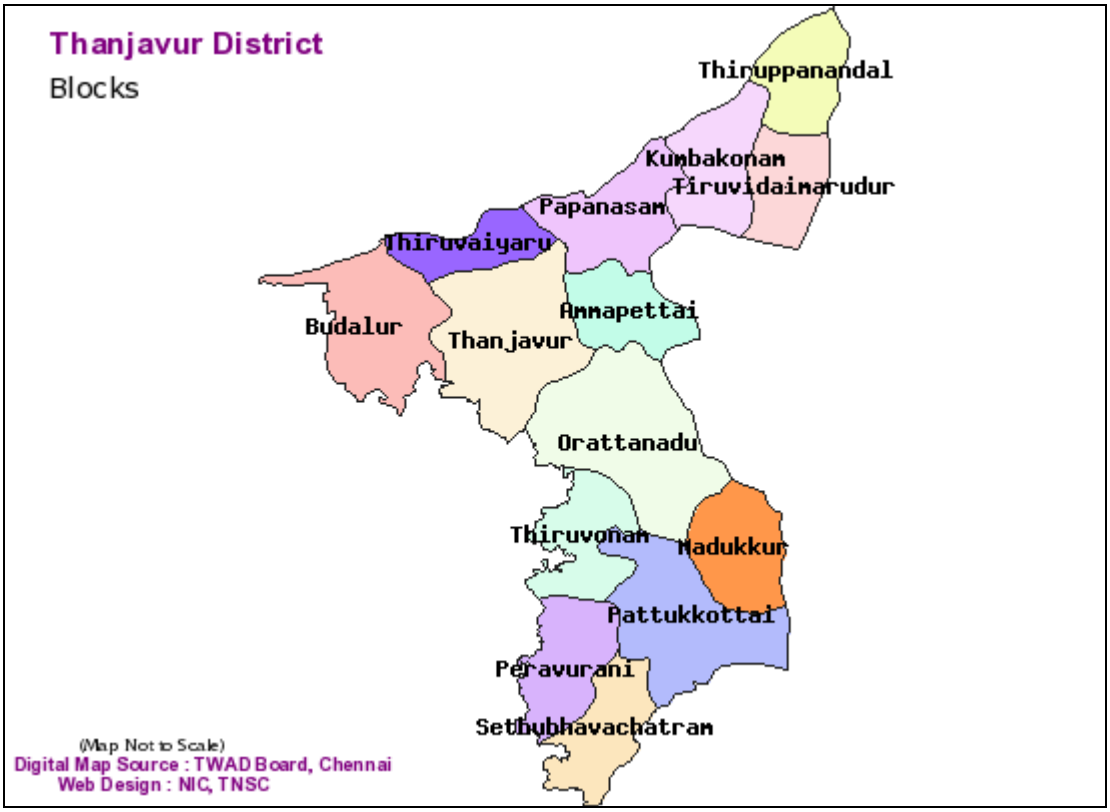


Fig 2 Blocks in Thanjavur District

2.4 Demographic Profile

2.4.1 Population and Literacy Level

The district has a population of 24.03 lakhs (2011 Census) which has been increased from 22.16 lakhs according to 2001 census, out of which about 66 percent live in rural areas and the rest live in urban areas shows more shift towards urban. The details are furnished below in Table.2.1.

From the initial provisional 2011 Census data released, the population density of Thanjavur district has increased from 652 to 707 persons per sq. km between the period and registering 8.44 per cent increase in the population pressure against the state population density of 555 persons per sq. km in 2011. It is also noted from the table that the child population had descended to 9.32 from 11.72 in the above period and particularly the child population decline was more in rural areas (2.64%) than in urban (1.9%).Thanjavur district administers 3,476 square kilometres of area.

Table.2.1 Demographic Transition in Thanjavur District

Particular /Indicator	Unit	Thanjavur		% change	Tamil Nadu		% change
		2001	2011		2001	2011	
Total population	(in lakhs)	22.16	24.03	8.44	624.06	721.39	15.60
Population density	(per sq km)	652	707	8.44	480	555	15.63
Sex ratio	No./ 1000 male	1,021	1031	0.98	987	995	0.81
Child sex ratio	No./ 1000 male	969	967	-0.21	968	961	-0.72
Rural population	(%)	66.22	64.61	-1.61	55.96	51.55	-4.41
Urban population	(%)	33.78	35.39	1.61	44.04	48.45	4.41
Male population	(in lakhs)	10.96	11.83	0.87	314.01	361.59	47.58
Female population	(in lakhs)	11.2	12.20	1	310.05	359.8	49.75
Rural population	(in lakhs)	14.68	15.52	0.84	349.22	371.89	22.67
Urban population	(in lakhs)	7.49	8.5	1.01	274.84	349.5	74.66
Overall literacy	(%)	75.45	82.72	7.27	73.45	80.33	6.88
Male literacy	(%)	84.67	89.06	4.39	82.42	86.81	4.39
Female literacy	(%)	66.70	76.61	9.91	64.43	73.86	9.43
Percentage of **child population** in total population (0-6 years)							
Total		11.72	9.32	-2.4	11.59	9.56	-2.03
Rural		12.1	9.46	-2.64	12.12	9.82	-2.3
Urban		10.96	9.06	-1.9	10.92	9.28	-1.64

Source: Census of India 2011, Statistical Hand Book 2011-2012

2.4.2 Working Population

The total workers in the district were 9.74 lakhs. The demographic details of the Thanjavur district are presented in the Table 2.2

Table 2.2 Workers in Thanjavur District

Description	Number	Percentage
Total workers	974079	100.00
a. Total main workers	834484	85.67
b. Marginal workers	139595	14.33
i. Cultivators	129913	13.34
ii. Agricultural labourers	415367	42.64
iii. Household industries	31200	3.20
iv. Other workers	397605	40.82

Source: Tamil Nadu An Economic Appraisal 2011-12 to 2013-14, Govt. of Tamil Nadu, Chennai - 108

The main occupation of the district is agriculture and allied activities. About 14.33 per cent of the total work force is engaged in the agricultural sector. The share of cultivators and agricultural labourers in the total number of workers in Thanjavur district constitute 13.34 per cent and 42.64 per cent of the total working population, respectively.

2.5 Topography

The geological formation of Thanjavur district is made up of Cretaceous, Tertiary and Alluvial deposits and the major area is occupied by the Alluvial and Tertiary deposits. The cretaceous formations occur as a small patch in West and South-West of Vallam. These formations have a very thick lateritic cap consisting of impure lime stones and sand stones of silt, clay calcarious and argillaceous variety, in the coast, these formations are over laid by Cuddalore sand stone of tertiary age.

The Cuddalore sand stone of Tertiary age are well developed as best seen, West of Grant Anaicut canal and near Orathanadu. These sand stones are covered by a thin layer of wind brown sandy clays, unconsolidated sand, clay bound sands and mottled clays with the lignite seams. This tertiary formation is invariably capped by laterite. In the east, the alluvial deposits of the river Cauvery and its tributaries lie over the Tertiary sand stone. They consist of sands, gravelly sands, clays and sandy clays. The thickness of these formations ranges from 30 Mt. to 400 Mt.

2.6 Soil type

In Thanjavur district, brown coloured soil is the maximum constituting nearly 65 per cent. Red soil and black soils are found in 19.30 and 15.97 percent of the area respectively. In Thanjavur district, 13 soil series were identified and the distribution of the various soil series is given in the Table 2.3 below. It could be seen from the table that Madukkur soil

series occupied 34.18 per cent of the area followed by Kalathur (15.90 per cent) and Padugai (11.27 per cent), Kallivayal soil series was the least which accounted for only 0.17 per cent.

Table.2.3 Distribution of Soils in Thanjavur district

Sl. No	Name of the Soil series	Soil series code	Productivity	Extent in ha.	% to total
1.	Madukkur	Klt	Average	1,10,573	34.18
2.	Kalathur	Pdg	Average	52,449	15.90
3.	Padugai	Pkt	Good	36,467	11.27
4.	Pattukkottai	Adn	Average	33,424	10.33
5.	Adhanur	Vlm	Average	30,642	9.47
6.	Vallam	Alt	Poor	13,045	4.03
7.	Alathur	Mud	Poor	12,111	3.74
8.	Mudukulam	Pvr	Average	9,266	2.86
9.	Peravurani	Klt	Extremely Poor	6.672	2.06
10.	Alangudi	Alg	Average	6,626	2.05
11.	Budalur	Bdl	Average	6,446	1.99
12.	Melkadu	Mlk	Extremely Poor	5,045	1.56
13.	Kallivayal	Klv	Extremely Poor	482	0.17
14.	Reserved Forest	RF		1,255	0.39
	Total			**323506**	**100**

Source: Soil Survey and Land use Organization, Thanjavur.

Table 2.4 Taluk wise Distribution of Soil in Thanjavur District

Sl. No.	Type of Soil	Places in District (With Area in Hectares) {Talukwise}								
		Thanjavur	Thiruvaiyarur	Orathanadu	Kumbakonam	Thirudaimaruthur	Papanasam	Pattukkottai	Peravuani	Grand Total
1	Madukkur	12641	-	46783	-	-	-	40469	10680	**110573**
2	Kalathur	14260	10523	-	8660	13051	4955	-	-	**51449**
3	Padugai	2119	14002	-	8903	4968	6475	-	-	**36467**
4	Pattukkottai	1463	-	6799	-	-	3651	12687	8824	**33324**
5	Adhanur	2213	3986	-	8499	8862	7082	-	-	**30642**
6	Vallam	13045	-	-	-	-	-	-	-	**13045**
7	Alathur	2523	-	1494	-	-	-	8094	-	**12111**
8	Mudukulam	6166	-	3100	-	-	-	-	-	**9266**
9	Peravurani	-	-	-	-	-	-	647	6025	**6672**
10	Alangudi	-	-	-	1596	324	4706	-	-	**6626**
11	Budalur	6449	-	-	-	-	-	-	-	**6449**
12	Melkadu	-	-	-	-	-	-	4397	648	**5045**
13	Kallivayal	-	-	-	-	-	-	158	324	**482**
14	Reserve Forest	-	-	-	-	-	-	1255	-	**1255**
Grand Total		**60879**	**28511**	**58176**	**27558**	**27205**	**26869**	**67707**	**26501**	**323406**

Source: The Joint Director of Agriculture, Thanjavur, 2010-11.

2.7 Climate and Rainfall

The performance of district agriculture is still heavily dependent on rainfall. Both south west and north east monsoons supported 85 per cent of total annual rainfall which is substantially deciding the performance of production and productivity of agriculture. The overall area coverage, production and productivity of crops largely depend on the timely onset of the monsoon, good distribution of rainfall and number of rainy days.

Table2.5 South West and North East Rainfall in Thanjavur District

(mm)

Year	South West (June-Sep)	North East (Oct-Dec)	Annual (June-May)
1999-00	147	63	942
2000-01	215	626	979
2001-02	264	450	989
2002-03	193	457	717
2003-04	364	463	1143
2004-05	354	639	1202
2005-06	303	953	1400
2006-07	253	445	811
2007-08	287	667	1133
2008-09	255	1015	1387
2009-10	270	811	1227
2010-11	391	837	1358
Average	**275**	**661**	**1107**
CV	**26.09**	**30.53**	**20.18**
Normal	**342**	**548**	**1053**
Share %	**32.48**	**52.04**	**100**

Source: (Source: Season and Crop Report, Dept. of Economics and Statistics, Chennai

The temporal and spatial spread of rainfall during South West monsoon had augmented much to store water in the reservoirs. In last four years, though the annual rainfall received exceeds the normal rainfall, the south west monsoon received comparatively lesser than normal amount which influenced the rainfed crop production.

The rainfall pattern (Figure 3) reveals the increasing trend in both annual and north east monsoon rainfall over years. However, 2002-03 and 2006-07 were observed as major drought years. It is also cautious to note that the year2014-15, the average rainfall

(964.66mm) is lower than normal rainfall (1031.1 mm) which is important for most of the irrigated and rainfed crops performance. (Table 2.6)

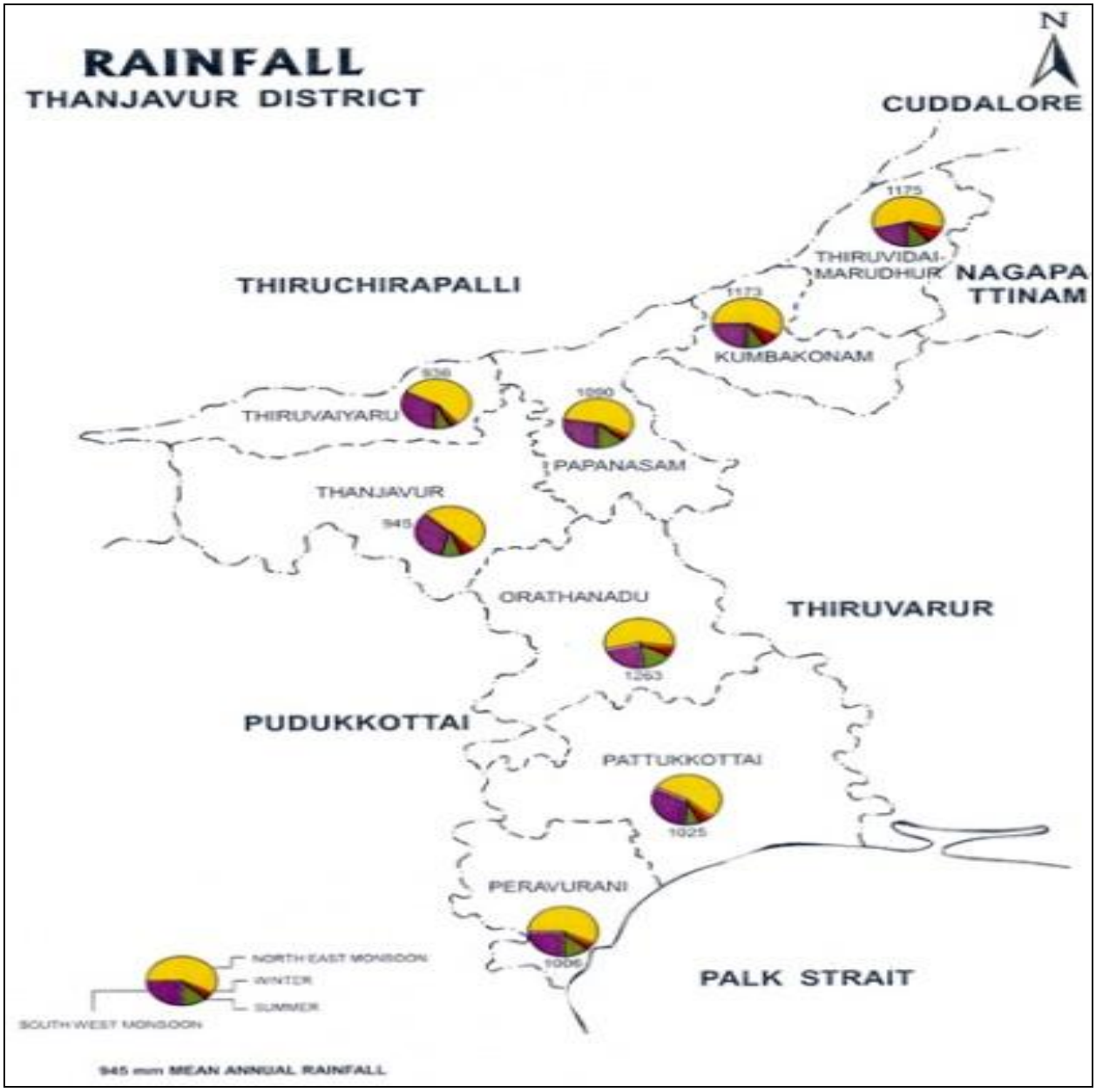


Fig 3 Rainfall of Thanjavur district

Table 2.6 Month wise / Season wise Rainfall Distribution in Thanjavur District

Season / Month	2014-15	
	Actual (mm)	Normal (mm)
South West Monsoon		
June	7.5	39.8
July	51.7	65
August	115.9	101.8
September	40.6	111.8
Total	**215.7(22.36)**	**318.4**
North East Monsoon		
October	233	183.8
November	175.6	219.2
December	140.5	147.3
Total	**549.1(56.92)**	**550.3**
Winter Season		
January	1.8	26.9
February	0	15.4
Total	**1.8(0.186)**	**42.3**
Hot Weather		
March	6.96	17.3
April	91.9	30.5
May	99.2	54.3
Total	**198.06 (20.53)**	**102.1**
Annual rainfall	**964.6(100)**	**1031.1**

Figures in parenthesis denote percentage to total annual rainfall
(Source: Season and Crop Report (2014-15),

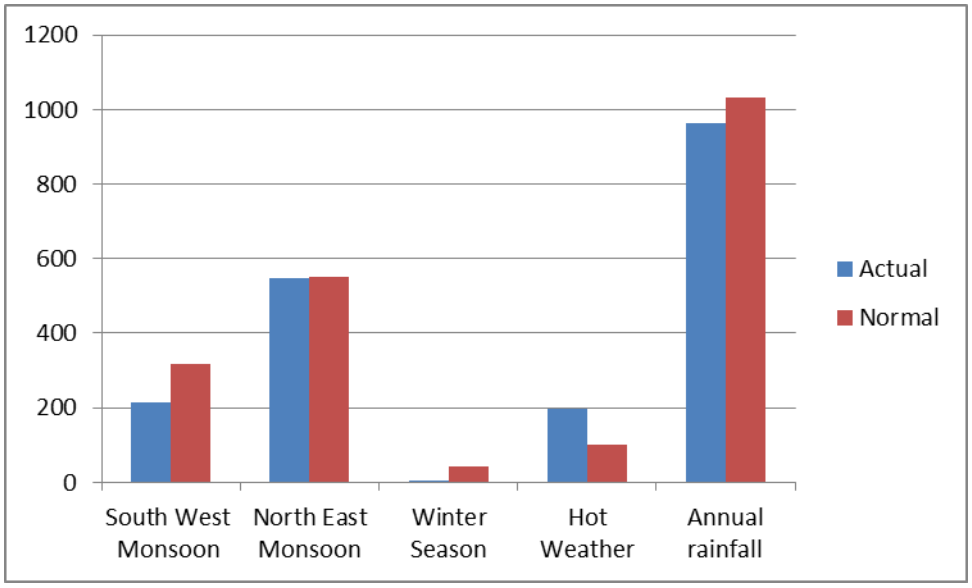


Fig.4. Rainfall Pattern in Thanjavur District in mm (2014-15)

2.8 Land

Thanjavur district consists of eight taluks with an area of 3397 sq.km viz., Kumbakonam, Orathanadu, Papanasam, Pattukkottai, Peravurani, Thanjavur, Thiruvaiyaru and Thiruvidaimarudur. It is further sub - divided into 14 community development blocks. There are 59 town panchayats and 906 revenue villages in Thanjavur district.

2.8.1 Land Use Pattern

The land use pattern in Thanjavur witnessed significant changes over last decade which throw light on the nature of the problems confronting the future development in agriculture. The land use pattern changes during 2014-15 were estimated and the same are presented in Table 2.7

The increase is accompanied by rapid urbanization and industrialization that took place in the district. Most often the extension of urban limits is always at the cost of viable agricultural lands. This has a negative impact on agriculture sector by diversion of fertile agricultural lands to non-agricultural purposes. Besides, it has also acted as a catalyst for transfers of water and labour force from agriculture to non-agricultural sector. It is cautious to note that the land area under current fallow category has increased more than two and half times.

Table 2.7 Land Use Pattern (2014-15)

Sl.No	Particulars	Area (ha)	per cent
1	Geographical Area	339657	100.00
2	Forest	3390	1.00
3	Barren & Uncultivable Area	2149	0.63
4	Land Put to Non-agricultural Uses	81737	24.06
5	Permanent Pastures & Other grazing lands	1218	0.36
6	Misc. tree crops & groves not incl. in the net area sown	5768	1.70
7	Current Fallow	13542	3.99
8	Other Fallow	28158	8.29
9	Net area sown	191598	56.41
10	Area sown more than once	79201	23.31
11	Gross area sown	270799	79.72

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

Table 2.8 Land Use Pattern of Thanjavur District (2014-15) Compound Growth Rates (2000-01 to 2011-12) per annum

Sl. No.	Classification	Area (ha)	CGR (%)
1	Forest	3390	-0.13
2	Barren and Uncultivable uses	2149	-0.29
3	Land put to Non-Agricultural uses	81737	0.47
4	Cultivable Waste	12141	-2.32
5	Permanent pastures and other Grazing Land	1218	-4.14
6	Land Under Miscellaneous Tree Crops and Groves not included in Net Area Sown	5768	-4.22
7	Current Fallow	13542	2.66
8	Other Fallow Land	28158	-2.22
9	Net Area Sown	191598	0.69
10	Total Geographical Area	339657	0.00
11	Area Sown More Than Once	85817	3.77
12	Total Cropped Area	270799	1.41
13	Irrigated Area	174746	

Area under current fallow is the precursor for shift from NSA to non-agricultural and urban usage. Hence, efforts need to be taken to bring back these lands for cultivation so as to increase the net cropped area of Thanjavur district. Another important change noted is that

the area under permanent pasture and other grazing lands and miscellaneous tree crops and groves not included in the NSA categories showed a sharp decline at 30 per cent over 2001-02 which drastically affect the livestock's-feed support for the existing live stocks. The decline trend in net sown area and area sown more than once resulted in reduction in cropping intensity from 133 per cent to 131 per cent in the above period.

2.8.2 Land Holdings Pattern

The land holding pattern in the district is given below in Table.2.9.

Table.2.9 Number and Area of Operational Holdings in Thanjavur District

Category of farmers	Number of holdings	% age to the total holdings 2010-11	Area operated (ha.)	% age to the area operated 2010-11
Marginal (below one ha.)	213782	76.96	75805	32.99
Small (1.0 - 2.0 ha)	38191	13.75	54198	23.59
Semi-medium (2.0 - 4.0)	18673	6.72	50951	22.17
Medium (4.0 - 10.0)	6407	2.31	36537	15.90
Large (above 10.0 ha)	720	0.26	12298	5.35
Total	277773	100	229789	100

Source: Agristat 2012, Director of Agriculture, Chennai

It could be revealed from the table above that the small holdings with a size of less than 2 ha constitute more than 90 per cent of the total number of holdings in the district and this category accounts for only about 13.75 per cent of the land area owned in 2010-11. On the other hand, the relatively larger land holdings with a size of more than 4 ha constituting about just 3.00 percent of the total number of holdings account for about 21 per cent of the total land owned in the district. However, the medium sized holdings with four to ten ha which constituted 2.31 per cent of the total holdings have accounted for nearly 16 per cent of the total area operated. Thus, there exists the skewed distribution of land among different farm sizes. Increasing pressure on labour scarcity and consolidation towards management and operational size for commercial agriculture and mechanization would happen to increase further productivity improvement.

2.9 Sources of Irrigation

The agricultural occupation of the district is well supported by the river Cauvery and its tributaries. Cauvery is considered to be the best of the river that drain the Southern Peninsula of India. With the river Cauvery irrigating the district, the cropping pattern followed was Paddy-Paddy-Rice fallow pulses/cotton/gingelly. The river flows from Karnataka State and passes through Dharmapuri, Salem, Erode, Namakkal, Thiruchirappali, Thanjavur, Thiruvarur and Nagapattinam districts of the Tamil Nadu state covering a distance of about 770 Kms. The river Cauvery flows through the entire Thanjavur district in different names through its tributaries and branches viz., Grand Anicut canal, Vennar, Pannaiyar, Koraiyar, Vettar, Kodamuritiyar, Thirumalairajanar, Arasalar, Veerasozhanar, Mudikondan, Noolar, Vanjiar, Vikaraman, Nattar, Kirtimanar, Nandalar, Majalar, Mahimalayar, Palavar, Cholasudamani, Puthar, Valappar, Vadavar, pamaniar, Mulliyar, Ayyanar, Adappar, Harichandranathi, Vellaiyar, Pandavaiyar, Odambogiyar, Kattar, Kaduvaiyar and all these branch off into a number of small streams. Canal water is the main source of irrigation for the district, however more changes in the share of different source of irrigation has taken place in the last decade.

Hence, the decadal changes in area irrigated by different sources were studied and the results are given in Table.2.10.

Table.2.10 Irrigation by Different Sources in Thanjavur District during 2014-15

Sl.No.	Source of irrigation		2012-13	2013-14	2014-15	Average
1	Canals	Gross	156643	162793	177861	165765.67
		Net	130676	132304	138358	133779.33
2	Tanks	Gross	21	0	53	24.67
		Net	21	0	44	21.67
3	Tube wells / Bore wells	Gross	49688	58925	63765	57459.33
		Net	35924	33638	43709	37757.00
4	Open wells	Gross	511	0	230	247.00
		Net	499	0	210	236.33
5	Supplementary wells	Gross	39016	38710	45471	41065.67
		Net	29430	30323	36374	32042.33
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

The cropping pattern change in Thanjavur district in last 10 years was analyzed and the results are presented in Table 2.11. Thanjavur district is an agricultural dominated district constituting 57 per cent of total geographical area under cultivation. However, as discussed elsewhere, the gross and net sown area were showing declining trend (more than 2%) over last decade. Particularly, paddy (-11.63 %), green gram (-24.53%), brinjal (-53.55%) and sugar cane (-15.96%) recorded huge reduction in their area. Cotton area declined to 76 times from 38052 ha in TE 2001-02 to 498 ha in TE 2010-11.

The declined trend was expressed in many crops viz., paddy, fruits and vegetables, cotton and sugarcane,in contrast the area in such a crops maize (0.6% to 0.8% of the GCA) pulses (39.05) and coconut (34.37 per cent) area were increased.

Table 2.11 Cropping pattern changes in Thanjavur district over Last decade (ha)

Crop	TE2001-02	% Share	TE2010-11	% share	Decadal change %
Paddy	190957	70.62	168747	63.70	-11.63
Maize	207	0.08	1665	0.63	703.05
Total cereals	**191196**	**70.71**	**170447**	**64.34**	**-10.85**
Red gram	67	0.02	73	0.03	9.45
Black gram	11637	4.30	20618	7.78	77.18
Green gram	6899	2.55	5207	1.97	-24.53
Total pulses	**18636**	**6.89**	**25912**	**9.78**	**39.05**
Banana	3386	1.25	3751	1.42	10.78
Mango	774	0.29	763	0.29	-1.42
Total fresh fruits	**5544**	**2.05**	**4708**	**1.78**	**-15.07**
Tapioca	70	0.03	256	0.10	264.45
Brinjal	277	0.10	129	0.05	-53.55
Bhendi	62	0.02	68	0.03	10.27
Total vegetables	**774**	**0.29**	**681**	**0.26**	**-11.97**
Cotton	38052	14.07	498	0.19	-98.69
Groundnut	7194	2.66	8263	3.12	14.86
Coconut	23888	8.83	32099	12.12	34.37
Gingelly	6062	2.24	6719	2.54	10.85

Crop	TE2001-02	% Share	TE2010-11	% share	Decadal change %
Sugarcane	11374	4.21	9559	3.61	-15.96
Spices and condiments	304	0.11	230	0.09	-24.53
Net sown area	**202818**	**75.00**	**197760**	**74.65**	**-2.49**
Gross cropped area	**270407**	**100**	**264928**	**100**	**-2.03**

Source: Various issues of Season and Crop reports; TE: Triennium ending

In general, cropping pattern changes towards commercial and low labour intensive crops was observed in Thanjavur district. The cropping pattern change noticed in Thanjavur district was mainly due to high labour scarcity, increased wage rates and crop specialization observed in many parts of the district. Hence, development of suitable crop plan for the existing resource endowment of soil productivity, canal and ground water support, labour scarcity, and regional specific crop suitability besides developing contingent plans for un-usual weather situation is important to increase the production and productivity of agriculture in Thanjavur.

2.10.1 Major Crops and Varieties grown

The major crops cultivated in Thanjavur district are paddy, pulses, gingelly, cotton, groundnut and sugarcane. The minor crops like maize, soyabean, and redgram are also grown in uplands.

2.10.2 Area under Different Crops

Table 2.12 Area under Major Crops (2014-15and Triennium Ending 2011-12)

Sl. No.	Crops	2014-15(Ha)	Triennium ending 2011-12(Ha)
1	Paddy	164001.33	170002
2	Maize	1239.33	1292
3	Black gram	19331.00	24340
4	Green gram	4276.67	5204
5	Ground nut	5364.00	7980
6	Coconut	35236.67	33030
7	Gingelly	6054.67	5493
8	Sugar cane	9856.00	9349
9	Banana	3193.67	3428
10	Mango	838.00	768
	TOTAL	**275298**	**260886**

(Source: Season and Crop Report 2011-12)

Table 2.13 Area under Major Crops of Thanjavur district in 2014-15

Sl.No	Particulars	Area (in ha)	Production (in tonnes)	Productivity (in kg/ha)
1	Paddy	164001.33	652932.33	3981.26
2	Maize	1239.33	7392.33	5964.78
3	Cholam	0.67	0.33	492.54
4	Cumbu	3.67	8.33	2269.75
5	Ragi	4.00	19.00	4750.00
6	Red Gram	33.33	37.67	1130.21
7	Black Gram	19331.00	13603.67	703.72
8	Green Gram	4276.67	2194.00	513.02
9	Groundnut	5364.00	18573.33	3462.59
10	Sunflower	23.67	32.33	1365.86
11	Gingelly	6054.67	3430.00	566.50
12	Cotton	1631.67	5378.67	3296.42
13	Coconut	35236.67	5351.33	151.87
14	Sugarcane	9856.00	1103357.33	111947.78
15	Onion	21.00	204.33	9730.00
16	Brinjal	193.33	1751.33	9058.76
17	Bhendi	74.00	543.67	7346.89
18	Tomato	1.67	22.67	13574.85
19	Banana	3193.67	139423.67	43656.25
20	Mango	838.00	5723.67	6830.16
21	Jack Fruit	50.67	830.00	16380.50
22	Pine Apple	0.33	8.33	25242.42
23	Guava	173.00	1069.00	6179.19
24	Chillies	35.67	24.00	672.83
25	Ginger	1.00	6.00	6000.00

Sl.No	Particulars	Area (in ha)	Production (in tonnes)	Productivity (in kg/ha)
26	Pepper	7.67	1.33	173.40
27	Turmeric	13.00	49.33	3794.62
28	Tamarind	161.67	375.33	2321.58
29	Tapioca	162.33	5234.00	32242.96
	Total	**251983.67**	**1967577.33**	323800.74

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

Block wise Area, Production Productivity are Presented from Table 2.14 to Table 2.20

Table 2.14 Area, Production and Productivity of Details for Latest Four Years

Sl. No	Name of the Crop	2011-12			2012-13		
		Area	Productivity (kg/ha)	Production (LMT)	Area	Productivity (kg/ha)	Production (LMT)
1	**a)Kuruvai**	40283	6540	2.6345	21655	6132	1.328
	b)Samba/Thaladi	140585	6180	8.6882	121942	4189	5.108
	c)Kodai	2186	5192	0.1135	4834	4588	0.222
	Total	183054		11.4362	148431		6.658
2	Total Millets (Kharif)	1361	5985	0.0815	803	5500	0.044
	Total Millets (Rabi)			0.0815			
	Total Millets	1361			803		0.044
3	Pulses						
	a)Red Gram	1			1		0.00
	b)Black Gram(Kharif)	11170	782	0.0873	17095	705	0.121
	b)Black Gram(Rabi)	28109					
	c)Green Gram	1	301	0	978	350	0.003
	d)Greem Gram (Rabi)	6073					
	e)Other Pulses	95	301	0.0003	80	350	0.00
	Total Pulses	45449		0.0876	18154		0.124
4	OilSeeds				36307		0.00
	a)Groundnut (Kharif)	1831	5122	0.0938	7046	4325	0.305
	b) Groundnut(Rabi)	6612					
	c)Gingelly	785	498	0.0039	4113	494	0.020
	d)Gingelly (Rabi)	3722					
	e)Sunflower	8	4200	0.0003	30	4100	0.001
	Total OilSeeds	12958		0.098	11189		0.326
5	Cotton	1055	1610	0.017	986	1740	0.017
6	Sugarcane	11399	101150	11.5301	10619	101005	10.726

Sl. No	Name of the Crop	2011-12			2012-13		
		Area	Productivity (kg/ha)	Production (LMT)	Area	Productivity (kg/ha)	Production (LMT)
	All Crops Total	255276		23.2504	190182		17.895
1	**a)Kuruvai**	28294	7151	2.023	31836	6560	2.08844
	b)Samba/Thaladi	131665	8193	10.787	128483	5803	7.45587
	c)Kodai	10718	4953	0.531	19489	5215	1.01365
	Total	170677		13.341	179808		10.56066
2	Total Millets (Kharif)	472	7539	0.036	1266	15550	0.19686
	Total Millets (Rabi)	1003	7050	0.0707	1266		
	Total Millets	1475		0.106			0.19686
3	Pulses						0.0000
	a)Red Gram	21	1000	0.0002	39	1550	0.00060
	b)Black Gram(Kharif)	2226	1212.6	0.027	4087	1350	0.05517
	b)Black Gram(Rabi)	22018	1100	0.2422	14196		
	c)Green Gram	0	1005	0.000	13	970	0.00013
	d)Greem Gram (Rabi)	6801			5158		0.0000
	e)Other Pulses	116	236	0.0003	120		0.0000
	Total Pulses	31272		0.270	23613		0.05591
4	OilSeeds						0.0000
	a)Groundnut (Kharif)	177	5325	0.0094	182	5670	0.01032
	b) Groundnut(Rabi)	4763			3865		0.0000
	c)Gingelly	1069	702	0.008	1034	710	0.00734
	d)Gingelly (Rabi)	6062			6032		0.0000
	e)Sunflower	11	4500	0.0005	5	4550	0.00023
	Total OilSeeds	12182		0.017	11118		0.01789
5	Cotton	1475	1875	0.0277	2036	1650	0.03359
6	Sugarcane	8352	108700	9.079	8918.0	99950	8.91354
	All Crops Total	224430		22.813	226759		19.77845

Table 2.15 Block wise Area, Production and Productivity of Major Fruit Crops (2013-14)

Sl. No	Name of the Block	Mango			Banana			Jack			Guava		
		Area (Ha.)	Pty. (Tons)	Prodn. (Tons)	Area (Ha.)	Pty. (Tons)	Prodn. (Tons)	Area (Ha.)	Pty. (Tons)	Prodn. (Tons)	Area (Ha.)	Pty. (Tons)	Prodn. (Tons)
1	Thanjavur	122.26	5.52	674.88	226.00	42.54	9614.04	12.83	8.97	115.09	43.50	11.03	479.81
2	Thiruvaiyaru	30.63	5.52	169.08	1179.00	42.54	50154.66	1.50	8.97	13.46	-	-	-
3	Budalur	160.42	5.87	941.67	207.50	43.76	9080.20	1.15	8.97	10.32	17.50	10.34	180.95
4	Orathanadu	73.00	6.23	454.79	114.82	42.12	4836.22	5.89	12.53	73.80	27.00	12.05	325.35
5	Thiruvonam	16.63	6.23	103.57	92.37	42.12	3890.62	2.28	12.53	28.57	0.50	12.05	6.03
6	Papanasam	97.35	5.52	537.37	409.00	42.54	17398.86	4.25	15.15	64.39	3.00	11.03	33.09
7	Ammapettai	28.31	6.23	176.37	34.01	42.54	1446.79	1.78	15.00	26.70	1.50	12.05	18.08
8	Thirupanandal	26.08	5.52	143.96	157.00	42.12	6612.84	1.93	15.00	28.95	0.50	11.03	5.52
9	Kumbakonam	88.00	5.00	440.00	292.00	42.54	12421.68	4.55	15.00	68.25	6.00	11.00	66.00
10	Thiruvidaimaruthur	122.00	5.00	610.00	230.00	42.00	9660.00	6.50	15.00	97.50	1.50	11.00	16.50
11	Pattukottai	29.52	5.52	162.92	9.83	42.54	417.96	0.60	15.12	9.07	0.08	11.03	0.88
12	Madukkur	30.69	5.52	169.41	12.72	42.54	541.11	8.70	15.12	131.54	0.50	11.03	5.52
13	Peravurani	24.12	5.52	133.14	29.54	42.54	1256.42	3.10	15.12	46.87	1.50	11.03	16.55
14	Sethubavachatram	15.00	5.52	82.80	14.46	42.54	615.13	0.50	15.12	7.56	-	-	-
Total		**864.01**	**78.72**	**4799.96**	**3008.25**	**594.98**	**127946.5**	**55.56**	**187.6**	**722.07**	**103.08**	**134.67**	**1154.28**

Table 2.15 Area, Production and Productivity of Major Fruit Crops (2013-14) (Contn.....)

Sl. No	Name of the Block	Sapota			Acid lime			Aonla			Total	
		Area (Ha.)	Pty. (Tons)	Prodn. (Tons)	Area (Ha.)	Pty. (Tons)	Prodn. (Tons)	Area (Ha.)	Pty. (Tons)	Prodn. (Tons)	Area (Ha.)	Prodn. (Tons)
1	Thanjavur	15.00	25.00	375.00	14.00	2.59	36.26	18.00	14.00	252.00	451.59	11547.07
2	Thiruvaiyaru	-	-	-	-	-	-	-	-	-	1211.13	50337.19
3	Budalur	7.00	18.50	129.50	25.00	2.59	64.75	24.50	13.62	333.69	443.07	10741.07
4	Orathanadu	-	-	-	0.50	2.85	1.43	-	11.73	0.00	221.21	5691.59
5	Thiruvonam	-	-	-	2.00	2.85	5.70	-	11.73	0.00	113.78	4034.49
6	Papanasam	0.18	25.00	4.50	3.50	-	-	-	-	0.00	517.28	18038.21
7	Ammapettai	-	-	-	2.00	2.85	5.70	4.00	11.73	46.92	71.60	1720.55
8	Thirupanandal	-	-	-	2.00	2.59	5.18	-	15.00	0.00	187.51	6796.45
9	Kumbakonam	-	-	-	4.00	2.59	10.36	-	15.00	0.00	394.55	13006.29
10	Thiruvidaimaruthur	-	-	-	7.00	2.59	18.13	-	15.00	0.00	367.00	10402.13
11	Pattukottai	-	-	-	-	-	-	-	14.00	0.00	40.02	590.83
12	Madukkur	-	-	-	1.50	2.59	3.89	-	14.00	0.00	54.11	851.46
13	Peravurani	-	-	-	0.65	2.59	1.68	-	-	0.00	58.91	1454.66
14	Sethubavachatram	-	-	-	0.50	2.59	1.30	-	-	0.00	30.46	706.78
	Total	**22.18**	**68.50**	**509.00**	**62.65**	**29.27**	**154.37**	**46.50**	**135.81**	**632.61**	**4162.21**	**135918.77**

Table 2.16 Area, Production and Productivity of Major Vegetable Crops (2013-14)

Sl. No	Name of the Block	Raddish			Tapioca			Brinjal			Bhendi			Onion		
		Area (Ha.)	Pty. (Tons)	Prodn. (Tons)	Area (Ha.)	Pty. (Tons)	Prodn. (Tons)	Area (Ha.)	Pty. (Tons)	Prodn. (Tons)	Area (Ha.)	Pty. (Tons)	Prodn. (Tons)	Area (Ha.)	Pty. (Tons)	Prodn. (Tons)
1	Thanjavur	-	-	-	16.83	40.36	679.26	34.00	11.10	377.40	18.72	7.49	140.21	2.00	13.50	27.00
2	Thiruvaiyaru	-	-	-	-	-	-	68.50	11.10	760.35	22.00	7.49	164.78	22.00	13.50	297.00
3	Budalur	-	-	-	-	-	-	10.99	11.20	123.09	13.00	7.45	96.85	2.00	13.72	27.44
4	Orathanadu	-	-	-	86.00	40.36	3470.96	5.85	12.25	71.66	19.00	7.90	150.10	2.00	13.72	27.44
5	Thiruvonam	-	-	-	-	-	-	1.00	12.25	12.25	7.00	7.90	55.30	-	-	-
6	Papanasam	20.00	20.00	400.00	23.10	40.36	932.32	27.26	11.10	302.59	11.98	8.00	95.80	2.00	8.67	17.34
7	Ammapettai	-	-	-	4.25	40.36	171.53	1.28	12.25	15.68	8.00	7.90	63.20	-	-	-
8	Thirupanandal	-	-	-	-	-	-	35.00	12.25	428.75	39.00	8.00	312.00	-	-	-
9	Kumbakonam	-	-	-	-	-	-	25.00	12.25	306.25	28.00	8.00	224.00	-	-	-
10	Thiruvidaimaruthur	-	-	-	-	-	-	6.00	11.10	66.60	16.00	8.00	128.00	-	-	-
11	Pattukottai	-	-	-	-	-	-				3.00	8.00	24.00	-	-	-
12	Madukkur	-	-	-	-	-	-	0.47	11.10	5.22	4.50	11.49	51.71	-	-	-
13	Peravurani	-	-	-	-	-	-	1.03	11.10	11.43	2.30	11.49	26.43	-	-	-
14	Sethubavachatram	-	-	-	-	-	-	-	-	-	1.80	11.49	20.68	-	-	-
Total		**20.00**	**20.00**	**400.00**	**130.18**	**161.44**	**5254.07**	**216.38**	**139.05**	**2481.27**	**194.30**	**120.60**	**1553.06**	**30.00**	**63.11**	**396.22**

Table 2.17 Area, Production and Productivity of Major Spice Crops (2013-14)

Sl. No	Name of the Block	Turmeric			Chillies			Pepper			Tamarind			Total	
		Area (Ha.)	Pty. (Tons)	Prodn. (Tons)	Area (Ha.)	Pty. (Tons)	Prodn. (Tons)	Area (Ha.)	Pty. (Tons)	Prodn. (Tons)	Area (Ha.)	Pty. (Tons)	Prodn. (Tons)	Area (Ha.)	Prodn. (Tons)
1	Thanjavur	-	-	-	5.00	0.71	3.55	-	-	-	3.00	2.32	6.96	8.00	10.51
2	Thiruvaiyaru	-	-	-	2.00	0.71	1.42	-	-	-	1.00	2.32	2.32	3.00	3.74
3	Budalur	-	-	-				-	-	-	17.00	2.15	36.55	17.00	36.55
4	Orathanadu	-	-	-	5.00	0.83	4.15	3.00	0.15	0.45	19.00	2.15	40.85	27.00	45.45
5	Thiruvonam	-	-	-	2.00	0.83	1.66	36.00	0.18	6.48	20.00	2.25	45.00	58.00	53.14
6	Papanasam	-	-	-	23.00	0.71	16.33	-	-	-	4.00	2.25	9.00	27.00	25.33
7	Ammapettai	-	-	-				-	-	-	4.00	2.25	9.00	4.00	9.00
8	Thirupanandal	-	-	-	4.00	0.71	2.84	-	-	-	9.00	2.32	20.88	13.00	23.72
9	Kumbakonam	5.00	5.75	28.75	3.00	1.00	3.00	-	-	-	23.00	2.32	53.36	31.00	85.11
10	Thiruvidaimaruthur	1.00	5.75	5.75	5.00	1.00	5.00	-	-	-	16.00	2.32	37.12	22.00	47.87
11	Pattukottai	-	-	-	-	-	-	0.90	0.18	0.16	4.00	2.32	9.28	4.90	9.44
12	Madukkur	-	-	-	-	-	-	-	-	-	11.00	2.32	25.52	11.00	25.52
13	Peravurani	-	-	-	1.00	1.00	1.00	-	-	-	2.00	2.32	4.64	3.00	5.64
14	Sethubavachatram	-	-	-	1.00	1.00	1.00	-	-	-	6.00	2.32	13.92	7.00	14.92
Total		**6.00**	**11.50**	**34.50**	**51.00**	**8.50**	**39.95**	**39.90**	**0.51**	**7.09**	**139.00**	**31.93**	**314.40**	**235.90**	**395.94**

Table 2.18 Area, Production and Productivity of Major Plantation Crops (2013-14)

Sl. No	Name of the Block	Cashew			Arecanut			Cocoa			Betelvine			Total	
		Area (Ha.)	Pty. (Tons)	Prodn. (Tons)	Area (Ha.)	Pty. (Tons)	Prodn. (Tons)	Area (Ha.)	Pty. (Tons)	Prodn. (Tons)	Area (Ha.)	Pty. (Tons)	Prodn. (Tons)	Area (Ha.)	Prodn. (Tons)
1	Thanjavur	1263.45	0.40	505.38	-	-	-	8.35	0.75	6.26	-	-	-	1271.80	511.64
2	Thiruvaiyaru	-	-	-	1.20	2.89	3.47	1.50	0.75	1.13	81.00	22.00	1782.00	83.70	1786.59
3	Budalur	26.50	0.40	10.60	-	-	-	4.00	0.75	3.00	-	-	-	30.50	13.60
4	Orathanadu	145.85	0.40	58.34	4.50	2.89	13.01	37.00	0.60	22.20	-	-	-	187.35	93.55
5	Thiruvonam	39.62	0.40	15.85	3.78	2.89	10.92	53.00	0.75	39.75	-	-	-	96.40	66.52
6	Papanasam	-	-	-	2.00	2.89	5.78	3.50	0.75	2.63	61.68	22.00	1356.85	67.18	1365.26
7	Ammapettai	14.80	0.40	5.92	-	-	-	6.00	0.75	4.50	-	-	-	20.80	10.42
8	Thirupanandal	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00
9	Kumbakonam	-	-	-	2.50	2.89	7.23	5.50	0.75	4.13	3.00	22.00	66.00	11.00	77.35
10	Thiruvidaimaruthur	-	-	-	1.00	2.89	2.89	-	-	-	7.00	22.00	154.00	8.00	156.89
11	Pattukottai	5.20	0.40	2.08	-	-	-	17.00	0.75	12.75	-	-	-	22.20	14.83
12	Madukkur	-	-	-	-	-	-	84.00	0.75	63.00	-	-	-	84.00	63.00
13	Peravurani	34.05	0.45	15.32	-	-	-	68.00	0.75	50.66	-	-	-	102.05	65.98
14	Sethubavachatram	-	-	-	-	-	-	74.00	0.75	55.13	-	-	-	74.00	55.13
Total		**1529.47**	**2.85**	**613.49**	**14.98**	**17.34**	**43.29**	**361.85**	**8.85**	**265.13**	**152.68**	**88.00**	**3358.85**	**2058.98**	**4280.76**

Table 2.19 Area, Production and Productivity of Major Flower Crops (2013-14)

Sl. No	Name of the Block	Rose			Jasmine			Tube Rose			Other Flowers			Total	
		Area (Ha.)	Pty. (Tons)	Prodn. (Tons)	Area (Ha.)	Pty. (Tons)	Prodn. (Tons)	Area (Ha.)	Pty. (Tons)	Prodn. (Tons)	Area (Ha.)	Pty. (Tons)	Prodn. (Tons)	Area (Ha.)	Prodn. (Tons)
1	Thanjavur	48.40	7.25	350.90	4.00	6.43	25.72	8.00	10.00	80.00	18.00	10.00	180.00	78.40	636.62
2	Thiruvaiyaru	-	-	-	-	-	-	-	-	-	12.00	10.00	120.00	12.00	120.00
3	Budalur	1.00	7.25	7.25	8.00	6.43	51.44	-	-	-	1.00	10.00	10.00	10.00	68.69
4	Orathanadu	-	-	-	4.00	5.25	21.00	-	-	-	-	-	-	4.00	21.00
5	Thiruvonam	-	-	-	-	-	-	-	-	-	2.00	10.00	20.00	2.00	20.00
6	Papanasam	-	-	-	-	-	-	-	-	-	10.00	10.00	100.00	10.00	100.00
7	Ammapettai	-	-	-	-	-	-	1.00	9.00	9.00	-	-	-	1.00	9.00
8	Thirupanandal	-	-	-	-	-	-	-	-	-	31.00	10.00	310.00	31.00	310.00
9	Kumbakonam	30.32	7.25	219.82	20.00	7.75	155.00	-	-	-	18.00	10.00	180.00	68.32	554.82
10	Thiruvidaimaruthur	-	-	-	2.00	7.75	15.50	-	-	-	1.00	10.00	10.00	3.00	25.50
11	Pattukottai	-	-	-	-	-	-	-	-	-	1.00	10.00	10.00	1.00	10.00
12	Madukkur	1.00	7.25	7.25	-	-	-	-	-	-	1.00	10.00	10.00	2.00	17.25
13	Peravurani	-	-	-	2.00	7.75	15.50	-	-	-	2.00	10.00	20.00	4.00	35.50
14	Sethubavachatram	-	-	-	-	-	-	-	-	-	1.00	10.00	10.00	1.00	10.00
Total		**80.72**		**585.22**	**40.00**	**41.36**	**284.16**	**9.00**	**19.00**	**89.00**	**98.00**	**120.00**	**980.00**	**227.72**	**1938.38**

Table 2.20 Area, Production and Productivity of Major Medicinal plants (2013-14)

Sl. No	Name of the Block	Vasambu			Aloe vera			Vettiver			Senna			Total	
		Area (Ha.)	Pty. (Tons)	Prodn. (Tons)	Area (Ha.)	Pty. (Tons)	Prodn. (Tons)	Area (Ha.)	Pty. (Tons)	Prodn. (Tons)	Area (Ha.)	Pty. (Tons)	Prodn. (Tons)	Area (Ha.)	Prodn. (Tons)
1	Thanjavur	-	-	-	-	-	-	2.77	2.80	7.76	5.00	2.00	10.00	7.77	17.76
2	Thiruvaiyaru	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	Budalur	-	-	-	3.00	14.60	43.80	-	-	-	-	-	-	3.00	43.80
4	Orathanadu	-	-	-	-	-	-	-	-	-	1.00	2.00	2.00	1.00	2.00
5	Thiruvonam	-	-	-	-	-	-	0.50	2.80	1.40	-	-	-	0.50	1.40
6	Papanasam	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Ammapettai	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Thirupanandal	16.00	9.50	152.00	-	-	-	-	-	-	-	-	-	16.00	152.00
9	Kumbakonam	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	Thiruvidaimaruthur	-	-	-	-	-	-	-	-	-	2.00	2.00	4.00	2.00	4.00
11	Pattukottai	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	Madukkur	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	Peravurani	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	Sethubavachatram	-	-	-	-	-	-	0.50	2.80	1.40	-	-	-	0.50	1.40
Total		**16.00**	**9.50**	**152.00**	**3.00**	**14.60**	**43.80**	**3.77**	**8.40**	**10.56**	**8.00**	**6.00**	**16.00**	**30.77**	**222.36**

2.11 Consumption of Chemical Fertilizers and Pesticides

The consumption pattern of Nitrogen, Phosphorus and Potassium fertilizers is given below in Table 2.21. A look at the use of fertilizer reveals that the farmers are using more quantity of nitrogenous fertilizers than any other form of inorganic fertilizers. The reason attributed could be the subsidized prices of nitrogenous fertilizers and the lack of knowledge about the importance of the balanced fertilizer application. The district fertilizer consumption constitutes about six per cent state fertilizer use. The per hectare fertilizer use in the district was relatively higher than the state figure, particularly nitrogen and potash were 161 and 71 kg/ha against 118.5 and 57 kg/ha for state. However, the pesticide chemicals in terms of dust and liquid use were relatively low in the district due to less area in vegetable and high chemical consuming crops.

Table.2.21 Fertilizer use in Thanjavur district

Fertilizer/chemical	Consumption 2010-11 (tons)		% Share to state	Consumption (kg/ ha)	
	Thanjavur	State		Thanjavur	State
Nitrogenous (N)	43080	660495	6.52	161.2	118.5
Phosphatic (P)	15253	288726	5.28	57.1	51.8
Potassic (K)	18922	316695	5.97	70.8	56.8
Total (NPK)	77255	1265917	6.10	289.0	227.2
Dust(MT)	3.62	3507.5	0.10	0.01	0.63
Liquid(Lit)	16870	4526180	0.37	63.1	812.3

Source: Hand book of Statistics, Govt. Tamil Nadu, 2012

2.15 Agricultural Marketing and Regulated Markets

1. To ensure remunerative price for agricultural produce through regulated markets.
2. To facilitate marketing of agricultural produce through regulated market infrastructure facilities, forming agricultural produce committees and co-ordination of marketing.
3. To make farmers aware of the benefits of grading, storing and value addition of their agriculture produce using the facilities in the regulated markets by and advertising through media and providing training.

Consistent production and sustaining the farm income needs strong marketing support. The marketing facilities available in Thanjavur are presented in Table 2.22.

Table 2.22 Marketing Facility in Thanjavur

Marketing	Thanjavur	Tamil Nadu	% share
No. of regulated markets	13	277	4.69
No. of sub-regulated markets	4	15	26.67
Quantity arrivals (lt)	0.45	17.73	2.54
Receipts (Lakhs Rs)	524	6428	8.15
Rural Godowns	4	108	3.70
Commercial grading centre	1	29	3.45

Source: Hand book of Statistics, Govt. Tamil Nadu, 2010

It could be seen from the Table 2.22 thatThanjavur district have four sub yards operated in Thanjavur with the total arrivals of 45 thousand ton of agricultural produce in 2007-08 fetching revenue of Rs 5.2 crores. Besides that, four rural storage godowns and a commercial grading centre serving to the farming community. As regards the performance of regulated markets, they are yet to make headway. Co-operative marketing society is not functioning in the district at present. There are four Farmers' Markets (*Uzhavar Sandhai*) functioning in the district.

Thanjavur Market Committee which is doing an excellent job since 1962.The Thanjavur Market Committee encompasses the entire revenue district of Thanjavur as its notified area. There are 13 regulated markets under Thanjavur Market Committee and each is having its own notified area.

2.14 Storage Facilities

Thanjavur district being a major rice production centre, the availability of storage facility by different agencies like Department of Agriculture, Food Corporation of India, Co-operatives Department, Tamil Nadu Civil Supplies Corporations, Panchayat unions godowns, Marketing Committee and Regulated Markets play key roles in storing the agricultural commodities produced from this district in supporting the price stabilization programme besides, continuous supply for paddy to the private and government modern rice mills.

Co-operatives and Tamil Nadu Civil Supply Corporation constitutes three fourth of the total storage facility of 64 thousand tonnes (t) in the district is followed by Regulated Market and Committees support with the storage capacity of 9.40 t. Thanjavur, Kumbakonam and

Pattukkottai are the major developmental blocks in which Tamil Nadu Civil Supply Corporations and the Co-operative departments had constructed large size godowns considering good road and rail network for their easy product movements to the processing mills located within and outside the district. The block-wise storage facilities by different agencies are presented in Table 2.23.

Besides the 64 t tones of closed storage facility, TNCSC procured about 50 per cent of total annual paddy production and stored in open (Cap Storage Points) and closed (less 20% to total storage capacity) godowns. TNCSC had 12 Cap storage points with a storage capacity of 228.5 t besides having own godown in their 3 modern rice mills (26.1 t), 3 covered godowns (27.8 t). In order to improve the quality of the stored paddy in open storage system (Cap storage points), suitable upgraded technology needs to be followed to avoid quality loss before reaching to the modern rice huller mills (around 50 numbers) under their contract.

Table 2.23 Block wise Distribution of Storage Facilities by Different Agency

Block	Agriculture		Food corporation		Co-operation		Civil supplies		Panchayat union		Marketing committees		Regulated markets		Total		Per cent
	No.	tones	No.	tones	No.	tones	No.	tones	No.	tones	No.	tones	No.	tones	No.	tones	
Thanjavur	-	-	-	-	55	8560	3	9800	2	2442	-	-	-	-	60	2080	32.55
Peravurani	3	75	-	-	-	-	2	2520	3	0.4	-	-	-	-	8	2595	4.06
S.B.Chatram	4	75	-	-	-	-	-	-	3	60	-		-		7	135	0.21
Thiruvonam	3	60	-	-	-	-	-	-	3	60	-	-	-	-	6	120	0.19
Budalur	4	120	-	-	1	10	-	-	1	5	3	1895	-		9	2030	3.18
Papanasam	4	120	-		11	517	1	1500	2	200	-	-	1	480	19	2817	4.41
Ammapettai	4	500	-	-	16	800	12	2100	1	100	-	-	-	-	33	3500	5.48
Thirupanandal	3	150	-	-	13	650	-	-	2	100	-	-	-	-	28	900	1.41
Pattukottai	3	70	-	-	23	2540	6	4975	-	-	-	-	-	-	32	7585	11.87
Kumbakonam	3	100	-	-	13	780	8	8650	1	25	4	7500	-	-	29	1705	26.69
Orathanadu	6	112	-	-	-	-	1	2000	1	70	-	-	-	-	8	2182	3.41
Thiruvidaimaruthur	4	80	2	400	15	750	8	800	1	50	-	-	-	-	30	2080	3.25
Madukkur	1	10	-	-	11	1108	-	-	2	200	-	-	-	-	14	1318	2.06
Thiruvaiyaru	5	70	-	-	-	-	1	210	2	150	-	-	3	360	11	790	1.24
District	**47**	**1542**	**2**	**400**	**103**	**15715**	**39**	**32555**	**22**	**3462**	**7**	**9395**	**4**	**840**	**234**	**63909**	**100**
Per cent share	**20.0**	**2.41**	**0.85**	**0.63**	**44.0**	**24.6**	**16.6**	**50.94**	**9.40**	**5.42**	**2.99**	**14.70**	**1.71**	**1.31**	**100**	**100.0**	

Source: Department of Agriculture, O/o JDA,Thanjavur

2.15 Animal Husbandry and Dairy Development

2.15.1 Livestock population

Table 2.24 Livestock population in 2014-15

Sl.No.	Particulars	Population
1	Cattle	387008
2	Buffaloes	11689
3	Sheep	40004
4	Goats	393915
5	Horses and ponies	129
6	Donkeys	11
7	Camels	0
8	Pigs	3131
	Total Livestock	**835887**
9	Elephants	0
10	Dogs	63206
11	Rabbits	1335
	Poultry	
13	Back yard Poultry	602999
13	Farm Poultry	181624
	Total Poultry	**784623**

Source: 19th livestock census, 2012

The total livestock population in the Thanjavur block is 835887 Numbers. Poultry population is higher in this district. From the below table it can be inferred that 387008 nos of the population thrives under cattle and goat (393915 No's). Other than cattle and goat, the farmers are rearing sheeps and pigs. The detail on total livestock production in the district is presented in Table 2.24.Creating suitable plan for production fodder in cropping system and improving the grassing lands in low productive soils would help to sustain the livestock population and increase off-farm income to the mono-crop cultured district of Thanjavur. Milk yield is presented in Table 2.25

Table 2.25 Milk Yield

Sl. No	Type of Animals	Thanjavur		
		Potential	Actual	Reason
1	Cow			
	1.Local	600	300	Poor nutrition and Management
	2.Cross Breed	2500	1250	
2	Buffalo			
	1.Local	-	-	-
	2.Cross Breed	-	-	

Source: TANUVAS, Chennai

2.15.1 Infrastructure

The different blocks in the district holds veterinary hospitals and dispensaries. There are about 98 dairy co-operative societies and 101 veterinary clinics available.

Table 2.26 Infrastructure Facilities in Tanjavur District

Sl. No	Name	Thanjavur
1	Dairy co-operative society	98
2	Veterinary Clinics	101
	1.V.H	-
	2.V.D	-
	3.Sub Centre	-
	4.Mobile Unit	-
	5.RVD	-
3	Milk Collection Centre	Yes
	1.Bulk Milk Coolers	-
	2.Chilling Centre	-

Source: TANUVAS, Chennai

2.15.2 Poultry Development

Table 2.27 Poultry Development

Sl.	Name of the Block	Chicks produced in Hatcheries	Birds sold for Breeding	Birds sold for Food (In Lakh Nos.)
Thanjavur District		**Nil**	**Nil**	**19.17***
		(* Estimated particulars)		

2.15.3 Fisheries

Thanjavur is one of the 13 maritime district of Tamil Nadu engaged in marine fishing and its fish production is about 5 per cent of the total catch of the State. The State has a total coast line of 1,076 km embedded with 442 fishermen villages of which Thanjavur district occupies 45.1 km stretch in Palk Strait. It has 27 fishing villages in the district from Thambikkottai in Pattukkottai taluk in the north and Sembagamadevi Pattinam in Peravurani taluk in the south. The total inland fish production is 11,530 tonnes and the respective figure for the marine fish production is 9,020 tonnes.

Out of 4,899 families, 490 families are living in terraced houses, 874 families are living in tiled houses, 736 families are living in fishermen free houses and remaining 2,799 families are living in thatched houses. The census data further reveals there are 370 mechanised boats which are operated from Kallivayalthottam, Mallippattinam and Sethubavachathram fishing villages. There is a T Jetty in Mallippattinam coastal village constructed in 1980 to facilitate easy landing of the catches of mechanised boats. Around 2,500 fishermen were involved in mechanised fishing operations. In addition to the mechanised boats, 924 plank built boats and 107 cattamarans are also operated from the coastal villages providing employment opportunity for more than 3,000 fisherman of this district.

Thanjavur district is also richest in inland fishing due to the presence of Cauvery river system. The irrigation channels, canals, major and minor tanks are the richest in fish varieties. The inland fishing consists mostly of local carps, major carps and other varieties such as cat fish, murrells, tilapia etc., About 5,000 inland fishermen are engaged in fishing. Seeds of catla, rohu, mrigal and common carp are also produced at the Fisheries Department, Fish Seed Production Centre. Silver carp and grass carps early fry are brought from West Bengal and reared by private fish seed producers. Enormous number of fishermen are engaged in fish production by culture methods. Fishing rights in rivers, channels, tanks and water bodies of Forest Department have to be leased out only to Fishermen Co-operative Societies on priority basis and in turn these societies will lease out the fishing rights to its members.

i) Coastal Fisheries

Thanjavur is one of the 13 maritime districts of Tamil Nadu state engaged in Marine Fishing and its fish production is about five per cent of the total catch in the state. The State hasa total coastal line running upto 1076 Kms embedded with 442 fishermen villages of which Thanjavur District occupies 45.1 Kms stretch in Palk Strait with 27 fishing villages in from Thambikkottai in Pattukkottai Taluk in the North and Sembagamadevi Pattinam in

Peravurani taluk in the South. The coastal aquaculture is being done in an area of 822 ha. whereas the inland aqua culture has an area of 2400ha. The following statement shows the fishermen population details of the District.

- □ Total number of Families: 4899
- □ Total number of male children: 4858
- □ Total number of Female Children: 5050
- □ Total number of Adult Male: 8094
- □ Total number of Adult Female: 7376
- □ Total number of Male: 12952
- □ Total number of Female: 12426
- □ Total Population: 25378

The census data further reveals that there are 370 mechanized boats which are operated from Kallivayalthottam, Mallippattinam and Sethubavachathram fishing villages. There is a “T“Jetty in Mallippattinam coastal village constructed in 1980 facilitates the easy landing of the catches of Mechanised Boats. About 2500 fishermen were involved in mechanised fishing operations. In addition to the mechanised boats, 924 Plank Built Boats and 107 Cattamarans are also operated from the coastal villages and provide employment opportunity for more than 3000 fisherman of this district. There are 23 Fishermen Co-operative Societies and Nine Fisherwomen Co-operative Societies functioning in Thanjavur District.

ii) Inland Fisheries

Thanjavur district is also the richest in inland fishing due to the presence of Cauvery river system. The irrigation channels, canals, major and minor tanks are richest in many varieties of fish. The inland fishing consists mostly of local Carps, Major Carps and other varieties such as Cat fish, Murrells, Tilapia etc.,

About 5,000 inland fishermen are engaged in fishing and the production of fish from inland water sources. Seeds of Catla, Rohu, Mrigal and Common Carp, early fry are also produced by the Fisheries Department. Fish seed production centre, Silver Carp, and grass carps, early fry were brought from West Bengal and reared by private fish seed producers. Enormous number of fishermen is indulged in fish production by culture methods.

2.16 Banking and Insurance

Formal credit support is essential for adopting the capital intensive input use and modern technologies. There are 190 commercial bank branches operating in Thanjavur district and providing credit support to the tune of₹.3856 with a per capita credit support of ₹.16048 in 2010-11 (Table 2.28).

In general, the commercial banks support and service in terms of deposit and credit support service had more than doubled over the last decade. Besides that, 21 cooperative bank branches with the share capital of ₹.36 crores (cr) by lending ₹109 cr in 2008-09 to the farm sector.

Table 2.28 Formal Credit facility to farm and non-farm sectors in Thanjavur

Details	Unit	2001-02	2010-11	% Change
Number of Banks / Offices	No	165	190	15
Aggregate Deposit	Cr.₹	1890	4877	158
Gross Bank Credit	Cr.₹	1045	3856	269
CD Ratio	%	55.29	79.1	43
Population served per branch	no	13431	12646	-6
Per capita deposit	₹	8528	20297	138
Per capita credit	₹	4715	16048	240

Source: Hand book of Statistics, Govt. Tamil Nadu, 2012.

2.17 Thanjavur District Annual Credit Plan Outlay 2012-13

The sector and scheme wise plan outlay for Thanjavur district are presented in Table 2.29, based on the District Annual Credit Plan (DACP) for the year 2012-13.The DACP for Thanjavur comprises a total outlay of ₹. 2592.34 cr under Priority Sector, which constitutes 34 per cent more than the last year's plan. In absolute terms, there is an increase of ₹. 881.42 cr over the annual credit plan 2011-12.

It is also observed from Table 2.29 that agriculture and allied activities contribute to the major share of ₹. 1864.40 cr constituting 71.92 per cent of the total plan outlay. The share of Non-Farm Sector is 6.52 per cent with the allocation of ₹. 169 cr. The share of Other Priority Sector is ₹.558.94 cr, which is 21.56per cent of the total Annual Credit Plan. Credit

Agency wise analysis reveal that the contribution of Public Sector Banks is to the tune of 72.04per cent and the share of private sector banks is 23.59per cent. Co-operative sector Banks contribute 3.46per cent to the Annual Credit Plan 2012-13.

Table 2.29 Scheme Wise, Sector Wise and Agency Wise Annual Credit Plan Outlay for Thanjavur District in 2012-13

Details	No. of Accounts	Share %	Amt (₹.Cr)	share %
Sectors				
Agriculture	655258	92.77	1864	71.92
Non-Farm sector	7237	1.02	169	6.52
Other primary sector	43840	6.21	559	21.56
Agency				
Public sector banks	529838	75.01	1867	72.04
Private sector banks	145909	20.66	612	23.59
Cooperative banks	27448	3.89	90	3.46
RRB	3065	0.43	16	0.6
TIIC	75	0.01	8	0.31
Scheme wise				
Crop loan	625668	88.58	1584.4	61.12
Minor Irrigation	5288	0.75	49	1.89
Farm Mechanization	2235	0.32	75	2.89
Land Development	956	0.14	16	0.62
Plantation & Horticulture	2373	0.34	25	0.96
Other Term loan	6337	0.90	20	0.77
Dairy loan	9710	1.37	53	2.04
Poultry	197	0.03	2	0.08
Sheep/Goat/Piggery	781	0.11	5	0.19
Fishery	531	0.08	13	0.50
Farm Forestry	898	0.13	5	0.19
Non-farm sector	7237	1.02	169	6.52
Educational	11116	1.57	122	4.71
Housing	3526	0.50	191	7.36
Others	29482	4.17	263	10.15
TOTAL	**706335**	**100**	**2592**	**100**

Source: Annual credit plan 2012-13, IOB- Lead Bank Office, Regional office, Thanjavur.2013, Pp 8.

Comparative study pertaining to sector wise outlay for the year 2011-12 and 2012-13 reveals that there is an increase of ₹ 690.18 crores (26.62%) under Agriculture, and ₹.184.63 crores (7.12%) under Other Priority Sector. There is an increase under Non-Farm Sector ie ₹.

6.61 crores (0.26%) The overall incremental projection in the Annual Credit Plan for 2012-13 is ₹. 881.42 crores constituting 34 per cent over the previous year plan. Under Agriculture sector, major share is contributed by short term agriculture loans amounting to ₹.1584.40 crores and contributing 61.12 per cent.

Table 2.30 Allocation and Achievement under Annual Credit Plan of Thanjavur District (2011-12)

	Farm Sector	Non – Farm Sector (NFS)	Other Priority Sector (OPS)	Total
Allocation	1186.88	162.40	374.31	1723.59
Achievement	2707.63	88.75	425.26	3221.64
Percentage of Achievement	228	55	114	187

Table 2.31 Numbers of Commercial Banks

<table>
<tr><th>Items</th><th>Deposits</th><th>Advances</th><th>Credit Deposit Ratio</th><th colspan="2">Sector wiseCredit Details (2007-08)</th></tr>
<tr><td rowspan="9"></td><td rowspan="9">3399.30</td><td rowspan="9">3228.11</td><td rowspan="9">96.31</td><td><u>Priority Sector</u></td><td></td></tr>
<tr><td>1.Agricultural Advances</td><td>1493.13</td></tr>
<tr><td>2. Industries</td><td>131.06</td></tr>
<tr><td>3. Services</td><td>817.01</td></tr>
<tr><td>Total</td><td>2441.20</td></tr>
<tr><td>Non - Priority</td><td></td></tr>
<tr><td>Sector Advances</td><td>1139.01</td></tr>
<tr><td>TOTAL ADVANCES</td><td>3580.21</td></tr>
<tr><td colspan="6">Total no. of public sector banks :16 Branches: 132</td></tr>
<tr><td colspan="6">Total no. of private sector banks : 10 Branches: 40</td></tr>
<tr><td colspan="6">Total no.of co-operative banks : 3 Branches: 33</td></tr>
<tr><td colspan="6">Total no.of gramin banks : 1 Branches: 1</td></tr>
<tr><td colspan="6">(The above data is Performance of only Commercial Banks and does not include Co-op. Banks)</td></tr>
</table>

Source: The Lead District Manager, IOB, Lead Bank Dept., Regl. Office, Thanjavur-1.

2.18 Co-operation

Cooperative banks are playing a leading role in mobilizing the deposits and credit disbursement in rural areas with a view to fulfil the needs of vulnerable section of the population. The list of co- operative societies are presented in Table 2.32.

Table 2.32 List of Cooperative Societies in Thanjavur District

Sl. No	Type of Societies	No. of Societies	Member - ship	Share Capital (In lakhs)	Working Capital (In lakhs)	Loans Advanced (In lakhs)	Outstanding (In lakhs)	Overdue (In lakhs)
1	P.A.C. Banks	242	375712	2436.58	39268.48	11111.09	28437.56	8781.40
2	C.U. Banks	5	78939	373.65	14862.42	12179.35	12384.67	940.95
3	P.A.C.R.D. Banks	8	47450	275.58	1888.05	1043.05	1036.42	424.29
4	E.C.C. Societies	56	36032	7565.43	13294.54	8447.59	15289.35	1191.06
5	C.W.S.Stores	2	28164	47.89	912.62	0.00	0.00	0.00
6	P.C.Stores	10	21104	26.02	77.63	0.30	12.20	0.00
7	Others (CMS-5, CUCS-1)	5	10202	29.04	113.03	1703.68	2709.62	0.00

Source: The Joint Registrar of Co-Op. Societies, Thanjavur Region, Thanjavur

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:

i. Assessing the trends in area, production and productivity of major crops and projection till the 12th Plan period.

ii. Yield gap analysis for the major crops

3.1 Trends in area, production and productivity of major crops

Trend analysis was done for the area, production and productivity of selected crops to derive growth rates for their future projections for 2023. The compound growth rate has been estimated using 10 years time series data from 2005-06 to 20014-15 with the continuous data available for Thanjavur district. This was owing to the fact that Thanjavur was bifurcated in to Thiruvarur and Thanjavur.

The compound growth model $y=ab^t$ --- (1) was used for estimating the annual compound growth rate (a CGR) using the estimated coefficient of 'b' using the formula aCGR= (Exp (b) – 1)x 100.

The logarithmic form of growth model is

$$Ln\ Y = ln\ a + t\ lnb \quad \ldots\ldots. (2)$$

$$Y = A + Bt \quad \ldots\ldots (3)$$

Where $Y=lny$; natural log value of dependant variable viz., area/production/productivity

B=lnb; is the regression coefficient of time t; =1, 2…15 representing 2005-06 to 2014-15.

A= lna; constant,

Potential crops were identified based on the crops covered by 80 per cent of the gross cropped area criteria. Food grains like paddy, maize, black gram, green gram constituted 74 per cent of gross cropped area in TE 2014-15, besides that ground nut, gingelly and sugarcane are the other major commercial crops which covers nine per cent of GCA. Thus, both groups were considered in developing the action plan which put together totally 83 per cent of GCA. Coconut occupied 12 per cent of the gross cropped area, having large plantation in certain places like Orathanadu, Pattukkottai and Sebuvachatram and its area

has increased continuously. The action plan is considered for the selected crops *viz.,* paddy, maize, black gram, green gram, groundnut, gingelly, cotton, banana, sugarcane and coconut.

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

Sl.No	Crop	Area (Ha)	%	Production	Yield (Kg/ha)
1	Paddy	164001	65.33	652932	3940
2	Maize	1239	0.49	7392	5761
3	Black gram	19331	7.70	13604	680
4	Green gram	4277	1.70	2194	467
5	sugarcane	9856	3.93	1103357	112
6	Banana	3194	1.27	139424	43672
7	Mango	838	0.33	5724	6823
8	Cotton	1632	0.65	5379	559
9	Groundnut	5364	2.14	18573	3529
10	Gingelly	6055	2.41	3430	567
11	Coconut	35237	14.04	N.A	N.A
	Total	**251023**	**100.00**		

***In lakh / Nuts /tonnes**

The Compound growth rates are shown in Table 3.2.

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

Sl. No	Crop	CGR during 2005-2006 to 2014-2015 (%)		
		Area	Production	Productivity
1	Paddy	0.82	5.60	4.75
2	Maize	5.66	17.72	11.42
3	Black gram	7.00	18.06	10.34
4	Green gram	-8.89	-1.45	8.16
5	sugarcane	-6.73	-5.41	1.31
6	Banana	-4.79	-5.17	-0.39
7	Mango	-0.46	3.41	3.89
9	Cotton	6.24	18.23	1.40
10	Groundnut	-4.41	0.53	7.60
11	Gingelly	-0.53	2.45	4.11
12	Coconut	6.66	N.A	N.A

Source: Deputy Director of Marketing, Thanjavur

Table 3.3 Projected Area, production and yield Based on the Major potential Crops Identified

Description	Paddy			Maize			Blackgram			Greengram		
	Area	Pdn	Yld	Area	Pdn	Yld	Area	Pdn	Yld	Area	Pdn	Yld
Compound Growth Rate (%)	0.287	0.469	0.978	21.917	33.787	9.768	10.291	11.771	1.226	0.531	-3.641	-4.166
Triennium Average ending 2011-12	170002	542170	3495	1292	7492	5822	24340	14282	588	5204	1531	295
2012-13	165463	486054	3177	2522	16049	6383	26450	12733	475	6158	1278	207
2013-14	165938	488332	3208	3074	21472	7006	29173	14232	481	6191	1231	199
2014-15	166415	490620	3240	3748	28727	7691	32175	15907	487	6224	1186	190
2015-16	166892	492920	3271	4569	38433	8442	35486	17779	493	6257	1143	182

Contd.,

Description	Groundnut			Coconut			Gingelly		
	Area	Production	Yield	Area	Production	Yield	Area	Production	Yield
Compound Growth Rate (%)	4.249	10.159	5.667	3.596	8.690*	4.015*	2.147	3.384	1.215
Triennium Average ending 2011-12	7980	27971	3513	33030	6137	18515	5493	2058	372
2012-13	9885	32374	3275	35089	7235	19902	6337	2266	358
2013-14	10305	35663	3460	36351	7863	20701	6473	2343	362
2014-15	10743	39286	3656	37659	8547	21532	6612	2422	367
2015-16	11199	43277	3864	39013	9289	22397	6754	2504	371

Contd.,

Description	Sugarcane			Banana			Mango		
	Area	Production	Yield	Area	Production	Yield	Area	Production	Yield
Compound Growth Rate (%)	-0.959	-0.828	0.151	-0.275	3.504	3.790	-0.132	1.215	1.349
Triennium Average ending 2011-12	9349	1095882	117	3428	141594	41272	768	4129	5367
2012-13	10967	1229123	112	3831	179436	46834	795	4288	5391
2013-14	10861	1218951	112	3821	185724	48609	794	4340	5464
2014-15	10757	1208863	112	3810	192233	50451	793	4393	5537
2015-16	10654	1198859	113	3800	198969	52363	792	4446	5612

Area in Hectares; Production in Tonnes; Yield in Kg/ ha (* Denotes growth rates during 2004 to 2011)

The doubling agricultural production in Thanjavur district could be achieved through enhancing area under the target crop considering the current rate of growth in area, production and productivity. The targeted production could be achieved by reaching the potential productivity by bridging the yield gaps and large scale adoption of critical crop specific yield boosting technologies. The crop projection and new varieties identified for doubling the agricultural production and tripling the farm incomes are discussed in the following sections.

In the last two decades, a technology shift in crop production and management techniques showed positive shift in productivity on maize, black gram, banana, mango, brinjal, bhendi, cotton, groundnut, sugarcane and coconut. However, considering only varieties of these crops and bridging the yield gap would increase the district average productivity of targeted crops. It is noticed from the trend analysis that except paddy and greengram, all other crops viz., maize, blackgram, groundnut, gingelly and coconut had a positive growth in their area which resulted in increase in the projected area in 2023. However, due to decreasing trend noticed in net sown area, increasing labour scarcity, decline in irrigation availability had created hardship in area expansion for many crops and further needed to develop the strategic plan for intensive agriculture through cropping season adjustment and crop specific mechanization improvements.

Considering the above discussed points, the targeted area, production and productivity of selected crops in 2023-24 were estimated and finalized after discussion in the Stake holders meeting. The Current level (TE 2010-11) and targeted level of area, production, productivity of selected crops are presented in Table.3.4. These projection targets were used further in setting the yield and production targets for each block level following the procedure discussed elsewhere.

Table.3.4 Current and potential area, production and productivity of major crops in Thanjavur

crop	Area (ha)			Production (t)[#]			Yield (t/ha)[@]		
	TE 2010-11	2023-24	% change	TE 2010-11	2023-24	% change	TE 2010-11	2023-24	% change
NSA	197760	194498	-1.65	-	-	-	-	-	-
GCA	264928	302969	14.36	-	-	-	-	-	-
Kuruvai	26568	38317	44.22	75500	167416	121.7	2.842	4.3692	53.8
Samba/ Thaladi	138057	115670	-16.22	333723	437546	31.1	2.417	3.7827	56.5

crop	Area (ha)			Production (t)#			Yield (t/ha)@		
	TE 2010-11	2023-24	% change	TE 2010-11	2023-24	% change	TE 2010-11	2023-24	% change
Navarai	4122	9905	140.32	10812	32120	197.1	2.623	3.2428	23.6
Total Paddy	168747	163892	-2.88	420035	637082	51.67	2.489	3.8872	56.2
Maize	1665	8681	421.40	9113	52755	478.9	5.473	6.077	11.0
Black Gram	20618	36242	75.78	11074	40337	264.2	0.537	1.113	107.2
Green gram	5207	5220	0.25	1364	3792	178.0	0.262	0.7265	177.3
Gnut (I)	6312	8425	33.48	24288	37121	52.8	3.848	4.4058	14.5
Gnut (R)	1951	2605	33.48	1743	4832	177.2	0.893	1.8553	107.7
Combined	8263	11030	33.5	26031	41953	61.2	3.150	3.8036	20.7
Gingelly(I)	899	1076	19.72	206	679	228.9	0.230	0.6308	174.7
Gingelly(I)	5820	6968	19.72	2060	3315	61.0	0.354	0.4758	34.5
Combined	6719	8044	19.7	2266	3994	76.3	0.337	0.4966	47.2
Sugarcane	9559	10182	6.52	1075409	1259172	17.1	113	124	9.9
Coconut*	32099	41200	28.35	5153	8995	74.6	0.161	0.2183	36.0
Cotton++	498	840	68.67	1245	3701	197.3	0.425	0.749	76.2
Banana	3751	3800	1.31	162445	189480	16.6	43.307	49.863	15.1
Mango	763	840	10.13	4243	5985	41.0	5.563	7.1244	28.1

Source: Estimated for this study using previous table;

Paddy production in terms of tones of rice and yield in terms of rice t/ha;

*:Coconut yield lakh nuts/ha and production lakhs nuts; **Cotton production in bales of each 170 kg of lint; @ Projected crop yield for 2023-24 estimated considering the growth in crop productivity, potential yield gap and the outcome of the two stakeholders meetings

3.4.1 Paddy

Paddy is cultivated in three different distinct seasons namely *Kuruvai* (June-Sep), *Samba* (Aug-Dec) or *Thaladi* (Sep-Jan) and few cases as summer crop (Jan-Aprl). However, *Samba/Thaladi* is the main season for paddy constituting 71 per cent of total paddy area in Thanjavur district, followed by kuruvai (23 %) and summer (6 %). The maximum yield gap of 3.59 t/ha in ADT39 which cover about 16 per cent of paddy area followed by 1.7 t/ha in case of CR1009 which covers around one fourth of samba area were observed. Though, paddy variety BPT 5204 had higher yield gap of 3.01 t/ha which constitutes 7.5 per cent of paddy

area due to its susceptibility to blast disease. ADT 49 is a newly released (2011) fine grain paddy variety from Aduthurai recently gained its momentum particularly in late Samba or Thaladi seasons. Paddy variety ADT(R) 49 is a medium slender, white fine grain type having qualities of BPT 5204 and moderately resistant to blast in old ayacut areas. Similarly, ADT50 is released as with high productivity potential (5.95 t/ha) to replace CR1009 which was released in 2012 from Aduthurai for this region.

In *kuruvai* season, ADT43 having highest yield gap of 1.8 tones/ha (in terms of rice) and ADT45, ADT36 are the other ruling varieties are also needed to be considered for quality seed production. In order to bridge these yield gaps in newly released varieties, the extension machinery needs to be strengthened to achieve the annual productivity increment of at least 3.5 per cent per year so as to achieve the targeted average rice productivity of 3.72 t/ha in 2023 with projected area of 1.67 lha under paddy which would able to produce 6.37. lt recording 52 per cent increase over current production (4.20 tonne/ha) from the district.

Table.3.5. Projected Increase in Yield and Production of Paddy in different season from 2011-12 to 2023-24

Year	Yield (kg of rice/ha)				Production (tonnes of rice)			
	Kuruvai	Samba/ thaladi	Navarai	All	Kuruvai	Samba/ thaladi	Navarai	All
TE2010-11	2.84	2.42	2.62	2.49	**75500**	**333723**	**10812**	**420035**
2011-12	2.94	2.50	2.67	2.58	80269	340749	11757	432776
2012-13	3.04	2.59	2.71	2.67	85340	347924	12784	446048
2013-14	3.14	2.68	2.75	2.76	90731	355249	13901	459881
2014-15	3.24	2.77	2.80	2.86	96463	362729	15115	474307
2015-16	3.35	2.87	2.85	2.95	102557	370366	16436	489359
2016-17	3.47	2.97	2.89	3.06	109036	378164	17872	505071
2017-18	3.58	3.08	2.94	3.16	115924	386126	19433	521483
2018-19	3.70	3.18	2.99	3.27	123247	394256	21130	538634
2019-20	3.83	3.30	3.04	3.39	131033	402557	22976	556567
2020-21	3.96	3.41	3.09	3.51	139311	411033	24983	575327
2021-22	4.09	3.53	3.14	3.63	148112	419687	27166	594965
2022-23	4.23	3.65	3.19	3.76	157468	428524	29539	615531
2023-24	4.37	3.78	3.24	3.89	167416	437546	32120	637082
Required CGR % per year	**3.36**	**3.50**	**1.64**	**3.49**	**6.32**	**2.11**	**8.74**	**5.93**

Source: Estimated for this study based on the trend analysis, yield gap analysis, stakeholders meeting discussions

The 52 per cent increased production have to be achieved with 5000 lesser area (1.64 lha), particularly reducing samba area by 16 per cent and increasing the kuruvai area by 44 per cent through large scale adoption of SRI technology and adoption of high yield potential varieties. In order to achieve the above targeted rice production, concerted efforts need to be taken to realize annual yield growth rate of 3.5 per cent which results in around six per cent annual growth in rice production (Table.3.5).

Strategies for maintaining the paddy area

The negative growths in paddy area, NSA, GCA, net irrigated are some of the negative factors in sustaining the paddy production system in Thanjavur district. It could be inferred from the block wise cropping pattern in 2011-12 (Appendix 1; best agricultural year in terms of area coverage, productivity and Mettur water release), paddy occupied 1.96 lha of which 0.4 lha in kuruvai, 1.38 lha in samba and 0.177 lha in summer season (summer paddy is mainly practiced in Thiruviyaru block). Considering little scope for area exploitation under paddy, the area target for paddy was set at 1.63 lha (taking total paddy area in TE 2010-11 declining trend in area). Bridging the yield gap could be achieved through adoption of new high yielding varieties, large scale adoption of SRI technologies, wider application of bio-fertilizer and bio-pesticides are some of the strategies for reaching 50 per cent additional production from the current level.

3.4.2 Maize

Maize is one of the recently introduced crops in Thanjavur. It was originally cultivated in 207 ha in 2001-02 which has now increased to 1665 ha. The annual compound growth rate of 22 per cent, 29.7 per cent and 6.17 per cent were recorded for area, production, productivityof maize in last decade.The private hybrids like pioneer and hi-sheel are the some of the maize hybrids promising in the district. The targeted production of 0.53 lt in 2023-24 from current level of 0.09 t in TE 2010-11 recording 479 per cent increase over the current level could be achieved by increasing the productivity and expanding the area in water deficit years particularly from Budalur, Thanjavur, Thirupanandal and Thiruvonam blocks (Appendix 5). It could be inferred from Table 3.6 that at least 14.46 per cent annual growth in production has to be achieved to reach the targeted Maize production of 0.53 lakh tonne from 0.086 lakh ha with the 0.81 per cent annual growth in productivity. The MH 7 is the recently released TNAU maize hybrid which was introduced in Cauvery Delta Zone through the demonstration plots by the KVKs and the SWMRI, Thanjavur.

Table.3.6 Projected Increase in Yield and Production of Maize from 2011-12 to 2023-24

Year	Yield (t /ha)	Production (tonnes)
TE2010-11	**5.473**	**9113**
2011-12	5.520	10431
2012-13	5.566	11939
2013-14	5.613	13666
2014-15	5.659	15643
2015-16	5.706	17905
2016-17	5.752	20494
2017-18	5.798	23458
2018-19	5.845	26851
2019-20	5.891	30734
2020-21	5.938	35178
2021-22	5.984	40266
2022-23	6.031	46089
2023-24	6.077	52755
Required CGR%	**0.81**	**14.46**

Source: Estimated for this study based on the trend analysis, yield gap analysis, stakeholders meeting discussions

3.4.3 Black gram

Currently, black gram has been cultivated in 20 ha mostly (90 per cent) as rice fallow pulses and rest as irrigated pulses sown in April. The average productivity was 530 kg/ha with the yield gap of 550 kg/ha having scope to further increasing the current level of production at 11 t to 40.34 t in 2023-24 showing 264 per cent higher production than current level. ADT5 is recommended for irrigated April sowing season and ADT3 for rice fallow pulses crop in December sowing. The critical yield boosting technologies like application of TNAU Pulse wonder and two times spraying of 2 per cent DAP and providing live saving irrigation through moving sprinklers would easily achieve the targeted production of 40 t.

The annual growth of 10.45 per cent has to be achieved to reach the targeted production of 40337 tonne from current level of 11000 tonne by reaching average productivity of 1.11 t/ha in 2023-24 from 0.538 t/ha in TE 2010-11 (Table.3.7). Location specific, seasonal specific technologies for achieving higher production are discussed in Appendix10.The 5.76

per cent annual growth in productivity could be achieved by using quality seeds, DAP spray, providing life saving irrigation to the targeted area.

Table. 3.7 Projected Increase in Yield and Production of Black Gram from 2011-12 to 2023-24

Year	Yield (t /ha)	Production (tonnes)
TE2010-11	**0.537**	**11074**
2011-12	0.5814	12232
2012-13	0.6257	13511
2013-14	0.6700	14923
2014-15	0.7143	16483
2015-16	0.7586	18207
2016-17	0.8029	20110
2017-18	0.8472	22212
2018-19	0.8915	24535
2019-20	0.9358	27100
2020-21	0.9801	29933
2021-22	1.0244	33062
2022-23	1.0687	36519
2023-24	1.113	40337
Required CGR% year	**5.76**	**10.45**

Source: Estimated for this study based on the trend analysis, yield gap analysis, stakeholders meeting discussions

3.4.4 Green gram

Green gram is currently produced in 5.2 tonne producing 1.36 tonne with the average productivity of 262 kg/ha. It had a negative growth in area, production and yield.

Table.3.8 Projected Increase in Yield and Production of Green gram from 2011-12 to 2023-24

Year	Yield (t /ha)	Production (tonnes)
TE2010-11	**0.262**	**1364**
2011-12	0.283	1476
2012-13	0.306	1596
2013-14	0.331	1727
2014-15	0.359	1868
2015-16	0.388	2021
2016-17	0.419	2187
2017-18	0.454	2366
2018-19	0.491	2559
2019-20	0.531	2769
2020-21	0.574	2995
2021-22	0.621	3240
2022-23	0.672	3505
2023-24	0.726	3792
Required CGR% year	**8.16**	**8.18**

Source: Estimated for this study based on the trend analysis, yield gap analysis, stakeholders meeting discussions

Considering current level of area by bringing the yield gap through large scale adoption of ADT3 and VBN3 varieties and adopting two times 2per cent DAP spray at 35 to 45 DAS and application of pulse wonder could be able to increase the productivity and would achieve the targeted production for 3792 tonne from the current level. This could be achieved by setting 8.16 per cent annual growth in productivity and 8.18 per cent growth in production (Table.3.8).

3.4.5 Groundnut

Groundnut and gingelly are the two major oil seeds particularly cultivated in the new ayacut area covering 6.31 tha under irrigated groundnut and 5.82 t/ha under rainfed gingelly totally covering around 15 t/ha with the production of 26000 t in groundnut in 2011-12. Groundnut is dominated in Orathanadu and Thiruvonum blocks constituting 67 per cent of the total irrigated groundnut area of the district .However, Pattukottai, Peravurani, S.B.Chatram, Thanjavur, & Budalur are the other groundnut area both in irrigated and rainfed conditions.

The positive growth in area, production and productivity has better scope for further expanding the area and production of groundnut. The area has been targeted at 11.02 t/ha in 2023-24 from current level of 8.26 t/ha to produce 41.95 tonnes by bridging the yield gap of 690kg/ha. In groundnut, the varieties like TMV7 and western (private Gujarat) varieties are popularly cultivated in Thanjavur district. The newly released TMV (gn)13 and Co(Gn)7 are the two major varieties having high productivity potential in irrigated situation. These new varieties can be promoted to achieve the targeted production of 41.93 tonne from 11 ha in 2023-24 (Table. 3.9).

Table.3.9 Projected Increase in Yield and Production of Groundnut under irrigated and rainfed situation from 2011-12 to 2023-24

Year	Yield t/ha			Production (tonnes)		
	Irrigated	Rainfed	Combined	Irrigated	Rainfed	Combined
TE2010-11	**3.848**	**0.893**	**3.150**	**24288**	**1743**	**26031**
2011-12	3.891	0.967	3.196	25094	1885	27004
2012-13	3.934	1.041	3.243	25926	2039	28014
2013-14	3.977	1.115	3.290	26786	2205	29062
2014-15	4.020	1.189	3.338	27674	2385	30149
2015-16	4.062	1.263	3.387	28592	2580	31276
2016-17	4.105	1.337	3.436	29541	2791	32446
2017-18	4.148	1.411	3.487	30521	3018	33659
2018-19	4.191	1.485	3.538	31533	3265	34918
2019-20	4.234	1.559	3.589	32579	3531	36223
2020-21	4.277	1.633	3.642	33659	3819	37578
2021-22	4.320	1.707	3.695	34776	4131	38983
2022-23	4.363	1.781	3.749	35929	4468	40441
2023-24	4.406	1.855	3.804	37121	4832	41953
Required CGR%	**1.05**	**5.78**	**1.46**	**3.32**	**8.16**	**3.74**

Source: Estimated for this study based on the trend analysis, yield gap analysis, stakeholders meeting discussions

Besides adoption of new varieties, the application of gypsum and manganese sulphate and adoption of IPM in RHC control would increase the productivity towards bridging the yield gap and targeted productivity 4.4 t/ha in irrigated and 1.86 t/ha in rainfed groundnut in 2023-24 from the 3.85t/ha and 0.89 t/ha productivity in 2010-11 (Table.3.9). An average

annual productivity growth of 1.46 per cent has to be achieved to reach the targeted production in 2023-24.

3.4.6 Gingelly

Similarly in gingelly, presently cultivated in 6.72 t/ha and have a positive growth in area and production 1.39 per cent and 1.36 per cent per annum as with the negative growth in productivity. Due to, non-suitability of machine harvest and increasing labour scarcity made the farmers to reduce the area under gingelly. The projected area of 8.04 t/ha could be achieved by bridging the existing yield gap of 193kg/ha and adoption of yield increase in technologies like application of Mn micronutrient mixture besides management of phyllody viral disease. The season specific technologies are discussed in Appendix10. The targeted production of 3.99 tonne/ha could be achieved by setting the annual growth rate of 4.46 per cent in production and 3.02 per cent growth in productivity (Table.3.10).

Table.3.10 Projected Increase in Yield and Production of Gingelly from 2011-12 to 2023-24

Year	Yield t/ha			Production (tonnes)		
	Irrigated	Rainfed	Combined	Irrigated	Rainfed	Combined
TE2010-11	**0.230**	**0.354**	**0.337**	**206**	**2060**	**2266**
2011-12	0.260	0.363	0.347	226	2136	2367
2012-13	0.291	0.373	0.358	248	2216	2473
2013-14	0.322	0.382	0.369	272	2299	2583
2014-15	0.353	0.391	0.380	298	2384	2698
2015-16	0.384	0.401	0.391	326	2473	2818
2016-17	0.415	0.410	0.403	358	2566	2944
2017-18	0.446	0.420	0.415	392	2661	3075
2018-19	0.476	0.429	0.428	430	2761	3212
2019-20	0.507	0.438	0.441	471	2864	3355
2020-21	0.538	0.448	0.454	516	2970	3505
2021-22	0.569	0.457	0.468	565	3081	3661
2022-23	0.600	0.466	0.482	620	3196	3824
2023-24	0.631	0.476	0.497	679	3315	3994
Required CGR%	8.08	2.30	3.02	9.59	3.73	4.46

Source: Estimated for this study based on the trend analysis, yield gap analysis, stakeholders meeting discussions

3.4.7 Sugarcane

Sugarcane is another important commercial crop cultivated in 9.56 tonne/ha and producing 10.75 t of which 60 per cent planted crop. Variety Co86032 is ruling in this district with the average productivity of 113 t/ha. Both the productivity and production had increasing trend (0.01% and 0.018 % annual growth rates) resulting in a projected production of 11.98 lakh tonne from 10.64 thousand ha (Table 3.3). This targeted production could be achieved by increasing the average productivity to 124 t/ha from the current level of 113 t/ha. The SSI technology and drip fertigation technology in sugarcane are the yield boosting technologies which could help in shift in the production. In some farms, it was reported that these technologies increased the cane productivity from 110 t/ha to 175t/ha. Hence, concerted efforts may be taken to the use of micro irrigation in sugarcane and large-scale adoption of Sustainable Sugarcane Initiative (SSI) by Department and Sugar Mills have to organize cluster based large scale adoption of SSI demonstration for increasing the cane production with the current area. The targeted production of 1.26 mt of cane has to be achieved by setting 1.22 per cent annual growth rate to touching the average productivity of 124 t/ha from 113 t/ha (Table.3.11).

Table.3.11 Projected Increase in Yield and Production of Sugarcane in different season from 2011-12 to 2023-24

Year	Yield (t of cane /ha)	Production (tones of cane)
TE2010-11	**113**	**1075409**
2011-12	113.36	1088538
2012-13	114.22	1101828
2013-14	115.08	1115280
2014-15	115.94	1128897
2015-16	116.80	1142679
2016-17	117.65	1156630
2017-18	118.51	1170751
2018-19	119.37	1185044
2019-20	120.23	1199512
2020-21	121.09	1214157
2021-22	121.95	1228980
2022-23	122.81	1243985
2023-24	124.00	1259172
Required CGR%	**0.73**	**1.22**

Source: Estimated for this study based on the trend analysis, yield gap analysis, stakeholders meeting discussions

3.4.8 Cotton

Cotton was an important commercial crop in early 2000s and occupied (32 tonne in 2001-02) nine per cent of GCA has now declined to less than 500 ha due to many unfavourable production situations.

Table.3.12 Projected Increase in Yield and Production of Cotton in different season from 2011-12 to 2023-24

Year	Yield (t /ha)	Production (bales of lint each 170kg)
TE2010-11	**0.425**	**1245**
2011-12	0.450	1354
2012-13	0.475	1472
2013-14	0.500	1601
2014-15	0.525	1741
2015-16	0.550	1893
2016-17	0.575	2059
2017-18	0.599	2238
2018-19	0.624	2434
2019-20	0.649	2647
2020-21	0.674	2878
2021-22	0.699	3130
2022-23	0.724	3404
2023-24	0.749	3701
Required CGR year	**4.46**	**8.74**

Source: Estimated for this study based on the trend analysis, yield gap analysis, stakeholders meeting discussions

However, recent development of Hybrids and Bt technology widen the scope for expanding the cotton in the traditional area particularly in Kumbakonam, Papanasam and Thiruvidaimaruthur blocks in Kharif crops where more water control with ground water supported villages. The area under cotton and maize could be further increased in case of delayed water release in *Kuruvai* in alternative plan. The targeted production of 3.7 thousand bales from current level of 1.2 t could be produced by doubling the area from 0.4 thousand/ha to 0.8 ha with increasing productivity from 4.25 q/ha to 7.5q/ha of lint in 2010-11 to 2023-24 (Table.3.12).

3.4.9 Coconut

Thanjavur district is the third largest district in Tamil Nadu in terms of area and productivity of coconut. In TE2010-11 coconut was cultivated in 32.1 ha with a productivity of 19.79 thousand nuts per ha which is higher than the state average productivity of 13.86 tnuts/ha. Coconut is the second largest crop in the district cropping pattern constituting 12 per cent of GCA. Pattukottai (22.25%), Sebhuvachatram (17.69%), Peravurani (16.66%), Madukkur (16.5), Orathanadu(9.93%) and Thiruvonam (5.62 %) are the major coconut production centers constituting around 88 per cent of coconut area of the district. Annually, 515 million nuts (mnut/yr) were produced from the district. The trend analysis for coconut area, production and productivity revealed that the area and production had a positive growth and projected production was 899 mnuts from 41 t/ha in 2023-24. The farmers are cultivating west coast Tall and T X D hybrid in larger area. Further increase in productivity could be achieved by reaching the potential yield 22 thousand nuts/ha through new varieties and better management of plantation (Table.3.3). The targeted area and production could be met by reaching the targeted average productivity of in 22 nuts/ha from the current productivity of 16 tnuts/ha. However, availability of quality seedling and adoption of drip fertigation system, IDM and IPM measures could further increase productivity and production realizing comparative advantage of the region.

Table.3.13 Projected Increase in Yield and Production of Coconut from 2011-12 to 2023-24

Year	Yield (lakhs nuts/ha)	Production (lakhs nuts)
TE2010-11	**0.161**	**5153**
2011-12	0.164	5379
2012-13	0.168	5614
2013-14	0.172	5860
2014-15	0.176	6116
2015-16	0.181	6384
2016-17	0.185	6664
2017-18	0.189	6956
2018-19	0.194	7260
2019-20	0.199	7578
2020-21	0.203	7910
2021-22	0.208	8256
2022-23	0.213	8618
2023-24	0.218	8995
Required growth	**2.39**	**4.38**

Source: Estimated for this study based on the trend analysis, yield gap analysis, stakeholders meeting discussions

In order to achieve the targeted production of 8995 lakhs nuts in 2023-24 with 0.41 lha of coconut plantation, we need to set the annual production target of 4.38 per cent and increase the productivity from 16000 nuts to 21800 nuts per ha in 2023-24 (Table.3.13).

Value addition in coconut by-product

The coconut by products utilization is poor due to lack of sound technology, industrial development; production of activated carbon cum coconut shell charcoal is a promising industrial development. Activated carbon is highly demanded export earning product in the world market.

US, France, UK, Australia, Japan, Taiwan, Malaysia, Sri Lanka, Philippines and Indonesia are among the major producers and exporters of coconut shell based activated carbon. World market for activated carbon is over 0.6 mt/year and is growing at a high rate directly related to promoting environmental preservation. In Tamil Nadu, M/s VVD & Sons produced 4 grades of activated carbon. The conversion ratio of coconut shell charcoal to activated carbon is 10:4. Hence, concerted efforts may be taken to utilize the coconut shell for large scale production of activated carbon through commodity groups with technical support from Coconut Board. Around 40 types of coconut based value added products are to be produced and marketed.

3.4.10 Banana and Mango

Banana and mango are the two major horticultural crops and showed increasing trend in the area, production particularly in the upland area. Banana is predominantly cultivated in Budalur, Kumbakonam, Orathanadu, Papanasam, Thanjavur, Thiruviyaru and TV. Maruthur blocks covering 80 per cent of the total district banana area (3751 ha in TE 2010-11) totally producing 1.62 lakh tonne in TE 2010-11. Considering development in G9 and tissue culture development on mondan and robusta and poovan banana varieties, farmers gradually increase the area under banana. The production target of 1.89 lakh tonne banana from 3.8 t/ha with the 15 per cent improvement in average productivity from 43.31 in 2010-11 to 49.86 t/ha in 2023-24 could be achieved. The targeted production could be achieved by setting the annual production growth of 1.19 per cent and a productivity growth of 1.09per cent (Table.3.14).

Mango is another fruit crop having more scope for additional income and comparative advantage to this district, farmers are interested to go for mango cultivation with new cultivars like Bangalura, Alphonsa in small scale. The availability of quality seedlings and following good agricultural practice using high density planting technique would increase the production and productivity of mango in Thanjavur.

Table.3.14 Projected Increase in Yield and Production of Banana & Mango in 2011-12 to 2023-24

Year	Banana		Mango	
	Yield (t/ha)	Production (lt)	Yield (t/ha)	Production (lakh tonne)
TE2010-11	43.307	162445	5.563	4243
2011-12	43.8114	164380	5.6830	4357
2012-13	44.3158	166338	5.8031	4474
2013-14	44.8201	168320	5.9232	4593
2014-15	45.3244	170325	6.0433	4717
2015-16	45.8287	172354	6.1634	4843
2016-17	46.3330	174407	6.2836	4973
2017-18	46.8374	176485	6.4037	5106
2018-19	47.3417	178587	6.5238	5243
2019-20	47.8460	180714	6.6439	5384
2020-21	48.3503	182867	6.7641	5528
2021-22	48.8546	185045	6.8842	5676
2022-23	49.3590	187250	7.0043	5828
2023-24	49.860	189480	7.124	5985
Required growth (%)	1.09	1.19	1.92	2.68

Source: Estimated for this study based on the trend analysis, yield gap analysis, stakeholders meeting discussions

Presently 42000 tonnes of mangoes were produced from 763 ha in 2010-11 (Table 3.14). Considering the growth trend, production target of 6000 tonnes could be achieved by setting the annual production growth rate of 2.68 per cent and the productivity growth of 1.92 per cent (Table.3.14)

3.3 Yield gap analysis

The potential yield for each variety was taken from the crop production guide which is derived based on the MLT experiments yield at the time of release of varieties in each crops. The yield gap analysis was carried out using maximum yield obtained in the Multi Location Trail (MLT) as potential yield and the highest crop cutting experiments (CCE) yield as progressive farmers' yields for major varieties of the selected crops. The results are presented in Table 3.15. Thanjavur being an agriculturally progressive district, the

multiplication trials (MLT) yields were relatively lower than progressive/ maximum CCE yield resulting that yield gap I turned to be negative for most of the crops except gingelly. Yield gap is the difference between the progressive farmer's yield and average farm yield which explains the gap due to soil and climatic factors, technology adopted, availability of farm inputs like suitable varieties, fertilizer, chemicals, irrigation water, labour and cultivation practices followed, etc.

Table.3.15 Variety wise Yield Gaps in selected crops in Thanjavur district (kg/ha)

Crop	Variety	Potential yield (A)	Progressive Farmers Yield (B)	Average yield (C)	Yield Gap (B-C)
Paddy (kuruvai)*	ADT45 ADT 43	8500 10000	7500 9100	6200 7260	1300 1840
	ADT 36	8070	7320	6025	1295
Paddy (Samba)*	ADT 50	9500	7500	5800	1700
	ADT49	8750	6800	5400	1400
	ADT 46	7500	6600	4883	1717
	ADT 39	7520	8120	4529	3591
	ADT 38	10750	7640	5042	2598
	BPT 5204	4500	7920	4909	3011
	CR 1009	5300	7680	5939	1741
	Co 43	5200	6300	3150	3150
Black gram	ADT 5	1323	1792	1242	550
Ground nut	VRI 2	2000	5700	5630	70
	TMV 7	1400	5708	5018	690
Gingelly	TMV 3	750	355	162	193
Sugarcane **	Co 86032	110	115	101	14

*Source: Potential yield in Column A of particular variety collected from ART maximum yield from variety release proposals and in Column B and C are estimated using CCE experiments 2010-11; O/o Joint director of Agriculture, Thanjavur.; * paddy yield kg/ha with husk*

** *Sugarcane Yield*

However, still there exist yield gap II would pave way to further scope to increase the production in selected crops particularly in specific location suited resource mapping by GIS technology in identifying the yield boosting technology towards bridging the yield gap II. The yield gap estimation reveals that maximum yield gap about two tons/ha (in rice term) was

reported in ADT43, ADT36, ADT46, ADT39 and Co43 in Thanjavur district. In fact, these varieties pertaining to high yield gap occupied around three fourth of the total paddy area. Hence, suitable demonstration and input supply oriented programmes need to be formulated to bridging the yield gap in rice. Considering pulses and oilseeds are high demanding crops to achieve the food and nutritional security. The yield gap of 5.5 q/ha was observed in black gram ADT5 variety followed by TMV7 groundnut with the yield gap of 6.9 q/ha that gives ample scope to further increase the production with given technology through timely management of recommended input application. Gingelly is another important oilseed crop in this district. The maximum progressive farmers' yield recorded 3.5 q / ha against the potential yield of 7.5 q/ha. Hence, crop specific yield boosting technologies like micro nutrient application and operations, soil test based fertilizer management, providing life saving irrigation at critical stages and adopting IPM practices are the major strategies to reduce the yield gap in gingelly. In Sugarcane, variety Co82032 is largely cultivated (95%) in Thanjavur, still there is 14 t yield gap was noticed. Hence, Sugarcane System Initiative (SSI) technology is not followed in many places. Further scope to increasing the sugarcane area under SSI technology led to doubling the sugarcane productivity in Thanjavur which covers fewer than four per cent of the total cropped area.

3.16 Technological interventions and strategies to reduce the yield gaps

Sl. No.	Crop	Constraints Faced	Suggestions
	Paddy	• Paddy is the dominant crop constituting 71 per cent of the cropped area. Trend analysis revealed negative growth rate in production and productivity.	• Potential yield gap of 1.98 tonnes was estimated • Indicating the further scope for improving the productivity thereby production by compensating the declining area. • Cost escalation warrant direct sowing of paddy demonstration in the suitable area. • Make the availability of quality seed on newly released varieties ADT 49, 50 and CO 51.
		• Quality loss in *Kuruvai* harvested paddy due to high moisture content was reported.	• De-silting the canal system up to 3 or 4thlevel is essential for efficient distribution of canal water particularly during deficit period. • Possibilities of creating farm pond to support lifesaving irrigation during non-availability period and one or two irrigation to the subsequent rice fallow pulse crop would enhance the pulse productivity by three times. • Erection of community level of drying yard and subsidy support for drying yard construction for large and small farmers would improve the management of Kuruvai harvested paddy

Sl. No.	Crop	Constraints Faced	Suggestions
		• Marketing, value addition of rice and rice based products. • Increasing labour cost on manual transplanting and less efficient performance for existing walk behind transplanter	• Increase the effective implementation of commodity groups and promote the production of rice based value added products. • Suitable modification has to be made to improve the efficiency of combined harvester considering the old and new delta soil type • Improving the canal irrigation efficiency by following turn-irrigation system may be implemented at least in the 1st crop. • Some farmers suggested suitable regulatory mechanism needed to be formulated to stop the summer paddy cultivation. At least electricity current holiday (removing free supply of electricity to agriculture) may be implemented during the summer month • Micro irrigation system in rice cultivation (drip, sprinkler) may be promoted through cluster demonstration approach in new *ayacut* with the ground water

			supported area • More no of check dams and shelter storage points may be created continuously in the secondary and tertiary canal
	Sugarcane	• Labour scarcity, increasing wage rate, low statutory cane price are the major threats to sugarcane cultivation. However, increasing productivity in the newly released varieties, contract based field operations are the strength in sugarcane cultivation in Thanjavur district.	• 20-30 per cent addition yield was observed in the SSI technology. Cluster based more number of SSI demonstrations has to be conducted in large areas with full subsidy support. • Machine harvesting is practiced in small scale due to availability of few machines from sugar mills. Low cost combined harvester machine, suitable for small scale farming maybe designed and made available to the commodity based groups and agriculture engineering department. • Total mechanization demonstration plots may be conducted in Pappanasam, Thanjavur, Thiruppananthal blocks for better adoption of technologies.
	Pulses .	• Inadequate quality seed, poor yield due to drought	• Seed replacement rate of pulses has been increased to 50 per cent from current level of 13 per cent besides; making the availability of newly released varieties through seed mini kits.

			• Support for farm pond construction in the rice follow pulses will be used to provide life saving irrigation and adoption of DAP spraying and application of pulse wonder so as to increase the production and decrease the yield gap. • More no. of mobile sprinklers may be made available through agricultural co-operative and agricultural engineering departments particularly in the ground water support area of rice fallow pulses area. • Red gram cultivation can be introduced in new *Ayacut* area through seedling planting technique
	Gingelly	• Non availability of quality seeds	• TMV6, VRI (SV) 2 varieties of gingelly seed may be made available through seed mini kits programme. • Transplanting method of gingelly cultivation may be popularized through large scale demonstration
	Groundnut	• Non availability of new variety, quality seed	• More certified seeds on TMV7, VRI 2, COGN 7 may be made available to the seed subsidy. More number of sprinkler irrigation system may be distributed to the groundnut

			farmers. • Commodity group may be organized for varietal market integration and value addition.
	Coconut	Poor yield and more damage by rhinoceros beetle	• Rejuvenation of old plantation with new variety west coast tall. TXD hybrids, Laccadive ordinary tall varieties seedling would be made available at subsidized price. • More number of drip irrigation systems should be distributed. Productions marketing of coconut value added products may be produced. Boron mixture and Tamil Nadu Agricultural University coconut tonic will be made available in large scale.
	Banana	Nematode problems in G9 banana are noticed	• Tissue culture plant on G 9, Mondan, Poovan, varieties will be made available to the Thiruvaiyaru, Thanjavur, Papanasam farmers. • Possibilities of intercropping banana in more than 20 years old coconut plantations will be made available.

	Mango	Banglora, Mulgova, Alfonsa and Banganapalli varieties are suitable for Thanjavur district.	• Mango plantations are gradually expanding in Bhudhalur, Thiruvidaimarudhur, Orathanadu and Kumbakonam blocks. • Suitable value addition support programme will be formulated to intake the growth in supply.
	Maize	Thanjavur, Bhudhalur and Thiruppananthal are the blocks where area entrance maize has increased over years.	• Hybrid varieties are dominant (>98%) in Thanjavur district. • Seed drill sowing and combined harvester for maize harvesting are gaining its momentum. Tamil Nadu Agricultural University variety CO 6, very popularized MH7, for which seed availability has to be increased for large scale adoption
	General	Crop diversification and cultivating of commercial crop	• In the new *ayacut* area special farm model demonstration has to be conducted for introduction of new/ commercial crops like maize, sunflower, cotton and other horticultural crops to increase the farm income with latest technologies • Farmers require pledge loan at 5 per cent interest rate up to 2,00,000 per farmer to meet the cultivation expenditure

		Increasing use of ground water distributed to fragmented plots.	• The existing scheme on underground pipeline for irrigation through agricultural engineering Dept needs to be increased for more beneficiaries with enhanced amount • Cluster approach has been followed in demonstrating for implementing new schemes, programmes to realize the demonstration effect • Solar pump schemes need to be expanded with full subsidy support
		Increasing cost of nutrient particularly P and K combined with decreasing carbon content and soil fertility of rice production system was noticed	• 100 per cent subsidy on distribution of bio- fertilizer and bio-pesticides and effort to increase the consumption of organic source fertilizer to reduce the chemical fertilizer use. • Soil and water test can be done free of cost every year before starting of agricultural season • The MNREG programme has to linked with agriculture operations i.e sharing the wage by the farmers and program. • Capacity building programme for identifying and production of rice based products. • Suitable programme may be initiated to use the tank silt by the farmer in and around

			Panchayat /PWD tanks in the village/ Panchayat • Farmers may be provided with the permanent bank supporting cards (credit cards) to meet the regular farm credit needs without any collateral securities.

CHAPTER IV

DISTRICT PLAN

The interventions proposed, the associated outlays, the physical targets, budgetary requirements, time frame for achievements in the agricultural (field crops) sector, horticultural sector, agricultural engineering sector, agricultural marketing sector and animal husbandry sector, dairy development sector, seed certification sector, co-operation, public works department and fisheries sector have been discussed in this chapter. This would comprehend the activities and the achievements to be made in the five years period of twelfth plan, under NADP.

District Plan

The various development issues, constraints and activities (interventions) planned for the development of agriculture and allied sectors have been discussed in earlier chapters. Based on the discussions, the district plan in full has been briefly outlined below in this chapter. The activities planned and the associated targets and costs are presented for the development of both agricultural and allied sectors.

4.1 Agricultural (Field crops) Sector

The development of agriculture sector has been aimed at by mainly pushing up the productivity levels of the major crops viz. Paddy, Pulses, millets, sugarcane, oil seeds, oil palm, cotton, coconut, and improving other activities like IPM, IT, SSF, mechanization, trainings and rainfed area development in the district. Activities planned for and the costs involved under each crop area are detailed below.

4.1.1 Paddy

i) Project Rationale

Rice is staple food in most of the Indian states and plays a major role in Indian economy. The rice cultivation faces challenges across the world and India is no exception, with a reduction in area in most of the regions, fluctuation in production and productivity, stagnating yields and ever increasing input costs. The cost of cultivation of paddy has consistently been increasing owing to the increased costs of seeds, fertilizers and labour. With increasing labour scarcity due to urbanization, sustaining the interest of farmers in rice cultivation has become a challenge. Thus, there is an urgent need to produce more output with a drop of water owing water scarcity.

(ii) Project goal

To increase and sustain the productivity of paddy with efficient utilization of resources through adoption of SRI technique in rice.

(iii) The Strategy

Paddy productivity in the district is on par with state average productivity. However, there is immense scope for increasing the productivity of paddy further in this district, by using appropriate crop varieties with suitable crop production techniques. Adequate supply of improved seeds of high yielding varieties, efficient nutrient management, better adoption of system of rice intensification, machine transplanting, etc would go a long way in sustaining and increasing the productivity of paddy in this district.

(iv) The Plan

The details of the plan showing the activities (interventions) planned, the targets fixed and the costs involved for increasing the paddy productivity in the district.

v) Project Components

The various components of the project and the costs involved over a period of five years

a) Distribution of certified seeds (paddy varieties) for all blocks except Thiruvayaru.
b) Distribution of micro nutrients for all blocks except Sethubavachatram and Thanjavur
c) Distribution of plant protection chemicals and bio inputs such as, biofertilizers, zinc sulphate, herbicides in all blocks except Sethubavachatram and Thanjavur
d) Promotion of SRI training through Farmers Field School in all blocks except Thiruvayaru.
e) Distribution of transplanter in all blocks except Sethubavachatram and Thanjavur.
f) Distribution of hybrid rice seeds for all blocks except Sethubavachatram, Budalur, Kumbakonam, Thanjavur and Thiruvayaru.

(vi) Implementing agency

The project will be implemented by Department of Agriculture

(vii) The Budget

It is proposed to incur **₹.24442.69** lakhs over a period of five years with the finance facilities under NADP.

(viii) Reporting

The block-level officials of the Department of Agriculture will implement the project and report the progress to the district-level official

Table 4.1.Budget Requirement for Agriculture Sector in Paddy

(₹.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	Promotion of SRI	Ha	0.15	All Block Except B2	10840	1626.00	12070	1810.50	12720	1908.00	13620	2043.00	14220	2133.00	63470	9520.50
2	Distribution of High Yielding Varieties	MT	0.35	All Blocks Except B10	485	169.62	597	208.82	648	226.67	662	231.57	641	224.22	3031	1060.89
3	Distribution of Foundation	MT	0.4	All Blocks Except B10, B3, B4	348	139.24	354	141.64	359	143.64	363	145.24	367	146.84	1792	716.60
4	seed production - Foundation	MT	0.32	All Blocks Except B2, B3, B4, B8, B10	20	6.40	174	55.74	29	9.28	33	10.56	37	11.84	293	93.82
5	seed production - Certified class	MT	0.26	All Blocks Except B2, B3, B4, B8, B10	244	63.44	271	70.46	323	83.98	325	84.50	327	85.02	1490	387.40
6	Incentives for paddy machine planting	Ha	0.1	All Blocks Except B2, B8	14280	1428.00	16750	1675.00	16950	1695.00	17900	1790.00	18600	1860.00	84480	8448.00
7	Distribution of Protray	No	0.0008	All Blocks Except B2, B4, B8, B10	1795	1.44	6090	4.87	7130	5.70	7170	5.74	7210	5.77	29395	23.52

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
8	Distribution of MN mixture/ Copper Sulphate	Ha	0.01	All Blocks Except B2, B8	10610	106.10	11800	118.00	12380	123.80	13330	133.30	13880	138.80	62000	620.00
9	Distribution of biofertilizer / PPFM / bioinputs / plant nutrient mobilizing bacteria	Ha	0.003	All Blocks Except B2, B8	14560	43.68	15950	47.85	17400	52.20	18500	55.50	19700	59.10	86110	258.33
10	Distribution of Zinc sulphate (Soil application & foliar)	Ha	0.01	All Blocks Except B2, B8	18860	188.60	21200	212.00	22300	223.00	23700	237.00	24400	244.00	110460	1104.60
11	Distribution of biocontrol agents/biopesticides	Ha	0.01	All Blocks Except B2, B8, B10	2920	29.20	5970	59.70	7520	75.20	8170	81.70	8720	87.20	33300	333.00
12	Gypsum application	Ha	0.015	All Blocks Except B2, B4, B8	3550	53.25	7850	117.75	9050	135.75	9250	138.75	9450	141.75	39150	587.25
13	Distribution of herbicides	Ha	0.01	All Blocks B2, B8	7900	79.00	12800	128.00	14700	147.00	16100	161.00	17000	170.00	68500	685.00
14	Hybrid Rice seed distribution	Ha	0.04	All Blocks Except B2, B3, B4, B8, B10	145	5.80	1169	46.76	1439	57.56	1462	58.48	1482	59.28	5697	227.88
15	Polyvinyl coated Tarpaulin (6m x 5m)	No	0.02	All Blocks Except	940	18.80	1520	30.40	1820	36.40	2920	58.40	3470	69.40	10670	213.40

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
				B2, B8, B10												
16	Establishment of community paddy nursery	ha	0.25	All Blocks	50	12.50	50	12.50	50	12.50	50	12.50	50	12.50	250	62.50
17	Demonstration of drip irrigation	ha	1	All Blocks	20	20.00	20	20.00	20	20.00	20	20.00	20	20.00	100	100.00
	Total					**3991.06**		**4759.99**		**4955.68**		**5267.23**		**5468.72**		**24442.69**

Ammapettai-B1, Sethubavachatram-B2, Budalur-B3, Kumbakonam-B4, Madukkur-B5, Thiruvonam-B6, Peravurani-B7, Thanjavur-B8, Pattukkottai-B9, Thiruvaiyaru-B10,Orathanadu-B11, Papanasam-B12, Tiruppanandal-B13, Thiruvidaimarudur-B14

4.1.2 .Enhancing Millets Productivity

Millets are highly favoured due to its productivity and short growing season under dry and high-temperature conditions. Millets, however, do respond to high fertility and moisture. Millet grain produced per hectare can be two to four times higher with use of irrigation and soil supplements. Improved breeds of millet improve their disease resistance and can significantly enhance farm yield productivity. The area under millets has been declining due to several reasons. Hence, it is important to create facilities for increasing millet production and productivity.

Project Component:

a) Distribution of quality seed material in Thiruvonam and Thanjavur blocks.
b) Distribution of LPG operated Bird Scarrer at Budalur.
c) Providing plant health management viz., herbicides, maize maxim for Budalur, Thiruvonam, Thanjavur and Peruvayaru blocks.
d) Distribution of biofertilizers Liquid / Carrier to Budalur.
e) Provide demonstration and farmers training about seed treatment and MN mixture for the farmers of Budalur, Peruvayaru, Thanjavur, Thiruvonam.
f) Installation of drip irrigation for maize in Budalur, Thiruvonam and Thanjavur blocks.
g) Expansion of area under Minor Millets at Budalur.
h) Formation of small millet groups at Budalur.
i) Establishment of millet processing unit for minor millet at Budalur.

Budget:

To enhance the production of millet in this district a budget ₹. **1049.03** lakhs is proposed.

Expected Outcome:

It is expected to increase the area under millet production upto 20%. And, also it improves the soil heath by the improvement of the nutrient status.

Implementing Agency:

The projects will be implemented by the Department of Agriculture.

Table 4.2.Budget Requirement for Agriculture Sector in Millets

(₹.in lakhs)

Components	Unit	Unit cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		
				Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Ph
llets														
stribution of LPG operated d Scarrer	Nos.	0.1	B3	50	5.00	50	5.00	50	5.00	50	5.00	50	5.00	25
stribution on biofertilizer - quid / Carrier	Ha	0.003	B3	10	0.03	10	0.03	10	0.03	10	0.03	10	0.03	5
pansion of area under Minor llets (Demo - supply of seed, ed treatment, MN mixture & ganic package)	Ha	0.05	B3	50	2.50	50	2.50	50	2.50	50	2.50	50	2.50	25
rmation of small millet groups	Nos.	0.2	B3	5	1.00	5	1.00	5	1.00	5	1.00	5	1.00	2
llet Processing unit-Minor llet	Nos.	2.5	B3	1	2.50	1	2.50	1	2.50	1	2.50	1	2.50	
aize														
monstration (Supply of seed, ed treatment & MN mixture, ganic package)	Ha	0.05	B3,B8,B7, ,B6	135	6.75	141	7.05	142	7.10	143	7.15	144	7.20	70
stribution of herbicides	Ha	0.008	B8,B7,B6,B3	145	1.16	172	1.38	174	1.39	176	1.41	178	1.42	84
stribution of Maize maxim (15 /ha)	Ha	0.045	B8,B6,B3	151	6.80	153	6.89	155	6.98	157	7.07	159	7.16	77
p irrigation for maize	Ha	1	B3,B6,B8	125	125.00	128	128.00	130	130.00	132	132.00	134	134.00	64
ed Distribution	MT	0.4	B6,B8	130	52.00	132	52.80	134	53.60	136	54.40	138	55.20	67
tal					**202.73**		**207.14**		**210.09**		**213.05**		**216.01**	

Ammapettai-B1, Sethubavachatram-B2, Budalur-B3, Kumbakonam-B4, Madukkur-B5, Thiruvonam-B6, Peravurani-B7, Thanjavur-B8, Pattukkottai-B9, Thiruvaiyaru-B10,Orathanadu-B11, Papanasam-B12, Tiruppanandal-B13, Thiruvidaimarudur-B14

4.1.3 Enhancing Pulse Productivity

(i) Project Rationale

Pulse crops have been an important component of agriculture since ancient times. Red gram, black gram, green gram, bengal gram, horse gram, lentil, peas and beans, soya beans and cowpea are some of the important pulse crops grown in many parts of the country. The increase in area and production is attributed to the development of high yielding and MYMV resistant varieties suitable for cultivation in rabi season in rice fallows. Pulses fit well under different cropping systems and thus have enormous potential for the future which needs to be capitalized. A horizontal expansion area under pulses could be possible in the country, under new nitches of cultivation and improved package of practices.

(ii) Project goal

To increase the production and productivity of pulses through improved package of practices.

(iii) Project strategy

Blackgram and greengram are the major pulse crops grown in the district under rice fallow condition. Hitherto, the farmers in general bestowed least attention in pushing up the yield levels and hence they are considered as the least cared crop. But in the recent years, few farmers realized the need for adopting a few package of practices and started realizing better results. To encourage the adoption of few improved practices in raising pulses and to push up the yield levels, the technology oriented development plan has been formulated under DAP of NADP.

(iv) Project components

The various components of the project and the costs involved over a period of fiveyears .

- Distribution of quality pulses seeds in all blocks except Thiruvayaru block.
- Distribution of plant boosters, bio fertilizers and plant protection chemicals for all blocks.
- Production of foundation and certified seeds in all blocks except Sethubavachatram and Thiruvayaru.
- Distribution of weedicide and plant protection chemicals for all blocks except Sethubavachatram, Papanasam, orathandu.
- Providing crop based demonstration for all blocks except Sethubavachatram, Kumbakonam, Thiruvayaru and Papanasam.

- Promotion of redgram transplantation for nursery preparation in all blocks except Sethubavachatram and Kumbakonam.

(v) The Plan

The activities (interventions) planned for and the associated physical targets

(vi) Implementing agency

The project will be implemented by Department of Agriculture.

(vii) The Budget

It is proposed to incur **₹ 39169.43** lakhs over a period of five years with the finance facilities under NADP.

(viii) Reporting

The block level officials of the Department of Agriculture will implement and report the progress to District level officials.

Table 4.3.Budget Requirement for Agriculture Sector 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
2	Production of Foundation/ Certified pulses seeds	MT	86000	All Blocks Except B2,B10	874	751.64	1418	1219.48	1941	1669.26	2459	2114.74	2981	2563.66	9673	8318.78
3	Distribution of Certified Seeds	MT	100000	All Blocks Except B10	4407	4407.00	4934	4934.00	5445	5445.00	5951	5951.00	6456	6456.00	27193	27193.00
4	Distribution of Gypsum	ha	400	All Blocks Except B2,B4	2025	8.10	3527	14.11	4079	16.32	4580	18.32	5131	20.52	19342	77.37
5	Distribution of Biofertilizer/ Organic packages (Rhizobium + Phosphobacteria) - Liquid / Carrier	Ha	600	All Blocks	4300	25.80	6052	36.31	6856	41.14	7858	47.15	8910	53.46	33976	203.86
6	Distribution of Micro Nutrients(5 kgs/ Ha)	Ha	350	All Blocks	6237	21.83	7847	27.46	8907	31.17	9917	34.71	10977	38.42	43885	153.60
7	DAP Spray	Ha	700	All Blocks	8980	62.86	8660	60.62	9670	67.69	10780	75.46	11990	83.93	50080	350.56
8	Pulse wonder - 5 kg/ha	Ha	1000	All Blocks	4750	47.50	6860	68.60	7870	78.70	8930	89.30	10000	100.00	38410	384.10
9	Bund Cropping	Ha	300	All Blocks Except B2,B4	3200	9.60	4502	13.51	5004	15.01	5506	16.52	5808	17.42	24020	72.06
10	Line sowing	Ha	2250	All Blocks Except B2,B4	2865	64.46	3483	78.37	3745	84.26	3996	89.91	4247	95.56	18336	412.56
11	Distribution of Yellow sticky trap /pheromone trap	ha	1000	All Blocks Except B2,B4	850	8.50	1101	11.01	1152	11.52	1203	12.03	1254	12.54	5560	55.60
12	Cropping system based demonstration	Ha	12500	All Blocks Except B2,B12,B13	405	50.63	426	53.25	467	58.38	523	65.38	569	71.13	2390	298.75
13	Distribution of weedicide	Ha	1000	All Blocks Except B2,B12,B13	3000	30.00	3952	39.52	4904	49.04	5856	58.56	6808	68.08	24520	245.20
14	Plant Protection Chemicals	Ha	1000	All Blocks Except B2,B10	3652	36.52	6104	61.04	7006	70.06	7908	79.08	8810	88.10	33480	334.80
15	Seed treatment and soil application with Trichoderma viridi	Ha	700	B5,B3,B11,B9, B7,B6,B14,B1	2200	15.40	2600	18.20	3000	21.00	3400	23.80	3900	27.30	15100	105.70

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
16	Pure crop demonstration - Black gram and green gram	Ha	6300	All Blocks Except B2,B4,B10,B12, B13	1090	68.67	1141	71.88	1192	75.10	1243	78.31	1296	81.65	5962	375.61
17	Demonstration on intercropping of pulses with other crops	Ha	8300	All Blocks Except B2,B4,B10,B12	460	38.18	561	46.56	662	54.95	763	63.33	864	71.71	3310	274.73
18	Demonstration through NGOs	Ha	8250	All Blocks Except B2,B4	470	38.78	525	43.31	576	47.52	627	51.73	678	55.94	2876	237.27
19	Promotion of Redgram Transplantation for nursery preparation	Ha	5000	All Blocks Except B2,B4	78	3.90	93	4.65	106	5.30	117	5.85	130	6.50	524	26.20
20	Promotion of ridges and furrow	Ha	1000	B12,B13	0	0.00	1000	10.00	1100	11.00	1200	12.00	1200	12.00	4500	45.00
21	Seed treatment with Trichoderma viridi	Ha	700	B8	130	0.91	132	0.92	134	0.94	136	0.95	138	0.97	670	4.69
	Total					**5690.27**		**6812.81**		**7853.35**		**8888.12**		**9924.88**		**39169.43**

Ammapettai-B1, Sethubavachatram-B2, Budalur-B3, Kumbakonam-B4, Madukkur-B5, Thiruvonam-B6, Peravurani-B7, Thanjavur-B8, Pattukkottai-B9, Thiruvaiyaru-B10,Orathanadu-B11, Papanasam-B12, Tiruppanandal-B13, Thiruvidaimarudur-B14

4.1.4 Sugarcane

(i) Project Rationale

Sugarcane is one of the important cash crops and it is a perfect gift to mankind. The demand for sugarcane in the country is mainly for the purpose for which they are utilized in various forms for consumption. Increasing the productivity, reducing the cost of production, integrated farming, farm level processing, proper value addition, product diversification and byproduct utilization coupled with effective marketing strategies and market promotional activities can definitely make the sugarcane industry more competitive and sustainable in the state of Tamil Nadu.

(ii) Project goal

To enhance the production and productivity of sugarcane through adoption of improved methods in sugarcane cultivation and technologies for processing and product diversification.

(iii) Project strategy

There exists wide variations in the productivity of sugarcane in Thanjavur district. In this district, the yield levels are considerably lower. The low yield per hectare in most of the areas in the district needs the application of science - based production technologies

(iv) Project components

The various components of the project and the costs involved over a period of five years.

- Sustainable Sugarcane Initiative such as distribution of single bed seeding in Pattukotai, Thiruvidaimaruthur, Peravurani and Ammapetai blocks.
- Increasing Production and Productivity through implementation of sustainable sugarcane. Initiative and Enrichment of Soil Fertility through distribution of biofertilizers and weedicides in all blocks except Sethubavachatram, Budalur, KUmbakonam, Thiruvonam and Thiruvayaru.
- Distribution of MN mixture, sugarcane booster and parasites for Ammapetai, Madukkur, Thanjvur, Orathanadu, Papanasam, Tiruppanandal and Tiruvidaimarudhur.
- Breeder seed production of sugarcane in Papanasam, Orathanadu, Madukkur and Tiruppanadal blocks.

- ❖ Creating demonstration of intercropping in sugarcane for Pattukotai, Papanasam, Orathandu, Tiruvidaimaruthur, Ammapatai, Peravurani, Madukkur and Tiruppanadal blocks.
- ❖ Arrange state level training in sugarcane cultivation for the farmers of Madukkur, Orathandu, Papanasam, Tiruppanadal blocks.
- ❖ Installation of micro drip to Orathandu, Papanasam, Tiruppanadal, Tiruvidaimaruthur, Madukkur and Ammapatai blocks.

(v) Project cost: ₹. 20449.39 Lakhs lakhs over a period of five years with the finance facilities under NADP.

(vi) Implementing agency

The project will be implemented by Department of Agriculture.

(vii) Reporting

The block level officials of the Department of Agriculture will implement and report the progress to District level officials.

Table 4.4.Budget Requirement for Agriculture Sector 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	Disribution of Gypsum (500 Kg/Ha)	Ha	0.02	All Blocks Except B2,B3,B4,B6, B10	750	15.00	4770	95.40	4790	95.80	4810	96.20	6830	136.60	21950	439.00
2	Distri. of biofertilizer (Ha)	Ha	0.006	All Blocks Except B2,B3,B4,B6, B10	700	4.20	4720	28.32	4740	28.44	4760	28.56	6780	40.68	21700	130.20
3	Distri. of weedicide (Ha)	Ha	0.01	All Blocks Except B2,B3,B4,B6, B8, B10	500	5.00	4523	45.23	4538	45.38	4552	45.52	6566	65.66	20679	206.79
4	Distribution of Chip Cutter	Nos	0.05	B1,B8,B14, B13,B12,B11,B5	24	1.20	69	3.45	134	6.70	119	5.95	144	7.20	490	24.50
5	Distribution of FeSO4 Spray	Ha	0.005	B11,B12	0	0.00	1000	5.00	1000	5.00	1000	5.00	1500	7.50	4500	22.50
6	Distribution of ZnSO4 Spray	Ha	0.005	B1,B5,B8,B14,B13,B12,B11	250	1.25	4270	21.35	4281	21.41	4293	21.47	6305	31.53	19399	97.00
7	Distribution of Micro Nutrient Mixture	Ha	0.02	B14,B13,B1,B5, B8,B12,B11	130	2.60	4145	82.90	4156	83.12	4170	83.40	6182	123.64	18783	375.66
8	Distribution of Parasite Trichogramma	Ha	0.00125	B14,B13,B1, B5,B8,B12, B11	175	0.22	4186	5.23	4197	5.25	4208	5.26	6219	7.77	18985	23.73
9	Distribution of Protray (2500 nos/ha)	Nos	0.0008	B14,B13,B1, B8,B12	300	0.24	410	0.33	513	0.41	614	0.49	715	0.57	2552	2.04
10	Distribution of Sugarcane Booster (10 Kg/Ha)	Ha	0.035	B14,B13,B1, B5,B8,B12, B11	30	1.05	4051	141.79	4072	142.52	4093	143.26	6114	213.99	18360	642.60
11	Distribution of Sugarcane Harvester	Nos	75	B4,B8	6	450.00	8	600.00	10	750.00	13	975.00	15	1125.00	52	3900.00

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
12	Distribution of Water Soluble Fertiliers	ha	0.25	B1,B14,B11, B12,B5,B13	8	2.00	4016	1004.00	4024	1006.00	4032	1008.00	6040	1510.00	18120	4530.00
13	Microirrigation - Drip (1.2x0.6)	ha	1.24	B11,B12,B5, B13,B1,B14	218	270.32	20	24.80	30	37.20	40	49.60	50	62.00	358	443.92
	Sustainable Sugarcane Initiative (SSI)															
14	A. Establishment of Shadenet	Nos	1.5	B13,B14,B12,B 11,B5,B1	4	6.00	28	42.00	32	48.00	36	54.00	40	60.00	140	210.00
15	B.Distribution of Single Bud Seedling	Ha	0.225	B9,B14,B7,B1	18	4.05	18	4.05	18	4.05	18	4.05	18	4.05	90	20.25
16	Trash Mulching	Ha	0.04	B14,B1,B7,B5,B 13,B9,B12, B11	30	1.20	4040	161.60	4050	162.00	4060	162.40	6070	242.80	18250	730.00
17	Demonstration on intercropping in Sugarcane	Ha	0.08	B9,B12,B11, B14,B1,B7,B5,B 13	8	0.64	4010	320.80	4012	320.96	4014	321.12	6016	481.28	18060	1444.80
18	Breeder seed production in sugarcane	Ha	0.4	B12,B11,B5, B13	0	0.00	4000	1600.00	4000	1600.00	4000	1600.00	6000	2400.00	18000	7200.00
20	State Level training in Sugarcane cultivation	No	0.4	B13,B5,B11, B12	0	0.00	4	1.60	4	1.60	4	1.60	4	1.60	16	6.40
	Grand Total					**764.97**		**4187.85**		**4363.83**		**4610.87**		**6521.87**		**20449.39**

Ammapettai-B1, Sethubavachatram-B2, Budalur-B3, Kumbakonam-B4, Madukkur-B5, Thiruvonam-B6, Peravurani-B7, Thanjavur-B8, Pattukkottai-B9, Thiruvaiyaru-B10,Orathanadu-B11, Papanasam-B12, Tiruppanandal-B13, Thiruvidaimarudur-B14

4.1.5 Cotton

(i) Project Rationale

Cotton is one of the principal crops of India and it plays a vital role in the country's economic growth by providing substantial employment and making significant contributions to export earnings. The growth and modernization of the spinning industry has led to a substantial growth in cotton consumption. Cotton is another crop cultivated by the farmers of Thanjavur district. However, adoption of improved package of practices by the farmers with the use of quality seeds, water management, marketing infrastructure and processing is the utmost concern for improvement of cotton yield.

(ii) Project goal

To increase the cotton production and productivity by adoption of improved agro techniques.

(iii) Project strategy

Adoption of improved agro techniques like

- Cultivation of hybrids, Bt cotton varieties, latest production technology and plant protection technologies, adoption of scientific and agronomic practices, integrated water and nutrient management practices for yield improvement in cotton.
- Validation of Integrated Pest Management Technology to improve yield and reduce the cost of cultivation of cotton to ensure better net return.

(iv) Project components

The component of the project and the costs involved over a period of five years.

- Distribution of plant protection and plant growth enhancing inputs in Ammapetai, Papanasam, Tirupanadal, and Tiruvidaimaruthur blocks.
- Distribution of cotton picking machine in Ammapetai, Papanasam, Tirupanadal, and Tiruvidaimaruthur blocks.
- Arrangement of farmers's training and exposure visit for the farmers of Ammapetai, Papanasam, Tirupanadal, and Tiruvidaimaruthur blocks.
- Promting precision farming at Kumbakonam block.
- Making training on high density planting for the farmers of Ammapetai, , Papanasam, Tirupanadal, Orathandu blocks.

(v) Project cost: ₹. 1019.55 Lakhs over a period of five years with the finance facilities under NADP.

(vi) Implementing agency

The project will be implemented by Department of Agriculture.

(vii) Reporting

The block level officials of the Department of Agriculture will implement and report the progress to District level official.

Table 4.5 Budget Requirement for Agriculture Sector 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	B1,B12, B13,B14	100	0.30	170	0.51	220	0.66	270	0.81	320	0.96	1080	3.24
2	Demonstration of IPT	Ha	15000	B1,B12,B13, B14	2	0.30	4	0.60	6	0.90	8	1.20	10	1.50	30	4.50
3	Distribution of biofertilizer	Ha	300	B1,B12, B13,B14	100	0.30	350	1.05	400	1.20	450	1.35	500	1.50	1800	5.40
4	Distribution of biopesticides / Bio agents	Ha	1000	B1,B12, B13,B14	100	1.00	350	3.50	400	4.00	450	4.50	500	5.00	1800	18.00
5	Distribution of cotton picking machine	No	5000	B1,B12, B13,B14	10	0.50	14	0.70	18	0.90	22	1.10	26	1.30	90	4.50
6	Distribution of MN Mixture	Ha	1000	B1,B4,B12,B 13,B14	600	6.00	950	9.50	1050	10.50	1150	11.50	1250	12.50	5000	50.00
7	Distribution of Pheromone trap	No	6000	B1,B12,B13, B14	100	6.00	250	15.00	300	18.00	350	21.00	400	24.00	1400	84.00
8	Distribution of PP chemicals	Ha	1000	B1,B4,B12,B 13, B14	600	6.00	950	9.50	1050	10.50	1150	11.50	1250	12.50	5000	50.00
9	Distribution of Yellow Sticky trap	No	3000	B1,B12, B13,B14	40	1.20	250	7.50	260	7.80	270	8.10	280	8.40	1100	33.00
10	Exposure visits	No	40000	B1,B12, B13,B14	2	0.80	4	1.60	4	1.60	4	1.60	4	1.60	18	7.20
11	Farmers training	No	20000	B1,B12,B13, B14	2	0.40	4	0.80	4	0.80	4	0.80	4	0.80	18	3.60
12	Field days	No	10000	B1,B12,B13, B14	2	0.20	4	0.40	4	0.40	4	0.40	4	0.40	18	1.80
13	Intercropping with pulses	Ha	10000	B1,B12,B13, B14	10	1.00	214	21.40	218	21.80	222	22.20	226	22.60	890	89.00
14	Promotion of precision farming in cotton -WSF	Ha	50000	B4	100	50.00	125	62.50	150	75.00	175	87.50	200	100.00	750	375.00
15	Soil reclamation with gypsum	Ha	1000	B1,B12,B13, B14	40	0.40	250	2.50	300	3.00	350	3.50	400	4.00	1340	13.40

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
16	TNAU Cotton plus distribution (6 Kg./ Ha)	Ha	1200	B1,B4,B12,B13,B14	530	6.36	1090	13.08	1150	13.80	1210	14.52	1270	15.24	5250	63.00
17	Frontline demo on ICM in cotton	Ha	7000	B12,B13	0	0.00	2	0.14	2	0.14	2	0.14	2	0.14	8	0.56
18	Frontline Demo on Desi and ELS cotton seed production	Ha	8000	B12,B13	0	0.00	20	1.60	20	1.60	20	1.60	20	1.60	80	6.40
19	Trials on High Density Planting system in cotton	Ha	9000	B1,B12,B13, B14	10	0.90	220	19.80	230	20.70	240	21.60	250	22.50	950	85.50
20	Topping of cotton	Ha	1000	B1,B12,B13, B14	30	0.30	100	1.00	120	1.20	130	1.30	140	1.40	520	5.20
21	Summer ploughing	Ha	7500	B1,B12,B13, B14	50	3.75	300	22.50	350	26.25	400	30.00	450	33.75	1550	116.25
	Grand total					**85.71**		**195.18**		**220.75**		**246.22**		**271.69**		**1019.55**

Ammapettai-B1, Sethubavachatram-B2, Budalur-B3, Kumbakonam-B4, Madukkur-B5, Thiruvonam-B6, Peravurani-B7, Thanjavur-B8, Pattukkottai-B9, Thiruvaiyaru-B10,Orathanadu-B11, Papanasam-B12, Tiruppanandal-B13, Thiruvidaimarudur-B14

4.1.6 Oilseeds

(i) Project Goal

The goal of the project is to increase the productivity of oilseeds through awareness creation. Field demonstration and adoption of improved package of practices.

(ii) Project Strategies

Groundnut cultivation is more localized in the coastal taluks of Pattukkottai, Peravurani etc. The crop is managed with the shallow ground water availability. There is ample scope to improve the yield levels by the adoption of improved package of practices and irrigation support.

(iii) Project Components

The various components of the project and the costs involved over a period of five years are provided in Table 4.8.

- Distribution of certified seeds in Tiruppanandal, Papanasam, Orathandu, Pattukotai, Thanjavur, Peravurani, Madukkur and Budalur block.
- Distribution of gypsum for Budalur, Madukkur, Thiruvonam, Peravurani, Thanjavur, Pattukotai, Orathandu blocks.
- Distribution of machineries such as thresher, Decordicator, stripper for groundnut to Madukkur and Orathandu blocks.
- Distribution of herbicides and light traps in Papanasam, Tiruppanandal, Kumbakonam, Ammapetai, Madukkur, Thanjavur, Budalur, Orathandu blocks.
- Distribution of rhizobium or PSB culture to Ammapetai, Thanjavur, Tiruvonam, Madukkur and Budalur blocks.

(iv) The Plan

With this in view, the developmental activities for groundnut and the associated physical targets and financial outlays have been planned and the details are portrayed.

(v) The Budget

It is proposed to incur **₹.6535.67** lakhs over a period of five years with the finance facilities under NADP.

(vi) Implementing agency

The project will be implemented by Department of Agriculture.

(vii)Reporting

The block level officials of the Department of Agriculture will implement and report the progress to District level officials.

Table 4.6.Budget Requirement for Agriculture Sector 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
I	**OILSEEDS**															
1	Polythene mulch Inclusive of erection	Ha	0.50	B8,B12,B13	185	92.50	230	115.00	250	125.00	270	135.00	290	145.00	1225	612.50
2	Herbicide	Ha	0.01	B12,B7,B13,B9,B8,B3	690	6.90	790	7.90	810	8.10	830	8.30	850	8.50	3970	39.70
3	Light trap (NCIPM)	Nos.	0.01	B12,B13,B14,B11,B5,B8,B3,B1	265	2.65	292	2.92	314	3.14	336	3.36	358	3.58	1565	15.65
4	Bio pesticide/fungicide	Ha	0.01	B14,B11,B5,B8,B3,B1	280	2.80	320	3.20	342	3.42	364	3.64	390	3.90	1696	16.96
5	Compact Block Demonstration - Groundnut	Ha	0.20	B12,B6,B7,B13,B9,B8,B3	195	39.00	91	18.20	97	19.40	103	20.60	109	21.80	595	119.00
6	Compact Block Demonstration - Gingelly / Castor	Ha	0.06	B7,B9,B8,B3	214	12.84	111	6.66	118	7.08	125	7.50	132	7.92	700	42.00
7	Strengthening seed chain by foundation seed production	Mt	0.76	B13,B12,B9,B8,B7	152	115.52	155	117.80	159	120.84	161	122.36	163	123.88	790	600.40
8	Strengthening seed chain by certified seed production	Mt	0.73	B13,12,B11,B9,B8,B7,B5,B3	147	106.95	150	109.14	152	110.60	154	112.06	156	113.52	757	552.25
9	Distribution of Certified seeds	Mt	0.84	B13,B12,B11,B8, B6,B5,B3	835	701.61	838	704.13	840	705.81	842	707.49	846	710.85	4202	3529.89
10	Distribution of Seed Treatment Chemicals and Bioagents (T.Viridi)	Kg	0.00	All Blocks Except B1,B2,B4,B6,B7, B10,B14	565	0.85	581	0.87	582	0.87	588	0.88	594	0.89	2910	4.37
11	Application of Gypsum to Groundnut Crop	Ha	0.02	B11,B9,B8,B7, B6,B5,B3	595	9.52	597	9.55	649	10.38	651	10.42	653	10.45	3145	50.32
12	Distribution of Micro Nutrient Mixture	Ha	0.02	B11,B9,B8,B7, B6,B5,B3	678	10.17	730	10.95	732	10.98	734	11.01	766	11.49	3640	54.60
13	Distribution of Biofertilizer	Ha	0.01	All Blocks Except B1,B2,B4,B10, B14	1050	6.30	1202	7.21	1204	7.22	1206	7.24	1238	7.43	5900	35.40
14	Distribution of Liquid Biofertilizer	Ha	0.01	B11,B9,B8,B7, B6,B5,B3	735	4.41	737	4.42	789	4.73	791	4.75	793	4.76	3845	23.07

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
15	Distribution of Rhizobium/ PSB Culture	Ha	0.01	B11,B8,B6,B5, B3	405	2.43	457	2.74	459	2.75	461	2.77	463	2.78	2245	13.47
16	Distribution of Pheromone Traps	Nos.	0.02	B11,B9,B8,B7, B6,B5,B3	270	5.40	272	5.44	274	5.48	296	5.92	318	6.36	1430	28.60
17	Distribution of Light Traps	Nos.	0.02	B11,B9,B8,B7, B6,B5,B3	252	5.04	254	5.08	256	5.12	279	5.58	301	6.02	1342	26.84
18	Castor as Bund crop	Ha	0.01	B12,B11,B6,B3,B 5	66	0.40	60	0.36	62	0.37	62	0.37	62	0.37	312	1.87
19	Combined Nutrient Spray	Ha	0.02	B11,B9,B8,B7, B6,B5,B3	388	5.82	390	5.85	392	5.88	394	5.91	396	5.94	1960	29.40
20	Seed Drill Sowing / Line sowing of Groundnut with Pulses as intercrop(hiring charges only)	Ha	0.03	B3,B5,B8,B11	160	4.80	162	4.86	169	5.07	171	5.13	173	5.19	835	25.05
21	Distribution of Tractor operated thresher	Nos.	1.50	B5,B11	11	16.50	11	16.50	11	16.50	11	16.50	11	16.50	55	82.50
22	Distribution of Power Operated Groundnut Stripper	Nos.	1.30	B5,B11	1	1.30	1	1.30	1	1.30	2	2.60	2	2.60	7	9.10
23	Distribution of Power operated Groundnut Decorticator	Nos.	1.00	B11	4	4.00	4	4.00	4	4.00	4	4.00	4	4.00	20	20.00
24	Production of Foundation Seeds	Mt	1.13	B13,B12,B9,B8,B 7,B6	22	24.41	27	30.06	29	32.32	31	34.58	33	36.84	140	158.20
25	Production of Certified Seeds	Mt	1.09	All Blocks Except B2,B4,B10,	28	30.52	33	35.97	36	39.24	39	42.51	43	46.87	179	195.11
26	Distribution of certified seeds	Mt	1.25	All Blocks Except B2,B4,B10,B12,B 13	25	31.25	28	35.00	31	38.75	34	42.50	37	46.25	155	193.75
27	Distribution of Micro nutrients (Manganese sulphate/ Zinc sulphate)	Ha	0.00	All Blocks Except B2,B4,B10	1900	7.60	2402	9.61	2804	11.22	3206	12.82	3608	14.43	13920	55.68
	Total					**1251.48**		**1274.72**		**1305.58**		**1335.79**		**1368.11**		**6535.67**

Ammapettai-B1, Sethubavachatram-B2, Budalur-B3, Kumbakonam-B4, Madukkur-B5, Thiruvonam-B6, Peravurani-B7, Thanjavur-B8, Pattukkottai-B9, Thiruvaiyaru-B10,Orathanadu-B11, Papanasam-B12, Tiruppanandal-B13, Thiruvidaimarudur-B14

4.1.7 Support for coconut cultivation

(i) Back ground

Thanjavur district is the rice bowl of Tamil Nadu. Cauvery river is an important irrigation source for this district and it serves 6 blocks out of 14 blocks. In four blocks, Coconut is being cultivated as the major crop next to paddy.

(ii) Project rationale

Under National Agriculture Development Programme, the following project can be implemented in Coconut cultivation in Thanjavur district.

(iii) Project strategy

The farmers who are engaged in Coconut cultivation in Thanjavur district are small and marginal farmers. They are mainly dependent on this crop for their livelihood. Due to vagaries of monsoon, the farmers are led to debt trap. Hence the above scheme may be implemented with 50 per cent subsidy under NADP project.

(iv) Project goals

1. Increase in yield can be obtained by way of introducing high yielding varieties/ hybrids.
2. To protect the Coconut crop from severe infestation with pest and diseases by way of proper IPM and IDM.
3. To maximize the quality parameters of nut for high copra and oil yield by incorporation of micronutrient mixtures.

(v) Project components

- Distribution of coconut seedling in all blocks except Thanjavur.
- Distribution of hybrid seedling for Ammapetai, Madukkur, Thiruvaiyaru, Orathandu, Tiruvidaimaruthur blocks.
- Providing drip irrigation for Madukkur, Thiruvonam, Peravurani, Ammapetai blocks.
- Distribution of MN mixture for Ammapetai, Ammapetai, Peravurani, Pattukotai, Tiruppandal, Tiruppandal, Orathandu, Thiruvaiyaru and Papanasam blocks.

- Establishment of nursery area for Papanasam block.
- Distribution of solar copra drier for Madukkur, Madukkur, Pattukotai, Orathandu, Thiruvonam and Tiruvidaimaruthur.
- Replanting and rejuvenation of coconut gardens in Madukkur, Peravurani, Pattukotai, Orathandu.
- Thanjavur wilt management for Thiruvonam, Peravurani, Pattukotai, Madukkur, Orathandu block.
- Provide training on neera production to Thiruvonam block.

(vi) Budget

As could be noted from the table above, the total cost of the project is **₹.2932.57** lakhs.

(vii) Implementing agency

The project will be implemented by Department of Agriculture.

Table 4.7 Budget Requirement for Agriculture Sector 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 Except B8	12360	7.42	12670	7.6	12930	7.76	13190	7.91	13500	8.1	64650	38.79
2	Distribution of Tall Seedlings	No	0.0004	All Blocks Except B3,B4,B8	11750	4.7	12050	4.82	12300	4.92	12550	5.02	12850	5.14	61500	24.6
3	Boom sprayer	No	0.2	B1,B5,B10, B9,B6,B11, B14	16	3.2	20	4	25	5	29	5.8	35	7	125	25
4	Distribution of D xT hybrid Seedlings	No	0.0015	B1,B5,B10, B9,B6,B11, B14	900	1.35	1000	1.5	560	0.84	630	0.95	680	1.02	3770	5.66
5	Distribution of power operated coconut leaf shredder	No	0.1	B1,B11,B14, B5,B9,B6	10	1	15	1.5	19	1.9	24	2.4	32	3.2	100	10
6	Distribution of MN mixture	Ha	0.1	B12,B10,B11 ,B14,B13,B9, B7,B1,B5	1920	192	2070	207	2220	222	2420	242	2620	262	11250	1125
7	Distribution of Pheromone traps for Red palm weevil/ Rhinocerous beetle	Ha	0.016	All Blocks Except B2,B3,B4,B8	545	8.72	600	9.6	650	10.4	700	11.2	750	12	3245	51.92
8	Distribution of power operated rocker sprayer	No	0.1	B5,B4,B1,B9 ,B6,B11,B14	28	2.8	43	4.3	77	7.7	101	10.1	115	11.5	364	36.4
9	Distribution of Solar copra drier	No	0.2	B5,B9,B14, B1,B6,B11	6	1.2	11	2.2	16	3.2	21	4.2	26	5.2	80	16
10	Distribution of tree climbers	No	0.15	B5,B11,B9	30	4.5	32	4.8	34	5.1	36	5.4	40	6	172	25.8
11	Drip irrigation	Ha	0.22	B5,B11,B6, B7	75	16.5	80	17.6	315	69.3	100	22	105	23.1	675	148.5
12	Establishment of nursery- Area	ha	2	B9	50	100	60	120	65	130	70	140	80	160	325	650
13	Intercropping with green manures	Ha	0.03	B5,B6,B7, B11	220	6.6	240	7.2	250	7.5	260	7.8	280	8.4	1250	37.5
14	Management of Black headed caterpillar	Ha	0.05	B2,B6,B9	110	5.5	80	4	80	4	80	4	80	4	430	21.5

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
15	Replanting and Rejunation of coconut gardens	Ha	0.45	B5,B7,B9, B11	112	50.4	112	50.4	113	50.85	133	59.85	133	59.85	603	271.35
16	Thanjavur wilt management (root feeding /soil application)	Ha	0.03	B6,B7,B9,B5 ,B11	102	3.06	107	3.21	112	3.36	112	3.36	112	3.36	545	16.35
17	Demonstration on Integrated fertiliser management	Ha	0.75	B5,B11,B7, B6	42	31.5	43	32.25	43	32.25	43	32.25	43	32.25	214	160.5
18	Distribution of coconut seedlings to school children	No	0.0004	B5,B2,B11, B6	652	0.26	752	0.3	802	0.32	852	0.34	952	0.38	4010	1.6
19	Training on neera production	Batches	0.25	B6	2	0.5	2	0.5	2	0.5	2	0.5	2	0.5	10	2.5
20	Removal of wilt affected coconut trees	Ha	0.4	B6	50	20	50	20	50	20	50	20	50	20	250	100
21	corpus fund release for FPG (2000 nos.)	No	5	B3,B6	6	30	6	30	6	30	6	30	6	30	30	150
22	Distribution of MN mixture/ Coconut tonic	Ha	0.01	B4,B2,B6	225	2.25	250	2.5	275	2.75	295	2.95	315	3.15	1360	13.6
	Grand Total					**493.46**		**535.28**		**619.65**		**618.03**		**666.15**		**2932.57**

Ammapettai-B1, Sethubavachatram-B2, Budalur-B3, Kumbakonam-B4, Madukkur-B5, Thiruvonam-B6, Peravurani-B7, Thanjavur-B8, Pattukkottai-B9, Thiruvaiyaru-B10,Orathanadu-B11, Papanasam-B12, Tiruppanandal-B13, Thiruvidaimarudur-B14

4.1.8. 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. 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 per cent oleic acid, 10 per cent linoleic acid. 44 per cent palmitic acid and 5 per cent 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. In view of the rich content of vitamins, palm oil can be utilized 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.

Project components

- Oil palm area expansion programme for all blocks except Kumbakonam.
- Inputs for intercropping for all blocks except Kumbakonam.
- Supply of diesel pumps to all blocks except Budalur, Kumbakonam, Peravurani, Pattukotai block.
- Supply of aluminium ladder, wire mesh and oil palm cuter for Tiruvidaimaruthur, Ammapetai, Orathandu, Madukkur, Sethubavachatram, Thanjavur, Papanasam, Tiruppandal.
- Enhancing neem and pungam area expansion programme in Thanjavur, Papanasam, Tiruppandal.

Budget

It is proposed to incur ₹.**1499.25** 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 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.

Implementing Agency

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

Table.4.8 Budget Requirement for Agriculture Sector 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
1	NMOOP -Mini Mission -II (Oilpalm)															
2	Oilpalm Area Expansion Programme	Ha	0.14	All Blocks Except B4	137	19.18	164	22.96	182	25.48	200	28.00	219	30.66	902	126.28
3	Cultivation maintenance	Ha	0.05	All Blocks Except B4	121	6.05	158	7.90	176	8.80	194	9.70	213	10.65	862	43.10
4	Inputs for Intercropping	Ha	0.1	All Blocks Except B4	110	11.00	149	14.90	167	16.70	185	18.50	204	20.40	815	81.50
5	Supply of Diesel pumps	No	0.3	All Blocks Except B3,B4,B7,B9	73	21.90	110	33.00	127	38.10	145	43.50	161	48.30	616	184.80
6	Construction of Borewells	No	1	All Blocks Except B3,B4,B7,B9	30	30.00	59	59.00	68	68.00	77	77.00	87	87.00	321	321.00
7	Motorised Chisel	No	0.2	B14,B1,B11,B5,B2, B8,B12,B13	17	3.40	43	8.60	47	9.40	52	10.40	57	11.40	216	43.20
8	Alumium portable ladder	No	0.06	All Blocks Except B3,B4,B7,B9	67	4.02	106	6.36	123	7.38	139	8.34	159	9.54	594	35.64
9	Wire mesh	No	0.1	B14,B1,B11,B5,B2, B8,B12,B13	97	9.70	124	12.40	139	13.90	148	14.80	158	15.80	666	66.60
10	Oilpalm Cutter	No	0.03	All Blocks Except B3,B4,B7,B9	139	4.17	192	5.76	206	6.18	225	6.75	244	7.32	1006	30.18
11	Neem/ Pungam Area Expansion Programme	Ha	0.2	B8,B12,B13	500	100.00	522	104.40	530	106.00	540	108.00	550	110.00	2642	528.40
12	Cultivation maintenance	Ha	0.05	B8,B12	100	5.00	111	5.55	116	5.80	118	5.90	120	6.00	565	28.25
13	Inputs for Intercropping	Ha	0.05	B8,B12,B13	20	1.00	45	2.25	46	2.30	47	2.35	48	2.40	206	10.30
	Total					**215.42**		**283.08**		**308.04**		**333.24**		**359.47**		**1499.25**

Ammapettai-B1, Sethubavachatram-B2, Budalur-B3, Kumbakonam-B4, Madukkur-B5, Thiruvonam-B6, Peravurani-B7, Thanjavur-B8, Pattukkottai-B9, Thiruvaiyaru-B10,Orathanadu-B11, Papanasam-B12, Tiruppanandal-B13, Thiruvidaimarudur-B14

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 for Ammapetai, Kumbakonam block farmers.
- State level and interstate level training programmes to farmers of Sethubavachatram, Ammapetai, Pattukotai, Tiruvidaimaruthur.
- Arranging exposure visits to farmers about rodent pest management, soil test based nutrient application for Ammapetai, and Tiruvidaimaruthur.
- Creating awareness and campaign about cotton, major and minor millets, oil palm, pulses, value addition for Ammapetai, and Tiruvidaimaruthur.
- Creating awareness and campaign about paddy for all blocks except Madukkur, Thiruvonam, Orathandu.

Budget

It is proposed to incur ₹.**240.53** 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 Requirement for Agriculture Sector in Training

(₹.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	B1,B14	2	2.50	4	5.00	6	7.50	8	10.00	10	12.50	30	37.50
2	Inter State Training of Farmers	Nos.	1.75	B1,B14	2	3.50	4	7.00	6	10.50	8	14.00	10	17.50	30	52.50
3	Training of 536 Groups of Seed Village Farmers in quality Seed Production technology.	Nos.	0.1	B1,B14	4	0.40	6	0.60	8	0.80	10	1.00	12	1.20	40	4.00
4	Training of Farmers under Mission Soil Health Card	Nos.	0.15	B1,B14	2	0.30	4	0.60	6	0.90	8	1.20	10	1.50	30	4.50
5	With in the district training of Farmers	Nos.	0.1	B1,B2,B9 ,B14	6	0.60	7	0.70	8	0.80	10	1.00	12	1.20	43	4.30
6	With in the State training of Farmers	Nos.	1.2	B14,B4, B7,B10, B13,B1	6	7.20	9	11.04	6	7.20	8	9.60	10	12.00	39	47.04
	Training of Farmers With in the district															
7	Awareness campaigns	Nos.	0.1	B1,B14	4	0.40	6	0.60	8	0.80	10	1.00	12	1.20	40	4.00
8	Cotton	Nos.	0.1	B1,B14	2	0.20	4	0.40	6	0.60	8	0.80	10	1.00	30	3.00
9	Major & Minor Millets	Nos.	0.1	B4,B12	3	0.30	0	0.00	0.2	0.02	0	0.00	0	0.00	3	0.32
10	Moisture conservation practices	Nos.	0.1	B1,B14	4	0.40	6	0.60	8	0.80	10	1.00	12	1.20	40	4.00
11	oil Palm	Nos.	0.1	B1,B14	4	0.40	6	0.60	8	0.80	10	1.00	12	1.20	40	4.00
12	Organic cultivation practices	Nos.	0.1	B1,B14	4	0.40	6	0.60	8	0.80	10	1.00	12	1.20	40	4.00
13	Paddy	Nos.	0.1	All Blocks Except B5,B6, B11	18	1.80	19	1.90	16.2	1.62	16	1.60	18	1.80	87	8.72
14	Pulses	Nos.	0.1	B10,B8, B2,B1,B3 ,B14	13	1.30	14	1.40	15	1.50	16	1.60	18	1.80	76	7.60

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
15	Value addition training	Nos.	0.1	B1,B14	4	0.40	6	0.60	8	0.80	10	1.00	12	1.20	40	4.00
	Exposure visit of Farmers															
16	Rodent Pest Management Demonstration	Nos.	0.04	B1,B14	142	5.68	142	5.68	142	5.68	142	5.68	142	5.68	710	28.40
17	With in State Exposure visit	Nos.	0.4	B13,B1, B12,B14	3	1.20	6	2.40	6	2.40	8	3.20	10	4.00	33	13.20
18	Organisation of Kisan gosthies on Soil test based nutrient application (Campaign)	Nos.	0.15	B1,B14	2	0.30	4	0.60	6	0.90	8	1.20	10	1.50	30	4.50
19	With in the district exposure visit	Nos.	0.15	B14,B1, B3,B2	3	0.45	6	0.90	6	0.90	8	1.20	10	1.50	33	4.95
	TOTAL					**27.73**		**41.22**		**45.32**		**57.08**		**69.18**		**240.53**

Ammapettai-B1, Sethubavachatram-B2, Budalur-B3, Kumbakonam-B4, Madukkur-B5, Thiruvonam-B6, Peravurani-B7, Thanjavur-B8, Pattukkottai-B9, Thiruvaiyaru-B10,Orathanadu-B11, Papanasam-B12, Tiruppanandal-B13, Thiruvidaimarudur-B14

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. Establishment of additional Seed Godown in Kumbakonam.
2. Provide bag closure for all blocks.
3. Construction of IAEC with vehicle shed and compound wall for Kumbakonam, Ammapetai, Orathandu, Papanasam, Thiruvaiyaru, Orathandu.
4. Construction of Uzhavar Maiyam/Farmers Hub at Peravurani, Tiruppandal, Papanasam, Thiruvaiyaru, Orathandu.
5. Distribution of Dunnage, Electronic platform balance and Moisture meter for all blocks.
6. Establishment of Thrashing floor/drying yard at Thanjavur, Peravurani, Thiruvonam, Tiruvidaimaruthur, Papanasam, Thiruvaiyaru, Kumbakonam, Budalur, Ammapetai.

Budget

It is proposed to incur ₹. **4706.20** akhs 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 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 Requirement for Agriculture Sector in Infrastructure

(₹.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	Additional Seed Godown	Nos.	1250000	B4	1	12.50	0	0.00	0	0.00	0	0.00	0	0.00	1	12.50
2	Construction of IAEC (383 Nos.) with vehicle shed and compound wall	Nos.	25000000	B11,B12,B13, B14,B5,B2,B1, B4	11	2750.00	0	0.00	1	250.00	0	0.00	0	0.00	12	3000.00
3	Construction of Sub-AEC (498 Nos.)	Nos.	3000000	All Blocks Except B4,B7,B9	16	480.00	6	180.00	2	60.00	0	0.00	0	0.00	24	720.00
4	Construction of Uzhavar Maiyam/Farmers Hub	Nos.	15000000	B7,B13,B12, B10,B11	2	300.00	2	300.00	1	150.00	0	0.00	0	0.00	5	750.00
5	Establishment of Threshing floor/drying yard	Nos.	500000	B8,B7,B6,B14, B12,B10,B4,B3, B1	3	15.00	10	50.00	2	10.00	4	20.00	0	0.00	19	95.00
6	Dunnage	Nos.	7500	All Blocks	105	7.88	125	9.38	125	9.38	60	4.50	40	3.00	455	34.13
7	Moisture meter	Nos.	25000	All Blocks	0	0.00	12.25	3.06	3	0.75	0	0.00	0	0.00	15.25	3.81
8	Bag closure	Nos.	10000	All Blocks	1	0.10	7.1	0.71	6	0.60	0	0.00	0	0.00	14.1	1.41
9	Electronic platform balance	Nos.	150000	All Blocks	0	0.00	7.5	11.25	7	10.50	0	0.00	0	0.00	14.5	21.75
10	Seed rack	Nos.	30000	All Blocks	11	3.30	14	4.20	14	4.20	7	2.10	1	0.30	47	14.10
11	Tarpaulin	Nos.	25000	All Blocks Except B12	1	0.25	12	3.00	12	3.00	5	1.25	0	0.00	30	7.50
12	Office Furnishings and other amenities	Nos.	200000	All Blocks	1	2.00	13	26.00	8	16.00	1	2.00	0	0.00	23	46.00
	Grand total					**3571.03**		**587.60**		**514.43**		**29.85**		**3.30**		**4706.20**

Ammapettai-B1, Sethubavachatram-B2, Budalur-B3, Kumbakonam-B4, Madukkur-B5, Thiruvonam-B6, Peravurani-B7, Thanjavur-B8, Pattukkottai-B9, Thiruvaiyaru-B10,Orathanadu-B11, Papanasam-B12, Tiruppanandal-B13, Thiruvidaimarudur-B14

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 at Kumbakonam.
- Production of enriched FYM and composting of farm waste through *Pluerotus* in Peravurani, Sethubavachatram, Madukkur, Pattukotai, Orathandu.
- Establishment of permanent and HDPE vermicompost units at Sethubavachatram, Kumbakonam, Madukkur, Peravurani, Pattukotai, Orathandu.
- Establishment of model organic villages at Sethubavachatram, Kumbakonam, Madukkur, Pattukotai, Orathandu.
- Providing green manures to all blocks except Budalur, Thanjavur, Thiruvaiyaru, Papanasam, Tiruppandal.

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 this district is ₹.**1075.32** 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 Requirement for Agriculture Sector 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	B1,B14,B11,B9,B5,B4,B2	20	10.00	30	15.00	37	18.50	44	22.00	51	25.50	182	91.00
2	HDPE Vermi compost units	Kit Nos	12000	B2,B4,B5,B7,B9,B11	35	4.20	45	5.40	55	6.60	60	7.20	65	7.80	260	31.20
3	Reclamation of Alkali Soil	MT	50000	B4,B7	2	1.00	2	1.00	22	11.00	2	1.00	2	1.00	30	15.00
4	Reclamation of Acid Soil	L. No.	6000	B4		0.00	0	0.00	20	1.20	0	0.00	0	0.00	20	1.20
5	Green Manuring	Nos	4000	All Blocks Except B3,B8,B10,B12,B13	1380	55.20	1940	77.60	520	20.80	2510	100.40	3020	120.80	9370	374.80
6	Establishment of Model organic villages	Ha	1000000	B2,B4,B5,B9,B11	6	60.00	7	70.00	24	240.00	9	90.00	10	100.00	56	560.00
8	Procurement and Distribution of Blue Green Algae	Nos	2500	B7	5	0.13	5	0.13	5	0.13	5	0.13	5	0.13	25	0.63
9	Production of Enriched FYM	MT	2500	B7	5	0.13	5	0.13	5	0.13	5	0.13	5	0.13	25	0.63
10	Composting of Farm Waste Through Pluerotus (Production and Distribution of Kits)	MT	200	B2,B5,B7,B9,B11	80	0.16	85	0.17	90	0.18	90	0.18	90	0.18	435	0.87
	Total					**130.81**		**169.42**		**298.53**		**221.03**		**255.53**		**1075.32**

Ammapettai-B1, Sethubavachatram-B2, Budalur-B3, Kumbakonam-B4, Madukkur-B5, Thiruvonam-B6, Peravurani-B7, Thanjavur-B8, Pattukkottai-B9, Thiruvaiyaru-B10,Orathanadu-B11, Papanasam-B12, Tiruppanandal-B13, Thiruvidaimarudur-B14

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) for all blocks except Thanjavur, Pattukotai.
2. Establishment of integrated Pest Management Villages at Madukkur, Pattukotai, Tiruppandal, Papanasam, Orathandu, Peravurani.
3. Establishment of Sugar cane Parasite Breeding Station at Peravurani.
4. Establishment of IPM School in Madukkur, Tiruppandal, Papanasam, Orathandu, Peravurani, Thiruvonam, Budalur, Pattukotai.
5. Establishment of bio- pesticide production unit at Peravurani.

Budget

It is proposed to incur **₹. 2825.20 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 Requirement for Agriculture Sector in Integrated Pest Management (IPM)

(₹.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
1	Farmers Field Schools (FFS)	Nos.	20000	All Blocks Except B8,B9	26	5.20	57	11.40	68	13.60	79	15.80	90	18.00	320	64.00
2	Integrated Pest Management Villages	Nos.	100000	B5,B9,B13, B12,B11,B7	2	2.00	22	22.00	22	22.00	22	22.00	22	22.00	90	90.00
3	Establishment of Coconut Parasite Breeding Station	Nos.	3500000	B7	0	0.00	2	70.00	2	70.00	2	70.00	2	70.00	8	280.00
4	Establishment of Sugar cane Parasite Breeding Station	Nos.	3500000	B7	0	0.00	3	105.00	3	105.00	3	105.00	3	105.00	12	420.00
5	Establishment of Bio-pesticide production unit	Nos.	12000000	B7	0	0.00	4	480.00	4	480.00	4	480.00	4	480.00	16	1920.00
6	IPM School	Nos.	40000	B5,B13,B12, B11,B7,B6,B3,B9	0	0.00	32	12.80	32	12.80	32	12.80	32	12.80	128	51.20
	Total					**7.20**		**701.20**		**703.40**		**705.60**		**707.80**		**2825.20**

Ammapettai-B1, Sethubavachatram-B2, Budalur-B3, Kumbakonam-B4, Madukkur-B5, Thiruvonam-B6, Peravurani-B7, Thanjavur-B8, Pattukkottai-B9, Thiruvaiyaru-B10,Orathanadu-B11, Papanasam-B12, Tiruppanandal-B13, Thiruvidaimarudur-B14

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 Nadu resulting 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 of Thanjavur district.

Project Component:

- Distribution of tractor, mini tractor and power tiller for all blocks except Tiruppandal, Papanasam, Kumbakonam.
- Distribution of MB plough, rotavator, laser leveller, baler and paddy transplanter for all blocks.
- Distribution of tractor drawn seed cum fertilizer drill for Budalur, Madukkur.
- Distribution of pump set, mobile sprinklers, rain guns and PVC Pipes to carry irrigation water from source to field for all blocks except Thanjavur, Thiruvaiyaru, Papanasam, Tiruppandal.
- Providing solar power pump system for Ammapetai, Sethubavachatram, Budalur, Kumbakonam, Thiruvaiyaru, Tiruvidaimaruthur, Tiruvidaimaruthur.
- Distribution of sprayers (power, hand and battery operated sprayer) for all blocks except Sethubavachatram, Thiruvonam.
- Distribution of combine harvester, multi crop thrasher and Tarpaulins at Ammapetai, Budalur, Madukkur, Pattukotai, Thiruvaiyaru, Thiruvaiyaru, Tiruvidaimaruthur.
- Distribution of weeder for Budalur, Kumbakonam, Thiruvonam, Thiruvaiyaru.

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 **₹.21200.27 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.

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Table 4.13.Budget Requirement for Agriculture Sector 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 Except B2,B4	185	7.40	195	7.80	206	8.24	213	8.52	219	8.76	1018	40.72
2	Battery operated sprayer	Nos.	4000	All Blocks Except B6,B2	785	31.40	857	34.28	930	37.20	1005	40.20	1080	43.20	4657	186.28
3	Power operated sprayer	Nos.	8000	All Blocks Except B6,B2	709	56.72	770	61.60	832	66.56	894	71.52	950	76.00	4155	332.40
4	Hand operated sprayer	Nos.	1500	All Blocks Except B4,B6	485	7.28	560	8.40	630	9.45	690	10.35	745	11.18	3110	46.65
5	Distribution of Baler	Nos	350000	B3	2	7.00	2	7.00	2	7.00	2	7.00	2	7.00	10	35.00
6	Distribution of chaff cutter	Nos	25000	B5,B7,B11	5	1.25	9	2.25	9	2.25	9	2.25	9	2.25	41	10.25
7	Distribution of combine harvester	Nos	1700000	B1,B3,B5,B9, B10,B11,B14	8	136.00	9	153.00	9	153.00	9	153.00	9	153.00	44	748.00
8	Distribution of Laser leveller	Nos	380000	B3,B5,B9,B10, B11	12	45.60	13	49.40	13	49.40	13	49.40	13	49.40	64	243.20
9	Distribution of Manual Weeder	Nos	2000	B3,B5,B10,B11, B12,B13	144	2.88	144	2.88	144	2.88	144	2.88	144	2.88	720	14.40
10	Distribution of MB plough	Nos	80000	B3	5	4.00	5	4.00	5	4.00	5	4.00	5	4.00	25	20.00
11	Distribution of Mini Tractor	Nos	300000	B3,B6,B7,B5,B9 ,B10,B11	16	48.00	16	48.00	16	48.00	16	48.00	16	48.00	80	240.00
12	Distribution of Mobile Sprinklers	Ha	25000	All Blocks Except B2,B7,B8,B12, B13	345	101.00	400	117.50	450	132.50	500	147.50	550	162.50	2245	661.00
13	Distribution of multicrop thrasher	Nos	400000	B11	2	8.00	2	8.00	2	8.00	2	8.00	2	8.00	10	40.00
14	Distribution of Paddy transplanter	Nos	500000	All Blocks Except B2,B4,B6,B8,B9	114	570.00	118	590.00	122	610.00	126	630.00	130	650.00	610	3050.00
15	Distribution of Power Weeder	Nos	65000	B3,B4,B5,B6, B11	137	89.05	187	121.55	237	154.05	76	49.40	337	219.05	974	633.10
16	Distribution of Powertiller	Nos	150000	All Blocks	200	300.00	211	316.50	222	333.00	233	349.50	244	366.00	1110	1665.00

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
17	Distribution of Rain guns	Ha	30000	All Blocks Except B2,B7,B8	449	134.70	504	151.20	554	166.20	604	181.20	654	196.20	2765	829.50
18	Distribution of Rotary Power weeder	Nos	70000	B4,B11,B7,B5, B3	217	151.90	268	187.60	320	224.00	370	259.00	420	294.00	1595	1116.50
19	Distribution of Rotavator	Nos	80000	All Blocks Except B6	182	145.60	200	160.00	217	173.60	235	188.00	252	201.60	1086	868.80
20	Distribution of Tarpaulins	Nos	8000	All Blocks Except B4,B10	480	38.40	497	39.76	514	41.12	528	42.24	540	43.20	2559	204.72
21	Distribution of Tractor	Nos	600000	All Blocks Except B13,B4,B12	50	300.00	56	336.00	62	372.00	68	408.00	74	444.00	310	1860.00
22	Distribution of Tractor Drawn Seed cum Fertilizer Drill	Nos	50000	B3,B5	4	2.00	4	2.00	4	2.00	4	2.00	4	2.00	20	10.00
23	PVC Pipes to carry Irrigation water from source to field	Unit	40000	All Blocks Except B8,B10,B12, B13	675	270.00	740	296.00	805	322.00	865	346.00	925	370.00	4010	1604.00
24	Solar power pump system	Nos	550000	B1,B2,B3,B4, B10,B11,B14	117	643.50	167	918.50	217	1193.50	267	1468.50	317	1743.50	1085	5967.50
25	Distribution Oil Engine Pumpset	Nos	30000	All Blocks Except B2,B8	302	90.60	357	107.10	407	122.10	457	137.10	507	152.10	2030	609.00
26	Distribution of Seed drill	Nos	50000	B6,B8	8	4.00	14	7.00	20	10.00	26	13.00	32	16.00	100	50.00
27	Seeddrill Sowing of Groundnut with Redgram as Intercrop	Nos	70000	B3	2	1.40	2	1.40	2	1.40	2	1.40	2	1.40	10	7.00
28	Distribution of dry land weeder (Power weeder)	Nos	65000	B3,B5,B6,B11	33	21.45	33	21.45	33	21.45	33	21.45	33	21.45	165	107.25
	Total					**3219.13**		**3760.17**		**4274.90**		**4649.41**		**5296.67**		**21200.27**

Ammapettai-B1, Sethubavachatram-B2, Budalur-B3, Kumbakonam-B4, Madukkur-B5, Thiruvonam-B6, Peravurani-B7, Thanjavur-B8, Pattukkottai-B9, Thiruvaiyaru-B10,Orathanadu-B11, Papanasam-B12, Tiruppanandal-B13, Thiruvidaimarudur-B14

4.1.14. Strengthening of State Seed Farm(SSF)

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

- Providing machineries such as dunnage, paddy transplanter, power tiller, tarpaulin for Kumbakonam.
- Provision of irrigation facilities through new bore well with EB connection for Kumbakonam.
- Farm connectivity for Kumbakonam.

Budget

It is proposed to incur ₹.**43.75** 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 Requirement for Agriculture Sector in (SSF)

(₹.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
I	**Irrigation Component**															
1	New bore well with EB connection	nos	8	B4	2	16.00	0	0.00	0	0.00	0	0.00	0	0.00	2	16.00
II	**Machineries**															
2	Dunnage (Poly Pallets)	nos	0.075	B4	50	3.75	0	0.00	0	0.00	0	0.00	0	0.00	50	3.75
3	Paddy Transplanter	nos	5	B4	1	5.00	0	0.00	0	0.00	0	0.00	0	0.00	1	5.00
4	Power Tiller	nos	3	B4	1	3.00	0	0.00	0	0.00	0	0.00	0	0.00	1	3.00
17	Tarpaulin	nos	0.1	B4	10	1.00	0	0.00	0	0.00	0	0.00	0	0.00	10	1.00
III	**Civil Works**															
5	Farm connectivity	Meter	0.015	B4	1000	15.00	0	0.00	0	0.00	0	0.00	0	0.00	1000	15.00
	Total					**43.75**		**0**.00		**0**.00		**0**.00		**0**.00		**43.75**

Ammapettai-B1, Sethubavachatram-B2, Budalur-B3, Kumbakonam-B4, Madukkur-B5, Thiruvonam-B6, Peravurani-B7, Thanjavur-B8, Pattukkottai-B9, Thiruvaiyaru-B10,Orathanadu-B11, Papanasam-B12, Tiruppanandal-B13, Thiruvidaimarudur-B14

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.

Project components

- Provide procurement of hardware for replacement of old hardware, printer cum scanner, Xerox machine, laptop, 4G internet to all blocks.
- Provision of handycam, GPS, android mobile, AV aids, LCD projector to all blocks.

Budget

It is proposed to incur **₹.133.56** 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 Requirement for Agriculture Sector in Information Technology

(₹.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
1	Procurement of Hardware for replacement of old hardware	Nos	50000	All Blocks	56	28.00	0	0.00	0	0.00	0	0.00	0	0.00	56	28.00
2	Connectivity Charges	Nos	11000	All Blocks	56	6.16	0	0.00	0	0.00	0	0.00	0	0.00	56	6.16
3	Printer cum Scanner	Nos	20000	All Blocks	14	2.80	0	0.00	0	0.00	0	0.00	0	0.00	14	2.80
4	UPS and Electrical Accessories	Nos	35000	All Blocks	14	4.90	0	0.00	0	0.00	0	0.00	0	0.00	14	4.90
5	Xerox machine	Nos	75000	All Blocks	14	10.50	0	0.00	0	0.00	0	0.00	0	0.00	14	10.50
6	Laptop/Desktop	Nos	50000	All Blocks	28	14.00	0	0.00	0	0.00	0	0.00	0	0.00	28	14.00
7	Anti -virus software	Nos	2500	All Blocks	28	0.70	0	0.00	0	0.00	0	0.00	0	0.00	28	0.70
8	Television	Nos	100000	All Blocks	14	14.00	0	0.00	0	0.00	0	0.00	0	0.00	14	14.00
9	Colour printer	Nos	15000	All Blocks	14	2.10	0	0.00	0	0.00	0	0.00	0	0.00	14	2.10
10	4G Internet - Dongle	Nos	2500	All Blocks	28	0.70	0	0.00	0	0.00	0	0.00	0	0.00	28	0.70
11	**Equipments for Documentation**															
a	Handycam	Nos	30000	All Blocks	14	4.20	0	0.00	0	0.00	0	0.00	0	0.00	14	4.20
b	Camera	Nos	25000	All Blocks	14	3.50	0	0.00	0	0.00	0	0.00	0	0.00	14	3.50
c	GPS instrument	Nos	20000	All Blocks	14	2.80	0	0.00	0	0.00	0	0.00	0	0.00	14	2.80
d	Android mobile	Nos	15000	All Blocks	28	4.20	0	0.00	0	0.00	0	0.00	0	0.00	28	4.20
e	External Hard disk	Nos	5000	All Blocks	70	3.50	0	0.00	0	0.00	0	0.00	0	0.00	70	3.50
12	Audio - visual Aids	Nos	150000	All Blocks	14	21.00	0	0.00	0	0.00	0	0.00	0	0.00	14	21.00
	LCD projector	Nos	75000	All Blocks	14	10.50	0	0.00	0	0.00	0	0.00	0	0.00	14	10.50
	Total					**133.56**		**0.00**		**0.00**		**0.00**		**0.00**		**133.56**

Ammapettai-B1, Sethubavachatram-B2, Budalur-B3, Kumbakonam-B4, Madukkur-B5, Thiruvonam-B6, Peravurani-B7, Thanjavur-B8, Pattukkottai-B9, Thiruvaiyaru-B10,Orathanadu-B11, Papanasam-B12, Tiruppanandal-B13, Thiruvidaimarudur-B14

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	3991.06	4759.99	4955.68	5267.23	5468.72	24442.69
2	Millets	202.73	207.14	210.09	213.05	216.01	1049.03
3	Pulses	5690.27	6812.81	7853.35	8888.12	9924.88	39169.43
4	Oilseeds	1251.48	1274.72	1305.58	1335.79	1368.11	6535.67
5	Oilpalm	215.42	283.08	308.04	333.24	359.47	1499.25
6	Cotton	85.71	195.18	220.75	246.22	271.69	1019.55
7	Sugarcane	764.97	4187.85	4363.83	4610.87	6521.87	20449.39
8	Coconut	493.46	535.28	619.65	618.03	666.15	2932.57
9	Training	27.73	41.22	45.32	57.08	69.18	240.53
10	Infrastructure	3571.03	587.60	514.43	29.85	3.30	4706.20
11	Soil Health Management	130.81	169.42	298.53	221.03	255.53	1075.32
12	Rainfed Area Development	0.00	0.00	0.00	0.00	0.00	0.00
13	Integrated Pest Management	7.20	701.20	703.40	705.60	707.80	2825.20
14	Farm Mechanization	3219.13	3760.17	4274.90	4649.41	5296.67	21200.27
15	Strengthening of State Seed Farm	43.75	0.00	0.00	0.00	0.00	43.75
16	Agriculture Information Technology	133.56	0.00	0.00	0.00	0.00	133.56
	Total	**19828.31**	**23515.66**	**25673.55**	**27175.52**	**31129.38**	**127322.41**

4.2. Agriculture Research Infrastructure and Development

The main products of the oil palm include, palm oil, palm kernel and palm kernel oil. The wastes generated when the fruits are processed to obtain palm oil and palm kernel have several uses. The sludge are useful in making traditional soaps and fertilizer and the palm kernel cake is used widely as an input into the feed industry and for fertilizer.Production of quality planting material of one or more specified crops by adopting good nursery management practices. Nursery premise only where sale of specified quality planting material ofrecognized source are being carried out by creating necessary infrastructurefacilities and proper record keeping. Infrastructure facilities like establishment of mist chambers, shade net houses, environment controlled chambers etc. are essential for production and supply of quality planting materials to the farmers and urban folks.

Much progress has been made in developing efficient procedures for extracting nematodes from soil, but investigations of nematode numbers as related to crop damage and other studies dealing with population dynamics are frequently of limited value because of unmanageable variation in sampling and extraction**.**A major problem with all extraction procedures is obtaining a representative sub sample of larger soil samples collected from plots or fields.

Indiscriminate use of chemical pesticides contributed in loss of soil productivity along with addition of salts to the soil. To revive the soil health and living on alternate source has become essential concept of bio fertilizer came forward, which can be a good supplement for a chemical fertilizers, Bio fertilizers are nutrient availability systems in which biological process are involved, The term bio fertilizers includes selective micro-organism like bacteria, fungi and algae. Which are capable of fixing atmospheric nitrogen or convert soluble phosphate and potash in the soil into forms available to the plants. Bio fertilizer is a cost effective, eco-friendly & renewable source of land nutrient they play a vital role in maintaining a long term soil fertility & sustainability.

The main objective of bio-control laboratories is to control pests/disease through the use of natural predators and bio-fertilizers instead of using chemical pesticides. To encourage the use of bio fertilizers / bio pesticide, Govt. of Tamil Nadu has established few bio-control laboratories. These labs produce bio fertilizers like Azospirillum, Phosphobacteria and VAM and bio-pesticides viz.,*Trichoderma, Pseudomonas*, *Beauveria* and *Verticilium* in

their laboratories and supplied to the farmers of various regions. The proposed intervention is also focused on establishment of bio control laboratories at stations for research and development. Grain Quality Evaluation Program is to provide an unbiased assessment of grain quality and end-use value to all sectors of the grain industry. Technology changes very rapidly and therefore, the facilities in every technicalInstitute become obsolete vary fast. Therefore, it is always necessary to support technical institutes regularly by providing assistance to upgrade infrastructure so as to excel in research and innovations.

The photosynthesis is a fundamental process in crops and the carbon fixed during this process is the major contributor to the plant growth and development and to the overall yield and performance in a crop context. Based on this back ground, the present research is proposed to establish the facility for photosynthesis improvement in major crops to promote a new agricultural revolution and contribute towards the challenge of meeting global food demands. Improving photosynthesis is the most significant opportunity for raising the yield potential of major crops and addresses the new risks associated with future climate change conditions. Training and demonstrations on precision water and nutrient usage, INM, IPM, use of natural plant enemies, cultivation under protected structures etc. imparts confidence with in the farmers in agriculture and make them to adopt to harvest bumper crop and to get triple the income. In this regard setting up of training institute will be off immense use in changing the economic and social status of the farmers, skilled workers, rural women and self-entrepreneurship development among the stake holders.

These problems all necessitate the need for making them aware of good farming practices from research infrastructure which may provide better infrastructure facilities and higher agricultural production by adopting the following research infrastructure facilities.so they can be getting a better knowledge on crops for getting higher agricultural production at Thanjavur district.

Project components

a) Creation of Oil palm Processing unit at Orathanadu
b) Providing Coconut Processing Facility at Orathandu
c) Establishment of Department laboratories at Orathanadu, Aduthurai, and Thanjavur blocks.
d) Establishment of Post-Harvest Technology Centre at Orathanadu

e) Establishment of nursery with sales out let at Orathanadu
f) Establishment of automated nematode extraction units and seed storage and processing godown at Orathanadu
g) Establishment of glass house, animal clinic, cattle shed and polyhouse at Orathanadu and Aduthurai blocks
h) Establishment of Biocontrol laboratory at Orathanadu and Aduthurai blocks
i) Construction of Trainees Hostel in Pattukotai and Thanjavur blocks
j) Establishment of biofertilizer laboratory at Thanjavur
k) Establishment of vermi compost production unit at Aduthurai
l) Construction of Technology Park at Aduthurai
m) Establishment of advanced photosynthetic analytic laboratory at Aduthurai
n) Establishment of grain quality analysis laboratory at Aduthurai
o) Establishment of Farmers Training Centre at Aduthurai
p) Establishment of Model Mechanized Research Farm at Aduthurai

Budget

The budget requirement for the above research and development activities is estimated at ₹.**1750.00** lakhs over a period of five years

Expected outcome

The implementation of the above project will result in better research activities and trainings on latest technologies which in turn results in better infrastructure facilities and higher agricultural production.

Implementing agency

Tamil Nadu Agricultural University will be implementing the project.

Table.4.17 Budget for Agricultural Research infrastructure & Development

(₹in lakhs)

Sl. No	Interventions	Unit Cost	Blocks Covered	2017-2018		2018-2019		2019-2020		2020-2021		2021-2022		Total	
				Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
	Research Infrastructure														
1	Creation of Oil palm Processing unit	50	Orathanadu	1	50.00	0	0	0	0	0	0	0	0	1	50
2	Coconut Processing Facility	50	Orathanadu	1	50.00	0	0	0	0	0	0	0	0	1	50
3	Establishment of Department laboratories	10	Orathanadu, Aduthurai & Thanjavur	3	30.00	2	20	2	20	2	20	2	20	11	110
4	Establishment of Post-Harvest Technology Centre	50	Orathanadu	0	0.00	1	50	0	0	0	0	0	0	1	50
5	Establishment of nursery with sales out let	25	Orathanadu, Aduthurai& Thanjavur	1	25.00	1	25	0	0	0	0	1	25	3	75
6	Establishment of automated nematode extraction units and seed storage and processing godown	10	Orathanadu	2	20.00	0	0	0	0	0	0	0	0	2	20
7	Establishment of glass house, animal clinic, cattle shed and polyhouse	6	Orathanadu & Aduthurai	1	6.00	1	6	1	6	1	6	1	6	5	30
8	Establishment of Biocontrol laboratory	80	Orathanadu &Aduthurai	1	80.00	0	0	0	0	0	0	1	80	2	160
9	Construction of Trainees Hostel	200	Pattukkottai & Thanjavur	1	200.00	0	0	1	200	0	0	0	0	2	400
10	Establishment of biofertilizer laboratory	90	Thanjavur	0	0.00	1	90	0	0	0	0	0	0	1	90
11	Establishment of vermi compost production unit	5	Aduthurai	1	5.00	0	0	0	0	0	0	0	0	1	5
12	Construction of Technology Park	100	Aduthurai	0	0.00	1	100	0	0	0	0	0	0	1	100
13	Establishment of advanced photosynthetic analytic laboratory	300	Aduthurai	0	0.00	0	0	0	0	0	0	1	300	1	300
14	Establishment of grain qualtiy analysis laboratory	50	Aduthurai	0	0.00	0	0	1	50	0	0	0	0	1	50
15	Establishment of Farmers Training Centre	100	Aduthurai	0	0.00	1	100	0	0	0	0	0	0	1	100
16	Establishment of Model Mechanized Research Farm	20	Aduthurai	0	0.00	0	0	1	20	0	0	0	0	1	20
18	Popularization of MGR 100 Rice	Aduthurai	20	0	0.00	1	20	0	0	0	0	0	0	**1**	**20**
19	Organic rice production	Aduthurai	120	0	0.00	0	0	1	120	0	0	0	0	**1**	**120**
	Total				466.00		411.00		416.00		26.00		431.00	37.00	1750.00

4.3. 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

Fruit Crops

Today's changing food pattern enhances the area expansion under fruits. The preferable choices of fruits are Mango, Apple, Banana, Grapes, 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.

Project components

- To enhance fruit production by expansion of area of bananana in all blocks.
- UHDP of papaya, mango, guava, pomegranate, acidlime, in Kumbakonam, Pattukotai, Madukkur, Ammapetai, Thiruvaiyaru blocks.
- HDP in mango, guava, litchi and pomegranate and normal planting of lime, mango, guava, sapota, amla, papaya and jackfruit in all blocks except Kumbakonam, Madukkur, Thiruvonam, Thiruvonam, Pattukotai blocks.
- Banana leaf production in all blocks except Thiruvonam, Tiruppandal, Tiruvidaimaruthur, Budalur, Papanasam.
- Enhancing commercial production of choice fruits in Papanasam.
- Enhancing commercial production of traditional fruits in Papanasam.

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.

Project components

- Area expansion of brinjal, bhendi, gren chilli in all blocks.
- Area expansion of tomato, gourds, greens, small onions in all blocks except Budalur, Thiruvaiyaru, Papanasam.
- Area expansion of cabbage, carrot, beet root in Peravurani.
- Cultivation of hybrid vegetables under protected structure in Tiruvidaimaruthur.

Flower crops

The major flowers grown are Gundumalli, Mullai, Rose, Crossandra, Chrysanthemum, Marigold, Tuberose, Arali, 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.

Project components

- Area expansion of loose flowers in all blocks.
- Area expansion of bulbous flowers in all blocks except Madukkur.

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.

Project components

- Area expansion of seed and rhizomatic spices in all blocks except Papanasam, Budalur, Thiruvaiyaru, Kumbakonam, Sethubavachatram, Thiruvaiyaru.
- Perennial spices in all blocks except Thiruvaiyaru, Thiruvaiyaru, Budalur, Papanasam.

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, oil palm, palmyrah, cashew, cinchona etc. So the promotion of cultivation of plantation crops in the potential districts will increase the economy of the farmer and also Indian economy.

Project components

- Area expansion of cocoa in Kumbakonam, Thiruvonam, Tiruppandal.
- Area expansion of cashew in Madukkur.
- Area expansion of coconut and arecanut in all blocks except Tiruvidaimaruthur, Tiruvidaimaruthur, Budalur, Budalur.

Rejuvenation of Old Orchards – Mango and cashew

In general, 40-45 years old mango trees exhibit decline in fruit yield because of dense and overcrowded canopy. The trees do not get proper sunlight resulting in decreased production of shoots. New emerging shoots are weak and are unsuitable for flowering and fruiting. The population of insects and pests builds up and the incidence of diseases increases in such orchards. These unproductive trees can be converted into productive ones by pruning with the techniques developed. Similarly, a procedure to rejuvenate and restorethe production potential of old unproductive and wilt affected guava orchards has been developed, which employs pruning of branches at different periodicity and at different severities. Crowding and encroachment of guava trees with subsequent inefficient light utilization is an obvious problem with older orchards, if trees are not well managed. The internal bearing capacity of guava trees also decreases with time, due to overshadowing of internal bearing wood.

Project components

- Rejuvenation of Old Orchards – Mango and cashew at Budalur, Sethubavachatram, Peravurani, Thiruvaiyaru, Thiruvaiyaru, Thiruvonam.

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.

Project components

- Provision of HDPE vermibedcin all blocks.
- Provide organic farming and PGS certification in 50 cluster in Thanjavur.

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.

Project components

- To give pollination support through bee keeping in all blocks.
- Provide honey extractor for all blocks except Tiruppandal.

Protected cultivation

Protected cultivation is a unique and specialized form of agriculture. Devices or technologies for protection (wind breaks, irrigation, soil mulches) or structures (green houses, tunnels, row covers) may be used with or without heat. The intent is to grow crops where otherwise they could not survive by modifying the natural environment to prolong the harvest period, often with earlier maturity to increase yields improve quality, enhances the stability of production and make commodities available when there is no outdoor production. Interventions proposed are establishment of Poly green house and shade net for vegetable production.

Project components

- Establishment of paddy green house in Sethubavachatram, Peravurani, Thiruvaiyaru, Tiruvidaimaruthur.
- Establishment of shade net in Thiruvaiyaru, Sethubavachatram, Peravurani, Tiruvidaimaruthur, Thiruvaiyaru.

Establishment of Mushroom unit

Mushrooms have been valued throughout the world as both food and medicine for thousands of years. They are a rich source of nutrition and form a major chunk of health

foods. Earlier mushroom eating was restricted to specific regions and areas of the world but due to globalization, interaction between different cultures, growing consumerism has ensured the accessibility of mushrooms in all areas. Mushrooms are increasingly gaining acceptance in different Cusines and in everday consumption. They have created a space in a common man's kitchen. Also, current trend of consumption conveys the opportunity that lies in the area of mushroom exports.

Project components

- Establishment of cottage mushroom unit in Papanasam.
- Making compost and mushroom production in Budalur.

Vermicompost unit

Earthworms are often referred to as farmer's friend s and nature's ploughmen. Earthworms are extremely important in soil formation, principally through their activities in consuming organic matter, fragmenting and mixing it intimately with mineral particles to form aggregates. During their feeding, earthworms promote microbial activity greatly, which in turn accelerates the breakdown of organic matter and stabilization of soil aggregates. The end product, commonly termed vermicompost and obtained as the organic wastes pass through the earthworm gut, is quite different from the parent waste material.

Project components

- Establishment of vermicompost unit at all blocks except Thiruvonam, Thiruvaiyaru.

Supporting structures for vegetable production

Supporting and training vegetables to grow upright, away from the soil surface, takes up less space in the bed. So in order to enhance the vegetables production the supporting structure such as Staking/ Trellis/ Propping and Permanent Pandhal structurehas to be established.

Project components

- Establishment of staking trellies/ propping in all blocks except Budalur, Thiruvonam, Thiruvaiyaru, Papanasam.
- Establishment permanent pandal structure in all blocks except Sethubavachatram, Thanjavur, Thiruvaiyaru, Papanasam.

Post-harvest management

Temperature management is most effective tool for maintaining quality and safety and for extending the post-harvest life of fresh horticultural commodities. It begins with the rapid

removal of field heat by initial cooling and continuous throughout the cold chain (cold storage), refrigerated transportation, refrigerated retail display and cold storage at wholesale distribution. In order to reduce the post-harvest losses its necessary to establishing Pack house (9m X 6m),Low cost onion structure 25 mt, Drying yard and Market intervention - Mobile vending cart.

Mechanization

Farm mechanization has been helpful to bring about significant improvement in horticulture productivity by bridging the demand- supply gap of farm workers. Thus the main objective is,

- To supply the horticulture machinery/implements such as Power Tiller (8BHP and above) for all blocks.
- Tractor Land development for Ammapetai, Sethubavachatram, Kumbakonam, Thanjavur, Tiruppandal.
- Manual Sprayer-Knapsack/Foot operated Sprayer for all blocks except Thiruvaiyaru, Thiruvaiyaru.
- Tractor Mounted / Operated Sprayer (Below 20HP) for Budalur, Papanasam.
- Post Hole Digger/Augur in Sethubavachatram.
- Hand operated sprayer with face mask in all blocks except Budalur, Madukkur, Papanasam.
- Provide nets for safe harvesting of fruits in Sethubavachatram, Madukkur, Pattukotai, Tiruvidaimaruthur.
- Power operated Sprayer, Plastic crates for vegetable & fruits handling in all blocks except Budalur, Thiruvaiyaru, Papanasam, Tiruvidaimaruthur.
- Providing equipments for manure in Kumbakonam.

Water and irrigation management

Irrigation plays an important role in raising and stabilizing yield of horticultural crops. Many orchards depend on rainfall. Trees suffer water deficit during crucial fruit development period. This is the reason why many times both productivity as well as fruit quality is not up to the level desired. Thus effective scheduling of irrigation is very important in decisions related to maximizing yields and improving fruit size.

Project components

- Installation of micro drip to all blocks.
- Distribution of raingun to all blocks except Thiruvaiyaru, Thiruvaiyaru.
- Providing water harvesting system for individuals in Thiruvaiyaru.

Capacity building

Promotion of innovation in application of information communication technology in agriculture and dissemination of knowledge is a critical role in knowledge based growth of horticulture. Therefore it is important to provide the Training to farmers within the State. Training to farmers outside the state, Exposure visit to farmers for 5 days, Training to farmers at HTC, Exposure visit of farmers outside India, Training to staff outside the state, Training to staff outside India, District level seminar, Computerization & governance, Publicity and Documentation.

Project components

- Arranging within the state training for all blocks except Thiruvaiyaru.
- Arranging outside the state training for all blocks except Papanasam, Budalur, Kumbakonam, Peravurani, Tiruvidaimaruthur, Thiruvaiyaru, Thiruvonam, Tiruppandal.
- Arranging exposure visit to all framers of the district except Ammapetai, Thiruvaiyaru.
- Conducting district level seminar at Thiruvaiyaru.
- Provide training to staffs outside the state in Sethubavachatram, Budalur, Kumbakonam, Pattukotai, Madukkur, Budalur, Tiruppandal, Thanjavur.
- Provide training to staffs outside India for Budalur, Thiruvaiyaru, Papanasam.

Budget

The budget requirement for fulfilling the various interventions is₹ **18083.63** Lakhs.

Implementing agency

The projects will be implemented by the Department of Horticulture.

Table.4.18. Budget requirement for interventions in Horticulture

(₹ 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	191	238.75	219	273.75	264	330.00	300	375.00	337	421.25	1311	1638.75
2	Banana / Hill Banana sucker & Pine apple sucker	Ha	0.875	All Blocks	355	310.63	385	336.88	400	350.00	430	376.25	481	420.88	2051	1794.63
3	UHDP in Papaya, Mango, Guava, Pomegranate, Acidlime	Ha	1.25	B4,B9,B5, B1,B10, B8	34	42.50	34	42.50	34	42.50	39	48.75	41	51.25	182	227.50
4	HDP in Mango, Guava, Litchi, Pomegranate	Ha	1	All Blocks Except B8,B11	112	112.00	138	138.00	161	161.00	217	217.00	219	219.00	847	847.00
5	Area expansion fruits with traditional varieties	Ha	0.6	All Blocks	1	0.60	2	1.20	2	1.20	2	1.20	3	1.80	10	6.00
6	Normal Planting in lime / lemons	Ha	0.6	B12,B3, B2,B7, B14	31	18.60	31	18.60	33	19.80	35	21.00	37	22.20	167	100.20
7	Normal Planting in Mango	Ha	0.6	B12,B3, B11,B2,B7, B14,B1, B10	49	29.40	50	30.00	52	31.20	52	31.20	55	33.00	258	154.80
8	Normal planting in Guava	Ha	0.6	B3,B11,B9, B5,B7,B14, B1,B6	103	61.80	104	62.40	104	62.40	99	59.40	108	64.80	518	310.80
9	Normal planting in Sapota	Ha	0.6	B9,B2,B7	10	6.00	10	6.00	6	3.60	13	7.80	15	9.00	54	32.40
10	Normal planting in Amla	Ha	0.6	B9,B7, B10	4	2.40	4	2.40	7	4.20	6	3.60	4	2.40	25	15.00
11	Normal planting in Papaya	Ha	0.6	B12,B4, B9,B7, B14,B1, B10, B13	50	30.00	50	30.00	50	30.00	55	33.00	50	30.00	255	153.00

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.
12	Normal planting in Jack	Ha	0.6	B7	10	6.00	10	6.00	10	6.00	10	6.00	10	6.00	50	30.00
13	Banana for leaf production	Ha	0.6	All Blocks Except B6,B13, B14,B3, B12	97	58.20	149	89.40	200	120.00	247	148.20	297	178.20	990	594.00
14	Commercial production of choice fruits (Kiwi, Mangoosteen, Rambutan, Fig, Date palm, Durian, Carambola, Dragon fruit,Passion Fruit, Kiwi, Grapes, Strawberry, etc.,)	Ha	1.25	B7	5	6.25	5	6.25	5	6.25	5	6.25	5	6.25	25	31.25
15	Commercial production of Traditional fruits (Woodapple, Manila Tamarind, Jamun, Ber, Karonda, Annona, Egg fruit, etc.,)	Ha	0.6	B7	5	3.00	5	3.00	5	3.00	5	3.00	5	3.00	25	15.00
II	**Area expansion of vegetable crops**															
16	Brinjal	Ha	0.5	All Blocks	136	68.00	145	72.50	163	81.50	172	86.00	202	101.00	818	409.00
17	Bhendi	Ha	0.5	All Blocks	146	73.00	157	78.50	166	83.00	176	88.00	209	104.50	854	427.00
18	Green Chillies	Ha	0.5	All Blocks	139	69.50	145	72.50	161	80.50	165	82.50	186	93.00	796	398.00
19	Tomato	Ha	0.5	All Blocks Except B1,B3,B11, B12	34	17.00	40	20.00	45	22.50	51	25.50	58	29.00	228	114.00
20	Gourds including pumpkin and tinda	Ha	0.5	All Blocks Except B3,B11,B12	61	30.50	67	33.50	72	36.00	77	38.50	85	42.50	362	181.00
21	Greens	Ha	0.5	All Blocks Except B11	63	31.50	68	34.00	74	37.00	88	44.00	94	47.00	387	193.50

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.
22	Small Onion	Ha	0.5	All Blocks Except B3,B12	63	31.50	73	36.50	83	41.50	93	46.50	103	51.50	415	207.50
23	Cauliflower	Ha	0.5	B7	5	2.50	5	2.50	5	2.50	5	2.50	5	2.50	25	12.50
24	Annual Moringa	Ha	0.5	All Blocks Except B10	46	23.00	50	25.00	54	27.00	61	30.50	65	32.50	276	138.00
25	Cabbage	Ha	0.5	B7	5	2.50	5	2.50	5	2.50	5	2.50	5	2.50	25	12.50
26	Cucumber/gherkin	Ha	0.5	B5,B7,B1,B6, B13	21	10.50	21	10.50	21	10.50	21	10.50	21	10.50	105	52.50
27	Caroot	Ha	0.5	B7	5	2.50	5	2.50	5	2.50	5	2.50	5	2.50	25	12.50
28	Lab Lab	Ha	0.5	B4,B9,B2,B5, B7,B1,B8	18	9.00	18	9.00	18	9.00	18	9.00	18	9.00	90	45.00
29	Chowchow	Ha	0.5	B7	5	2.50	5	2.50	5	2.50	5	2.50	5	2.50	25	12.50
30	Radish	Ha	0.5	B4,B9,B2,B5, B1,B6,B13,B8	53	26.50	57	28.50	61	30.50	73	36.50	82	41.00	326	163.00
31	Melons	Ha	0.5	B4,B9,B2,B5, B1,B6,B13,B8	24	12.00	24	12.00	24	12.00	25	12.50	25	12.50	122	61.00
32	Cluster bean	Ha	0.5	All Blocks Except B6,B10,B11	48	24.00	38	19.00	43	21.50	48	24.00	53	26.50	230	115.00
33	Beetroot	Ha	0.5	B7	5	2.50	5	2.50	5	2.50	5	2.50	5	2.50	25	12.50
34	Tapioca	Ha	0.5	B9,B2,B5,B7, B1,B10,B6, B13	96	48.00	107	53.50	113	56.50	123	61.50	126	63.00	565	282.50
35	Yams and colacassia	Ha	0.5	B11,B2,B7, B14	33	16.50	38	19.00	43	21.50	48	24.00	53	26.50	215	107.50
36	Sweet potato	Ha	0.5	B7,B14	15	7.50	20	10.00	25	12.50	30	15.00	35	17.50	125	62.50
37	Cultivation of hybrid Vegetables under protected structures	1000 Sq.m	1.4	B14	1	1.40	1	1.40	1	1.40	1	1.40	1	1.40	5	7.00

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.
III	**Area expansion of Medicinal and Aromatic plants**															
38	Solanum nigrum	Ha	0.2989	B1	1	0.30	1	0.30	1.5	0.45	1.5	0.45	2	0.60	7	2.09
39	Lemon grass/palmarosa	Ha	0.32	B7	5	1.60	5	1.60	5	1.60	5	1.60	5	1.60	25	8.00
40	Red sandal	Ha	0.6754	All Blocks Except B9,B3,B11, B12	25	16.89	25	16.89	25	16.89	25	16.89	25	16.89	125	84.43
41	Sandal	Ha	0.5822	All Blocks Except B9,B3,B11, B12	25	14.56	24	13.97	24	13.97	24	13.97	23	13.39	120	69.86
42	Mint	Ha	0.15	B7	5	0.75	5	0.75	5	0.75	5	0.75	5	0.75	25	3.75
IV	**Area expansion of Spices crops**															
43	Seed and Rhizomatic spices (Coriander, Turmeric, Ginger, Dry Chilly, Cumin, Fennel, Fenu greek, Dil, Cardamom etc.,)	Ha	0.3	All Blocks Except B12,B3,B11, B4,B2,B10	34	10.20	39	11.70	44	13.20	49	14.70	54	16.20	220	66.00
44	Perennial spices (Pepper, Curry leaf, All spice, Cinnamon, Clove, Tamarind, Nut meg etc.,)	Ha	0.5	All Blocks Except B10,B11,B3, B12	50	25.00	55	27.50	63	31.50	70	35.00	76	38.00	314	157.00
V	**Area expansion of Flower crops**															
45	Loose flowers - Jasminum sp, Crossandra, Marigold, Rose, Chrysanthemum, Nerium, Torenia	Ha	0.4	All Blocks	40	16.00	45	18.00	48	19.20	56	22.40	63	25.20	252	100.80
46	Bulbous flowers - Tube rose, Gladioli, Dahlia, Bird of paradise, Heliconia, Tulip	Ha	1.5	All Blocks Except B5	35	52.50	40	60.00	45	67.50	53	79.50	59	88.50	232	348.00

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.
VI	**Area expansion /Gap filling of Plantation crops**															
47	Cocoa	Ha	0.5	B4,B6,B13	11	5.50	12	6.00	14	7.00	14	7.00	14	7.00	65	32.50
48	Cashew	Ha	0.5	B5	5	2.50	5	2.50	5	2.50	5	2.50	5	2.50	25	12.50
49	Arecanut	Ha	0.5	All Blocks Except B14,B2,B3, B12	50	25.00	58	29.00	50	25.00	55	27.50	57	28.50	270	135.00
50	Betelvine	Ha	0.5	B2,B7,B11	12	6.00	12	6.00	12	6.00	13	6.50	13	6.50	62	31.00
51	Coconut	Ha	0.5	All Blocks Except B2,B9,B3, B12	137	68.50	147	73.50	157	78.50	172	86.00	182	91.00	795	397.50
VII	**Rejuvenation/INM-IPM/Mulching/Anti bird net**															
52	Mango/Cashew - Rejuvenation	Ha	0.4	B3,B10,B12	30	12.00	29	11.60	33	13.20	45	18.00	35	14.00	172	68.80
53	INM/IPM for Horticultural crops	Ha	0.04	B12,B3,B2, B7,B6,B13	80	3.20	80	3.20	67	2.68	70	2.80	60	2.40	357	14.28
54	Mulching	Ha	0.32	All Blocks Except B9	117	37.44	127	40.64	141	45.12	154	49.28	169	54.08	708	226.56
VIII	**Pollination Support through Bee Keeping**															
55	Bee hive & Colony	No	0.04	All Blocks	1225	49.00	1250	50.00	1260	50.40	1340	53.60	1405	56.20	6480	259.20
56	Honey Extractor	No	0.2	All Blocks Except B13	185	37.00	205	41.00	229	45.80	282	56.40	315	63.00	1216	243.20
IX	**Organic Farming**															
57	Organic farming and PGS certification in 50 acre cluster	1 cluster	14.95	B8	0	0.00	1	14.95	1	14.95	1	14.95	1	14.95	4	59.80

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.
58	HDPE Vermibed	No	0.16	All Blocks	159	25.44	159	25.44	169	27.04	171	27.36	166	26.56	824	131.84
X	**Rainfed Area development**															
59	Integrated farming system - Horticulture Based farming	Ha	0.5	B1,B2,B5,B9	24	12.00	24	12.00	24	12.00	29	14.50	29	14.50	130	65.00
60	Green manuring	Ha	0.04	B4,B9,B2,B5, B1,B6,B8, B13	55	2.20	55	2.20	60	2.40	60	2.40	60	2.40	290	11.60
61	Moisture stress management - Minimum irrigation gurantee by PUSA hydrogel	Ha	0.1	All Blocks Except B3,B12	325	32.50	330	33.00	340	34.00	365	36.50	365	36.50	1725	172.50
B	**Infra structures and Assets creation**															
I	**Protected cultivation**															
1	Poly Green House	1000 Sq.m	9.35	B2,B7,B10, B14	5	46.75	4	37.40	5	46.75	4	37.40	4	37.40	22	205.70
2	Shadenet	1000 Sq.m	7.1	B11,B2,B14, B7,B10	9	63.90	8.5	60.35	8.5	60.35	9	63.90	9	63.90	44	312.40
II	**Mushroom production**															
3	Mushroom production and compost making	1 No.	20	B3	1	20.00	0	0.00	0	0.00	0	0.00	0	0.00	1	20.00
4	Cottage mushroom unit	1 No.	1	B2	1	1.00	0	0.00	1	1.00	0	0.00	1	1.00	3	3.00
III	**Vermicompost unit**															
5	Permanent Vermicompost Unit	600 cu.ft	1	All Blocks Except B6,B11	29	29.00	29	29.00	26	26.00	26	26.00	35	35.00	145	145.00

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.
IV	**Supporting structures for Horticulture crop production**															
6	Staking/ Trellies/ Propping	Ha	1	All Blocks Except B3,B6,B11, B12	30	30.00	31	31.00	33	33.00	33	33.00	33	33.00	160	160.00
7	Permanent Pandhal structure	Ha	4	All Blocks Except B2,B8,B11, B12	22	88.00	20	80.00	20	80.00	20	80.00	20	80.00	102	408.00
C	**Special interventions**															
1	Offseason Annual Moringa production - Pod	Ha	1.25	All Blocks Except B1,B3,B11, B12	30	37.50	30	37.50	31	38.75	31	38.75	31	38.75	153	191.25
2	Offseason Annual Moringa production -Leaf	Ha	2	All Blocks Except B1,B3,B11	119	238.00	116	232.00	119	238.00	118	236.00	118	236.00	590	1180.00
3	Farm deficiency correction	Ha	0.04	All Blocks Except B10	1250	50.00	1320	52.80	1410	56.40	1500	60.00	1560	62.40	7040	281.60
4	Promotion of Roof top Garden/ Potager garden Kit	No	0.005	All Blocks Except B10,B11, B12	695	3.48	645	3.23	720	3.60	720	3.60	720	3.60	3500	17.50
5	Promotion of Roof top Garden/ Potager garden Kit with shadenet	No	0.0735	B2,B7, B11	65	4.78	65	4.78	70	5.15	70	5.15	70	5.15	340	24.99
6	Banana Bunch Sleeve	Ha	0.25	All Blocks Except B3,B12	231	57.75	331	82.75	436	109.00	541	135.25	641	160.25	2180	545.00
7	AESA based IPM in fruits and vegetables Pheramone trap	Ha	0.04	All Blocks Except B3,B11, B12	90	3.60	90	3.60	90	3.60	90	3.60	90	3.60	450	18.00

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.
8	AESA Based IPM in fruits and vegetables Yellow sticky trap	Ha	0.04	All Blocks Except B3,B11, B12	90	3.60	90	3.60	90	3.60	90	3.60	90	3.60	450	18.00
9	AESA Based IPM in fruits and vegetables Light trap	Ha	0.08	All Blocks Except B3,B11,B12, B14	85	6.80	85	6.80	85	6.80	85	6.80	85	6.80	425	34.00
10	Coastal area development programme - Public	Per villag e	1	B6	5	5.00	5	5.00	5	5.00	5	5.00	5	5.00	25	25.00
D	**Post Harvest Management**															
1	Pack house (9m X 6m)	1 No	4	B2,B7,B10, B14	7	28.00	8	32.00	7	28.00	7	28.00	7	28.00	36	144.00
2	Low cost onion structure 25 mt	1 No	1.75	B2,B7	2	3.50	3	5.25	2	3.50	2	3.50	3	5.25	12	21.00
3	Drying yard	1 No	5	B14	1	5.00	1	5.00	1	5.00	1	5.00	1	5.00	5	25.00
4	Market intervention -Mobile venindg cart	1 No	0.3	All Blocks Except B8,B10,B14, B3,B11,B12	34	10.20	34	10.20	34	10.20	34	10.20	34	10.20	170	51.00
E	**Mechanization - Machineries, Equipments & Tools**															
1	Power tiller/Tractor/Minitractor	Nos	1	All Blocks	57	57.00	54	54.00	51	51.00	53	53.00	51	51.00	266	266.00
2	Land development, tillage and seed bed preparation equipments	Nos	0.3	B1,B2,B4,B9, B13, B8	14	4.20	14	4.20	14	4.20	15	4.50	15	4.50	72	21.60
3	Manual Sprayer-Knapsack/Foot operated Sprayer	Nos	0.12	All Blocks Except B10,B11	110	13.20	113	13.56	110	13.20	140	16.80	135	16.20	608	72.96
4	Tractor Mounted / Operated Sprayer (Below 20HP)	Nos	0.2	B3,B12	0	0.00	0	0.00	0	0.00	2	0.40	0	0.00	2	0.40

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.
5	Tractor Mounted / Operated Sprayer (Above 20HP)	Nos	1.26	B3	1	1.26	1	1.26	0	0.00	0	0.00	0	0.00	2	2.52
6	Post Hole Digger/Augur, Pneumatic/ other Planter		1.26	B2	1	1.26	0	0.00	0	0.00	0	0.00	1	1.26	2	2.52
7	Mulch laying machine	No	0.7	B5	5	3.50	5	3.50	5	3.50	5	3.50	5	3.50	25	17.50
8	Hand operated sprayer with face mask	Nos	0.025	All Blocks Except B3,B5, B12	155	3.88	160	4.00	170	4.25	175	4.38	185	4.63	845	21.13
9	Nets for safe harvesting of fruits,Headlights for flower picking	Nos	0.005	B2,B5,B9, B14	26	0.13	31	0.16	36	0.18	41	0.21	46	0.23	180	0.90
10	Power operated sprayer	Nos	0.05	B1,B10	22	1.10	22	1.10	22	1.10	22	1.10	22	1.10	110	5.50
11	Plastic crates for vegetable & fruits handling	No of sets containing 10crates	0.075	All Blocks Except B3,B11, B12,B14	240	18.00	240	18.00	245	18.38	255	19.13	255	19.13	1235	92.63
12	5 layered Polythene spread sheets for drying horticulture produce	No	0.16	All Blocks Except B6,B10,B14, B11,B3	80	12.80	80	12.80	80	12.80	85	13.60	85	13.60	410	65.60
13	Aluminium Ladders for Harvesting	No	0.2	B4,B9,B2,B5, B1, B13,B8	50	10.00	50	10.00	50	10.00	50	10.00	50	10.00	250	50.00
14	Equipments for manure management (Motorized Shredder for cutting biomass for making Vermicomposts and organic mulching)	No	1.26	B2	1	1.26	0	0.00	0	0.00	0	0.00	0	0.00	1	1.26
G	**Water / Irrigation Management**															
1	Micro Irrigation - Drip	Ha	1.12	All Blocks	188	210.56	200	224.00	230	257.60	220	246.40	242	271.04	1080	1209.60

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.
2	Rain gun	Ha	0.34	All Blocks Except B10,B11	121	41.14	107	36.38	124	42.16	109	37.06	124	42.16	585	198.90
3	Sprinkler	No	0.195	All Blocks Except B10	130	25.35	135	26.33	155	30.23	140	27.30	155	30.23	715	139.43
4	Water harvesting system for individuals	No	1.5	B10	10	15.00	10	15.00	10	15.00	10	15.00	10	15.00	50	75.00
H	**Capacity Building**															
1	Training to farmers within the State. 2 days Rs.1000/farmer/day	No	0.02	All Blocks Except B11	165	3.30	160	3.20	155	3.10	164	3.28	164	3.28	808	16.16
2	Training to farmers outside the state. 30 farmers/Batch	No	0.105	B12,B3,B4, B7,B14,B10, B6, B13	15	1.58	17	1.79	14	1.47	19	2.00	20	2.10	85	8.93
3	Exposure visit to farmers for 5 days. Rs.1000/farmer/day	No	0.05	All Blocks Except B10,B11	110	5.50	105	5.25	95	4.75	134	6.70	160	8.00	604	30.20
4	Training to farmers at HTC	No	0.0025	All Blocks Except B10,B14,B7, B9, B11	22	0.06	22	0.06	24	0.06	26	0.07	24	0.06	118	0.30
5	Exposure visit of farmers outside India	No	4	B12,B3, B7,B10	7	28.00	7	28.00	5	20.00	3	12.00	3	12.00	25	100.00
6	Training to staff outside the state / Batch of 5 members	No	0.04	B12,B3,B4, B9,B5,B1, B13,B8	8	0.32	8	0.32	8	0.32	6	0.24	6	0.24	36	1.44
7	Training to staff outside India	No	6	B3,B10, B12	4	24.00	4	24.00	4	24.00	6	36.00	2	12.00	20	120.00
8	District level seminar	No	2	B10	2	4.00	2	4.00	2	4.00	2	4.00	2	4.00	10	20.00
9	Computerization & governance	No	1	B4,B2,B5,B7, B1,B8	6	6.00	0	0.00	0	0.00	0	0.00	0	0.00	6	6.00

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.
10	Publicity and Documentation	No	0.5	B12,B3,B4, B2,B5,B1, B10,B13,B8	8	4.00	8	4.00	10	5.00	8	4.00	8	4.00	42	21.00
I	**Crop Insurance and Risk Mitigating schemes**															
1	Crop Insurance	Ha	0.025	All Blocks Except B4,B1,B14, B11,B7,B8	67	1.68	65	1.63	72	1.80	62	1.55	42	1.05	308	7.70
	Grand Total					**3128.01**		**3314.78**		**3591.48**		**3883.54**		**4165.83**		**18083.63**

Ammapettai-B1, Sethubavachatram-B2, Budalur-B3, Kumbakonam-B4, Madukkur-B5, Thiruvonam-B6, Peravurani-B7, Thanjavur-B8, Pattukkottai-B9, Thiruvaiyaru-B10,Orathanadu-B11, Papanasam-B12, Tiruppanandal-B13, Thiruvidaimarudur-B14

4.4. 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 for all blocks.
- 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 to all blocks.
- Promotion of ownership to small and marginal farmers for various agricultural machinery and equipments such as Tractors, Power tillers, , Self-propelled machinery, Disc plough, Cultivator, Harrow, Ridger, Laser Land Leveller, Rotavator, Rotopuddler, Reversible Hydraulic Plough, Post hole digger, Reaper, Seed driller, Balers, coconut frond chopper, Drum Seeder) and Plant protection equipments for all blocks.
- Establishment of hi-tech machinery hubs for high value crops like sugarcane, cotton etc to all blocks.
- Promotion of appropriate technologies and to set up farm machinery banks in identified villages to all blocks.
- 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 in all blocks.

- Strengthening of communication and information facilities in order to disseminate the information in rural areas in all blocks..
- 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, 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 in all blocks.
- 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 for all blocks.

- Prevention of sea water intrusion through construction of subsurface dyke, Village Pond / Community Pond, Farm Pond, Recharge shaft and Weir/Bed Dam in all blocks.
- 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 for all blocks.

Expected outcome

Implementation of the above strategies such as supply of farm implements to carry out mechanised cultivation operations anddemonstration 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 foodgrains 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 Mechanizationcould 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 Major component required to implement in this district are capacity building of farmers and end users with the budget of ₹18.20 lakhs,Financial assistance for the procurement of Agricultural Machinery, Post-harvest machinery and equipments in rural areas with the budget of ₹9568.35 lakhs, Establishment of Farm Machinery Banks,Hi-tech productive equipment hub, Promotion of Farm Mechanization in Selected Villages with the budget of ₹196.00 lakhs and also implementation of minor irrigation, Tractor hiring scheme, Solar energy, Innovative schemes of AED, Pilot mechanization Demonstration, Post-harvest technology and management machinery with budget of ₹1561.70 lakhs. Some other interventions such as Bio- mass gasifier, Construction of Agricultural Engineering Extension centres (AEECs)with the budget of ₹ 837.50 lakhsare required to implement in this district to enhance the Agricultural Productivity. The overall budget requirement for implementation of above interventions is ₹ **12181.75 lakhs**.

Implementing agency

The projects will be implemented by the Department of Agricultural Engineering

Table.4.19. 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	56	2.24	56	2.24	56	2.24	56	2.24	56	2.24	280	11.20
2	Training of farmers	No's/ Ha	0.04	B8,B3,B10, B11,B6, B4, B14,B13, B12,B1	21	0.84	21	0.84	21	0.84	21	0.84	21	0.84	105	4.20
3	Demonstration of Post Harvest Technologies	No's/ Ha	0.04	B8,B3,B10, B11,B6, B4, B14,B13, B12,B1	14	0.56	14	0.56	14	0.56	14	0.56	14	0.56	70	2.80
4	Tractor (8-15 PTO HP)	No's/ Ha	3	All Blocks	10	30.00	8	24.00	6	18.00	10	30.00	8	24.00	42	126.00
5	Tractor (15-20 PTO HP)	No's/ Ha	4	All Blocks	50	200.00	45	180.00	40	160.00	45	180.00	45	180.00	225	900.00
6	Tractor (Above 20-40 PTO HP)	No's/ Ha	6	All Blocks	25	150.00	25	150.00	20	120.00	20	120.00	20	120.00	110	660.00
7	Tractor (40-70 PTO HP)	No's/ Ha	8.5	All Blocks	40	340.00	35	297.50	35	297.50	30	255.00	40	340.00	180	1530.00
8	Power Tiller (8 BHP & above)	No's/ Ha	1.75	All Blocks	675	1181.25	550	962.50	500	875.00	540	945.00	600	1050.00	2865	5013.75
9	Self Propelled Rice Transplanter (4 rows)	No's/ Ha	2.5	All Blocks	43	107.50	40	100.00	40	100.00	35	87.50	40	100.00	198	495.00
10	Self Propelled Rice Transplanter (Above 4-8 rows)	No's/ Ha	16	All Blocks	4	64.00	3	48.00	3	48.00	3	48.00	4	64.00	17	272.00
11	Post Hole Digger / Augur	No's/ Ha	0.63	B8,B3,B10, B11,B6,	2	1.26	1	0.63	0	0.00	0	0.00	2	1.26	5	3.15
12	Rotavator	No's/ Ha	0.35	All Blocks	10	3.50	8	2.80	8	2.80	8	2.80	6	2.10	40	14.00
13	Power Weeder (engine operated above 2 BHP)	No's/ Ha	0.7	All Blocks	12	8.40	8	5.60	8	5.60	10	7.00	12	8.40	50	35.00
14	Cultivator	No's/ Ha	0.3	All Blocks	10	3.00	10	3.00	8	2.40	8	2.40	10	3.00	46	13.80
15	Laser Land Leveller	No's/ Ha	3.8	All Blocks	2	7.60	2	7.60	2	7.60	2	7.60	2	7.60	10	38.00

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
16	Rotavator	No's/ Ha	0.95	All Blocks	55	52.25	50	47.50	40	38.00	45	42.75	45	42.75	235	223.25
17	Zero till seed cum fertilizer drill	No's/ Ha	0.7	All Blocks	2	1.40	2	1.40	2	1.40	2	1.40	2	1.40	10	7.00
18	Coconut Frond chopper	No's/ Ha	1.05	All Blocks	5	5.25	4	4.20	4	4.20	3	3.15	5	5.25	21	22.05
19	Balers (Round)	No's/ Ha	3.5	All Blocks	4	14.00	3	10.50	3	10.50	3	10.50	33	115.50	46	161.00
20	Tree climber	No's/ Ha	0.07	All Blocks	2	0.14	2	0.14	2	0.14	2	0.14	2	0.14	10	0.70
21	Manual sprayer:Knapsack/foot operated sprayer	No's/ Ha	0.015	All Blocks	220	3.30	200	3.00	180	2.70	200	3.00	150	2.25	950	14.25
22	Powered Knapsack Sprayer/Power operated Taiwan sprayer (capacity above 12-16 lts)	No's/ Ha	0.08	All Blocks	110	8.80	80	6.40	100	8.00	75	6.00	100	8.00	465	37.20
23	Powered Knapsack Sprayer/Power operated Taiwan sprayer (capacity above 16 lts)	No's/ Ha	0.1	All Blocks	5	0.50	4	0.40	4	0.40	4	0.40	5	0.50	22	2.20
24	Establishment of Farm Machinery Banks for Custom Hiring	No's/ Ha	28	B8,B3,B10, B11,B6, B4, B14,B13, B12,B1	5	140.00	2	56.00	0	0.00	0	0.00	0	0.00	7	196.00
25	Purchase of Tractors for AED	No's/ Ha	8	All Blocks	5	40.00	0	0.00	0	0.00	0	0.00	0	0.00	5	40.00
26	Purchase of Tractor drawn implemnets for AED	No's/ Ha	0.5	All Blocks	12	6.00	0	0.00	0	0.00	0	0.00	0	0.00	12	6.00
27	Purchase of Paddy Transplanter for AED	No's/ Ha	18	B14,B13	2	36.00	0	0.00	0	0.00	0	0.00	0	0.00	2	36.00
28	Purchase of Paddy combine Harvester for AED	No's/ Ha	17	B14,B13	2	34.00	0	0.00	0	0.00	0	0.00	0	0.00	2	34.00
29	Purchase of Balers for AED	No's/ Ha	4.5	B14,B13, B12	3	13.50	0	0.00	0	0.00	0	0.00	0	0.00	3	13.50
30	Purchase of Rotary Drill for AED	No's/ Ha	72	B1	1	72.00	0	0.00	0	0.00	0	0.00	0	0.00	1	72.00

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	Purchase of Air Compressor 750 cfm for AED	No's/ Ha	25	B14	1	25.00	0	0.00	0	0.00	0	0.00	0	0.00	1	25.00
32	5 hp	No's/ Ha	3.75		0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
33	7.5 hp	No's/ Ha	5.3	All Blocks	10	53.00	10	53.00	10	53.00	10	53.00	10	53.00	50	265.00
34	10 hp	No's/ Ha	6.75	All Blocks	30	202.50	25	168.75	30	202.50	30	202.50	30	202.50	145	978.75
35	upto 400sq.ft	No's/ Ha	4.25	B14	1	4.25	0	0.00	0	0.00	0	0.00	0	0.00	1	4.25
36	400-600sq.ft	No's/ Ha	6.5	B14,B13, B12	0	0.00	1	6.50	1	6.50	1	6.50	1	6.50	4	26.00
37	Chain saw/ Wheel barrow/ Mango grader/ planter and other suitable self propelled machineries and equipments for horticulture Crops	No's/ Ha	1	B4, B14,B13, B12,B1	0	0.00	2	2.00	2	2.00	3	3.00	3	3.00	10	10.00
38	Aluminium Ladder/ Ladder	No's/ Ha	0.2	B4, B14,B13, B12,B1	0	0.00	2	0.40	2	0.40	3	0.60	3	0.60	10	2.00
39	Aluminium pole	No's/ Ha	0.03	B4, B1	0	0.00	1	0.03	1	0.03	0	0.00	0	0.00	2	0.06
40	Plucker	No's/ Ha	0.02	B4, B1	0	0.00	1	0.02	1	0.02	0	0.00	0	0.00	2	0.04
41	Mini Dal Mill	No's/ Ha	1.7	B4	0	0.00	0	0.00	0	0.00	0	0.00	1	1.70	1	1.70
42	Millet Mill	No's/ Ha	1.5	B4, B13,B12,B1	0	0.00	1	1.50	1	1.50	1	1.50	1	1.50	4	6.00
43	Oil mill with filter press (for all type of Horticulture / Food grain / Oil seeds crop)	No's/ Ha	1.2	B4, B14,B13, B12	0	0.00	1	1.20	1	1.20	1	1.20	1	1.20	4	4.80

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
44	Dehydration unit/ Pricking Machine/ Humidifier (for all type of Horticulture / Food grain / Oil seeds crop)	No's/ Ha	1	B4, B14,B13	0	0.00	1	1.00	1	1.00	1	1.00	1	1.00	4	4.00
45	Packing Machines (for all types of Horticulture / Food grain / Oil seeds crop)	No's/ Ha	3	B8, B3 & B11	0	0.00	1	3.00	1	3.00	1	3.00	1	3.00	4	12.00
46	All types of Power driven Dehusker/ sheller/ Threshers/ Harvesters/ De-spiking/ Deconing Machine/ Peeler/ Splitter/ Stripper (for all type of Horticulture / Food grain / Oil seeds crop)	No's/ Ha	1.2	B8, B3 & B11	0	0.00	1	1.20	1	1.20	2	2.40	2	2.40	6	7.20
47	All types of Grinder/ Pulveriser/ Polisher (for all type of Horticulture / Food grain / Oil seed crop)	No's/ Ha	0.3	B4, B14,B13, B12,B1	0	0.00	1	0.30	1	0.30	1	0.30	1	0.30	4	1.20
48	All types of Cleaner cum grader/ Gradient separator/ Specific gravity separator (for all types of Horticulture / Food grain / Oil seed crop)	No's/ Ha	0.75	B4, B14,B13,B12 ,B1	0	0.00	1	0.75	1	0.75	1	0.75	1	0.75	4	3.00
49	Construction of Agricultural Engineering Extension centres (AEECs)	No's/ Ha	75	B8, B3 & B11	1	75.00	1	75.00	1	75.00	0	0.00	0	0.00	3	225.00
50	Subsurface dyke	No's/ Ha	15	All Blocks	0	0.00	2	30.00	2	30.00	5	75.00	5	75.00	14	210.00
51	Village pond/community pond	No's/ Ha	5.5	All Blocks	0	0.00	5	27.50	5	27.50	10	55.00	15	82.50	35	192.50

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
52	Weir/ Bed Dam	No's/ Ha	30	B8, B3 & B11	7	210.00	0	0.00	0	0.00	0	0.00	0	0.00	7	210.00
53	Total					**3097.04**		**2289.26**		**2114.08**		**2164.33**		**2517.04**		**12181.75**

Ammapettai-B1, Sethubavachatram-B2, Budalur-B3, Kumbakonam-B4, Madukkur-B5, Thiruvonam-B6, Peravurani-B7, Thanjavur-B8, Pattukkottai-B9, Thiruvaiyaru-B10,Orathanadu-B11, Papanasam-B12, Tiruppanandal-B13, Thiruvidaimarudur-B14

4.5. 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 Uzhavar shandies 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) Construction of Storage godown for commodity groups for all blocks.

b) Construction of drying yards for all blocks.

c) Upgradation of rural shandies and uzhavar shandies for all blocks.

d) Establishment of cold storage in Thanjavur, Pattukotai, and Kumbakonam blocks.

e) Formation of Farmer Producer Organizations (FPO) in all blocks.

f) Distribution of groundnut decorticator in Budalur, Orathanadu , and Thiruvonam blocks.

g) Distribution of plastic crates to vegetable commodity group farmers for all blocks.

h) Establishment of coconut sugar production in Pattukotai.

i) Establishment of cold press gingelly oil unit in Thiruvaiyaru, Ammapetai, Papanasam, Kumbakonam, Tiruvidaimaruthur.

j) Distribution of maize seller to Budalur.

k) Costruction of food court and administrative office room in Thanjavur, Pattukotai, Kumbakonam.

l) Distribution of multi-layered low density polyethylene sheet to commodity group farmers to all blocks.

m) Imparting value addition, agmark grading, food safty, post harvest technonolgy and supply chain management trainings to commodity group farmers for all blocks.

n) Exposure visit (within state & outside state) for commodity group farmers to acquire value addition technologies for all blocks.

Budget

The district plan proposes an outlay of **Rs.6951.00** 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 4.20. Budget for strengthening of Agricultural Marketing and Agri-Business in Thanjavur 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
	Strengthening of Uzhavar Sandhai and Regulated Market															
1	Additional Shops	1	0.3	B1, B6, B12	6	1.80	3	0.90	3	0.90	5	1.50	3	0.90	20	6.00
2	Cold Storage	1	40	B1, B6, B12	3	120.00	0	0.00	0	0.00	0	0.00	0	0.00	3	120.00
3	Compound walls	1	0.05	B1, B6, B12	3	0.15	0	0.00	0	0.00		0.00	0	0.00	3	0.15
4	Drying Yard	1	5.5	All Blocks	27	148.50	33	181.50	28	154.00	26	143.00	26	143.00	140	770.00
5	Storage godown	2	15	All Blocks	15	225.00	7	105.00	11	165.00	3	45.00	12	180.00	48	720.00
6	Ticker Board and External Electrification	1	1	B1, B6, B12	5	5.00	0	0.00	0	0.00	0	0.00	0	0.00	5	5.00
7	Food Court (7.00 x 5.60 m)	1	5	B1, B6, B12	2	10.00	0	0.00	0	0.00	0	0.00	0	0.00	2	10.00
8	Drinking Water Facility	1	4	B1, B6, B12	3	12.00	0	0.00	0	0.00	0	0.00	0	0.00	3	12.00
9	Administrative Office Room (Vevichle shed ,waiting hall,washing Room,Borewell with Motor, water Tank)	1	8	B1, B6, B12	14	112.00	0	0.00	0	0.00	0	0.00	0	0.00	14	112.00
10	Upgradation of Uzhavar Shadhais	1	5	All Blocks	17	85.00	22	110.00	16	80.00	21	105.00	15	75.00	91	455.00
	Formation of FPO / Strengthening of Existing Commodity Groups															
11	FPO	1	43.21	All Blocks	19	820.99	16	691.36	18	777.78	15	648.15	17	734.57	85	3672.85
	Provision of Market Access and Market Activities															
12	Distribution of Multilayered low density polyethylene sheet at 75% subsidy Silpaulin) to commodity group farmers – 18'x30' size (120GSM) full cost Rs.3000/No subsidy Rs.3000/No	1	0.03	All Blocks	305	9.15	290	8.70	315	9.45	270	8.10	260	7.80	1440	43.00

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
13	Electronic Digital Weighing Scale - 5 Kg	1	0.05	B1, B6, B12	80	4.00	50	2.50	25	1.25	25	1.25	5	0.25	185	9.00
14	Plastic crates		0	All Blocks	1050	3.15	1015	3.05	860	2.58	775	2.33	725	2.18	4425	13.00
	Post Harvest Infrastructure and Machinaries															
15	Construction of compound wall in Coconut Complex in Pattukkottai	1	55	B6	1	55.00	0	0.00	0	0.00	0	0.00	0	0.00	1	55.00
16	Establishment of Coconut Sugar Production unit in Coconut market complex	1	19	B6	0	0.00	1	19.00	0	0.00	0	0.00	0	0.00	1	19.00
17	Groundnut decorticator (power)	1	3	B2, B4, B5	1	3.00	2	6.00	2	6.00	3	9.00	0	0.00	8	24.00
18	Maize Sheller	1	3	B2		0.00	1	3.00		0.00	1	3.00	0	0.00	2	6.00
19	Solar Dryer	1	10	B1,B4, B5, B7, B8, B9	3	30.00	2	20.00	2	20.00	1	10.00	4	40.00	12	120.00
20	SOLAR TUNNEL DRYER	1	15	B6		0.00		0.00	15	225.00	0	0.00		0.00	15	225.00
21	Cold Press gingilly oil unit	1	3	B3,B10,B11 ,B12,B13	0	0.00	6	18.00	1	3.00	5	15.00	6	18.00	18	54.00
	Capacity building Programme															
22	Exposure Visits - within state	1	0.75	All Blocks	68	51.00	68	51.00	68	51.00	68	51.00	68	51.00	340	255.00
23	Exposure Visits - outside state - 3 days	1	2	All Blocks	20	40.00	14	28.00	25	50.00	24	48.00	17	34.00	100	200.00
24	Training on Market led Extension, Agmark grading&Food safety, post harvest technology, Supply Chain Management, Grading-sorting-packing, Market linkages & Exports, Food processing and value addition at district level	1	0.15	All Blocks	60	9.00	60	9.00	60	9.00	59	8.85	59	8.85	298	45.00
	Total					**1744.74**		**1257.01**		**1554.96**		**1099.18**		**1295.55**		**6951.00**

B1-Thanjavur, B2-Budalur, B3-Thiruvaiyaru, B4-Orathanadu, B5-Thiruvonam, B6-Pattukkottai, B7-Madukkur, B8-Peravurani, B9-Sethubavachathiram, B10-Ammapettai, B11-Papanasam, B12-Kumbakonam, B13-Thiruvidaimaruthur, B14-Thiruppanandal

4.6. 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

  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, Digital Moisturemeter, Air conditioner, Generator 30KV, Induction Stove, Dehuller/ Scarifier, and Miscellaneous are required for all blocks.

- Capacity building

  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 for all blocks.

- Strengthening of communication and networking facilities

  Information on quality seed production techniques would be disseminate among the farmers and seed growers for all blocks.

Expected outcome

Strengthening of seed testing labs, 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 Thanjavur district. The overall budget requirement for implementation of above interventions is ₹ **549.92** lakhs.

Implementingagency

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

Table.4.21. Budget requirement for Seed and Organic Certification

(₹. 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
I	**Strengthening of Seed Certification lab**															
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,Thermohydro meter,Dunnage,Trolley for carriages,Working chair,Working table, Miscellaneous,	All Blocks	Nos	13.36	1	13.36	0	0.00	1	13.36	0	0.00	0	0.00	2	26.72
II	**Strengthening of communication and networking facilities**															
2	Computer accessories	All Blocks	No's	0.5	20	10.00	0	0.00	0	0.00	0	0.00	0	0.00	20	10.00
III	**Capacity Building**															
3	Training to seed grower for quality seed production	All Blocks	No's	0.2	0	0.00	14	2.80	14	2.80	14	2.80	14	2.80	56	11.20
	Training to seed producers on seed certification procedures	All Blocks	No's	0.1	0	0.00	5	0.50	5	0.50	5	0.50	5	0.50	20	2.00
IV	**Infrastructure and assets**															
4	Strengthening of office premises by constructing new buildings	All Blocks	m2	0.25	0	0.00	0	0.00	0	0.00	2000	500.00	0	0.00	2000	500.00
	Total					**23.36**		**3.30**		**16.66**		**503.30**		**3.30**		**549.92**

Ammapettai-B1, Sethubavachatram-B2, Budalur-B3, Kumbakonam-B4, Madukkur-B5, Thiruvonam-B6, Peravurani-B7, Thanjavur-B8, Pattukkottai-B9, Thiruvaiyaru-B10,Orathanadu-B11, Papanasam-B12, Tiruppanandal-B13, Thiruvidaimarudur-B14

4.7. 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
2. Increasing the availability of fodder by strengthening farm infrastructure
3. Livestock breeding management
4. Livestock health
5. Improving the livestock productivity
6. Improving the service delivery at veterinary institutions
7. Enhancing livestock management
8. Capacity building

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 chaff cutters to the farmers in all blocks.
5. Development of seed production plots 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 Madukkur.
2. Construction of silo pit and overhead tanks in Madukkur.
3. Installation of rain gun and sprinklers in Madukkur.
4. Procurement of agri inputs in Madukkur.
5. Establishment of vermin composting unit in Madukkur.

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 for all blocks.
2. Establishment of IVF lab in Madukkur.
3. Establishment of LN2 and embryo transfer lab in Madukkur.

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 Madukkur.

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. Distribution of sheep, goat, buffalo, piggery, poultry units

1. Distribution of poultry, buffalo, native chicken in all blocks.
2. Encourage integrated farming in all blocks.
3. Establishment of modern dairy/ bull shed in Madukkur.

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.

1. Deep freezer facility for storage of vaccines and medicines for all blocks.
2. Establishment of infrastructure facilities, disease diagnostic lab, mobile veterinary units, surgical theaters for all blocks.
3. Provide ambulance facilities in all blocks except Thiruvaiyaru.

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 for all blocks.

2. Conservation of indigenous breeds for 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.

1. Establishment of farmers training Centre at Thiruvaiyaru.
2. Conducting demonstrations camps and campaigns for all blocks.
3. Creating awareness of livestock management to the farmers through training programmes for all blocks.

Budget allocation

The major themes proposed in the plan for animal husbandry sector with a total budget out lay of₹. **7019.70.**

Project implementing agency

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

Table.4.22. 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)	0	0.05	All Blocks	140	7.00	140	7.00	140	7.00	140	7.00	140	7.00	700	35.00
2	Distrbution of Azolla trays	0	0.033333	All blocks	174	5.80	168	5.60	168	5.60	168	5.60	168	5.60	846	28.20
3	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
4	Distribution of Chaff Cutter to farmers	0	0.25	All Blocks	168	42.00	168	42.00	168	42.00	168	42.00	168	42.00	840	210.00
	Increasing the Availability of Fodder by Strengthening Farm Infrastructure															
5	Establishment of Vermicompost unit (10 beds) at Farms	Nos	4	B5	10	40.00	10	40.00	10	40.00	10	40.00	10	40.00	50	200.00
6	Erection of Transformers to improve irrigation facility in Govt.farm	Nos	30	B5	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	B5	0	0.00	20	100.00	0	0.00	0	0.00	0	0.00	20	100.00
8	Establishment of Feed mixing/ feed block units	Nos	25	B5	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	B5	5	5.00	4	4.00	4	4.00	4	4.00	4	4.00	21	21.00
10	Construction of Over Head Tanks/ GLR / Pre-fabricated tanks in farm	Nos	20	B5	0	0.00	2	40.00	0	0.00	0	0.00	0	0.00	2	40.00
11	Drip irrigation for livestock farms	acre	0.6	B5	50	30.00	50	30.00	50	30.00	50	30.00	50	30.00	250	150.00
12	Borewell for livestock farms	Nos	8	B5	2	16.00	2	16.00	2	16.00	2	16.00	2	16.00	10	80.00

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
13	Installation of Raingun in Govt.farm in cultivated areas	acre	0.4	B5	20	8.00	20	8.00	20	8.00	20	8.00	20	8.00	100	40.00
14	Installation of Sprinkler system in fodder cultivated areas in Govt.farm	acre	0.4	B5	10	4.00	10	4.00	10	4.00	10	4.00	10	4.00	50	20.00
15	Procurement of Agri inputs for Farms	acre	0.15	B5	80	12.00	80	12.00	80	12.00	80	12.00	80	12.00	400	60.00
16	Procurement of Agricultural implements (tractor, trailers, harvesters, ploughs, chaff cutter, grass cutter etc)	Pack	50	B5	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		0.01	All Blocks	3970	39.70	4250	42.50	4250	42.50	5090	50.90	5090	50.90	22650	226.50
18	Induction of new Genetic Pool	Nos	0.5	B5	50	25.00	50	25.00	50	25.00	50	25.00	50	25.00	250	125.00
19	Establishment of IVF Lab	Nos	300	B5	0	0.00	1	300.00	0	0.00	0	0.00	0	0.00	1	300.00
20	Establishment of Liquid Nitrogen Plant	Nos	500	B5	1	500.00	1	500.00	0	0.00	0	0.00	0	0.00	2	1000.00
21	Establishment of Embryo Transfer Lab	Nos	100	B5	0	0.00	1	100.00	0	0.00	0	0.00	0	0.00	1	100.00
22	Establishment/ Strengthening of Semen Processing Lab	Nos	25	B5	1	25.00	1	25.00	1	25.00	1	25.00	1	25.00	5	125.00
	Livestock Health															
23	Animal Quarantine Facility in Govt.farm to prevent disease outbreak	Nos	50	B5	1	50.00	0	0.00	0	0.00	0	0.00	0	0.00	1	50.00
	Improving the Livestock Productivity															
24	Distibution of Sheep/Goat units -semi		0.6	All Blocks	28	16.80	28	16.80	28	16.80	28	16.80	28	16.80	140	84.00

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
	intensive system															
25	Distribution of Buffalo units(5 Buffaloes)		4.5	All Blocks	28	126.00	28	126.00	28	126.00	28	126.00	28	126.00	140	630.00
26	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
27	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
28	Establishment of disposal pits for poultry unit	Nos	1	All Blocks	25	25.00	25	25.00	25	25.00	25	25.00	25	25.00	125	125.00
29	Milking Mechine	Nos	0.5	B5	10	5.00	0	0.00	20	10.00	0	0.00	20	10.00	50	25.00
30	Establishment of Modern Dairy/ Bull Shed	Nos	150	B5	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															
31	Deep freezer facility for Storage of vaccines and Medicines	Nos	10	All Blocks	0	0.00	0	0.00	14	140.00	0	0.00	0	0.00	14	140.00
32	Establishment of Infrastructure facilities for Veterinary Institutions		30	All Blocks	14	420.00	0	0.00	0	0.00	0	0.00	0	0.00	14	420.00
33	Establishment of Mobile Disease Diagnostic Labs	Nos	20	B10	1	20.00	0	0.00	0	0.00	0	0.00	0	0.00	1	20.00
34	Establishment of Mobile Veterinary Units		10	All Blocks	14	140.00	0	0.00	0	0.00	0	0.00	0	0.00	14	140.00
35	Establishment of surgical theatres at veterinary institution	Nos	30	All Blocks	3	90.00	3	90.00	3	90.00	3	90.00	2	60.00	14	420.00
36	Providing solar lighting panels at veterinary institution		1	All Blocks	209	209.00	0	0.00	0	0.00	0	0.00	0	0.00	209	209.00

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
37	Package of Modern Veterinary Diagnostic Aids to Veterinary Institutions such as Computerised X rays, Ultrasound, Diathermy etc.	Nos	30	All Blocks	3	90.00	3	90.00	3	90.00	3	90.00	2	60.00	14	420.00
38	Establishment of Ambulance facility for animals	Nos	80	B10	1	80.00	1	80.00	0	0.00	0	0.00	0	0.00	2	160.00
	Livestock Management															
39	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
40	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
	Capacity Building															
41	Establishment of Farmers training Centre	Nos	200	B10	0	0.00	1	200.00	0	0.00	0	0.00	0	0.00	1	200.00
42	Conducting Demonstrations, Camps and Campaigns		0.1	All Blocks	14	1.40	14	1.40	14	1.40	14	1.40	14	1.40	70	7.00
43	Creating awarness of livestock management to the farmers through Training Programmes		0.1	All Blocks	14	1.40	14	1.40	14	1.40	14	1.40	14	1.40	70	7.00
	Grand Total					**2329.10**		**2104.70**		**1029.70**		**728.10**		**828.10**		**7019.70**

Ammapettai-B1, Sethubavachatram-B2, Budalur-B3, Kumbakonam-B4, Madukkur-B5, Thiruvonam-B6, Peravurani-B7, Thanjavur-B8, Pattukkottai-B9, Thiruvaiyaru-B10,Orathanadu-B11, Papanasam-B12, Tiruppanandal-B13, Thiruvidaimarudur-B14

4.8. Animal Science Research

Water quality has emerged as a major issue in Thanjavur despite fair achievements in coverage for animals by safe water supply. Although all the habitations in the State are having access to drinking water, excess of arsenic, fluoride and iron poses a major threat to community health and general well-being of people. The programme provided a framework for the implementation of a State Level Water Quality Testing and Monitoring System. Livestock rearers face in lifting and transporting heavy animals to far-off treatment centres. Timely treatment would safeguard farmers from the trouble and heavy loss,the government to launch Animal Ambulance Service in phases for Thanjavur district.

Project components

- Referral Water testing laboratories for all blocks.
- Animal ambulance for all blocks.
- Centralized molecular laboratories for all blocks.
- Socio economic empowerment of livestock farmers in all blocks.
- Establishment of livestock conservation centre for all blocks.

Budget

It is proposed to incur ₹.**3145.74** 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 improve the research on animals and produce good quality breeds in animals and increase income of the farmers of Tamil Nadu.

Implementing Agency

Tamilnadu Animal Sciences and Veterinary University will implement the project

Table.4.23. Budget requirement for Animal Science Research

(₹. 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	**Infrastructure and Assets**															
1	Animal Ambulance and referral hospitals for addressing rural veterinary care	No	141	All Blocks	1	141.00	1	141.00	1	141.00	0	0.00	0	0.00	3	423.00
2	Centralized Molecular laboratories	Nos	508	All Blocks	0	0.00	1	508.00	1	508.00	0	0.00	0	0.00	2	1016.00
3	Referral Water Testing Laboratories	Nos	216.4	All Blocks	1	216.40	1	216.40	1	216.40	0	0.00	1	216.40	4	865.60
4	Socio economic empowerment of livestock farmers	Nos	51.39	All Blocks	1	51.39	0	0.00	1	51.39	1	51.39	1	51.39	4	205.56
5	Livestock conservation centre	Nos	105.93	All Blocks	1	105.93	1	105.93	2	211.86	1	105.93	1	105.93	6	635.58
	Total					**514.72**		**971.33**		**1128.65**		**157.32**		**373.72**		**3145.74**

Ammapettai-B1, Sethubavachatram-B2, Budalur-B3, Kumbakonam-B4, Madukkur-B5, Thiruvonam-B6, Peravurani-B7, Thanjavur-B8, Pattukkottai-B9, Thiruvaiyaru-B10,Orathanadu-B11, Papanasam-B12, Tiruppanandal-B13, Thiruvidaimarudur-B14

4.9. 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 for all blocks.
2. Milk pumps for all blocks.
3. Curd processing equipment’s for all blocks.
4. Pasteurizers for all blocks.
5. Heaters and chillers for all blocks.
6. Washer and conveyors for all blocks.
7. SSPipes and fittings for all blocks.
8. Cleaning equipment’s for all blocks.
9. Electrical installations (UPS, generators, stabilizers, control panel) for all blocks.
10. Provide solar system for water heating in all blocks.
11. Distribution of paking macheneries for milk, butter, ghee, SMP and other milk products for 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 yearsit 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 for all blocks.
2. Fodder development equipment and seed material for all blocks.
3. Milk testing equipment's for all blocks.
4. Equipment's for artificial insemination for all blocks.
5. Milk society buildings and cow shed for all blocks.
6. Cryogenic containers for all blocks.
7. Weighing machines for all blocks.
8. Computer accessories for all blocks.
9. Distribution of bulk milk coolers and milk cans for all blocks.
10. Arrangement of two wheelers for AI technicians in all blocks.

Capacity building

India is the largest milk producer in the world with an annual production of over 155.4metric 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 for all blocks.
2. Infertility camps for 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 for all blocks.
2. Milk product storage cabinets for all blocks.
3. Product billing system for 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, the following interventions have been suggested

1. Adulteration detection equipment’s for all blocks.
2. Milk testing equipment and laboratory for 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. Refrigeration plant for all blocks.
2. Dairy processing plants for all blocks.
3. Water and effluent treatment plants for all blocks.
4. Steam raisning plant for all blocks.
5. Fat handling and other dairy equipment’s for all blocks.

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. Construction of dairy farm for all blocks.
2. BMC building for all blocks.
3. Ware house for dairy products and dairy consumbales for all blocks.

Budget allocation

An outlay of **Rs.16548.00 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.4.24. 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	1	25.00	1	25.00	1	25.00	5	125.00
2	Milk Storage Tanks 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
3	Tub washer, Canwashers, Crate conveyor systems.	1	10	All blocks	1	10.00	1	10.00	1	10.00	1	10.00	1	10.00	5	50.00
4	Point of Sale Machines and billing systems	1	0.25	All blocks	20	5.00	20	5.00	20	5.00	20	5.00	20	5.00	100	25.00
5	SS pipes and fittings	1	5	All blocks	1	5.00	1	5.00	1	5.00	2	10.00	2	10.00	7	35.00
6	Solar system for water heating	1	2	All blocks	3	6.00	3	6.00	3	6.00	3	6.00	3	6.00	15	30.00
7	Packing Machineries for milk, Butter, Ghee, SMP and Other Milk products	1	18	All blocks	2	36.00	1	18.00	1	18.00	1	18.00	1	18.00	6	108.00
8	Plate Heat type Chillers and pasteurizers	1	10	All blocks	2	20.00	1	10.00	1	10.00	1	10.00	0	0.00	5	50.00
9	Milk Pumps of Vaious capacities	1	0.5	All blocks	8	4.00	8	4.00	8	4.00	8	4.00	8	4.00	40	20.00
10	Generator of various capacities	1	20	All blocks	0	0.00	2	40.00	0	0.00	0	0.00	0	0.00	2	40.00
11	Curd processing equipments	1	50	All blocks	0	0.00	1	50.00	0	0.00	0	0.00	0	0.00	1	50.00
12	Cleaning In Place equipments with accessories	1	75	All blocks	0	0.00	1	75.00	0	0.00	0	0.00	0	0.00	1	75.00

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
	Procurement and Input															
13	Veterinary Medicine	1	2	All blocks	5	10.00	5	10.00	5	10.00	5	10.00	5	10.00	25	50.00
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	50	12.50	50	12.50	50	12.50	50	12.50	50	12.50	250	62.50
17	Fodder development equipments like chaff cutter, Mower etc.,	1	0.2	All blocks	50	10.00	50	10.00	50	10.00	50	10.00	50	10.00	250	50.00
18	Bulk Milk coolers of Various capacities	1	15	All blocks	3	45.00	3	45.00	3	45.00	3	45.00	3	45.00	15	225.00
19	Milk cans	1	0.035	All blocks	500	17.50	500	17.50	500	17.50	500	17.50	500	17.50	2500	87.50
20	Electronic weighing scales of various capacities.	1	0.3	All blocks	50	15.00	50	15.00	50	15.00	50	15.00	50	15.00	250	75.00
21	Electronic milk testing equipments	1	1.25	All blocks	50	62.50	50	62.50	50	62.50	50	62.50	50	62.50	250	312.50
22	Milking machine	1	0.8	All blocks	50	40.00	50	40.00	50	40.00	50	40.00	50	40.00	250	200.00
23	Cow shed	1	5	All blocks	25	125.00	25	125.00	25	125.00	25	125.00	25	125.00	125	625.00
24	Society Buildings	1	20	All blocks	10	200.00	10	200.00	10	200.00	10	200.00	10	200.00	50	1000.00
25	Cryogenic containers	1	0.35	All blocks	50	17.50	50	17.50	50	17.50	50	17.50	50	17.50	250	87.50
26	Equipments for Artificial Insemination	1	0.5	All blocks	10	5.00	10	5.00	10	5.00	10	5.00	10	5.00	50	25.00
	Capacity building															
27	Training of personnel of MPCS, Union and Federation.	1	0.05	All blocks	200	10.00	200	10.00	200	10.00	200	10.00	200	10.00	1000	50.00

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
28	Infertility Camps	1	0.2	All blocks	100	20.00	100	20.00	100	20.00	100	20.00	100	20.00	500	100.00
	Marketing															
29	Parlour structures	1	5	All blocks	100	500.00	100	500.00	100	500.00	100	500.00	100	500.00	500	2500.00
30	Milk product storage cabinets	1	0.3	All blocks	300	90.00	300	90.00	300	90.00	300	90.00	300	90.00	1500	450.00
31	Product Billing systems	1	0.3	All blocks	30	9.00	30	9.00	30	9.00	30	9.00	30	9.00	150	45.00
	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
	Processing															
34	Dairy Processing Plants	1	6000	All blocks	0	0.00	0	0.00	1	6000.00	0	0.00	0	0.00	1	6000.00
35	Refrigeration Plants	1	500	All blocks	0	0.00	0	0.00	1	500.00	0	0.00	0	0.00	1	500.00
36	Water Treatment Plants. Reverse Osmosis plant	1	100	All blocks	0	0.00	0	0.00	1	100.00	0	0.00	0	0.00	1	100.00
37	Effluement treatment plant	1	100	All blocks	0	0.00	0	0.00	1	100.00	0	0.00	0	0.00	1	100.00
38	Steam raisning plant with accessories	1	100	All blocks	0	0.00	0	0.00	1	100.00	0	0.00	0	0.00	1	100.00
39	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
40	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															
41	Construction of Dairy	1	1500	All blocks	0	0.00	0	0.00	1	1500.00	0	0.00	0	0.00	1	1500.00

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
42	BMC buildings	1	15	All blocks	3	45.00	3	45.00	3	45.00	3	45.00	3	45.00	15	225.00
43	Ware house for Dairy products	1	200	All blocks	0	0.00	0	0.00	0	0.00	2	400.00	0	0.00	2	400.00
44	Ware house for Dairy consumables	1	200	All blocks	0	0.00	0	0.00	0	0.00	2	400.00	0	0.00	2	400.00
	Grand Total					**1439.00**		**1576.00**		**9911.00**		**2216.00**		**1406.00**		**16548.00**

Ammapettai-B1, Sethubavachatram-B2, Budalur-B3, Kumbakonam-B4, Madukkur-B5, Thiruvonam-B6, Peravurani-B7, Thanjavur-B8, Pattukkottai-B9, Thiruvaiyaru-B10,Orathanadu-B11, Papanasam-B12, Tiruppanandal-B13, Thiruvidaimarudur-B14

4.10. Fisheries

Augmentation of fish production in Delta district

Fishing activity, starting as a traditional livelihood activity in early fifties has now transformed into commercial enterprise contributing to the State and National economy, livelihood and nutritional security, rural employment generation and foreign exchange earnings significantly. 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.

Varieties of freshwater, brackish water and marine fish along with crabs and lobsters would be sold in hygienic condition; the fishery products like dry fish, canned fish and fish pickle would also be sold to the consumers in a good condition. This can be achieved by creating infrastructures like modern fish kiosk and installation of modern fish marketing vehicles.

Provision of moped ice boxes and life jackets

The process of catching fish from river or pond and taking them to markets take a long time and it kills freshness of fish. This delay could be minimized with the help of mopeds vehicle. The objective behind making available moped to fishermen is to help them rush their fish to the market and also take them to doorsteps of the consumer. Hence, it is proposed that Government could provide mopeds to fishermen to help them rush fresh fish to consumers. The mopeds attached with other vending items like icebox, weighing machine, cutter, knives, torch light etc., as there is great need to promote the sale of fish in domestic markets. Moreover, infrastructural facilities, especially fish landing centres and wholesale and retail markets, are inadequate and unhygienic, often posing serious threats to public health. Also it is proposed that in order to increase the safety of the fishermen while moving to river/pond to provide life buoys and life jackets.

Project goal

The main objective of the project is to increase the fish production through assured supply of IMC fish seeds and distribution of mopped ice box for fish handling and dissemination of technologies through organizing fish festival. These activities will increase the livelihood of the fishermen and fish catchers.

Project components

The major components of the fish production are

a) Introduction of IMC seeds in riverine check dams and weirs at Budalur, Papanasam, Thanjavur, Thiruvaiyaru, and Tiruvidaimaruthur.
b) Increasing Fishing Efficiency of Inland Fishermen and Fish Farmers Budalur, Kumbakonam, Orathanadu, Papanasam, Pattukotai, Thanjavur, Thiruvaiyaru.
c) Enhancement of Fish production in irrigation tanks and Panchayat tanks by stocking fish seeds in all blocks.
d) Increasing safety at sea by providing life safety appliances at Pattukotai, Peravurani, and Sethubavachatram.
e) Improvement of hygienic fish handling by providing ice boxes Pattukotai, Peravurani, and Sethubavachatram.
f) Increasing fish production in existing fish/shrimp farms by providing aerators and infrastructure boxes Pattukotai, Peravurani, and Sethubavachatram.
g) Resource conservation in marine sector by promotion of fishing using passive gears boxes Pattukotai, Peravurani, and Sethubavachatram.
h) Promotion of hygienic fishing Harbours and fish landing centres boxes Pattukotai, Peravurani, Sethubavachatram.
i) Resource enhancement by ranching of seeds in rivers and sea in Budalur, Pattukotai, Peravurani, Sethubavachatram, Thanjavur, Thiruvaiyaru.
j) Introduction of short seasonal fish species in existing farm ponds in all blocks.
k) Organization of Fish festival at Kumbakonam, Orathanadu, Pattukotai.

Creation of infrastructure facilities

Project rationale

The demand in fish seed will be increased in the ensuing years as the Agri farmers tend to venture into aquaculture. To improve this trend and to meet the demand, it is necessary to utilize the existing resources optimally to bridge the gap. This intervention will not only restore the infrastructure of the Government fish seed farms but also self-sufficiency can be achieved in the near future in seed production. Such seed farms have to be strengthened by undertaking repair and renovation, thereby increasing the fish seed production and narrow the gap between the demand and supply and by renovating breeder pond, additional breeders can be maintained for sustained fingerling production.

Tilapia is named as the Food Fish of the 21st century and is popularly known as aquatic chicken. Tilapia occupies lower level food chain which makes the culture economical and eco-friendly. Monosex culture of Tilapia is advantageous as they grow fast and uniformity in size is generally obtained in a culture pond. The Genetically Improved Farmed Tilapia (GIFT) has enhanced the culture as well as market potential as it is scientifically proved to be superior to fresh water carps and would be an ideal candidate for fish culture. Moreover, GIFT fish has high export potential to USA, African countries and Japan. Domestic demand also needs to be tapped due to easiness to fillet the fish. Technical parameters of Tilapia culture includes site selection, pond development, pre and post stocking operations, stocking, fertilization, feeding, harvest and post-harvest operations. So establishment of GIFT farms will increase the livelihood of fishermen through export.

Project goal

The programs are planned for creation of required infrastructure facilities to facilitate the fish production and fish marketing.

Project components

a) Establishment of fish culture ponds and provision of inputs in Kumbakonam, Orathanadu, Pattukotai, Thanjavur, Tiruvidaimaruthur.
b) Increasing seed availability by establishing seed rearing units in Kumbakonam, Orathanadu, Papanasam, Pattukotai, Thanjavur, and Thiruvaiyaru.
c) Establishment of District Extension and Training centres Orathanadu, Pattukotai, and Thanjavur.

Project area

The fish culture ponds, seed rearing units, direct extension and training centres and GIFT farms will be established in Kumbakonam, Orathanadu, Thanjavur, Sethubhavachatram and Pattukottai blocks.

Project implementing agency

The proposed infrastructures will be established by the Department of Fisheries. The progress of the work will be monitored by heads of district level officials.

Overall budget

The interventions on production and growth, infrastructure development, training and exposure visits and research and development are planned to implement with a budget outlay of **₹. 3128.00 lakhs.**

Table.4.25. 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	Resource conservation in marine sector by promotion of fishing using passive gears	No	1	Pattukottai; Peravurani; Sethubava chatram	0	0	20	20	20	20	30	30	100	100	170	170
2	Resource enhancement by ranching of seeds in rivers and sea	No	10	Budalur; Pattukottai; Peravurani; Sethubavach atram; Thanjavur; Thiruvaiyaru	0	0	10	100	10	100	10	100	10	100	40	400
3	Promotion of hygienic fish handling in fishing Harbours and fish landing centers	No	5	Pattukottai; Peravurani; Sethubavach atram	0	0	14	70	4	20	4	20	4	20	26	130
4	Introduction of short seasonal fish species in existing farm ponds	No	0.79	Ammapet; Budalur;Kum bakonam; Orathanadu; Papanasam; Thanjavur; Thiruvaiyaru; Thiruvidaima rudur; Thiruvonam; Tiruppandal	0	0	5	3.95	10	7.9	5	3.95	0	0	20	16
5	Introduciton of IMC seeds in riverine check dams and weirs (ha.) (2000 AFL/ha. @Rs.2/seed-100% subsidy)	No	1	Budalur; Papanasam; Thanjavur; Thiruvaiyaru; Thiruvidaima rudur	0.2	0.2	40.2	40.2	20.2	20.2	0.2	0.2	0.2	0.2	61	61

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
6	Increasing safety at sea by providing life buoy/life jackets	No	0.02	Pattukottai, Peravurani, Sethubavachatram	0	0	1200	21	500	8.75	750	13.13	1000	17.5	3450	60
7	Increasing fishing efficiency of inland fishermen and fish farmers	No	0.15	Budalur; Kumba konam; Orathanadu; Papanasam; Pattukottai; Thanjavur; Thiruvaiyaru	10	1.5	10	1.5	10	1.5	10	1.5	10	1.5	50	8
8	Increasing fish production in existing fish/shrimp farms by providing aerators and infrastructure	No	3.35	Pattukottai; Peravurani, Sethubavachatram	0	0	20	67	25	83.75	50	167.5	100	335	195	653
9	Increasing fish production in Tamil Nadu through production and distribution of genetically improved Tilapia	No	100	Tanjavur	0	0	1	100	0	0	0	0	0	0	1	100
10	Improvement of hygenic fish handling by providing ice boxes	No	0.07	Pattukottai; Peravurani, Sethubavachatram	0	0	200	13	100	6.5	100	6.5	100	6.5	500	33
11	Establishment of GIFT farms and provision of inputs	No	5.05	Ammapet; Orathanadu; Papanasam; Pattukottai; Thanjavur	0	0	10	50.5	5	25.25	10	50.5	5	25.25	30	152
12	Enhancement of Fish production in irrigation tanks and Panchayat tanks by stocking fish seeds	No	0.076	All Blocks	0	0	200	15.2	250	19	250	19	190	14.44	890	68

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
13	Biological Control of Aquatic Weeds by Stocking of Grass Carps in Aquatic Weed Infested water bodies	Ha	0.02	Ammapet; Budalur;Kumbakonam; -Madukkur; Orathanadu; Papanasam; Pattukottai; Peravurani;Thanjavur; Thiruvaiyaru; Thiruvidaimarudur;-Thiruvonam; Tiruppandal	600	12	200	4	300	6	195	3.9	100	2	1395	28
	Section Total					**14**		**506**		**319**		**416**		**622**		**1877**
	Creation of infrastructure facilities															
14	Increasing seed availability by establishing seed rearing units	No	3	Kumbakonam, Orathanadu; Papanasam, Pattukottai; Thanjavur; Thiruvaiyaru	0	0	10	30	4	12	2	6	0	0	16	48
15	Establishment of fish culture ponds and provision of inputs	No	4.5	Kumbakonam, Orathanadu, Pattukottai; Thanjavur; Thiruvidaimarudur	0	0	5	22.5	5	22.5	5	22.5	5	22.5	20	90
16	Establishment of District Extension and Training centres	No	50	Orathanadu; Pattukottai; Thanjavur	0	0	1	50	1	50	1	50	0	0	3	150
	Section Total					**0**		**103**		**85**		**79**		**23**		**288**

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
	Capacity building programme															
17	Exposure visit to farmers to other states	No	0.06	All Blocks Except Peravurani; Sethubavachatram; Thiruvaiyaru	0	0	110	6.6	110	6.6	110	6.6	110	6.6	440	26
18	Organisation of Fish festivel	No	5	Kumbakonam, Orathanadu; Pattukottai	0	0	1	5	1	5	1	5	1	5	4	20
19	Providing trainers training and exposure visit to Departmental staff	No	0.1	Pattukottai; Sethubavachatram;Thanjavur	0	0	10	1	10	1	10	1	10	1	40	4
20	Training to fish farmers	No	0.03	Ammapet; Budalur; Kumbakonam, Orathanadu; Papanasam; Pattukottai; Thanjavur; Thiruvaiyaru; -Thiruvonam; Tiruppandal	0	0	100	3	100	3	100	3	100	3	400	12
21	Creation of Marine infrastructure facilities for the fisher-folk of coastal towns and villages to enhance Marine fish production, hygienic handling of catch and prevention of Post harvest losses	No	300	All Blocks	0	0	0	0	3	900	0	0	0	0	3	900
	Section Total					**0**		**16**		**16**		**16**		**16**		**62**
	Grand Total					**14.00**		**624.00**		**1319.00**		**510.00**		**660.00**		**3128.00**

Ammapettai-B1, Sethubavachatram-B2, Budalur-B3, Kumbakonam-B4, Madukkur-B5, Thiruvonam-B6, Peravurani-B7, Thanjavur-B8, Pattukkottai-B9, Thiruvaiyaru-B10,Orathanadu-B11, Papanasam-B12, Tiruppanandal-B13, Thiruvidaimarudur-B14

4.8.1 Fisheries Research

Cage Culture of fast growing food fishes in Seasonal Tanks

Indian freshwater resources have been estimated to be 5.47 million ha. Tamil Nadu has 0.37 million ha of freshwater resources. About 8 districts are blessed with good water resources and the scope for culture in the long and short term seasonal ponds and tanks and irrigation tanks is promising. The productivity in all these seasonal wild waters is found to be very low (less than 25 kg per ha) due to extensive nature of culture in the natural open waters. There is a scope for intensifying the stocking and production through cage farming in all these open water bodies.

Open water bodies like tanks and lakes with large extend of water spread are reported to give a very low fish production in the country due to various reasons. The low stocking and poor control over the stock due to the large extend of the water span are the major reasons behind such low production and this can be rectified by the adoption of cage farming in the open waters. Natural fertility in the open water bodies can be used for the successful growth of fishes by adoption suitable stocking density and culture practice so as to have high survival and better growth. This has been proved beyond doubt in many east Asian countries where the per unit production is around 50kg per sq. m. Such high productivity is also possible in Indian water bodies if suitable cages are framed and erected in the open water bodies like natural tanks, lakes, pools and reservoirs where the control of the fish stock will be possible in the cages.

The proposal for cage farming in seasonal tanks aims at popularizing and adopting cage farming technology for carps (preferably common carp and Mrigal) and other highly preferred air breathing fishes like *Pagassius* spp in which high stocking densities are possible. The cage farming methodology will be demonstrated in selected water bodies initially in Tirunelveli where the farmers can take this technology and practice for large scale adoption in all the districts.

Project strategy

The present proposal is to demonstrate and train the inland fish farmers in cage farming of fishes and crustaceans for enhancing the production and revenue. The selected water bodies in the State districts will serve as a demo ground and dissemination centre for the technology. Appropriate cages of various sizes (from 1 to 10 m^2) will be procured from the standard cage manufacturers in the country or abroad and used for the farming purposes.

Project components

- To encourage inland aquaculture by yield enhancement through innovative farming for commercially important inland fishes.
- Strengthening of farm infrastructure facilities in inland centeres of TNFU
- Establishment of regional labs for disease diagonosis, water quality and aquatic animal health management in all blocks.
- Establishment of mobile aquaculture in all blocks.
- To reduce post harvest losses in fisheries make awareness to fishers on hydienic handling, fish processing technonolgy and create skill development among farmers in all blocks.
- Enhancing per capita consumption of fish create awareness among farmers on health beneficial attributes of fish in all blocks.
- To ensure nutritional security through supply of fish foods through public distribution system. And supply chain management to produce consumption of farmed fishes in all blocks.
- Utilizing fish processing wate by installation of waste rendering plant, development of compost plot, installation of biogas unit, develop new technologies for effective management of shrimp shell waste in all blocks.
- Design and development of e-interface gadgets for sustainablr aquaculture in all blocks.
- Design and development of synchronised harvester for freshwater aquaculture.
- Development of cost effective gadgets for effective navigation.
- Establishment of incubation centre for value addition product development in all blocks.

Budget

The proposed intervention will be implemented with a budget outlay of **₹. 2656.43 lakhs.**

Project implementing agency

The project will be implemented by the Tamil Nadu Fisheries University. The progress of the work will be monitored by the Vice Chancellor and Nodal Officer of the concerned project.

Expected outcome

The implementation of the project will trigger the adoption of cage farming in the inland fisheries system.

Table 4.26 Budget requirement for 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**														
	Yield enhancement through innovative farming techniques for commercially important inland fishes	200	Thanjavur	1	200.00	0	0.00	0	0.00	1	200.00	0	0.00	2	400.00
	Strenghtening of farm infrastructure facilities in inland centres of TNFU	150	Thanjavur	0	0.00	1	150.00	0	0.00	0	0.00	0	0.00	1	150.00
iii	**Aquatic animal health and management**														
	Establishment of regional labs for disease diagnosis, water qaulity and aquatic animal health management	150	Thanjavur	0	0.00	0	0.00	1	150.00	0	0.00	0	0.00	1	150.00
	Mobile aquaclinics for water quality analysis and disease diagnosis	100	Thanjavur	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**														
	Reduction of post harvest losses														
	Awareness to fishers on hygienic handling of fish	0.005	Thanjavur	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	Thanjavur	25	15.00	25	15.00	25	15.00	25	15.00	25	15.00	125	75.00
	Capacity building and skill development programmes on fish processing technologies	6.6	Thanjavur	13	85.80	13	85.80	13	85.80	13	85.80	13	85.80	65	429.00
	Enhancement of per capita consumption of fish														
	Awareness campaign on health beneficial attributes of fish	0.005	Thanjavur	52	0.26	52	0.26	52	0.26	52	0.26	52	0.26	260	1.30

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
	Production of short films on nutritive value of fish and screening in theatres and television channels	50	Thanjavur	0	0.00	0	0.00	1	50.00	0	0.00	0	0.00	1	50.00
	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	Thanjavur	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	Thanjavur	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	Thanjavur	0	0.00	1	64.50	0	0.00	0	0.00	0	0.00	1	64.50
	Utilization of fish processing waste and by catch														
	installation of waste rendering plant at selected fishing harbors and fish markets	130	Thanjavur	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	Thanjavur	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	Thanjavur	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	Thanjavur	0	0.00	1	100.00	0	0.00	0	0.00	0	0.00	1	100.00
3	**Fisheries Engineering**														
i	**Aquacultural engineering**														
a	**Farm implements**														
	Deisgn and development of e interface gadgets for sustainable aquaculture	20	Thanjavur	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	Thanjavur	0	0.00	0	0.00	1	30.00	0	0.00	0	0.00	1	30.00

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
c	**Renewable energy technologies**														
	Design and development of renewable energy powered aerators for aquaculture	35	Thanjavur	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	Thanjavur	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	Thanjavur	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	Thanjavur	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	Thanjavur	0	0.00	0	0.00	0	0.00	0	0.00	1	8.00	1	8.00
iii	**Post-harvest fisheries engg**														
a	**Handling, transportation and storage**														
	Design and development of handling devices/machines for fish processing	50	Thanjavur	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	Thanjavur	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	Thanjavur	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	Thanjavur	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**		**2656.43**

Public works department

4.11. Increasing the ground water level

Public works department is a premier agency of the state government operating throughout the state for construction of works in Roads, Bridges, Buildings, maintenance and repairs of works and construction of works of other departments of the state government and centrally sponsored schemes. The main function of public works department is designing, construction and maintenance of roads and bridges, residential and non-residential building of state government, construction of national highway, construction of roads financed from NABARD, RIDF, CRF and construction of various works on Airport and Air landing ground.

With the declining and erratic rainfall, it has become necessary to go in for *in situ* water conservation. Further the loss of top soil through erosion needs to be controlled to maintain the soil fertility. The reduction of water storage facilities and the conversion of water bodies for non-agricultural purposes result in the rainwater run-off. The *in situ* water conservation will help in reducing the water and soil erosion and also improve the ground water recharge which is the need of the day. Hence, to raise the water table level, construction of check dams, need to be taken up in canals to increase the storage capacity of the tanks and there by crop cultivation area in tank ayacut area may be increased. Thus the main objective of Public works department in this district is to construct check dam and Anicutacross the river in order to increase the ground water level.

The major intervention proposed

1. Pumping scheme across M.S.River in Maharasamudram village to feed Alivalam No.3 Channel in Naduvikkottai village of Pattukkottai Taluk in Thanjavur District in Pattukotai.
2. Pumping scheme across Nasuviniyar River near Medayankollaivillage to feed Ettipulikadu Channel No.2 ayacut in Karambayam village of Pattukkottai taluk in Thanjavur district in Pattukotai.
3. Pumping scheme across Kannanar River to feed Vadavar Extension Channel No.12th near Kanniyakurichi village in Olayakunnam village of Pattukkottai taluk in Thanjavur district in Pattukotai.
4. Pumping scheme across Kannanar River to feed SiruthalaiEri and Keelavannipattuayacut in OkkanaduKeelaiyur village of Orathanadu taluk in Thanjavur district in orathandu.
5. Pumping scheme across M.S.River to feed Rajamadam 19, 20, 21 channel and ChellikurichiEri in Sendakottai village in Pattukkottai taluk in Thanjavur district in Pattukotai.

6. Construction of Check dam across Muthalaimuthuvari in Vannarapettai village of Thanjavur taluk in Thanjavur district of thanjavur block.
7. Pumping scheme across M.S.River to feed Rajamadam main channel in Enathi village Pattukkottai taluk in Thanjavur district in Pattukotai.
8. Construction of check dam across Kandikulamvari in palayanagaram village in peravurani Taluk in Thanjavur District in peravurani.
9. Pumping scheme across M.S.River to feed Seethakulam and Koon Eri in Pallikondan village in Pattukkottai taluk in Thanjavur district in Pattukotai.
10. Pumping scheme acrossM.S.River to feed Rajamadam No.17th channel in Muthalcheri Village of Pattukkottai taluk in Thanjavur District in Pattukotai.
11. Pumping scheme across in Mudiyanar River to feed Thiruvampadi Main Channel and tail end ayacut of Karuppattikadu in Thiruvathevan village of Peravurani taluk in Thajavur district in peravurani.
12. Pumping scheme across Vallamvari to feed Kulamangalam No:3 channel ayacut near Thalayamangalam village in Orathanadu taluk in Thanjavur district in orathandu.
13. Construction of Bed dam across Singanerivadigal in Keelavannipattu village of Orathanadu taluk in Thajavur district in orathandu.

Budget

The budget requirement for fulfilling the above interventions is **₹.1947.06 lakhs** for 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 4.27. Budget requirement 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	Pumping scheme across M.S.River in Maharasamudram village to feed Alivalam No.3 Channel in Naduvikkottai village of Pattukkottai Taluk in Thanjavur District.	Ha	0.79	Pattukkottai	589.02	468.00	0	0.00	0	0.00	0	0.00	0	0.00	589.02	468.00
2	Pumping scheme across Nasuviniyar River near Medayan kollaivillage to feed Ettipulikadu Channel No.2 ayacut in Karambayam village of Pattukkottai taluk in Thanjavur district.	Ha	0.73	Pattukkottai	401.02	294.00	0	0.00	0	0.00	0	0.00	0	0.00	401.02	294.00
3	Pumping scheme across Kannanar River to feed Vadavar Extension Channel No.12th near Kanniyakurichi village in Olayakunnam village of Pattukkottai taluk in Thanjavur district.	Ha	0.19	Pattukkottai	1492	281.00	0	0.00	0	0.00	0	0.00	0	0.00	1492	281.00

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	Pumping scheme across Kannanar River to feed Siruthalai Eri and Keelavannipattu ayacut in Okkanadu Keelaiyur village of Orathanadu taluk in Thanjavur district.	Ha	1.08	Orathanadu	237.07	256.00	0	0.00	0	0.00	0	0.00	0	0.00	237.07	256.00
5	Pumping scheme across M.S.River to feed Rajamadam 19, 20, 21 channel and Chellikurichi Eri in Sendakottai village in Pattukkottai taluk in Thanjavur district.	Ha	0.04	Pattukkottai	0	0.00	2010	85.10	0	0.00	0	0.00	0	0.00	2010	85.10
6	Construction of Check dam across Muthalaimuthu vari in Vannarapettai village of Thanjavur taluk in Thanjavur district.	Ha	0.05	Thanjavur	0	0.00	306	15.46	0	0.00	0	0.00	0	0.00	306	15.46
7	Pumping scheme across M.S.River to feed Rajamadam main channel in Enathi village Pattukkottai taluk in Thanjavur district.	Ha	0.06	Pattukkottai	0	0.00	954.99	55.50	0	0.00	0	0.00	0	0.00	954.99	55.50
8	Construction of check dam across Kandikulam vari in palayanagaram village in peravurani Taluk in Thanjavur District.	Ha	0.17	Peravurani	0	0.00	83.58	14.11	0	0.00	0	0.00	0	0.00	83.58	14.11

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
9	Pumping scheme across Kattuvari to feed Vadavar Extension Channel No.1st and Mannarkudi Channel No.7th ayacut in Sundarakottai village of Mannargudi taluk in Thiruvarur district.	Ha	0.05	Mannarkudi	0	0.00	1511.23	72.93	0	0.00	0	0.00	0	0.00	1511.23	72.93
10	Pumping scheme across M.S.River to feed Seethakulam and Koon Eri in Pallikondan village in Pattukkottai taluk in Thanjavur district.	Ha	0.13	Pattukkottai	0	0.00	0	0.00	200	25.50	0	0.00	0	0.00	200	25.50
11	Pumping scheme across Kalagamvari to benefit High lever lands in Thalikottai village of Mannarkudi taluk in Thiruvarur district.	Ha	0.11	Mannarkudi	0	0.00	0	0.00	1069.17	115.60	0	0.00	0	0.00	1069.17	115.60
12	Pumping scheme across M.S.River to feed Rajamadam No.17th channel in Muthalcheri Village of Pattukkottai taluk in Thanjavur District	Ha	0.12	Pattukkottai	0	0.00	0	0.00	499.54	60.50	0	0.00	0	0.00	499.54	60.50

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
13	Pumping scheme across in Mudiyanar River to feed Thiruvampadi Main Channel and tail end ayacut of Karuppattikadu in Thiruvathevan village of Peravurani taluk in Thajavur district.	Ha	0.16	Peravurani	0	0.00	0	0.00	265.64	41.25	0	0.00	0	0.00	265.64	41.25
14	Pumping scheme across Vallamvari to feed Kulamangalam No:3 channel ayacut near Thalayamangalam village in Orathanadu taluk in Thanjavur district.	Ha	0.07	Orathanadu	0	0.00	0	0.00	896.86	64.50	0	0.00	0	0.00	896.86	64.50
15	Construction of Bed dam across Singaneri vadigal in Keelavannipattu village of Orathanadu taluk in Thajavur district.	Ha	0.44	Orathanadu	0	0.00	0	0.00	0	0.00	166.15	73.11	0	0.00	166.15	73.11
16	Drainage scheme for Submersion relief to irrigable ayacut in Karambakudi and Akkarakottagam village ayacut of Mannargudi taluk in Thiruvarur district.	Ha	0.04	Mannarkudi	0	0.00	0	0.00	0	0.00	570	24.50	0	0.00	570	24.50
	Total					**1299.00**		**243.10**		**307.35**		**97.61**		**0.00**		**1947.06**

4.12. 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) Infrastructure development such as construction of office building and compound wall at Thanjavur, Thiruvaiyaru, Budalur, Kumbakonam, Tiruppandal, Papanasam.
b) Office building renovation at Thanjavur, Orathanadu, Thiruvaiyaru, Budalur, Ammapetai, Tiruppandal, Sethubavachatram, Madukkur, Pattukotai, Peravurani, Thiruvonam.
c) Construction of marriage hall at Kumbakonam.
d) Provision of furniture, solar panel to Thanjavur, Thiruvaiyaru, Budalur, Kumbakonam.

Capital Asset Creation

a) Godown renovation in Ammapetai, Papanasam.
b) Establishment of processing unit at Pattukotai.
c) Godown construction at Thanjavur, Thiruvaiyaru, Budalur, Kumbakonam, Tiruppandal, Tiruvidaimaruthur, Papanasam, Pattukotai, Orathanadu, Budalur.
d) Provide safety locker to Kumbakonam, Papanasam.

Budget

It is proposed to incur **₹.2045.00** 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, PublicDistribution 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.4.28 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
1	Construction of Compound wall	B8, B10, B3, B4, B13, B14, B12	10	50.00	16	79.50	13	62.21	15	60.80	3	15.00	57	267.51
2	Construction of Godown	B8, B10, B3, B4, B13, B14, B12, B9, B11, B7	15	201.80	3	36.00	3	36.00	3	36.00	3	36.00	27	345.80
3	Construction of Office Building	B8, B11, B10, B3, B1, B13, B2, B5, B9, B7, B6	19	325.00	13	192.00	12	200.00	9	140.00	3	30.00	56	887.00
4	Establishment of Processing unit	B9	2	25.44	0	0.00	0	0.00	0	0.00	0	0.00	2	25.44
5	Renovation of Godown	B1, B12	0	0.00	0	0.00	0	0.00	1	3.00	1	1.00	2	4.00
6	Renovation of Office Building	B8, B11, B10, B3, B1, B13, B2, B5, B9, B7, B6	6	29.00	10	33.00	14	53.00	10	32.50	10	33.50	50	181.00
7	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 machine, LED Display for tender process, Purchase of Jewel Carat Meter, Smart Card Printing	All Blocks	42	95.61	38	60.45	33	47.62	32	44.99	25	43.48	170	292.15

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, 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)													
8	Amenities for Cooperative Centres (RO Water unit, Sanitation, Vehicle Parking Shed, Construction and renovation of Marriage Hall, Construction and renovation of amenity centres)	All Blocks	1	40.00	0	0.00	0	0.00	0	0.00	3	2.10	4	42.10
	Total			**766.85**		**400.95**		**398.83**		**317.29**		**161.08**		**2045.00**

Ammapettai-B1, Sethubavachatram-B2, Budalur-B3, Kumbakonam-B4, Madukkur-B5, Thiruvonam-B6, Peravurani-B7, Thanjavur-B8, Pattukkottai-B9, Thiruvaiyaru-B10,Orathanadu-B11, Papanasam-B12, Tiruppanandal-B13, Thiruvidaimarudur-B14

Table.4.29 Budget Abstract for Thanjavur District

(₹. In lakhs)

Sl. No	Sectors	2017-18	2018-19	2019-20	2020-21	2021-22	Total
1	Agriculture	19828.31	23515.66	25673.55	27175.52	31129.38	127322.41
2	Agricultural Research (TNAU)	466.00	411.00	416.00	26.00	431.00	1750.00
3	Horticulture	3128.01	3314.78	3591.48	3883.54	4165.83	18083.63
4	Agricultural Engineering	3097.04	2289.26	2114.08	2164.33	2517.04	12181.75
5	Agricultural Marketing	1744.74	1257.01	1554.96	1099.18	1295.55	6951.00
6	Seed Certification & Organic Certification	23.36	3.30	16.66	503.30	3.30	549.92
7	Animal Husbandry	2329.10	2104.70	1029.70	728.10	828.10	7019.70
8	Animal Science Research (TANUVAS)	514.72	971.33	1128.65	157.32	373.72	3145.74
9	Dairy Development	1439.00	1576.00	9911.00	2216.00	1406.00	16548.00
10	Fisheries	14.00	624.00	1319.00	510.00	660.00	3128.00
11	Fisheries Research (TNFU)	318.73	1155.53	698.73	373.73	109.73	2656.43
12	Water Resource Organization (PWD)	1299.00	243.10	307.35	97.61	0.00	1947.06
13	Civil Supplies & Co-Operation	766.85	400.95	398.83	317.29	161.08	2045.00
	Total	**34968.86**	**37866.62**	**48159.99**	**39251.92**	**43080.73**	**203328.64**

The plan outlay for five years (2017-22) for Thanjavur district is given in Table 4.28. Among the different activities, Agriculture and Horticulture sector requires huge financial outlay (**₹** 127159.91 and 18083.63 lakhs respectively) of the total plan outlay of **₹. 203328.64** lakhs. Greater emphasis has been given to farm mechanization and soil and water conservation measures as they have become pre-requisites to the implementation of modern technologies and also to increase the productive and potential of crops in Thanjavur district.


KARNATAKA
KERALA
SRI LANKA